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THE LONG-TERM STABILITY OF DETERRENCE

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In this article, we construct a model of deterrence that specifically integrates both systemic and decision-making variables. After contrasting its underlying structure with more standard views of the deterrence relationship, we demonstrate the logical consistency of the power transition model with the expected utility framework. The model we develop combines and extends the insights of each of these two approaches, thereby permitting us to develop a theory of the necessary and sufficient conditions of major power war and conflict initiation. In other words, for the first time, we are able to specify, precisely, the theoretical consequences of variations in power dynamics, evaluations of the status quo, salience, and attitudes toward risk. As theories of the necessary conditions for international conflict, neither the power transition theory nor the expected utility model provide this information. Thus, by combining and then extending these two frameworks, we merely refine propositions implicit in each of them, making them more exact. The resulting structure provides several additional insights into the dynamics of nuclear conflict.

1. MODELING THE LONG-TERM STABILITY OF DETERRENCE

Our purpose is to explore the fundamental assumptions of deterrence theory and to uncover the conditions under which deterrence is, or is not, stable. In examining the circumstances that give rise to the long-term stability of deterrence, we concentrate exclusively on nuclear rather than conventional stability. We do this not only because of the obvious importance of the nuclear question, but also because of the long and as yet unresolved debate in both academic and policy circles about the precise nature of the deterrence equilibrium. While many analysts, writing in the tradition of Bernard Brodie (1946), have characterized the strategic relationship of the superpowers as unusually robust, others have been less sanguine about the prospects of the current strategic relationship of the superpowers delivering us to the millennium (Hardin *et al.*, 1985; Howard, 1984; Huth, 1988; Huth and Russett, 1984, 1988; Kugler, 1984). Is the strategic relationship stable or delicate? This is the central question we address in this essay.

Nuclear deterrence is an elusive quarry. The absence of a superpower war since the devastation of Hiroshima and Nagasaki, fortunately, makes it impossible to test directly the theory of deterrence. Still, it does not follow that the stability of the post-war era can be attributed to the ability of each superpower to obliterate the other. Though many have made this argument (see, for instance, Huntington, 1982), much the same could also have been said about the stabilizing impact of alliances and the balance of power system prior to 1914. It is entirely possible that a global nuclear war has thus far been averted simply because the necessary conditions for such a conflict have not been satisfied (Doran and Parsons, 1980; Kugler, 1984; Modelski and Morgan, 1985).

The inability to gauge directly the stability of nuclear deterrence, though, is not necessarily fatal to the task of resolving the dispute about the robustness of deterrence. If a theory of international conflict is fully articulated, the nature of the deterrence equilibrium can be indirectly tested by exploring the theory's subsidiary propositions and their corollaries. For instance, if the nuclear era is indeed *sui generis* and inherently more stable than previous periods, then one would expect nuclear nations and their nuclear or non-nuclear opponents to behave differently than when such states had only conventional capabilities (Huth and Russett, 1984). On the other hand, if nuclear powers and their opponents behave the same way they have in the past, then the claims of Brodie and his followers are thrown into question (Kugler, 1984).

As the first step toward a basic reevaluation of the deterrence paradigm, we summarize the underlying assumptions and major policy implications of a viewpoint on deterrence that we call the *classical* model. This model, which can be traced back to Brodie's seminal contribution, rests upon the assumption that deterrence stability is directly affected by the absolute cost of warfare. The implication, of course, is that since the costs of war approach the limit in the nuclear age, strategic nuclear deterrence constitutes an unusually robust and stable relationship.

The theory that we develop herein is, by contrast, rooted in an alternate set of assumptions about the nature of war and peace decisions. Like earlier writers in this tradition who focus on *marginal* advantages generated by changes or transitions in nuclear capabilities (see, *inter alia*, Organski 1958, or Kahn 1962), we find that the balance of terror is rather delicate. Thus, like applied strategists in this field who worry about "missile gaps" or "windows of vulnerability," we conclude that the possibility of a deterrence failure is very real in spite of the huge absolute losses that face belligerents in a nuclear conflict.

The Classic Perspective on Deterrence

In the "first wave" of theorizing about the strategic implications of nuclear weapons, Brodie (1946) argued that, given the 'unacceptable' cost of nuclear war, a commitment to retaliation would secure the long-term prospects of deterrence. Although this simple and straightforward idea has undergone considerable elaboration and refinement over the past forty years, it remains the fundamental starting assumption of the vast majority of strategic theorists whose work delimits the classical model (Morgan 1983; Jervis 1979, 1984; Kaufmann 1956; or Brodie 1946, 1959, 1978). Rather than review this vast literature *in toto*, we will summarize the refinements and developments of the classical view of deterrence by describing, briefly, its formal specification. We believe that a model developed by Intriligator and Brito (1984, 1987) is the clearest and most consistent articulation of the prevailing view of "classical" deterrence. Their model has the added virtue of highlighting some of the non-obvious implications of Brodie's original premise.[1]

In formalizing the argument of classical deterrence theory, Intriligator and Brito begin by transforming verbal statements about levels of "unacceptable" costs into structured equations. Specifically, they start with the assumption that both the deterrer, i, and the challenger, j, can anticipate the absolute level of destruction that would dissuade them from initiating a war. Like Brodie, they assume that each actor can determine a threshold above which each is unwilling to initiate a conflict and a second one below which each will still consider war as an option to resolve disputes. In between is a gray area of unstable deterrence wherein each actor is not predisposed to attack the other but remains undeterred.[2] Mutual Assured Destruction is attained when both sides are forced to yield because the costs of war initiation are 'unacceptable". Figure 1 shows how this model defines the stages of a deterrent relationship.

The critical deductions of the classical view of nuclear deterrence follow from these simple assumptions. First, as the expected cost of conflict increases, the likelihood of war decreases. Second, as the absolute costs exceed acceptable damage, deterrence becomes increasingly stable and waging a nuclear war becomes unthinkable.

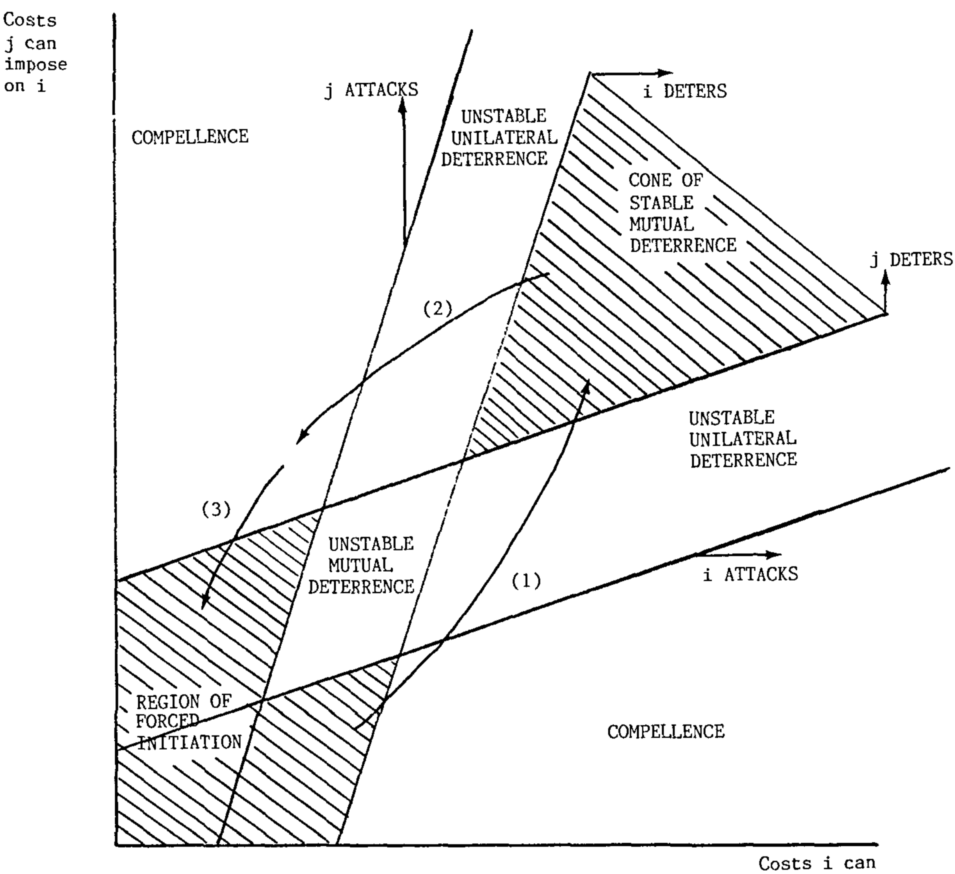


FIGURE 1 The Classic View of Deterrence (Intriligator and Brito, 1987).

The distinction between conventional and nuclear deterrence is apparent from a comparison of the region of forced preemption and the cone of stable mutual deterrence. The difference is based on absolute costs. When absolute costs are low, war may be waged among relatively equal contenders; but when they are prohibitively high, stable deterrence is assured (Waltz, 1981: 4). In other words, at the conventional level, parity leads to constant probing or war; but at the nuclear level, parity leads to peace. Thus, similar structural conditions at different levels of destruction produce dramatically different behavior from competing states. This is precisely why Brodie (1946) argued that nuclear war is no longer viable: not because it cannot be waged, but because it cannot be won.

Building on the interaction between levels of destruction and war, Intriligator and Brito derive the conditions for stable and unstable deterrence. Their model indicates explicitly how stability has been enhanced by the deployment of nuclear weapons. Indeed, the model explains why, in the period of nuclear monopoly, the United States relied on a policy of Massive Retaliation and why, in periods of relative balance, the United States, the Soviet Union, and increasingly, China and France have come to rely on Mutual Assured Destruction.

Retaliation is critical to this argument. During the transition from the region of forced initiation to the cone of mutual deterrence, war can only be averted when the stronger party pursues a policy of retaliation *and* self-restraint. Note, though, that if the stronger party initiates a war during such a transition period, the conflict will most likely be short and decisive: if the weaker actor does not yield when faced with the prospect of a one-sided nuclear confrontation, it will capitulate soon after the unilateral use of nuclear weapons.

One very important (and frequently unrecognized) implication of this model concerns the impact of nuclear proliferation. Like some other classical deterrence theorists (e.g., Waltz, 1981, or Bueno de Mesquita and Riker, 1982), Intriligator and Brito (1981) argue that, under specified conditions, the proliferation of nuclear weapons reduces the likelihood of nuclear war.[3] Counterintuitively, when only a few actors have nuclear weapons, and stockpiles are limited, the likelihood of war increases because nuclear powers might be tempted to use them preemptively to resolve a serious dispute. But, as the number of actors with large nuclear stockpiles increases, the probability of war actually decreases and eventually approaches zero (Intriligator and Brito, 1981, p. 256; Berkowitz, 1985).[4]

The classical model also suggests that the risk of war is reduced as the destructive capability of strategic weapon systems increases. During readjustment periods outside the cone of stability, preemptive or preventive nuclear wars are possible. Once the cone is reached, however, the deployment of more potent strategic weapons enhances deterrence. Indeed, the balance of terror is most stable when it assures an "overkill" capacity that not only insures a second-strike capability but also provides a cushion that minimizes any disturbances introduced by technological breakthroughs or by the uneven deployment of new generations of strategic weapons.

Most classical deterrence theorists agree that the United States and the Soviet Union are now firmly ensconced in the cone of mutual assured destruction. To reach this point, however, the two superpowers had to travel a risky path characterized by potential instability. Trajectory 1 in Figure 1, which Intriligator and Brito (1984: 82) suggest describes this path, shows that before they reached the cone of mutual deterrence around 1974, the superpowers had to move through an unstable period in which neither could deter, and another period in which only the stronger could unilaterally deter the weaker. The lower part of this trajectory similarly describes the history of the nuclear relationship of the Chinese and Soviets (Kugler, 1984).

Intriligator and Brito's model also reveals why most classical deterrence theorists oppose the deployment of a full-fledged strategic defense system. When one actor in the cone develops an effective defensive system, deterrence is destabilized since that actor can no longer be deterred by the threat of retaliation (see trajectory 2). Clearly, when one state deploys a defensive system, the retaliatory capacity of its opponent is limited; consequently, competitors who were once in the cone of mutual deterrence must again travel through a period of instability before stable deterrence can be reestablished.[5] Moreover, if both sides deploy effective defense systems concurrently, as in trajectory 3, the probability of a massive conventional war is increased; after deployment, neither side can utilize nuclear weapons to threaten the other with unacceptable destruction to prevent the outbreak of war.[6] Classical deterrence, therefore, produces stable outcomes when the relationship between actors is static. But a different picture emerges as soon as antagonists are assumed to move across deterrence thresholds.

Clearly, a major empirical problem for the classical model arises in explaining the actual stability of deterrence during these theoretically identified periods of instability. To be sure, one might plausibly argue that the observed stability of the US-USSR relationship was due to the fact that the United States has been a status quo power and, hence, preferred not to attack the Soviet Union even when it was not deterred (Intriligator and Brito, 1984: 82; Zagare, 1987: chapter 7). But it is difficult to sustain this argument in the Soviet-Chinese case. If the United States had to deter the Soviet Union at the height of the Sino-Soviet rift, then the USSR could not have been a status quo country; and given the stormy relationship of the United States and China following the Korean War, the United States could not have been expected to intervene on behalf of China during the early stages of the Chinese strategic augmentation (Kugler 1984).[7] What therefore prevented the Soviet Union from initiating a preemptive nuclear strike against China? From the view point of the classical model, the most compelling explanation of the lack of war during these periods of strategic imbalance is luck (Jones and Thompson, 1978).

The Power Transition Perspective on Nuclear Deterrence

The perspective on deterrence we propose emerges from research on conventional conflict which strongly suggests that, in the past, decisions to wage major wars have been made by leaders who act as if they were net power maximizers (Organski and Kugler 1980). Thus, in contrast to classical deterrence theorists, we begin with the proposition that the calculus of war and peace has not changed with the advent of nuclear weapons even though the consequences have (obviously) been magnified. In other words, we postulate that decision-makers will seek to maximize their marginal payoffs whether they are faced with massive or with limited absolute costs.

The structural and the temporal dynamic of our model is provided by the power transition theory suggested first by Organski in 1958 and amended, after empirical evaluation, by Organski and Kugler in 1980. Unlike balance of power theory—from which classical deterrence theory is derived—this framework is entirely consistent with the weight of systematically collected empirical evidence suggesting that power parity is associated with the outbreak of major wars among major powers (Garnham, 1976; Houwelling and Siccama, 1988; Siverson and Sullivan, 1983; Weede, 1976). In other words, the power tran-

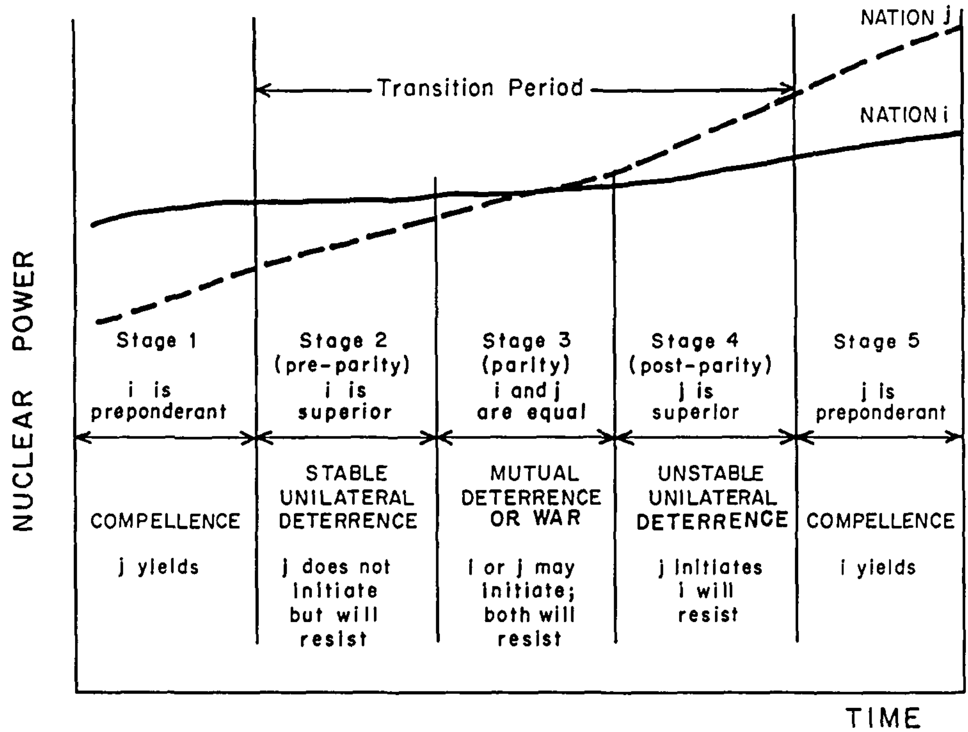


FIGURE 2 Conflict Dynamics and the Power Transition.

sition model provides a set of necessary conditions for interstate conflict that have proven to be particularly effective in postdicting the onset of massive conventional wars during the last 150 years (Organski and Kugler 1980; Thompson 1973). In addition, the power transition perspective is wholly compatible with the premise that decision-makers act as if they were marginal utility maximizers and, as we demonstrate shortly, with the expected utility model of conflict initiation which itself has impressive empirical support (Bueno de Mesquita, 1981, 1985a). For these reasons, the power transition framework is an extremely attractive base upon which to construct a theory of the necessary *and* sufficient conditions for war in the nuclear age.

The graph of Figure 2 shows the conditions for stable and unstable deterrence as specified by the power transition theory. Under certain conditions, the predictions of power transition and classical deterrence coincide. Specifically, when one nation is preponderant (stages 1 and 5),[8] both judge war to be unlikely since the preponderant power should be able to extract whatever it wishes from the weaker state without significant costs to itself. The two frameworks diverge in their expectations, however, during each of the three stages of the transition period.

From the vantage point of the power transition model, during the immediate *pre-parity* period (stage 2), the conditions for stable unilateral deterrence emerge. During this period, the challenger, j, is able to resist the demands of i. Thus, the necessary conditions for a confrontation are present but demands for a significant change in the status quo required for massive conflict are unlikely. After all, since the prevailing international order is controlled by, and designed for, the benefit of the militarily superior dominant power, i has little incentive to issue a challenge and j, despite dissatisfaction, is not capable of imposing its demands.[9]

Under conditions of *parity and transition* (stage 3), the expectations of classical deterrence theory and the power transition theory diverge most dramatically. In the view of classical deterrence, parity, coupled with "unacceptable" costs of conflict initiation, insures peace. From the power transition perspective, however, parity under conditions of transition provides simultaneously the necessary conditions for serious conflict *or* peace. The rationale for this conclusion is straightforward. During a power transition, j is sufficiently strong to make credible threats and, if its demands fail to bring adjustments, wage war. In other words, power transition postulates that competitors wage war precisely because each side has a relatively equal opportunity to achieve a net gain from victory, and because each can anticipate the possibility of a net loss from compromise or capitulation. Empirically, conflicts of the magnitude of World War I and II were fought only when these rare conditions were present. Nevertheless, the empirical record also reveals that the possibility of a net gain during a transition period is not a sufficient condition for major international conflicts; in fact, only half of the recorded transitions among major powers have resulted in a major war (Organski and Kugler 1980). This suggests that the conditions for stable mutual deterrence and massive war occur simultaneously during power transition periods.

It is important to note, moreover, that unlike the instability associated with changes from unilateral to mutual deterrence in the classical deterrence model—see trajectory 1 in Figure 1—the power transition model shows that the path leading from preponderance to parity is stable. This result is consistent with the record of relations between the United States, the Soviet Union, and China between 1945 and the present, thereby adding credibility to the consistency of findings between the conventional and the nuclear periods.

According to power transition, the conditions for a major war are also present after the "power transition" when a challenger has surpassed the previously dominant power and achieves a position of marginal superiority. Unlike the pre-parity period (stage 2) which is stable because of the dominant power's satisfaction with the prevailing order, the post-parity period (stage 4) is unstable because of j's dissatisfaction with the status quo. Sooner or later, j's frustration will manifest itself in a challenge, and when it does, the declining nation i may resist to preserve the status quo. These, then, are the conditions for major war.

Since the conditions postulated in stage 4 of the power transition have not yet materialized, only indirect evidence can be used to support this assertion for the nuclear period. Recall, however, that unlike classical deterrence theory, the power transition model suggests that marginal advantages caused by technological breakthrough can destabilize deterrence. And indeed, every American president since Kennedy has been concerned with the potential for instability brought on by a "missile gap" or a "window of vulnerability." Gorbachev has strongly opposed the "Star Wars" program of the Reagan administration because of the instability imputed to this so-called defensive system. While it is clear that the absolute losses would be unacceptable in a nuclear war, practitioners seem to be particularly concerned with the marginal advantages that their country could gain through a new development, and have fueled expenditures to achieve such dubious margins.

In sum, the power transition model provides a theoretically rich and empirically consistent perspective from which the dynamics of international conflict can be viewed, but it is unable to anticipate the onset of specific wars. Our purpose here, is to move beyond this framework toward the specification of the necessary *and* sufficient conditions of major war initiation. To this end we next augment the structural dynamic provided by the power transition theory with a decision-making component that explicitly takes into account the implications of strategic interaction for the calculus of war and peace. In subsequent research we intend to evaluate this theory on the basis of its descriptive and predictive power during the nuclear age.

2. THE REVISED MODEL OF DETERRENCE

To develop the decision-making component of our model, we adopt a two-stage approach. First, we establish the logical consistency of the power transition theory and the expected utility framework developed by Bueno de Mesquita (1981, 1985a);[10] and second, we use these results to develop a game-theoretic model of interstate conflict that systematically extends the boundaries of each of these theoretically congruent perspectives. This permits us to call upon the impressive empirical support of the expected utility model to buttress the expectations of the power transition theory and also, ultimately, to use the expected utility estimates to operationalize the model we develop herein.

Power Transition and Expected Utility: Theoretical Connections

In his work on international conflict, Bueno de Mesquita (1981, 1985a) develops a theory of the necessary conditions for war and other conflict decisions. This model, which provides a useful starting point for integrating the systemic and decision-making perspectives, postulates that a decision to initiate war is made by a unitary, rational decision-maker attempting to maximize expected utility. The model permits the concurrent evaluation of a number of decisions and is flexible enough to consider both bilateral and multilateral interactions among national elites facing different risk conditions. Especially germane to the nuclear dilemma, however, is the simple bilateral structure, which shows that the basic assumptions and implications of the expected utility approach are generally consistent with those of power transition.

At the heart of the expected utility model is the assumption that a decision-maker, considering a challenge to the status quo, takes into account two distinct streams of costs and benefits: those that are associated with his evaluation of the status quo given that he does not challenge it, and those that are anticipated as a consequence of a challenge. There are three possible outcomes which can emerge if a decision-maker does nothing: the status quo can remain unchanged, it can get better, or it can get worse. Similarly, three outcomes are implied if a challenge is made: the opponent can concede, or resist. If the opponent resists, the challenger can either win or lose. The final decision to attempt to change the status quo is made by weighing the net gains and losses associated with challenging and not challenging (Bueno de Mesquita *et al.*, 1985, pp. 22-23).

Both power transition and expected utility calculate the marginal gains anticipated from a conflict and utilize similar variables. Specifically, in power transition, the expected utility concept of "probability of success" is indicated by relative capability. The difference between the power transition and the expected utility model, though, is that the latter *explicitly* incorporates into the calculus of war and peace the current and expected future evaluation of the status quo, includes a measure of risk, and adds an indicator of outcome salience to determine the importance of a dispute. The power transition model, by contrast, postulates that the nature of the status quo is negative for the challenger, that the challenger alone is willing to take risks, and that the stakes—control of the international system—are sizable.

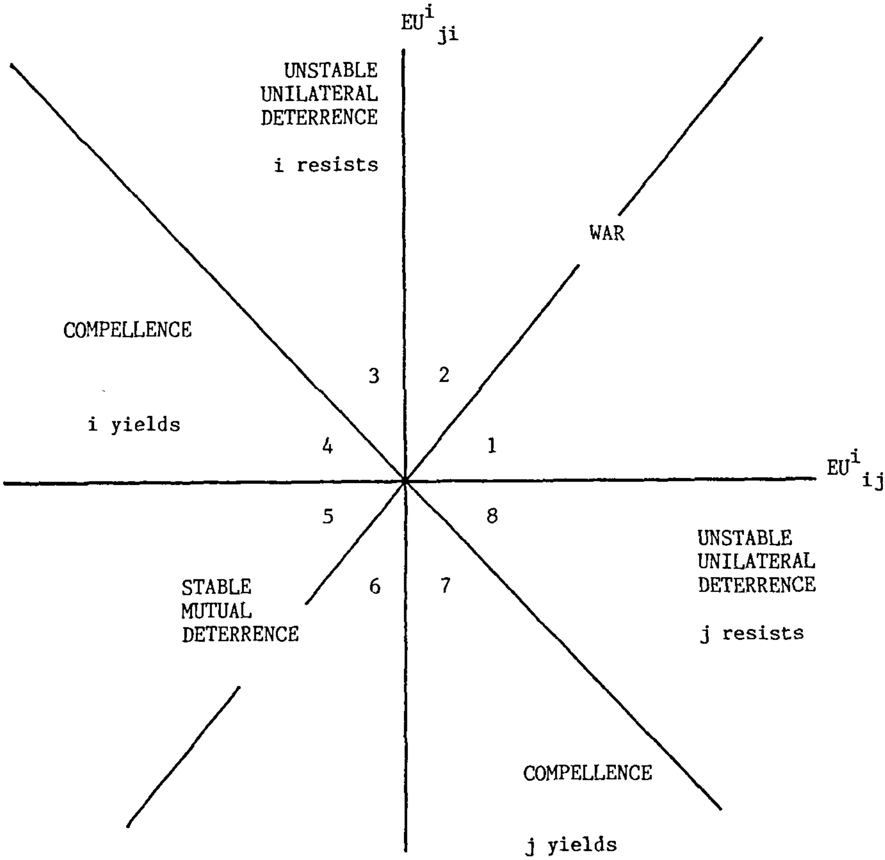
Since the underlying assumptions of each model are essentially congruent, it should not be surprising that when the empirical domain of their propositions overlaps, (i.e., major power conflict), the theoretical implications are generally consistent (Bueno de Mesquita, 1985b). To illustrate this, consider for now the impact of power changes on each player's expected utility, holding risk, salience, and preferences constant. It is easy to see in this simplified form that power changes and expected utility shifts covary. Thus, in Figure 2, as i's probability of success decreases, along with its relative capability, when one moves from the far left part of the graph through the transition period to the far right side, j's expected utility from a challenge increases. What distinguishes the two models, therefore, is the further consideration by the expected utility theory of the nature of the underlying political relationship of the two potential antagonists. Power transition suggests that *major* wars are possible only under conditions of parity when each state enjoys a reasonable chance of defeating the other. To this, the expected utility model adds the stipulation that decision-makers who choose to wage such wars must also perceive that the benefits of conflict outweigh the costs associated with altering the status quo; otherwise the challenge is withdrawn.

The connection between the aggregate results of expected utility and power transition become obvious when the coordinate system of Figure 3 is considered. Along the horizontal axis we have graphed nation i's evaluation of net gains from a bilateral confrontation with j, and along the vertical axis, i's perception of j's expected utility in a confrontation with i.[11] The specific predictions derived from the expected utility model depend upon the location of the plot of these two calculations. For example, if from i's perspective both i and j expect a net gain from a confrontation, the interaction would be placed in octants 1 or 2, suggesting that disputes between such actors are likely to result in war. Similarly, when the perception of interactions between i and j falls in octants 5 or 6, i anticipates a net loss, and perceives that disputes between them are unlikely to escalate because they are mutually deterred.

Disputes that fall into octants 7 and 8 are those in which i anticipates a net gain. In octant 7, i perceives that his demands are reasonable since they are less than what j expects to lose in a confrontation. Hence, i expects j to yield. By contrast, in octant 8, i demands more than j is willing to concede and anticipates resistance that may result in a limited conflict before j capitulates. Octants 3 and 4 are a mirror image of octants 7 and 8, but with the roles of the players reversed. In octant 3, i expects to resist j's demands, while in octant 4 i expects that he will have to yield to j.

Consider now how i's expected utility in a confrontation with j relates to the implications of the power transition model when i is preponderant (see Figure 2, stage 1). If each player's evaluation of the status quo and risk propensity is held constant, i's probability of success will be high and consequently its expected utility from a dispute with j positive. For similar reasons, j's expected utility should be negative. Such disputes obviously fall into octant 7 in Figure 3. Thus, power transition and expected utility both suggest that, under these conditions, j will yield to i.

A different outcome is suggested when i is superior but no longer preponderant (see



KEY: EU^i_{ij} = i's assessment of i's expected utility

EU^i_{ji} = i's perception of j's expected utility

FIGURE 3 Perceptions of Deterrence Stability Given the Net Gains of Conflict.

Figure 2, stage 2). Under these conditions, j's probability of success is higher and i's lower than in the previous period. Although j still cannot defeat i, j is capable of imposing significant costs upon i should i seek to extract large concession from j. In the terms of Figure 3, such a conflict would fall in octant 8. Thus, the expected utility framework suggests that a conflict short of all-out war will occur. By contrast, the power transition framework, anticipates stability because the dominant power i is assumed to be satisfied and have no incentive to challenge j. Still, the two models *are* congruent about the likely nature of conflict when j is superior since post-parity disputes fall into octant 3. Both the power transition and expected utility theories predict a potential conflict.

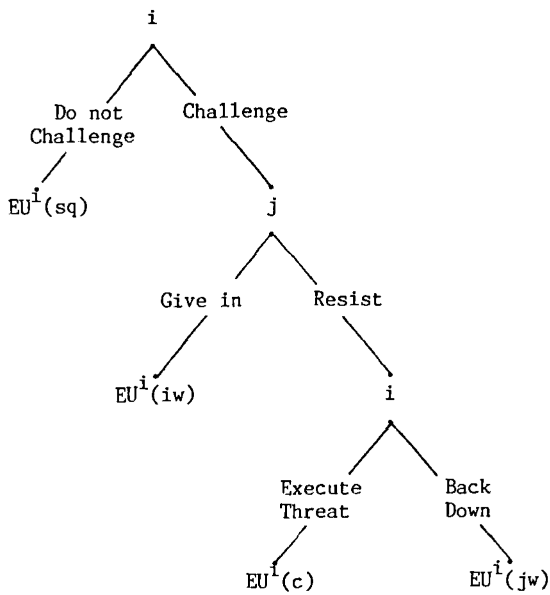
Finally consider the period of transition and power parity wherein each nation's capability, and hence, probability of success is approximately equal. Neither i nor j has a particular incentive to fight, but neither has a good reason not to resist if challenged. Clearly, when *the capability of the two nations is balanced,* they are playing a fair game with a value of zero. Equality of resources, then, is the relationship described by the origin of Figure 3, teetering between octants 1 and 2, and 5 and 6, or between mutual deterence and major war. Disparities in the perceived value of the status quo, the value of conflict, or variations in the risk propensities of leaders, can tilt the balance one way or the other. Once more, the two frameworks yield a similar conclusion: the balance of terror under parity conditions is, at best, precarious (Kugler and Zagare, 1987).

Underlying Assumptions

So far we have shown that the power transition and expected utility models are theoretically congruent. Separately, each provides a set of necessary conditions for the onset of war and conflict initiation. Together they reduce this set and generate important insights into the dynamics of major power war. Yet this is not enough. A set, even a relatively small one, of necesssary conditions remains inadequate for discriminating between those major power disputes that escalate into an all-out war and those that are resolved at lower levels of conflict. In other words, ideally, we would like to be able to specify the conditions that distinguish power transitions that culminate in war from those that do not, and the exact configuration of positive expected utility estimates associated with violent conflict and those that are not.

To this end, we now develop a theory that builds upon the base provided by the power transition and expected utility frameworks and extends their logic. Specifically, the theory we construct rests upon a small set of assumptions drawn from the power transition perpective about the relationship between power dynamics and conflict incentives. It also takes into account each of the key components of the expected utility model by disaggregating its output and reassembling it in game-theoretic form. This restructuring of the expected utility model allows us to explore the impact of strategic interaction on the decision to choose war or peace and to isolate the role played by each element of the model in such choices.[12] In other words, our theory makes no assumption that is not implicit or explicit in either framework. It is in this sense that it adds nothing new to the analysis of interstate war. It is, therefore, an extremely parsimonious integration and extension of previous research.

The underlying expected utility model used as the basis of this investigation is given by Figure 4. In Figure 5 each of the principal components of the expected utility model, as perceived by nation i, are restructured in matrix form where the key decision-makers of nations i and j are assumed to have the same two broad choices posited by the expected utility framework, either to support the status quo, or to take active measures to overturn it. These two strategies, in turn, give rise to four possible outcomes; if neither challenges, the status quo persists; if one challenges and the other does not resist, the challenger wins; if one state challenges but backs down when the other resists, the challenger loses; and if one challenges and the other retaliates, conflict occurs. The preception of i of i and j's utility for each of these outcomes is given by the ordered pair in each cell of the payoff matrix. The first entry represents i's evaluation of the associated outcome, while the second entry represents i's perception of j's evaluation of the same outcome. In the



KEY: $EU^i(sq)$ = Expected Utility of i from the status quo
$EU^i(c)$ = Expected Utility of i from conflict
$EU^i(iw)$ = Expected Utility of i from winning
$EU^i(jw)$ = Expected Utility of i from j winning

FIGURE 4 The Expected Utility Representation of Deterrence From i's Perspective.

		NATION j	
		DO NOT CHALLENGE	CHALLENGE
NATION i	DO NOT CHALLENGE	Status Quo (sq) $(EU^i(sq), EU^j(sq))$	j wins (jw) $(EU^i(jw), EU^j(jw))$
	CHALLENGE	i wins (iw) $(EU^i(iw), EU^j(iw))$	Conflict (c) $(EU^i(c), EU^j(c))$

FIGURE 5 Potential Payoffs in a Crisis Situation.

subsequent discussion, these outcomes will be ranked from highest to lowest, with "4" assigned to each player's best outcome, "3" to each player's next-best outcome, and so on.[13]

As indicated above, in restructuring the components of the expected utility model in this way, we hope to compensate for the tendency of aggregate expected utility calculations to over-predict the conditions for international conflicts.[14] In other words, by incorporating important structural information about the relationship of utilities to outcomes, we are able to specify more precisely the theoretical consequences of each player's evaluation of the status quo and risk-taking propensities for the long-term stability of deterrence. And although we will be particularly interested in the nature of the deterrence equilibrium under conditions of parity, we shall also describe the ramifications of our integrated model during the periods prior to, and after, parity.

To operationally distinguish the various periods of the graph of Figure 2 from one another, we make the following assumptions, each of which is completely consistent with both the power transition and the expected utility components of the model:

1. During the actual transition period of power parity, each state has a capable and credible retaliatory threat, but neither state is able to impose its will on the other as a result of an armed conflict.[15]
2. During the period before or after parity, each state has a capable threat, but because of its power advantage, only the threat of the stronger state is credible (Bueno de Mesquita, 1981, pp. 88-89).
3. During the two periods of extreme imbalance, the stronger state's threat, as before, is postulated to be capable and credible. By contrast, the obviously inferior state's threat is assumed to be neither.

We also make several assumptions about the perceptual distortions implied by a player's attitude toward risk:

4. Following Bueno de Mesquita (1985a), we assume that a *risk-neutral* player will accurately perceive the nature of his relationship with his opponent. Under parity conditions, for instance, this means that the leader of a risk-neutral state will credit the opponent with both a capable and credible deterrent threat (see assumption 1).
5. By contrast, a *risk-acceptant* decision maker will exaggerate his own strength, or equivalently, underestimate the power of his opponent.[16]
6. Finally, *risk-aversion.* A risk-averse decision maker is postulated to exaggerate his opponent's power and to underestimate his own.[17]

Notice that these assumptions are fully consistent with the standard definitions of risk attitudes which equate risk with either the convexity or concavity of a player's utility function. For instance, with this definition, a risk-acceptant actor is assumed to be more likely, *ceteris paribus,* to prefer to resist an opponent's challenge than a risk-averse actor.[18] Thus, in our model, the impact on preferences of both risk and salience are operationally the same.[19]

To evaluate the strategic implications of these two sets of assumptions, we use a dynamic game-theoretic framework called the *theory-of-moves.*[20] As originally developed by Brams and Wittman (1981), and more recently extended by others, this framework "describes optimal strategic calculations in normal-form games in which the players can move and countermove from an initial outcome in sequential play" (Brams, 1983, p. 184). At the heart of the theory of moves is the concept of an (extended) *nonmyopic equilibrium* (Kilgour, 1984) which will be used to gauge the nature of the deterrence equilibrium under balance of power, or parity, conditions. When an asymmetric distribution of power is postulated, a related equilibrium concept associated with the notion of *holding power* (Kilgour and Zagare, 1987) will be called upon.

Both of these stabililty measures assume that players are able to move and countermove after an initial strategy choice in a sequential game, and that each player is able to evaluate the long-term consequences of moving to another outcome. When neither player, looking ahead, has an incentive to move to another outcome, then that outcome is considered a nonmyopic equilibrium or a holding power outcome, depending upon the rules that are assumed to govern strategy switches. When these rules are judged to be strictly alternating and hence, symmetric, stable outcomes are called nonmyopic equilibria; by contrast, holding power outcomes are outcomes which are stable given the ability of one of the players to control the sequential move process by forcing the other player to make the next move. It is precisely because the rules associated with the concept of a holding power outcome are asymmetric that we use this concept as a measure of deterrence stability during periods of power imbalance.

The Impact of Strategic Interaction: The Model Illustrated

To illustrate how these concepts and assumptions are applied to generate the deductions of our integrated model, consider now the payoff matrix of Figure 6. This figure represents the strategic situation facing two risk-neutral decision-makers under balance of power or transition conditions (see assumptions 1 and 4). In other words, each player is credited with a capable retaliatory threat. This is reflected in the fact that each player prefers that, if he challenges the status quo, the deterrent threat of his opponent *not* be carried out. Each player's threat is also assumed to be credible, that is, each prefers to carry out his threat rather than acquiesce to the demands of his opponent (see note 15). Finally, Figure 6 reflects the assumption that each player is dissatisfied with the status quo.

Is deterrence stable under these conditions? To answer this question, we simply test for the nonmyopic stability of the status quo. It is easy to demonstrate that this outcome is a nonmyopic equilibrium.[21] Since neither player has a long-term incentive to move away from (3,3), we judge deterrence to be a stable relationship between two equally powerful states, each with a capable and credible retaliatory threat.[22]

But what if one of the players (say j) is risk-acceptant? Recall that if j is risk-acceptant, he will overestimate his own capabilities and perceive the power relationship to be that of the post-parity period where he has already surpassed i. As reflected in the matrix of Figure 7, j will also perceive that i, because of his inferior position, lacks a credible threat (assumption 5). If j is risk-acceptant, he will anticipate that outcome (2,4)—the holding power outcome of the game in Figure 7—will evolve if he challenges i. Since j prefers this outcome to the original status quo, deterrence is unstable. Unfortunately, since a risk-neutral i, in fact, prefers to resist j's challenge—see Figure 6—j's misperception of the actual power relationship will lead to war.

		NATION j	
		DO NOT CHALLENGE	CHALLENGE
NATION i	DO NOT CHALLENGE	Status Quo (3,3)	j wins (1,4)
	CHALLENGE	i wins (4,1)	Conflict (2,2)

FIGURE 6 Mutual Deterrence Under Parity Conditions

		NATION j	
		DO NOT CHALLENGE	CHALLENGE
NATION i	DO NOT CHALLENGE	Status Quo (3,3)	j wins (2,4)
	CHALLENGE	i wins (4,1)	Conflict (1,2)

FIGURE 7 Mutual Deterrence Under Parity Conditions When j is Risk-Acceptant or i is Risk-Averse.

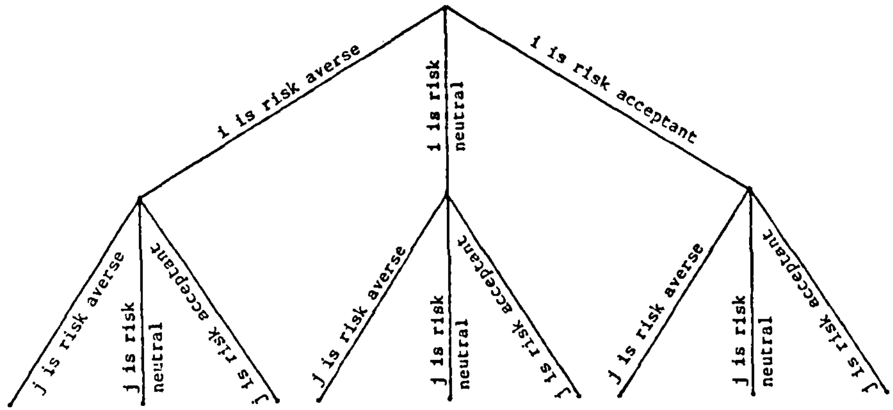
For contrast, consider now the implications of i's risk-aversion. As per assumption 6, if i is risk-averse, he will perceive that j has attained a position of superiority in the interval to the right of the transition period. Given this perception, i will prefer not to resist a challenge from j and will perceive that j would resist a challenge from i (assumption 2). Under these conditions—see Figure 7—i would not move from the status quo. By symmetry, neither would a risk-averse j. Hence, if i and j are both risk-averse, and power is balanced, deterrence is stable.

The same is also true if one player is risk-averse and the other is risk-neutral. As just demonstrated, the status quo is stable for a risk-neutral player at the point of transition (see Figure 6). But if one player is risk-averse and the other is risk-acceptant, still another scenario is implied. Under these conditions, the risk-acceptant actor has an incentive to challenge the other, and the risk-averse actor will capitulate. Thus, this particular mix of risk-attitudes will result in a victory for the player willing to accept the risks of conflict.

Even these conclusions, though, depend upon each player's perception of the status quo. For instance, a satisfied risk-acceptant actor will not upset it. Thus, under balance of power or parity conditions, deterrence stability depends not only on the attitude of the players toward risk, but also on the nature of their political relationship. In other words, by itself, a balance of power neither insures nor prevents conflict.

3. PRINCIPAL RESULTS

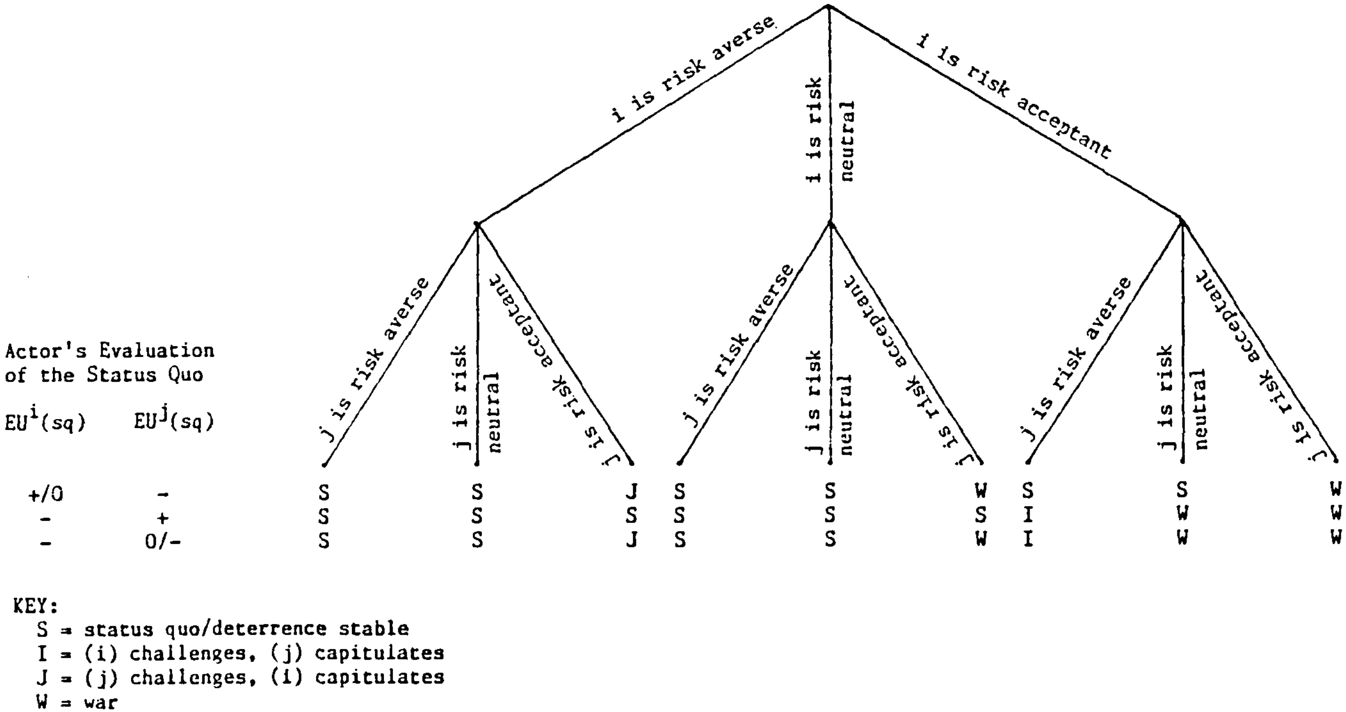
The principle deductions of our model are summarized in Figure 8 which evaluates deterrence stability *during each stage of the power transition,*[23] controlling for each player's



	Actor's Evaluation of the Status Quo $EU^i(sq)$	$EU^j(sq)$									
Pre-parity (i superior)	+/0	-	S	S	S	S	S	S	S	S	S
Post-parity (j superior)	-	+	S	J	J	S	J	J	S	W	W
	-	0/-	S	J	J	S	J	J	S	W	W

(a) Deterrence Under Conditions of Superiority

FIGURE 8 Deterrence Through the Stages of the Power Transition.



(b) Deterrence Under Conditions of Parity.

FIGURE 8 Deterrence Through the Stages of the Power Transition.

evaluation of the status quo[24] and his attitude toward risk. For each combination of variables, we list the outcome implied by a theory-of-moves analysis. The outcomes listed in Figure 8a apply to games played during the immediate pre- and post-parity periods where first i, and then j, is marginally stronger. Figure 8b lists the deductions for the critical transition period.

Important nonobvious results are discovered during the immediate pre- and post-parity periods. In the pre-parity period in which the dominant power is still superior, deterrence is stable since the dominant state is presumed to be satisfied with the status quo and the challenger is still too weak to press for a dramatic alteration of the system. Note that this stability does not depend upon either the challenger's risk propensity or evaluation of the status quo.[25] Thus, Organski's (1958) early suggestion that the challenger will attack before the transition has occurred, is not consistent with either the empirical record or the deductions of the integrated model.

Nevertheless, it is possible for a dominant power to be dissatisfied with the system it created and controls.[26] In this case, the derivations presented for the post-parity period would hold. Under these conditions (see figure 8a), the status quo is stable as long as the stronger state (i in the pre-parity period or j in the post-parity period) is risk-averse. Otherwise stability evaporates and the stronger nation will move to rectify its dissatisfaction. As long as the weaker nation is risk-averse or risk-neutral, it will capitulate to the demands of the stronger nation. But, and this is an important "but," when the weaker state is risk-acceptant, it will resist and war results.

During the critical transition period of power parity (see Figure 8b), we locate the precise set of conditions that balance of power advocates consider necessary, and that classical deterrence theorists view as sufficient, for international stability. And indeed we find that, under some conditions, deterrence *is* stable when power is balanced. Specifically any combination of risk-averse and risk-neutral decision makers in i and j is sufficient to ensure deterrence stability. Moreover, a balance of power is associated with peace even if one of the players is risk-acceptant, provided that the risk-acceptant player is also satisfied with the status quo.

Still, as Figure 8b indicates, unlike the predictions of the balance of power model and classical deterrence theory, deterrence is not stable under all parity conditions. The conditional stability of the balance of power begins to evaporate as soon as an unsatisfied, risk-acceptant player emerges. Such a player is likely to issue a challenge to the status quo. If the opponent is risk-averse, war can be averted since the opponent will accept his demands. But if his opponent is either risk-neutral or risk-acceptant, war is likely. Again, both the power transition and the expected utility components of our model suggest that wars fought under these conditions will be both intense and severe.

To be sure, the conditions associated with major wars are not common. For such wars to occur, two major powers must be in the process of moving through a power transition—a rare event in itself.[27] Moreover, at least one of these states must be dissatisfied with the status quo, must be willing to assume the risk of attempting to overturn it, and must be faced by an opponent willing to accept the challenge. Such a confluence of conditions is, fortunately, not the usual condition of the international system. The leaders of most major powers are probably risk-neutral and hence, disinclined to take enormous risks (Bueno de Mesquita, 1985a, pp. 168-69; Brodie, 1973, p. 26). This is probably the principal reason why major wars do not occur more often. Still, when the structural conditions of the power transition are present, i.e., parity, the possibility of a serious conflict remains. Thus, as before, we find that the deterrence equilibrium hinges on the perceptions of net gains by key leaders and the strategies they choose to pursue. The long-term stability of deterrence, therefore, is tenuous indeed.

4. CONCLUSIONS AND IMPLICATIONS

We have constructed a model of deterrence that specifically integrates systemic and decision-making variables. After contrasting this model with classical deterrence we develop a theory of the necessary and sufficient conditions of major power war and conflict initiation that is internally consistent and congruent with the historical record. In other words, for the first time, we specify theoretically the exact consequences of variations in power dynamics, evaluations of the status quo, salience, and attitudes toward risk.

The implications of this model are sobering. Adopting an optimistic perspective, we find that, more often than not, deterrence is stable. Indeed, the transition model of deterrence provides a completely consistent explanation for the absence of a nuclear conflict since 1945 that is similar to the pre-nuclear period. Specifically, when the dominant nation enjoys nuclear preponderance, or is simply superior, major wars are not likely. This conclusion squares well with the real world. The American nuclear advantage over the Soviet Union from 1945 to about 1974 did not, and should not have, generated a nuclear war. Likewise, the model suggests why there was no nuclear exchange between the USSR and China during the Sino-Soviet rift, between the United States and China during the limited conflict in Korea, or in the two decades thereafter when China was a sworn enemy of both the United States and the Soviet Union. Moreover, the model shows why a balance of nuclear arsenals produces overwhelming odds in favor of peace as long as the leaders of unsatisfied nations choose to shun serious risks.

The stability of deterrence is threatened, however, when nuclear parity is approached, maintained, or breached over time and the leading contenders have fundamental and persistent differences in their world view. Contrary to the arguments of classical deterrence, then, we find no support for the notion that mutual overkill produces a "cone of stability." Instead, under nuclear parity, the chances for instability increase directly with the risk propensity of leaders. Indeed, we argue that containment of conflict does not depend on the absolute size of nuclear arsenals or on their deployment in different theatres; rather, it hinges on the perceptions and preferences of key decision makers. Although deterrence or appeasement *can* emerge when either the dominant nation or the challenger accepts the status quo, or does not wish to take risks to revise it dramatically, serious conflict is not excluded as a direct consequence of nuclear parity.

The practical implications of this view of deterrence are disturbing. In the present phase of the nuclear era, more than ever, peace rests on political relationships and leadership characteristics, and not, as classical deterrence contends, on the effectiveness of weapon systems. Decision makers seem to have understood the uncertainty of deterrence better than most academics. Reagan's Strategic Defense Initiative is, from our perspective, a calculated re-examination of the uncertainty generated by Mutual Assured Destruction. Recall that with essential equivalence, the simple perception of aggressive intent by a challenger will create a 'window of vulnerability'. Thus, if Soviet leaders are willing to endure higher costs than the United States in order to achieve marginal gains, nuclear parity will lead to war. However, we also find fault with attempts to reimpose superiority or preponderance because the most stable point *during* the transition is equality. Unsuccessful attempts to gain an advantage decrease the stability of deterrence because they reduce trust among competitors and commitment to the status quo. Indeed, weapon adjustments, by themselves, cannot remove the threat to the stability of deterrence. Rather, long-term stability requires a reconciliation of political preferences and goals.

The power transition model of deterrence also has important implications for the issue of proliferation. Some equilibrium theorists, viewing a nuclear balance as ultra-stable, have argued in favor of limited proliferation. Classical deterrence implies that proliferation, if managed correctly, can increase deterrence stability even in highly volatile disputes by ensuring parity among potential opponents and diminishing the need for the superpowers to intervene in local conflicts. Waltz (1981), Bueno de Mesquita and Riker (1982), and Intriligator and Brito (1981) support this position and each proposes slightly different ways in which nuclear weapons should be dispersed. The basis for their arguments is that, if the fear of immense absolute losses has in fact inhibited the continuing competition between the United States and the Soviet Union, then the selective proliferation of nuclear weapons to other states will also enhance sub-systemic stability.

The power transition perspective on deterrence suggests, however, that nuclear proliferation increases the opportunity for massive conflict. When marginal rather than absolute costs are considered, the more actors who meet the conditions of a power transition, the higher the likelihood of nuclear war. Thus, as the number of actors joining the nuclear club and achieving parity increases, the likelihood of conflict also increases. Indeed, the possession of sophisticated nuclear arsenals is insufficient to deter challenges and, ultimately, war. The logical examination of deterrence from the power transition perspective suggests that while deterrence may preserve peace, it can in no way assure such an outcome.

Finally, we note that the model we have developed reveals that while the manipulation of nuclear arsenals may be the easiest, it is not the most effective way to ensure deterrence stability. The record of strategic deployments since 1945 indicates that attempts to achieve superiority or even preponderance in either offensive or defensive systems have been effectively countered by each superpower. This implies that rather than continued competition in the area of weapon systems, the long-term stability of the superpower relationship requires a political reconciliation—somewhat akin to Henry Kissinger's notion of détente—that enhances the value of the status quo and diminishes the likelihood of potentially intense disputes.

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NOTES

1. We make no claim that all classical deterrence theorists share these views. Rather, we are suggesting that Intriligator and Brito's model is consistent with the underlying assumptions of the vast majority of classical theorists. As will be seen, however, some of the policy implications of their model, particularly with respect to the desirability of nuclear proliferation, lie outside the mainstream of the classical model.

2. Intriligator and Brito (1984) have no particular label for the intermediate zones between the area of initiation and the cone of mutual deterrence. In a personal communication, Intriligator (1987) referred to them as regions of "jittery deterrence" in which deterrence was problematic and potentially unstable.
3. For the relevant citations, see Berkowitz, 1985.
4. Kaplan (1957) calls this a unit veto system.
5. Intriligator (1985) argues that a "thin" defensive system enhances deterrence by reducing the likelihood of accidental exchanges or attacks by third parties with primitive nuclear capabilities. Consequently, small nuclear nations could be compelled by those with more complex capabilities, while large nuclear powers in the cone of mutual assured destruction would still be deterred.
6. See Brams and Kilgour (1988) for a formal demonstration.
7. We say this in spite of the fact that Kissinger (1979: 764) is on record as saying that the United States would have supported the Chinese in the event of a Soviet attack. Kissinger, thought is not explicit about either the nature (conventional/nuclear) or level (limited/unlimited) of support. Since many strategic theorists have questioned the credibility of United States support for its NATO allies, it hardly seems reasonable to attribute the lack of a Soviet attack on the Chinese to the American deterrent.
8. At this (model-building) stage of our research, we prefer not to operationally define these terms. Doing so would only add false precision to the model and probably lead to a distracting debate with some of our colleagues. On the other hand, we are not unaware that terms like "preponderance," "superiority," and "parity" are both vague and emotionally loaded concepts in the nuclear age. Indeed, some have claimed that they no longer have any meaning at all. While this may in fact be the case with respect to the current strategic relationship of the United States and the Soviet Union, it has not always been so. For example, many strategic analysts identify the periods from 1951 to 1955 and from 1962 to 1966 as periods of clear American superiority. (See, *inter alia,* Quester, 1970; Kahan, 1975; Russett, 1983; or Smoke, 1987.) And at least in the early stages of the development of the Chinese strategic forces, the Soviets obviously enjoyed a preponderance of nuclear power. Thus, we tentatively define preponderance to imply an overwhelming advantage over an opponent whose ability to retaliate and hurt the preponderant power is minimal. By superiority we mean a relationship wherein one power is able to prevail in a nuclear war, but not without suffering significant losses in the process. And by parity we mean a relationship of mutual assured destruction. Elsewhere, one of us (Kugler, 1984) has attempted to operationalize these concepts. In a later work we plan to add further precision to them.
9. There is less than unanimous support for this conclusion among transition theorists. For instance, Organski (1958) first argued that the challenger might initiate conflict prior to the actual transition because of the salience of its dissatisfaction with the status quo. Thompson (1973) also ascribes to this view. But Organski and Kugler (1980) found that, historically, all challenges have occurred only after the transition has been completed. They argued that the challenger, faced with opposition from the dominant coalition, will wait until it is marginally stronger to redress its grievances, since only then will a realistic opportunity to alter the existing order exist.
10. We are not the first to notice the connection between these two theoretical frameworks; nor are we the first to argue that the expected utility model reduces, in bilateral situations, to a variant of power theory. (For these observations see, respectively, Bueno de Mesquita, 1985b: 124-25 and Luterbacher, 1985: 178.) We are, however, the first to make explicit the exact nature of the relationship of the power transition theory and the expected utility model and to develop the full implications of these connections.
11. A complete analysis requires that a similar graph, representing j's perceptions, also be constructed. (For the details, see Bueno de Mesquita *et al.*, 1985, chapter 2; or Kugler 1987.) But to simplify the subsequent exposition, we assume for now that i and j are in intersubjective agreement about each other's expected utility estimates.
12. The product of an expected utility calculation is a number, either positive or negative. Bueno de Mesquita (1981) has demonstrated, to our satisfaction, that wars and interstate conflicts are associated with positive expected utility scores. While this is no mean feat, we desire more explanatory power than can be conveyed by a single number. What role in conflict decisions, for example, is played by relative capabilities, power dynamics, risk propensities, and so on? By unpacking the expected utility scores, and placing the component parts into a richer theoretical environment, we hope to provide some insight into such questions.
13. As before, a complete analysis requires the construction of a similar matrix from j's perspective.
14. Since the expected utility model provides only a set of necessary conditions for conflict initiation, it is unable to discriminate between violent and nonviolent conflicts wherein one or more of the participants has a positive expected utility score. It is in this sense that the model overpredicts the conditions for interstate conflict. This is because the set of violent conflicts which satisfy the positive expected utility criterion is a subset of a (much?) larger set containing nonevents which obviously do not show up in the data set employed by Bueno de Mesquita.
15. We define a *credible* threat to be the preference of the threatening player to carry out its deterrent threat rather than to accede to a demand by its opponent (Fraser and Hipel, 1979). Thus, a player with a credible threat is assumed to prefer to resist, if challenged, and to retaliate, if attacked. A *capable* threat is defined as

a threat that is worse for the threatened player than either the status quo or the outcome the threatened player can induce unilaterally by upsetting it (Zagare, 1987). Thus, a player whose opponent has a capable threat will be hurt *if* it is carried out.

16. Specfically, if the leader of state i is risk-acceptant at a time of actual parity, he will incorrectly perceive himself to be in the pre-parity period where his state enjoys a power advantage. Or if the leader of the challenger j is risk-acceptant at the transition point, he will perceive himself to be in a post-parity period where his state is stronger. Prior to or at the transition point, then, we assume that a risk-acceptant leader of the dominant state will believe his state to be one interval to the left of his actual position while the leader of an inferior but risk-acceptant challenger will perceive himself to be one interval to the right of his actual position (see Figure 2). Of course, in the two post-parity periods, these relationships are simply reversed.
17. This implies that a risk-averse leader of a dominant state at, or prior to, parity perceives himself to be to the right of his actual position, while the leader of the challenging state will perceive himself to be even weaker than he is. As before, after the actual transition, these relationships are reversed.
18. These assumptions have no practical effect for one player at either extreme of the power spectrum. Specifically, a risk-acceptant actor with a clearly predominant position will be unable to exaggerate its strength beyond this position, while a clearly inferior challenger with risk-averse decision-makers will be unable to underestimate its already vulnerable position.
19. As Brams (1976, p. 63) has noted, "Risk acceptance and preference intensity are simply two different ways to describe the same phenomenon."
20. For a justification of this framework to study deterrence and crisis interactions see Zagare (1985, 1987).
21. For a detailed demonstration see Zagare (1987).
22. Notice what has been added to the model by the game-theoretic component. In the matrix of Figure 6, since each player's challenge strategy dominates his not challenge strategy, his expected utility for challenging exceeds his expected utility for not challenging. Yet, by taking account of the relationship of the outcomes to each other, we are able to reduce the set of necessary conditions for conflict derived from the expected utility framework. In other words, while a straightforward application of the expected utility model suggests that deterrence is potentially unstable when each player has a credible and capable retaliatory threat, a theory-of-moves analysis reveals that it is not. [See Zagare (1987) for a discussion of this point.]
23. The outcomes predicted under conditions of preponderance are singularly straightforward and consistent with the implications of both power transition and expected utility. When one side is preponderant, the critical variable is the stronger nation's evaluation of the status quo. Risk attitudes are discounted for the simple reason that when the dominant nation is risk-averse, it will still perceive itself to be stronger than the challenger, while a risk-acceptant challenger will recognize itself to be weaker. Thus, under these conditions, the status quo is stable as long as the preponderant state is satisfied; when it is not, it will simply impose its will on its helpless opponent. Though the weaker party may protest vigorously, its resistance, if any, will be strictly pro forma and perfunctory.
24. We do not consider the possibility that both players anticipate positive improvements in the status quo. Not only are such situations rare in international politics, but the implications of this set of assumptions, which define what Keohane (1984, p. 51) calls a relationship of "harmony," are patently obvious. Under such conditions, deterrence is spurious.
25. This deduction is consistent with the empirical results reported in Organski and Kugler (1980).
26 The large literature on systemic change suggests, however, that the assumption of the dominant state's (hegemon's) satisfaction with the prevailing regime is rather robust.
27. In the last one hundred years, transition periods have occurred less than five percent of the time.

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