PUNCTUATED EQUILIBRIUM OR EVOLUTION?: A COMPARATIVE TEST OF TWO MODELS OF RIVALRY DEVELOPMENT

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Abstract

Two prominent explanations have been offered to explain the development of enduring rivalry. The evolutionary model stipulates that enduring rivalries are largely indistinguishable from lesser competitions at their outset and develop over time, taking on more distinctive conflict patterns as the adversaries recognize their long-term competition and react accordingly. In contrast, the punctuated equilibrium model suggests that patterns in enduring rivalries are largely determined at the outset of the competitions by exogenous factors, with little systematic change in conflict patterns over the lifetime of the rivalry. This paper provides the first head-to-head test of competing propositions from these two models, focusing on the severity level of confrontations in potential rivalries. Eventual enduring rivalries do not appear to differ fundamentally from other types of adversaries early in their relationship, supporting the evolutionary model. While proto-rivalries tend to show increasing conflict severity over time, enduring rivalries do not, supporting the punctuated equilibrium model. Elements of each model help to account for changes in conflict severity, although neither model receives complete support. We conclude by discussing future research directions, emphasizing the elaboration and possible integration of these models.

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Research on enduring rivalries has proliferated in the past decade. Most commonly, enduring rivalries have been used as a case selection device in studies of other phenomena such as deterrence (e.g., Huth and Russett, 1993) or power distributions (e.g., Geller, 1993). The implicit assumption in these works is that enduring rivalries are inherently different from lower-order conflicts in ways that are both theoretically and empirically meaningful. There appears to be good reason to accept this assumption; a relatively small number of enduring rivalries account for many more militarized disputes, crises, wars, and violent territorial transfers on the average than do lesser types of interstate competition (Goertz and Diehl, 1992; Diehl and Goertz, 2000; Hensel, 1998a).[1] Yet such observations are made in the aggregate, and do not include any dynamic element that would identify changes over time. Even assuming that fully established enduring rivalries are systematically different from non-rivalry relationships, it is not clear whether enduring rivalries are inherently different from lesser conflicts from their outset, or whether enduring rivalries initially resemble lesser conflicts and subsequently develop important differences over time. In short, it is not clear how rivalries develop, or when they can reasonably be considered to be different from a non-rivalry context of competition between states.

The nascent literature on rivalries offers two explanations for the development of rivalry. The evolutionary model (Hensel, 1996a) stipulates that enduring rivalries are largely indistinguishable from lesser conflicts in the early stages of rivalry development. Over time, however, enduring rivalries are said to become more severe as the participants come to recognize their competition and demonstrate more coercive bargaining strategies. In contrast, the punctuated equilibrium model (Diehl and Goertz, 2000) suggests that patterns in enduring rivalries are largely determined near the outset of the competitions, with little secular change in conflict patterns over the lifetime of the rivalry.

The evolutionary and punctuated equilibrium models of rivalry development suggest very different implications for understanding rivalry dynamics, managing or preventing the violent

manifestations of rivalries, and applying rivalry to study additional topics in world politics. If the evolutionary model is correct, then the behavioral characteristics of early confrontations -- such as outcomes or severity levels -- hold the key for the development of enduring rivalries. Scholars might then focus on bargaining strategies and other endogenous factors to understand how certain conflicts become protracted and serious enough to qualify as enduring rivalries, while others end relatively quickly. The evolutionary model would also give policymakers some hope, as behavioral characteristics are potentially manipulable by the adversaries or by interested third parties. In contrast, the punctuated equilibrium model places more emphasis on structural conditions, such as the power distribution between states or the regime type of the belligerents. Such conditions are not easily subject to change in the short run, whether by third parties or by the participants themselves, suggesting few policy options for limiting or preventing the onset of rivalry. Furthermore, if the evolutionary approach is correct, then studying arms races, deterrence, or relative power using populations of enduring rivalries is likely to be a risky research strategy. Even if interactions in fully developed enduring rivalries differ substantially from non-rivalry contexts, the early years of eventual rivalries are likely to resemble non-rivalry contexts much more than they resemble true enduring rivalries, likely weakening or contaminating the analysis of theories that depend on a rivalry context.

To begin, we detail the logic and expectations of the punctuated equilibrium and evolutionary models. We then discuss what extant research can tell us about the validity of each model. This leads into the construction and testing of competing propositions derived from the two models, focusing on patterns of militarized dispute severity in the early years of rivalries. We find qualified evidence to support each model, and conclude by discussing the implications of these results for future research on conflict and rivalry.

THEORETICAL MODELS OF RIVALRY DEVELOPMENT

The Punctuated Equilibrium Model

The punctuated equilibrium model (Goertz and Diehl 1995; Diehl and Goertz 2000) has its intellectual roots in evolutionary biology (Eldredge and Gould, 1972), and is related to recent work on public policy formation in the United States (Baumgartner and Jones, 1993). The biological application of this model suggests that the development of species is a very slow process, characterized by long periods of stability with little or no change and interrupted by brief periods of rapid change. The application of the punctuated equilibrium model to rivalries similarly suggests that both peaceful interstate relationships and enduring rivalries are relatively stable phenomena over time. For a rivalry to begin from a background of non-militarized relations, this model suggests that there must be some sudden disruption in the local, regional, or global environment that alters the status quo ante. Additionally, once established, rivalries take on a stability of their own and are difficult to disrupt, typically continuing for decades until dislodged by sudden environmental shocks (Diehl and Goertz, 2000).[2]

The punctuated equilibrium model of rivalry depends centrally on the concept of a "basic rivalry level" or BRL (Goertz and Diehl, 1998). Azar (1972) proposed that each pair of countries has a "normal relations range," or an average level of hostile or cooperative interaction, around which their relations vary; Goertz and Diehl reformulate this as a "basic rivalry level" (BRL) around which relations fluctuate. The punctuated equilibrium model anticipates that conflict patterns within rivalries will "lock in" around this BRL at the outset of the rivalry relationship, and will remain similar throughout the rivalry. Periods of conflict and détente are seen as statistically random variations around this basic level, with no secular trend towards more conflictual or more peaceful relations. In statistical terms, the difference between the severity of any given confrontation and the overall dyadic BRL is a random variable that is independent of past disputes and wars and that remains constant from one dispute to the next (i.e., the standard assumptions one makes about error terms in linear models). This is not to suggest, though, that all conflict

within a rivalry is exactly the same over time. This model expects some variation in severity and duration across different disputes, occasionally including large deviations (full-scale interstate wars) from the basic rivalry level.

According to the punctuated equilibrium model, enduring rivalries are seen as differing from lesser forms of conflictual relationships primarily because of variation in their underlying BRLs.[3] Goertz and Diehl do not list specific factors that are thought to account for any observed variation in basic rivalry levels, although they argue that the strongest influences are likely to be structural or exogenous. In particular, Goertz and Diehl (1995; Diehl and Goertz, 2000) identify political shocks as the most important influences on rivalries. Political shocks are dramatic changes in the interstate system that can fundamentally alter the processes, relationships, and expectations driving interactions between states. Such political shocks set the stage for rapid and fundamental change in interstate relationships, both disrupting the stability of non-militarized relationships in a way that can generate rivalry, and perhaps eventually disrupting the more conflictual stability that characterizes enduring rivalries in a way that can lead to rivalry termination.

Political shocks may be either exogenous to the rivalry, such as the occurrence of a world war, or endogenous to the rival adversaries, such as the change in the administration or regime of one of the rivals following a civil war. In the biological model of punctuated equilibrium, it is predominantly environmental shocks --- such as massive climatic change --- that cause the extinction of species. In an analogous manner, sudden changes in the international political system make rivalry initiation, alteration, and termination possible. Unlike the biological model, however, Diehl and Goertz (2000) also consider political shocks endogenous to the rivals, in the form of major domestic political changes within one or both rivals. Environmental shocks influence the opportunity structure of states, while domestic political changes introduce new ideas, values, and foreign policy goals. Thus, although this model considers both external and internal shocks as important, the role that these shocks play can differ significantly.

The punctuated equilibrium model see systemic or environmental shocks as influencing rivalries in at least two ways. The first is that shocks transform the environment in which

international relations occur. This transformation opens up new opportunities for conflict, such as the possibility of a U.S.-Soviet rivalry in the new bipolar world after World War II. While some windows of opportunity are opened, a system shock may also change the environment such that some rivalries come to an end; France and Germany cease to be rivals (and even become allies) after 1945. Second, and related in some ways, systemic changes have a dramatic impact on some bilateral or multilateral relationships. Thus, "opportunities" occasioned by the political shocks are differentially distributed across the units of the system (Most and Starr, 1989). The end of the Cold War, for example, led to a severing of many patron-client relationships between the Soviet Union and Third World countries. This has led some proxy conflicts to wither away in the absence of the military and political support previously provided by the superpowers. Thus, system shocks alter the general environment for the formation and continuation of enduring rivalries, but they also directly influence some state-level relationships that affect rivalry processes.

In this paper's test of the punctuated equilibrium model, we consider system-level shocks in the form of world wars. Although other system shocks are conceivable (e.g., rapid shifts in the power distribution), world wars have been shown empirically to have the greatest effect (Diehl and Goertz, 2000; Colaresi, 2000). World wars are considered to be system-defining events. They tend to sweep away existing patterns of international interactions and encourage new patterns to emerge. Similarly, world wars may change the structure of the system, perhaps transforming a system from a bipolar to a multipolar one or changing alignment patterns within the system. In either case, some states will find themselves in opposing coalitions or in conflict over issues or concerns occasioned by the new world order

State level shocks presume that rivalries will be affected when new leadership and new forms of government occur. In this paper we consider two of the state level shocks noted by Diehl and Goertz (2000): the achievement of state political independence, and the occurrence of a civil war. The emergence of a reorganized, new member of the international system can have several effects that promote the formation of rivalries. First is the mere increase in the number of interaction opportunities that stem from having another state in the area or system. Second, the

emergence of a new state represents a dramatic shock for neighboring states who have been accustomed to a set pattern of interactions with their neighbors; most new states have been former dependent territories and as such had relatively peaceful relations with their neighbors. Third, a new state changes, almost by definition, the balance of power in the immediate area, which raises uncertainty. Fourth, newly independent states may feel a need to gain international legitimacy or status through conflict (Maoz, 1989). Finally there is the threat that the new state will be the victim of other states that opposed independence and that seek to return to the status quo ante or that see the new state as a weak target, capable of little resistance. Thus, the punctuated equilibrium model posits that when a state gains its independence it will be more likely to become involved in rivalries shortly thereafter, and that the resulting conflict is more likely to be severe. Along these lines, Maoz (1989) finds that some newly independent states are more likely to become involved in militarized disputes.

The punctuated equilibrium model, as developed by Diehl and Goertz (2000) also sees civil wars as a shock to the conduct of rivalries. First, some ongoing rivalries will end as the state in a civil war turns its attention and resources to consolidation of power and to domestic problems. At the same time, however, the regime may seek legitimacy by initiating conflict against a foreign enemy, seeking to rally public support and distract attention from lingering domestic problems. One might expect that distraction or diversion (Levy, 1989) might be the response to a civil war with the ending of ongoing enduring rivalries for some states and the beginning of conflicts for others. Additionally, a civil war may be perceived as weakening the affected state, creating a chance for intervention by opportunistic states.

The Evolutionary Model

In contrast to the sudden change and then protracted stability of the punctuated equilibrium model, Hensel's (1996a) evolutionary model of rivalry development draws more from evolutionary conceptions based on incremental change. This evolutionary model does not assume that exogenous or structural conditions determine the development of rivalries. Rather, rivalries

are argued to develop and change over time in response to interactions between the rival states, meaning that conflict patterns within any given rivalry are likely to vary systematically over the rivalry process. Whereas the punctuated equilibrium model assumes that enduring rivalries exhibit a distinct conflict pattern from the outset that is inherently more dangerous than isolated or proto-rivalries, the evolutionary approach suggests that the distinctions between what have been called "isolated," "proto," and enduring rivalries (Diehl and Goertz, 2000) are not immediately evident. Instead, potential rivalries are assumed to pass through different "phases," each with unique characteristics and conflict patterns. Events and interactions within each phase influence the outbreak and severity level of subsequent confrontations, and help to determine whether or not a given conflictual relationship will advance to the next phase (perhaps eventually reaching the level of full-fledged enduring rivalry).

Past research using this evolutionary model (e.g., Hensel, 1996a, 1998a) identifies three general phases in the evolution of rivalries. In the early phase of rivalry, relations between two states are guided by little or no history of past conflict, and there may be little expectation of future interactions to guide their strategies. Hensel argues that conflict in this phase is likely to involve less coercive bargaining, *ceteris paribus*, and to be less likely to be followed by future confrontations than conflict in other rivalry phases. The intermediate phase -- coming after two adversaries have engaged in several confrontations but before they can meaningfully be described as true enduring rivals -- is a transition phase in which both the push of the past (the lengthening history of past conflict) and the pull of the future (the expectation of continued future conflict) begin to have an important impact on conflict behavior. The advanced phase of rivalry is characterized by substantial threat perception and competition between the rivals, and corresponds to the time when two adversaries have reached the level of "enduring rivalry" as described by Goertz and Diehl. Conflict in the advanced phase is expected to be even more severe than in the earlier phases, *ceteris paribus*, because of the accumulation of hostility and grievances from the past and expectations about the future. Conflict occurring in this phase is also seen as likely to be followed by recurrent conflict shortly afterward.

According to the evolutionary model, conflictual relationships such as rivalries begin because of the way that states handle any contentious issues between them (see also Hensel, 1998b, 2001). As two adversaries begin to employ militarized means rather than peaceful techniques to settle their issues -- whether these are highly salient issues such as territory or less salient issues such as economic policies -- they create an atmosphere of distrust and hostility that can culminate in rivalry. Hensel (1996a, 1998a) describes two distinct types of evolutionary influences that help to account for movement between the different phases of rivalry. The first is a general expectation that, *ceteris paribus*, relations between two adversaries will become more conflictual as two adversaries accumulate a longer history of militarized conflict. Each confrontation between two adversaries is likely to lead to a general deterioration in relations as the result of increased feelings of hostility, distrust, or enmity, as well as any death or losses that may have resulted. As a result, each successive confrontation between the same adversaries is seen as pushing them closer to the recognition of long-term rivalry and its implications. This effect should be even stronger for adversaries that have fought a full-scale interstate war. Although there may be a short-term "war-weariness" effect in the immediate aftermath of a war, at least in terms of the reluctance to engage in renewed military conflict, the experience of such a protracted and bloody confrontation is likely to increase the adversaries' hostility, distrust, and enmity -- and likely the severity of their subsequent conflicts -- for a lengthy period after the war.[4]

Beyond this general effect, the second type of evolutionary factor involves the specific effects of past interactions, such as the outcomes and severity levels of past confrontations (for rivalry-specific applications see Hensel, 1996a; for more general applications see Maoz 1984; Hensel 1994; Werner 1999). For example, a confrontation that ends in a stalemate is likely to increase distrust and hostility between two adversaries without resolving any of their disputed issues to either side's satisfaction.[5] In contrast, a dispute that ends in a negotiated compromise -- *ceteris paribus* -- is more likely to help resolve the issues between the adversaries, or at least to help create a more trusting environment due to the experience of negotiating a satisfactory resolution to the dispute. Similarly, a dispute that ends in a decisive victory for one side (whether through a

battlefield victory or by compelling the opponent to back down) is likely to reduce conflict levels in its immediate aftermath, if only because the defeated side requires time to recover or to prepare for another challenge at a more propitious moment. Beyond the outcome of the previous confrontation, the evolutionary approach suggests that the severity level is likely to be quite important. All else remaining equal, more severe confrontations appear likely to intensify the distrust and hostility between two adversaries relative to more trivial confrontations that end quickly and with little bloodshed or destruction, thus increasing subsequent conflict levels.[6]

In short, between the specific and general effects, the evolutionary approach sees rivalry developing out of earlier interactions between two adversaries. In each case, the impact of these evolutionary factors is likely to be greater when the history of past conflict activates the domestic political scene on each side by attracting the attention and interest of important domestic actors in government, the political opposition, and the mass public. An activated political scene can help to prolong rivalry by rewarding aggressive behavior by leaders and by punishing conciliatory actions toward the rival (Hensel 1998b). It should be noted that the specific and general effects of rivalry may exert opposite influences on future relations between two rivals. That is, while the general effect due to a long history of past conflict may lead to increased hostility between two rivals, a negotiated compromise outcome may help to decrease hostility, and an especially severe confrontation – while perhaps increasing hostility between the adversaries – may lead to the establishment of confidence building measures or to either bilateral or third party diplomatic initiatives meant to manage or settle the rivalry.

It should also be noted that this evolutionary model is quite different from Bennett's (1998) research on hazard rates and the ending of rivalry. Bennett finds enduring rivalries to have strong, positive duration dependence, indicating that they are increasingly likely to end as they go on. At first glance, this appears to contradict the general evolutionary approach described above, but Bennett's research has focused on enduring rivalries once they are established. Bennett only studies cases that eventually qualify as enduring rivals, and he excludes the first twenty years of a rivalry relationship from analysis because (by definition) the rivalry can not terminate during these

years. While these choices are necessary for the study of enduring rivalry termination, they do not tell us anything about the processes by which certain adversaries become enduring rivals and others end their conflictual relationships at the level of proto-rivalry or isolated conflict. It is quite possible that adversaries moving along the path to enduring rivalry may be more likely to advance further toward rivalry as they build up a longer history of conflict, when all conflictual adversaries are studied as potential enduring rivalries; this is consistent with Hensel's and Maoz' findings regarding the recurrence of militarized conflict. Once enduring rivalry has been established, though, this trend might reverse -- consistent with Bennett's finding -- as the rivals begin to adopt confidence-building measures or to manage the issues underlying their rivalry, transforming their relationship into "mature rivalry" (Kuenne 1989) or ending their rivalry altogether.

The Stochastic Model

Erik Gartzke and Michael Simon (1999) have recently introduced another alternative model that purports to account for rivalry. Gartzke and Simon suggest that what appear to be "enduring rivalries" may result from a stochastic process rather than from any causally meaningful process associated with the evolutionary or punctuated equilibrium (or any other) models. Such a stochastic process would involve a random distribution of militarized conflict across time and space, with apparent rivalry-like conflict series being accounted for by the random accumulation of events (much like consecutive coin flips may randomly come up heads). Gartzke and Simon conduct a simulation that suggests that their stochastic model can account for the observed number of enduring rivalries almost perfectly, with 45.4 rivalries predicted versus 45 rivalries observed by Diehl and Goertz, leading them to caution against the acceptance of rivalries as a theoretically or empirically meaningful phenomenon in world politics.

Several problems limit the value of this stochastic critique. First, it is based on the misleading premise that "evidence of a relationship between disputes separated longitudinally" in the rivalry literature "is assumed rather than demonstrated" (Gartzke and Simon 1999: 777). Yet scholars such as Maoz, Hensel, and Werner have developed and tested theoretical arguments for

such a connection, generally producing strong empirical support. Second, the simulation that Gartzke and Simon use to demonstrate that their stochastic model can account for observed rivalry processes is inappropriate, being based on a flawed methodology that dramatically inflates the model's accuracy. Even using the Goertz and Diehl rivalry measure -- the measure for which their model appears to produce the closest fit with empirical realities since 1816 -- the stochastic model can only account for between one third and one half of all observed rivalries after its methodological flaws are taken into account (Hensel 2000). Furthermore, beyond its incomplete theoretical premise and its methodological flaws, this stochastic model is not directly relevant for the present paper's emphasis on dispute severity, because its focus is on the origins of rivalry-like series rather than on severity patterns within these series.

EVALUATING THE MODELS

Recent Empirical Evidence

Although neither model has received much direct empirical attention in the recent rivalry literature, some empirical evidence supports the punctuated equilibrium model and its underlying basic rivalry level concept. Goertz and Diehl (1998) and Diehl and Goertz (2000) explore whether the early development of enduring rivalries follows the predictions of the basic rivalry level concept, the so-called “volcano” model (a pattern of rising hostility culminating in war and the end of the rivalry), or several other patterns.[7] They find only a relatively small number of rivalries showing increasing or convex trends over time, which fits the volcano model and is most consistent with a gradual evolutionary process because of the expectation that the effects of rivalry take time to develop. Yet the null hypothesis model of no secular trend is the dominant pattern (occurring in about two-thirds of the cases), which is consistent with the predictions of the punctuated equilibrium model because of its expectation that the effects of rivalry center almost immediately around two adversaries' basic rivalry level.[8]

Goertz and Diehl (1998) and Diehl and Goertz (2000) also note that the basic rivalry level appears to “lock in” at the outset of the rivalry and does not “fade out” at the end. That is, the basic

rivalry level is established early in the rivalry relationship and is not easily disrupted throughout the life of the rivalry. In examining the first three and last three disputes in the rivalry sequence, they do not find either a trend toward escalation at the outset nor deescalation at the conclusion of the rivalry. Also consistent with the notion that rivalry patterns are stable over time and require dramatic shocks to interrupt this stability, Goertz and Diehl (1995) report that that political shocks at the systemic or nation-state level are virtual necessary conditions to start or end a rivalry. Eighty-seven percent of all rivalries begin within ten years of a political shock of some type, and 92 percent of all uncensored rivalries end within ten years of a shock. The occurrence of a shock is also found to increase both the probability that an enduring rivalry will begin in the next decade, and the probability that an ongoing rivalry will end in the next decade.[9]

Similarly, Levy and Ali (1998) report the importance of political shocks on the stability of rivalry relationships. The Thirty Years War in Germany is cited as a shock that profoundly altered Dutch relationships with both current and potential rivals in the 17th century. The death of Frederick Henry also brought a lull to the Dutch-Spanish competition and set in motion events that led to increased competition with the British. In effect, an exogenous and an endogenous shock had the effect (along with other factors) of ending one militarized rivalry and beginning another. This is consistent with the punctuated equilibrium model's notion of rivalry stability that is only likely to be disrupted by abrupt environmental change.

Other findings offer mixed support for the punctuated equilibrium model, the quick lock-in of the basic rivalry level, and lack of a fade out pattern. In their game-theoretic analysis of four Middle East rivalries, Maoz and Mor (1996) find that the enduring rivalries exhibit acute conflict at the outset with a constant motivation to extend the conflict from the beginning; this suggests that conflicts do not “evolve” into enduring rivalries, but may exhibit severe rivalry characteristics from their origins. For Cioffi-Revilla (1998), stability is defined as the probability of rivalry continuation into the future. In his analysis, a hazard rate for termination is used to indicate whether rivalries show an increasing or decreasing tendency to end, with the latter signifying a stable relationship. His results indicate three phases of rivalry stability: initial stability, maturation,

and termination. In the initial phase, Cioffi-Revilla discovers that rivalries are very stable and therefore not prone to end in their early phases. The maturation or mid-life period shows that rivalries become mildly unstable, with an increasing hazard rate for termination; perhaps this indicates that many rivalries never go beyond the proto-rivalry stage and enduring rivalries are special cases that seem to run against the tide. In the termination phase, within the latter stage of rivalries (when the advanced stage of enduring rivalry is reached), they have a strong propensity to end, which is consistent with the findings of Bennett (1998).

There is somewhat less direct empirical evidence on the evolutionary model, although much of it is supportive. Hensel (1996a) finds that as a pair of adversaries accumulates a longer history of militarized conflict, and thus moves along toward enduring rivalry, their relationship tends to become even more conflictual, particularly in terms of an ever-increasing likelihood of repeated conflict. Vasquez (1998) also reports a pattern of rising conflict in recurrent disputes during the U.S.-Japan rivalry that led to World War II, although this is clearly only a single case. In seeking to account for conflict patterns within a rivalry, Hensel (1996a) still finds that rivalry context is an important factor, even controlling for a host of other influences (e.g., contentious issues or capability shifts). He also shows the influence of past interactions on rivalry behavior in noting that the likelihood of a recurrence of conflict in a rivalry was reduced when the dispute ended in a decisive or compromise outcome.

Other follow-up studies by Hensel generally, although not universally, support the evolutionary model. Hensel (1998a) finds that the likelihood of conflict recurrence increases dramatically as one moved into later rivalry phase; the likelihood of recurring conflict doubles in the intermediate rivalry phase and quintuples in the most advanced or enduring rivalry phase. Using COPDAB events data on non-militarized interactions between states, Hensel (1997) finds that later phases of a rivalry exhibit more intense conflictual (and interestingly enough, more cooperative as well)[10] interactions; this helps establish that previous findings based exclusively on militarized disputes are not unique to that phenomenon or to the militarized dispute data set. Hensel and McLaughlin (1996) also find that a history of past disputes is associated with greater

conflict in a rivalry. Yet, contrary to the evolutionary view, they also find that war is more likely *earlier* in a rivalry. Also casting some doubt on the evolutionary approach is Maoz and Mor (1998), who find that the games of "Deadlock" and "Bully" are the most common in young rivalries, suggesting that the early stages of enduring rivalries are marked by hostility on both sides with few attempts (at least successful ones) at conciliation, cooperation, and conflict resolution.

Overall, there is some empirical support for both the punctuated equilibrium and evolutionary models, largely from studies conducted by proponents of each approach. A handful of studies by other scholars offer mixed conclusions on the validity of each approach. None of these studies directly tests competing propositions of the two models. Two recent conference papers (Hensel and Sowers, 1998; Stinnett and Diehl, 1998) attempt to model the development of enduring rivalries. Each looks at the impact of structural and behavioral factors, roughly corresponding to the punctuated equilibrium and evolutionary models respectively, on the onset of rivalry. The findings of each study reveal that both structural (e.g., power distribution) and behavioral (e.g., dispute outcomes) factors influence the development of enduring rivalries. Nevertheless, such studies do not provide tests of the two models against one another.[11] Our next step is to identify competing propositions that will allow the first direct tests of the two models.

Competing Hypotheses

The empirical evidence reviewed above has generally attempted to test the propositions of either the punctuated equilibrium model or the evolutionary model against a null model of no statistical relationship; little attempt has been made to test the two models head-to-head in controlled analyses. In seeking to test the punctuated equilibrium and evolutionary models against one another, we are concerned with identifying propositions that differentiate between the two. In this section, we outline four such propositions, focusing on the severity of conflict as indicative of rivalry conflict patterns. We make this choice because the two models refer to such severity in their formulations, severity is frequently used in the international conflict literature as an indicator of conflict patterns, and data on rivalry severity is readily available.

Both the punctuated equilibrium and evolutionary models postulate that the rivalry context affects militarized relations between two states. They also agree that enduring rivalries – *once established* – are relatively stable phenomena, which are very difficult to end without environmental shocks or favorable domestic and international conditions. The biggest disagreement between the two models lies in how and when rivalries become established in the first place. Whereas the punctuated equilibrium model suggests that enduring rivalries are established almost immediately because of structural factors, the evolutionary model suggests that rivalries take longer to develop their distinctive patterns of behavior, with the exact speed of development depending on how two prospective rival states interact with each other along the way. Thus, one key difference between the models is the length of time required before two adversaries recognize each other as long-term rivals and treat each other accordingly.

A related difference between these two models concerns the specific sources of rivalry and the certainty with which two given adversaries will become enduring rivals. Under the punctuated equilibrium model, dyads that will eventually become enduring rivalries are essentially predestined to do so. Rivalry results from factors that exist from the outset, such as political shocks or other exogenous factors, and the rivalry is likely to last until these factors are subsequently changed (perhaps by additional political shocks). In contrast, the evolutionary model suggests that rivalry results primarily from interactions between the adversaries, which can not be known in advance. As a result, dyads that eventually become rivalries can not be known or identified in advance, until they have engaged in a series of conflictual interactions that lead them to the increased tension and hostility that characterize rivalry without settling their issues definitively. Under this model, nothing about rivalry can be known with any certainty, and it is quite possible that two adversaries may avert rivalry either early or late in their relationship through a series or relatively cooperative relations. Even adversaries whose conflict begins shortly after one side's independence, a world war, or some other type of political shock are not predestined by the existence of the shock to become long-term rivals; interactions between them in the aftermath of the shock may help them to settle or manage their differences short of rivalry.

Keeping in mind these general differences, the punctuated equilibrium and evolutionary models diverge on a number of specific expectations that can be examined to evaluate the two models' relative performance. To begin, the punctuated equilibrium model argues that enduring rivalry conflict patterns are evident from the outset of that conflict, and thus it is appropriate to identify such rivalries in a *post hoc* fashion. In contrast, the evolutionary model argues that enduring rivalries are indistinguishable from their lesser rivalry counterparts in the early stages of the competition, only developing distinctive patterns of behavior with the passage of time and the accumulation of a history of conflict. Only the evolutionary model would expect to see changes in conflict severity over time, while the punctuated equilibrium model would generally expect to see consistency from the first confrontation through the final confrontation in a given rivalry.

It must be noted that each hypothesis to be developed reflects the ideal-type expectations of each model, suggesting that all rivalries should follow one pattern or the other.[12] Empirically, however, it is probably more realistic to expect that the two models each address general tendencies, and that there will be come deviant cases that do not fit with the dominant pattern. For example, Diehl and Goertz (2000) identify a variety of different patterns in dispute severity levels during the early development of rivalries, although that analysis did not attempt to account for these different patterns or to control for the impact of other relevant factors. Similarly, while some research on the democratic peace is most consistent with the normative explanation, other research is more consistent with the structural explanation or with explanations based on other factors, and many studies end up supporting multiple models (see Ray, 1995: Chapter One). We thus recognize that neither model is likely to account for one hundred percent of the rivalries that have occurred since 1816 (or for all of the patterns in conflict severity within those rivalries).

Hypothesis 1A (Punctuated Equilibrium): *Conflict severity patterns should not change systematically across the different phases of rivalries.*

Hypothesis 1B (Evolution): *Conflict between rivals should become more severe in later rivalry phases than in earlier phases.*

The second set of propositions is a corollary of the first and concerns the outbreak of full-scale war. Looking at wars allows us to test whether the expected relationships are present for all levels of conflict severity -- including minor incidents as well as the bloodiest wars -- or merely after some critical threshold. Under the evolutionary approach, wars -- the most severe forms of interstate conflict -- are expected to be more common in later stages of enduring rivalries, after two adversaries have built up a legacy of hostility and distrust in previous confrontations. The punctuated equilibrium model, in contrast, expects a more random distribution of wars over the course of an enduring rivalry, with war-fighting rivalries simply reflecting a higher basic rivalry level from the beginning of their relationship than other adversaries that never reach full-scale war.

Hypothesis 2A (Punctuated Equilibrium): *Full-scale wars should be distributed randomly across the different rivalry phases.*

Hypothesis 2B (Evolution): *Full-scale wars should be more likely in later rivalry phases than in earlier phases.*

Third is the proposition that there is no difference in conflict severity in the early phase of enduring rivalries relative to the early phase of lesser conflicts (i.e., isolated and proto-rivalries). The evolutionary model anticipates that these initial conflicts help to determine whether two adversaries will eventually become enduring rivals or whether they will be able to end their conflict short of such an outcome. As a result, the initial conflicts should appear largely the same, regardless of whether the disputes repeat into an enduring rivalry or never reoccur between the same states. The punctuated equilibrium model predicts that early enduring rivalry conflicts will, on average, be more severe than lesser order conflicts, because the sources of the ultimate "basic rivalry level" are already in place.

Hypothesis 3A (Punctuated Equilibrium): *Severity patterns should differ at the beginning of conflictual relationships, with eventual enduring rivalries displaying more severe patterns than eventual proto-rivalries and especially isolated conflict dyads.*

Hypothesis 3B (Evolution): *Severity patterns should show little difference at the beginning of conflictual relationships, with any eventual difference between enduring rivalries, proto-rivalries, and eventual isolated conflict dyads developing over the course of their respective relationships.*

Our fourth set of propositions involves the sources of militarized dispute severity. The punctuated equilibrium model suggests that conflict behavior is influenced primarily by the external determinants of a given rivalry's basic rivalry level, and that these influences should be roughly constant from the beginning of a rivalry until its conclusion. As suggested above, this model suggests that the most important such influences should be political shocks, which set the stage for rivalry by disrupting the pre-shock status quo and by determining the adversaries' basic rivalry level. Once a shock has occurred, two adversaries are likely to approach their basic rivalry level quickly (the "quick lock-in" effect noted by Diehl and Goertz, 2000), and the severity of their subsequent confrontations should vary randomly around this level. Thus, the shock(s) that preceded a given rivalry can be seen as setting the primary determinant of the basic rivalry level and thus of conflict severity patterns within that rivalry, with no systematic evolutionary role for later interactions between the adversaries.[13]

The evolutionary model argues that interactions in the early stages of a potential rivalry will help to determine which relationships will eventually develop into enduring rivalries and which will avoid such development. As a result, the evolutionary model puts much more emphasis on past interactions as a source of conflict behavior, and much less emphasis on external factors such as political shocks. As discussed earlier, this expectation entails both general evolutionary influences (the number of recent militarized confrontations between the adversaries) and specific evolutionary

effects related to the outcome and severity level of their most recent dispute. Regardless of any impact of political shocks or any other structural exogenous factors, then, these influences of recent interactions between two adversaries are expected to have a systematic impact on conflict severity levels within rivalries.

Hypothesis 4A (Punctuated Equilibrium): *Variation in militarized dispute severity patterns should be closely associated with factors that existed at the beginning of the rivalry relationship, such as the political shocks that preceded the rivalry; interactions within the rivalry relationship should have no systematic impact.*

Hypothesis 4B (Evolution): *Variation in militarized dispute severity patterns should be closely associated with recent interactions during the rivalry relationship, including the number, outcomes, and severity levels of past confrontations.*

RESEARCH DESIGN

The above hypotheses are tested using the population of international rivalries identified by Diehl and Goertz (2000) for the 1816-1992 period.[14] Their data set includes 2984 dyadic militarized disputes aggregated into 1166 militarized rivalry relationships, including 63 enduring rivalries, 223 proto-rivalries, and 880 cases of "isolated conflict." These rivalries are constructed from the Correlates of War Project Militarized Dispute (MID) data set (Jones, Bremer, and Singer, 1996). Each of these rivalry relationships features at least one militarized dispute, and the severity of these disputes is the basis on which we conduct the tests noted above. Operationally, isolated rivalries are those that experience two or fewer disputes (by definition, these will be less than eleven years in duration, given how disputes are connected to one another in rivalries) and enduring rivalries are those that experience at least six disputes and do so in a time period lasting at least twenty years. Those rivalries not fitting in either category comprise the middle of the rivalry continuum and are therefore considered proto-rivalries.[15]

Given this set of rivalries, we now move to determine what constitutes the early, intermediate, and advanced phases of enduring rivalries, the divisions noted by the evolutionary model. To do this, we refer to the operational definitions noted above. The early phase of an enduring rivalry is said to be the first two disputes in the rivalry sequence, the intermediate phase (which is only relevant for proto- and enduring rivalries) begins with the third dispute, and the advanced phase (which is only relevant for enduring rivalries) begins with the first time that the adversaries reach the thresholds of at least six militarized disputes and an elapsed rivalry duration of twenty years.[16] This division corresponds to the criteria used to distinguish isolated, proto, and enduring rivalries noted above.

An objection may be raised against the use of a rivalry measure that is based on militarized conflict between two states, and that is then used to study militarized conflict between those same two states. Such an objection may suggest the possibility of selection bias, since militarized dispute activity is used both to identify enduring rivals and to distinguish the different phases of rivalry. Yet this objection is misplaced for several reasons. First, enduring rivalries are identified based on the number of militarized disputes among the same adversaries, rather than on any specific characteristics of these disputes. It may be that enduring rivals engage in both frequent and severe disputes, but it may also be that disputes between rivals typically remain at lower average severity levels than disputes in non-rivalry contexts, or there may be no difference in dispute severity between enduring rivalry and other types of contexts. The same is true for identifying individual phases of rivalry, which is done based on the number of disputes between two adversaries rather than on dispute severity or other details. Furthermore, at least with an evolutionary perspective, there is no problem due to selecting cases based on events that may happen many years in the future. The evolutionary rivalry phase -- early, intermediate, or advanced -- is based on how many disputes have occurred in the recent past, and can not be changed based on the occurrence or avoidance of subsequent events. The early phase thus involves the entire time from the first militarized dispute between two adversaries through the

beginning of their third dispute, at which point subsequent relations are classified as occurring in the intermediate phase, but the early phase is never reclassified.[17]

The severity of a rivalry at a given point in time is determined by the severity of its last militarized dispute. The severity of an individual dispute is taken directly from the rivalry list and is measured on a 0-200 scale based on the "level of hostility" exhibited by both rivals in the dispute and the number of fatalities in the confrontation (Diehl and Goertz, 2000). Arithmetic means of the severity scores will be calculated for each rivalry phase or rivalry type as is appropriate for testing the first and third propositions above. Analysis of variance (ANOVA) tests will be used to determine whether or not significant differences exist between different rivalry phases or types. For analyzing the occurrence of war, proposition two, in the enduring rivalry sequence, we rely on Small and Singer's (1982) definition of war as any militarized confrontation resulting in 1,000 or more battle-related fatalities.

In our analyses that attempt to account for the severity patterns, we employ ordinary least squares regression to account for variation in the Diehl and Goertz dispute severity measure, based on explanatory factors from the punctuated equilibrium and evolutionary models as well as on several relevant control variables. The predictions of the punctuated equilibrium model revolve around the political shocks that are seen as likely to generate rivalry and produce the basic rivalry level. Following the lead of Goertz and Diehl (1995), we identify three specific types of shocks that might be expected to produce rivalry: a world war, the independence of one or both rival states, and the occurrence of a civil war in one or both rival states. All three of these types of shocks represent a major shift in the local, regional, or global environment, and might be expected to disrupt the status quo ante sufficiently that new rivalries might begin. Each shock is measured by a dummy variable, indicating whether or not the rivalry in question began during or within ten years after the shock.[18] By measuring each shock separately, we are able to avoid the potential problem of treating shocks as a constant in the model, as might be the case with a single dummy variable measuring whether or not any type of shock was involved. World war, independence, and civil war shocks are involved in 36.1, 32.3, and 33.2 percent of our cases, respectively, with

some cases following more than one type of shock; around one-fourth of our cases did not follow any of these three shocks.

The predictions of the evolutionary model center around recent militarized conflict between two adversaries. The general evolutionary expectation is that -- *ceteris paribus* -- two adversaries with a longer history of militarized conflict and especially war will be more conflictual in the future. This expectation is measured by the number of militarized disputes between the adversaries in the previous ten years, and by a dichotomous indicator of whether or not they have engaged in at least one full-scale interstate war. Ten years appears to offer a reasonable window for recent conflict between two adversaries in this general evolutionary sense; similar results are also observed when using a longer window of fifteen years or when using the entire history of conflict in the rivalry up to a given point in time. Relating to more specific evolutionary expectations, dummy variables are included to indicate whether the previous dispute between the same adversaries ended in a compromise outcome or a decisive outcome (combining the "victory" and "yield" categories in the MID data set – Jones, Bremer, and Singer, 1996), leaving stalemated outcomes out of the equation as the referent category. Finally, the severity level of the past dispute is measured using a formula described by Diehl and Goertz (2000).[19]

Finally, we control for the effects of three variables that have been shown to be closely associated with patterns of dispute escalation or severity. Excluding these factors would call our analyses into question for ignoring factors that we know from past research to be quite important in conflict severity and escalation processes, and would be likely to create problems with omitted variable bias. One factor that has been undeniably important in numerous studies involves joint democracy, with democratic adversaries being found consistently to be less conflictual or war-prone than other types of adversaries. Joint democracy is measured using the Polity 98 data set (see Jaggers and Gurr, 1996 for general details on the Polity data), with a dummy variable indicating whether or not both rivals are categorized as having an institutionalized democracy score of six or greater on the 0-10 Polity scale (Dixon, 1994).

Three other factors -- military parity, major power status, and contention over territorial issues -- are expected to increase conflict (Kugler and Lemke 1996; Thompson 1995; Hensel 1996b). Military parity is measured using the composite index of national capabilities (CINC) measure derived from the military personnel and military expenditures indicators in the Correlates of War Project (COW) National Material Capabilities data set; two rivals are considered to be roughly equal (or in "parity") if the weaker side possesses at least eighty percent of the capabilities of the stronger side. Major power status is measured by a dummy variable indicating whether or not both adversaries are major powers, as defined and compiled by the Correlates of War project. Finally, we code for the presence or absence of territorial issues in each militarized dispute, as indicated by the type of status quo revision sought by each rival according to the MID data; territorial issues are coded as present if at least one rival sought to alter the territorial status quo.

EMPIRICAL ANALYSES

The first two competing hypotheses concern possible changes in the severity level of confrontations over time in enduring rivalries, with the evolutionary model predicting a pattern of generally increasing dispute severity across rivalry phases and the punctuated equilibrium model predicting roughly constant severity across the phases. The left column of Table 1 uses analysis of variance (ANOVA) tables to examine dispute severity patterns over time in the development of proto- and enduring rivalries, as well as general severity patterns regardless of eventual rivalry type. Proto-rivalries appear to exhibit increasing dispute severity from the early rivalry phase to the intermediate phase ($F = 5.18$, $p < .025$), suggesting some support for the evolutionary model's expectation that conflict patterns in rivalry develop over time with a lengthening history of conflict, although the increase is modest. Severity levels for enduring rivals in the early, intermediate, and advanced phases are statistically indistinguishable, though ($F = 0.69$, $p < .51$), which is exactly what the punctuated equilibrium model would predict.[20] Both models thus receive limited support from Table 1, with the evolutionary model appearing to be more accurate for proto-rivalries and the punctuated equilibrium model appearing more consistent with the results for enduring rivalries.

[Table 1 about here]

More specific than the first hypotheses on general dispute severity levels, the next two competing propositions focus on the most severe confrontations, full-scale interstate wars. Our concern is whether the occurrence of war is more likely in later stages of enduring rivalries (as predicted by the evolutionary model) or whether war is more randomly distributed across the three designated phases of enduring rivalries. The right column of Table 1 indicates the distribution of wars across rivalry phases, along with the percentage of all disputes in each phase that escalate to war. Although the probability of that any given dispute will escalate to full-scale war increases over time for proto-rivalries and decreases over time for enduring rivalries, the results in each portion of this table fail to attain conventional levels of statistical significance, supporting the punctuated equilibrium model's general expectation of roughly constant severity levels over time.

[Table 2 about here]

Another way to compare the two models involves the question of whether or not eventual proto- or enduring rivalries show distinctive patterns from their very outset. The punctuated equilibrium model's Hypothesis 3A suggests that enduring rivalries should show different conflict patterns from the beginning, while the evolutionary model's alternative Hypothesis 3B suggests that any difference between enduring rivals and other adversaries should only appear after the rivals have experienced a number of militarized conflict. Table 2 shows the mean severity scores of disputes in the early and intermediate phases of rivalries, stratified by their ultimate rivalry type. The results are generally consistent with the evolutionary model, as isolated, proto, and enduring rivalries are statistically indistinguishable in either of these phases ($p < .15$ in the early phase, $p < .74$ in the intermediate). Little evidence supports the punctuated equilibrium model's expectation that proto-rivalries should immediately be more severe than isolated ones, and enduring rivalries should immediately be the most severe of the three types. Indeed, not only is there no statistically significant difference in severity during either the early or intermediate phases, but disputes occurring in isolated conflict situations (i.e., those relationships that end short of either proto- or enduring rivalry) are the most severe disputes in the early phase.

A related implication of the punctuated equilibrium model's expectation of immediate differences in conflict severity between enduring rivals and other types of adversaries involves participants in full-scale wars. If the punctuated equilibrium model is correct, then most wars that are fought in the early phase of rivalry should be fought between adversaries that eventually become enduring rivals, because such adversaries' basic rivalry levels should be much more conflictual than those of the average proto-rivalry or isolated conflict dyad. In contrast, the evolutionary model would expect that many early war fighters should end their conflicts short of full enduring rivalry, as the adversaries learn from their initial confrontations. The war may lead to a decisive victory that resolves the disputed issues definitively, both sides may develop an aversion to war and attempt to resolve their issues through peaceful negotiations, or third parties may attempt to help resolve the conflict because of their interest in promoting regional or global stability. The right column in Table 2 lists the number of wars fought in each rivalry phase based on the eventual rivalry type of the participants, along with the percentage of all wars fought during that rivalry phase.[21] In the early phase, eventual enduring rivals account for only fourteen dyadic wars of the 167 total, or eleven percent; eventual proto-rivals account for sixteen percent (27 wars) and isolated conflict adversaries account for three-fourths (126 wars). Similarly, in the intermediate phase, eventual enduring rivals account for roughly one-third of all wars (24 of 69).[22]

While the BRL concept involves much more than simple war involvement, it is clear from these results that conflict severity levels in the early or intermediate rivalry phase -- including the occurrence of full-scale war -- do not offer a good indication of which dyads are likely to become enduring rivals. Most early war participants do not go on to become enduring rivals, instead ending their conflictual relationship at the proto-rivalry or (most likely) isolated conflict level. Similarly, there is no statistical difference between eventual isolated conflict, proto-rivalry, and enduring rivalry dyads in conflict severity levels during the early or intermediate rivalry phases. These findings alone should not be taken as definitive support for the evolutionary model's expectation that past interactions between two adversaries shape their subsequent relations, but

they certainly cast doubt on the punctuated equilibrium model's expectation that eventual enduring rivalries are immediately and significantly more escalatory than other types of adversaries.

Taken together, the first three sets of hypotheses have produced relatively inconclusive results. Proto-rivalries show statistically significant evolution in conflict severity levels, with later disputes reaching higher severity levels than earlier, which is consistent with the evolutionary model. Similarly, eventual rivalry status makes no statistical difference in conflict severity levels in the early or intermediate phase, indicating that eventual enduring rivals do not show distinct patterns of behavior from their outset. Yet eventual enduring rivalries do not show any statistically significant changes in conflict severity levels across rivalry phases, which is more consistent with the tenets of the punctuated equilibrium model. It may be that the general patterns are obscured by several competing trends, though, in which case these generally weak results would not be very surprising. Our remaining analyses attempt to expand beyond these basic analyses of general trends by accounting for conflict severity, drawing from factors related to each model as well as relevant control variables. By doing so, we hope to be able to account for variations in severity levels, perhaps casting new light both on the general trends covered in Tables 1 and 2 and on the relative value of the two models of rivalry.

[Table 3 about here]

Table 3 presents a regression analysis of dispute severity in the early and intermediate rivalry phases, or the time before a given rivalry qualifies as an enduring rivalry, and includes separate models for eventual proto-rivalries and eventual enduring rivalries. The punctuated equilibrium model argues generally that exogenous factors such as political shocks can lead to the outbreak of rivalry and may affect conflict levels (basic rivalry levels) within rivalry. The three political shocks included in Table 3 appear to have little systematic impact on the severity of militarized disputes in rivalries, particularly world war and civil war shocks; rivalries beginning within a decade of either type of shock do not show any statistically significant differences in conflict severity. Eventual enduring rivalries that begin within ten years of the independence of one or both rivals generally exhibit more severe dispute behavior ($p < .01$), although independence

shocks have no systematic impact for proto-rivalries or in the aggregated analysis incorporating all rivalry types. Overall, then, the factors identified by the punctuated equilibrium model appear to have little systematic impact on dispute severity. It may be that factors like political shocks help lead to the initial outbreak of rivalry, but that other factors have a much stronger influence on conflict behavior within rivalry.[23]

With respect to factors from the evolutionary model, Table 3 suggests that the expectation of greater conflict from a longer history of past conflict plays little role in dispute severity. The number of recent militarized disputes significantly increases dispute severity for proto-rivalries ($p < .05$), but has no systematic impact on enduring rivalries. Experience with a recent war has a statistically insignificant impact in each model. At least with regard to dispute severity, then, the general context of recent conflict between two adversaries does not appear to play much of a role.

The impact of specific characteristics of the most recent dispute between two adversaries is stronger and more consistent, though. Past dispute outcomes (whether compromises or decisive outcomes, relative to the referent category of stalemates) play little systematic role in proto-rivalries, but have stronger effects on conflict severity in eventual enduring rivalries. Disputes following a previous compromise outcome appear to be somewhat more severe ($p < .11$), and disputes following a previous decisive outcome are less severe ($p < .03$), than disputes in eventual enduring rivalries following a stalemate outcome (after controlling for the impact of past dispute severity). Regardless of the past outcome, the severity level of the previous militarized dispute between two adversaries is closely tied to dispute severity across all types of rivalries, with more severe past disputes generally increasing the severity of additional disputes in their aftermath (after controlling for the impact of past dispute outcomes).[24]

These results offer relatively weak support for the evolutionary model. Past dispute outcomes appear to have little impact on dispute severity within eventual proto-rivalries, but they do have some impact in eventual enduring rivalries. It should be noted, though, that dispute outcomes have been found to have strong effects on the likelihood of recurrent conflict (e.g., Hensel 1996a), so their relative lack of impact here should not be taken to indicate that they have

no impact on rivalry dynamics. The impact of past dispute severity is highly significant in each portion of Table 3, suggesting an important role for this evolutionary factor.[25]

As with the first two tables, the analyses reported in Table 3 have not presented decisive evidence in favor of either the evolutionary or punctuated equilibrium model. The factors associated with the evolutionary model have fared slightly better than those associated with the punctuated equilibrium model, but only two of the five evolutionary variables produce statistically significant results in each model reported in Table 3. This lack of strong support may result from one of several sources. It may be that additional factors are more important than these factors associated with either the punctuated equilibrium or evolutionary models; we will consider this possibility shortly. Another possibility involves the possibility of different rivalry patterns for different adversaries. Even if the overall patterns of conflict severity do not offer overwhelming support for either the punctuated equilibrium or evolutionary models, it is quite possible that the two models are each relevant in different situations. One important possibility to consider is that an early interstate war could change two adversaries' relationship fundamentally. For example, adversaries that have not fought an interstate war might be expected to follow a general pattern of gradual evolution in response to recent interactions. In contrast, experience with a war might be expected to change the entire relationship, potentially minimizing the impact of other general evolutionary factors or political shocks that might have been relevant before the war began.

[Table 4 about here]

Table 4 disaggregates the results from Table 3 based on whether a given conflictual relationship included at least one full-scale war during the early phase of rivalry (i.e., during the first two militarized disputes).[26] The disaggregated analysis reveals few major differences between dyads based on early war experience. Political shocks play little role in either model, with independence shocks significantly increasing dispute severity for adversaries who did not experience a war in the early phase of rivalry ($p < .05$), but no meaningful impact for world war or civil war shocks. Neither general evolutionary factor -- the number of recent militarized disputes or the experience of a recent war -- has a significant impact in either model. Finally, past dispute

severity significantly increases severity in both models ($p < .05$ for cases with an early war, $p < .01$ otherwise), and past decisive outcomes significantly decrease severity ($p < .05$) for cases with no early war. There are few noteworthy differences between these two models that can not be accounted for simply by the much larger number of cases without an early war experience, suggesting that -- while either the evolutionary or punctuated equilibrium model may perform better in certain situations than in others -- early war experience does not help distinguish between the evolutionary and punctuated equilibrium models.

SUMMARY AND CONCLUSIONS

This paper has attempted the first direct test of two models of rivalry development: the evolutionary model and the punctuated equilibrium model. Our analyses produce distinctly mixed results, identifying several rivalry patterns that are consistent with each model and several patterns of conflict that do not appear to be consistent with either model. Consistent with the punctuated equilibrium model, enduring rivalries are slightly (but not significantly) more severe at all stages than proto-rivalries -- although isolated conflict cases appear to be the most severe overall -- and enduring rivalries do not show meaningful changes in conflict severity across the three phases. As predicted by the evolutionary model, militarized disputes within proto-rivalries are more severe in later phases of the rivalry relationship (and even enduring rivalries show a weak similar pattern in their first two phases), and there is no meaningful difference in conflict severity between different rivalry types in either the early or intermediate rivalry phases. War also occurs disproportionately in later stages of both proto- and enduring rivalries, although this is primarily a function of the greater number of militarized disputes during in those phases.

Neither the punctuated equilibrium model not the evolutionary model is especially effective in accounting for severity patterns. We looked at the impact of political shocks on severity, as such shocks are critical factors in the origins and termination of enduring rivalries according to the punctuated equilibrium model. Yet only shocks associated with independence had any impact on rivalry severity, and even this effect was inconsistent across different analyses. The evolutionary

model's expectations fared slightly better, yet many of the variables suggested by that model did not achieve statistical significance. In general, the overall results offer mixed evidence in support of each model, but do not suggest the superiority of one model of rivalry development over the other. Similar results are found when the analyses are split based on the early war experience of two adversaries; neither model is able to land a knockout blow in any of the analyses.

In some ways, it is not surprising that the results came out as weak as they did. Militarized dispute severity is a complicated topic, and the punctuated equilibrium and evolutionary models were developed primarily to explain the origins of rivalry rather than the severity levels of individual confrontations along the road to rivalry. The punctuated equilibrium model, while not accounting well for dispute severity, is much more successful when accounting for the initial origins of rivalry; Goertz and Diehl (1995) note that almost all enduring rivalries (and many proto-rivalries) begin within a decade of at least one type of political shock. Similarly, the evolutionary model -- while producing somewhat mixed results in many of our analyses of dispute severity -- is much more successful when accounting for the recurrence of militarized conflict between past adversaries (Hensel, 1996a). It appears from this evidence that both of these models do a much better job of explaining the origins of rivalries or of militarized disputes in any given year than they do of explaining the course or outcome of any disputes that might arise. Leaders in potential rivalries may be willing to initiate militarized disputes in response to recent interactions with the adversary, or in response to the disruption created by political shocks, but once they do so the course of events within the dispute appears to follow quite different dynamics.

In order to account more effectively for dispute severity patterns, we would need to include a number of other factors that are exogenous to both of these models. For example, Leng (1993) presents substantial evidence that crisis bargaining strategies have a large role in determining the outcome of crises. While we have addressed several exogenous variables in our analyses, such as joint democracy and contention over territorial issues, factors such as crisis bargaining strategies are far beyond the scope of the present study. Interestingly, though, our findings are consistent with another finding from Leng's research on crises. Leng (1983), examining recurrent crises

between the same adversaries, finds that states typically maintain or increase their level of coercion in subsequent crises against the same adversaries, and only rarely deescalate from one crisis to the next. While we have been unable to use the same fine-grained analysis of crisis bargaining strategies in each of the militarized disputes in our data set, our most consistent predictor of dispute severity is the severity level of the previous dispute between the same adversaries; a severe previous dispute thus predicts additional severe conflict in the future.[27]

It is worth noting, though, that the purpose of this paper has not been to produce the best possible accounting of the determinants of dispute severity patterns. Rather, our goal has been to develop a comparative test of the two leading models of rivalry development, in order to determine which does a better job of accounting for conflict severity patterns. We now consider a variety of implications of our analyses for this comparison, as well as directions for future research. To begin with, these analyses do not amount to a comprehensive test of all of the predictions of either model. In particular, these analyses have been confined to the topic of severity within known rivalry types, and have not made any attempt to account for the outbreak or continuation of rivalry. Indeed, in past research, the evolutionary approach has been most successful in accounting for militarized dispute recurrence, with the number and characteristics of past confrontations playing a central role in the recurrence of conflict along the road to -- or during -- rivalry. Conflict recurrence is difficult to test comparatively, though, especially because the punctuated equilibrium model assumes that it is irrelevant. If a long-term enduring rivalry is predestined or is established by the end of the first or second militarized dispute between two adversaries, then there is little point to studying the impact of structural or behavioral factors on future conflict recurrence. Similarly, our analyses did not capture the full specification of the punctuated equilibrium model either. We identified significant fluctuations in severity within enduring rivalries, but the punctuated equilibrium model is more concerned with patterns in that variation than with its absolute magnitude. As long as any variation is “random” around the basic rivalry level (as opposed to a pattern of increasing or decreasing severity, for example), the punctuated equilibrium model may be regarded as valid even if the amount of random variation is large.

Our results suggest a number of conclusions about the viability of these two models and suggestions for future research on rivalry development. First, it appears likely that not all rivalries exhibit the same pattern of development. Our tests have looked at the aggregate behavior of proto- and enduring rivalries, but this may belie several different patterns among individual rivalries. Although Diehl and Goertz (2000) argue that conflict patterns consistent with the punctuated equilibrium model are the predominant ones, they acknowledge a significant subset of enduring rivalries that follow other developmental patterns. Indeed, our results appear to indicate somewhat different dynamics for proto- and enduring rivalries, with different shocks and evolutionary factors playing important roles for the different rivalry types.

It appears clear, then, that future analyses of rivalry development must be sensitive to the concern that one model may not necessarily fit all rivalries. For example, Thompson (1995) argues that major power and minor power rivalries may exhibit important differences, and Vasquez (1996) argues that rivalries involving territorial issues are likely to follow very different paths than non-territorial rivalries. We have examined this possibility by contrasting cases that experienced an early war with those that did not, with little additional insight beyond the aggregated model, but a credible case could be made for many further contrasts that might support one model or the other. Future empirical work is urged to consider such possibilities, actively developing and testing models that allow for multiple rivalry patterns.

Second, both the evolutionary and punctuated equilibrium models might profitably be reformulated in such a way that would yield stronger and more consistent results. For example, it might be argued that the evolutionary process can be accelerated, essentially skipping or quickening the stages of development, if a given rivalry begins with a war or an especially severe dispute. Hensel (1998b) suggests that many of the dynamics of rivalry may require the political activation of both states' governments and societies with regard to the rivalry. The evolutionary model suggests that conflict between two states is likely to activate the mass public gradually, as larger segments of society begin to feel that the budding rivalry affects their personal interests. In order to maintain a rivalry long enough to reach the advanced phase of rivalry, a government has

likely had to mobilize domestic support for policies that might otherwise be opposed for wasting resources and risking (or causing) costly confrontations with the rival. Furthermore, each confrontation with the rival may activate part of the mass public by creating or magnifying the general perception that personal interests are at stake. Certain events, such as full-scale war (or possibly even external political shocks), may hasten the process relative to the general accumulation of conflict suggested by the evolutionary model, activating the public politically before two states have engaged in a long series of confrontations. Any factor that activates the public in support of rivalry – whether gradually or rapidly – can thus be seen as contributing to the development of an enduring rivalry from an evolutionary perspective.

Finally, the models may be conceptualized less as competing than as complementary; it is not true that evidence supporting one model necessarily must count as evidence against the other. Future scholars might profitably attempt to move away from the current, relatively extreme versions of each model and synthesize both models into a unified model that incorporates elements of both. For example, the punctuated equilibrium model may be able to offer the basic foundation for a unified model; political shocks, the specific issues under contention, or other factors may set a "basic rivalry level" for two particular adversaries, whose subsequent interactions may generally center around this level. Yet it may well be that the direction and magnitude of this variation in conflict behavior -- rather than being random, as in the extreme version of the punctuated equilibrium model -- is a function of endogenous rivalry process, as envisioned by the evolutionary model. If future work could integrate these two models more closely, we may be able to come to a much better understanding of rivalry processes than with either model individually.

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TABLE 1: Militarized Dispute Severity across Rivalry Phases

A. Eventual Proto-Rivalries Only

Phase	Mean (Std. Dev.)	N	Wars (% of MIDs)
Early	74.96 (52.75)	446	27 (6.1%)
Intermediate	82.80 (53.92)	522	45 (8.6)
Total	79.19 (53.39)	968	72 (7.4)
	F = 5.18 (p < .025)		

B. Eventual Enduring Rivalries Only

Phase	Mean (Std. Dev.)	N	Wars (% of MIDs)
Early	78.75 (56.10)	126	14 (11.1%)
Intermediate	84.01 (51.81)	393	24 (6.1)
Advanced	80.32 (54.46)	415	31 (7.5)
Total	81.66 (53.59)	934	69 (7.4)
	F = 0.69 (p < .51)		

C. All Militarized Relationships (Any Rivalry Type)

Phase	Mean (Std. Dev.)	N	Wars (% of MIDs)
Early	79.40 (57.78)	1654	167 (10.1%)
Intermediate	83.32 (53.00)	915	69 (7.5)
Advanced	80.32 (54.46)	415	31 (7.5)
Total	80.73 (55.90)	2984	267 (9.0)
	F = 1.46 (p < .24)		

TABLE 2: Militarized Dispute Severity before the Advanced Rivalry Phase

A. The Early Phase

Eventual Rivalry Type	Mean (Std. Dev.)	N	Wars (% of Total)
Isolated Dispute	81.31 (59.86)	1082	126 (75.5%)
Proto-rivalry	74.96 (52.75)	446	27 (16.2)
Enduring Rivalry	78.75 (56.10)	126	14 (11.1)
Total	79.40 (57.75)	1654	167
	F = 1.91 (p < .15)		

B. The Intermediate Phase

Eventual Rivalry Type	Mean (Std. Dev.)	N	Wars (% of Total)
Proto-rivalry	82.80 (53.92)	522	45 (65.2%)
Enduring Rivalry	84.01 (51.81)	393	24 (35.8)
Total	83.32 (53.03)	915	69
	F = 0.12 (p < .74)		

TABLE 3: Accounting for Militarized Dispute Severity in the Early and Intermediate Rivalry Phases

Variable	Model I: Eventual Proto-Rivalries Coeff. (S.E.)	Model II: Eventual Enduring Rivalries Coeff. (S.E.)
Intercept	55.85 (5.08)***	59.34 (7.11)***
Punctuated Equilibrium Factors		
World war shock	3.91 (4.29)	1.60 (6.44)
Indep. shock	1.17 (4.31)	18.09 (5.98)***
Civil war shock	- 5.35 (4.11)	- 7.91 (5.71)
General Evolutionary Factors (past ten years)		
# Past MIDs	2.13 (1.10)**	- 0.52 (0.61)
Past war	0.91 (7.64)	5.99 (6.28)
Specific Evolutionary Factors (previous MID)		
Decisive outcome	-3.15 (5.10)	-16.20 (6.74)**
Compromise	6.02 (8.37)	14.18 (9.67)
MID severity	0.17 (0.04)***	0.13 (0.05)***
Control Factors		
Joint democracy	- 8.42 (8.22)	-13.72 (10.34)
Military parity	0.46 (4.08)	3.44 (5.24)
Major power dyad	16.97 (6.23)***	7.72 (7.22)
Terr. issues	27.45 (4.72)***	13.13 (5.13)**
	F = 6.65 ($p < .001$) $R^2 = .10$ N = 745	F = 5.20 ($p < .001$) $R^2 = .12$ N = 456

*$p \leq .10$, **$p \leq .05$, ***$p \leq .01$

Note: This table excludes the first militarized dispute in each rivalry relationship, in order to include evolutionary variables measuring the outcomes and severity levels of past disputes.

TABLE 4: Early War Experience and Militarized Dispute Severity in the Intermediate and Advanced Rivalry Phases

	Model I: Interstate War Occurred in Early Phase of Rivalry	Model II: No Early War
Variable	Coeff. (S.E.)	Coeff. (S.E.)
Intercept	86.65 (12.58)***	60.88 (4.08)***
Punctuated Equilibrium Factors		
World war shock	- 7.17 (10.63)	- 1.03 (3.74)
Indep. shock	9.27 (11.86)	6.98 (3.46)**
Civil war shock	- 6.08 (9.69)	- 2.84 (3.35)
General Evolutionary Factors (past ten years)		
# Past MIDs	- 0.22 (0.86)	- 0.45 (0.52)
Past war	4.98 (6.98)	1.88 (5.76)
Specific Evolutionary Factors (previous MID)		
Decisive outcome	-13.22 (9.58)	- 9.38 (4.30)**
Compromise	-25.94 (14.37)*	9.02 (7.00)
MID severity	0.13 (0.06)**	0.15 (0.03)***
Control Factors		
Joint democracy	-11.51 (12.72)	- 7.00 (7.55)
Military parity	- 6.84 (7.94)	1.83 (3.35)
Major power dyad	- 6.45 (11.41)	4.57 (4.12)
Terr. issues	17.78 (7.33)**	22.85 (3.62)***
	F = 2.50 ($p < .01$) $R^2 = .10$ N = 275	F = 7.21 ($p < .001$) $R^2 = .08$ N = 1055

*$p \leq .10$, **$p \leq .05$, ***$p \leq .01$

Note: This table excludes the first militarized dispute in each rivalry relationship, in order to include evolutionary variables measuring the outcomes and severity levels of past disputes.

Notes

[1] A contrary view is offered by Gartzke and Simon (1999), although as will be seen, we reject their argument that enduring rivalry can be accounted for by a stochastic process.
[2] "Stability" in the context of enduring rivalry refers to the maintenance of the rivalry itself, rather than the avoidance of conflict or rivalry that it would entail in a more peaceful context. The frequent militarized disputes that characterize rivalry are thus consistent with this rivalry usage of stability, as each one acts to maintain stability by prolonging the rivalry.
[3] Although the punctuated equilibrium model does not predict that all enduring rivalries are more severe than all lesser conflicts, its proponents (Diehl and Goertz, 2000) do suggest that on average enduring rivalries will be the most severe form of interstate conflict.
[4] It might be argued that wars represent political shocks that are more consistent with the punctuated equilibrium model of rivalry. Yet an interstate war represents a specific form of interaction between the adversaries, which is consistent with the evolutionary model's emphasis on past interactions affecting future relations. Furthermore, the other political shocks considered by the punctuated equilibrium model relate to events outside the control of the rivals themselves (system level shocks) or events within one rival (civil war), not to interactions between the rivals.
[5] This usage of the term "stalemate" refers strictly to the type of outcome in a dispute, reflecting the absence of any negotiated or imposed changes to the status quo ante as a result of the dispute. This usage is independent of the duration or severity of a dispute, and includes cases ranging from one-day incidents that are quickly dropped to inconclusive full-scale wars. Stalemates thus include much more than disputes that simply lapse or fizzle out quickly, and on average the evolutionary model expects stalemates -- like any other militarized confrontation, *ceteris paribus* -- to increase the sense of distrust and hostility between the adversaries.
[6] It should be noted that this paper's analyses focus solely on the severity levels of subsequent confrontations, not on the likelihood of subsequent conflict between the same adversaries. It is quite possible that a "war-weariness" effect may decrease the likelihood of future conflict between the same adversaries, while increasing the severity level of any renewed confrontations that arise. See, e.g., Leng's (1983) finding of increasingly aggressive bargaining strategies and increased risk of war in recurrent crises, although Leng did not address the probability of renewed conflict.
[7] The existence of a BRL can be established by examining conflict patterns in a rivalry, where curve fitting, regression, or other techniques can be used to determine whether significant changes occur in those patterns over time. The actual magnitude and range of the BRL can be measured by reference to its severity level or other indicators of conflict behavior (e.g., dispute density).
[8] These two studies were conducted on slightly different populations of enduring rivalries and used somewhat different indicators of conflict severity (Goertz and Diehl, 1998, also looked at conflict duration). Nevertheless, the results were quite similar across the two studies.
[9] It should be noted that Bennett (1998) finds that the effect of shocks on rivalry termination may depend heavily on the specific measurement that is used.
[10] Separate analyses of cooperative and conflictual forms of interaction reveal that enduring rivals engage in more intense activities of each type than other adversaries, indicating that rivals' interactions often include many attempts to limit or manage their conflict as well as the more prominent militarized confrontations. Further aggregated analysis reveals that on balance, relationships between rivals are more conflictual than those between non-rival adversaries.
[11] This is similar to many studies of the democratic peace in which normative and institutional explanations are each found to have some validity. Rarely are the two explanations tested against each other using competing propositions.
[12] This is similar to other attempts to compare different explanations for similar phenomena. For example, research comparing explanations for the democratic peace generally proceeds as if expecting all interstate conflict to be consistent with either the normative explanation or the structural explanation (or some additional explanation), rather than expecting each explanation to receive some level of empirical support.

[13] Past theoretical work on the punctuated equilibrium model (e.g., Goertz and Diehl, 1995; Diehl and Goertz, 2000) does not specify all of the expected sources of BRLs. While political shocks should be one important source of BRLs, additional factors may also contribute.
[14] The data set used in our analyses is available online at <http://www.pol.uiuc.edu/faculty/diehl.html > and at <http://data.icow.org>.
[15] Disputes that occur within 10-15 years of each other are considered to be part of "the same rivalry." A dispute is considered part of the same rivalry if it involves the same two states and occurs within eleven years of the first dispute of the sequence, twelve years after the second dispute, up to fifteen years after the fifth dispute.
[16] Over half of the enduring rivalries are "right-censored," meaning that they had not ended by 1992, the cutoff date of the data. Thus, it is conceivable that there will be more disputes in the later phase of those rivalries and that our severity estimates may be biased. Nevertheless, we note that dropping the censored cases from analyses produces results very similar to those using all 63 enduring rivalries (according to Diehl and Goertz, 2000) and therefore we do not expect that the conclusions reported below will be substantially affected. The proportions of censored isolated and proto rivalries are considerably smaller and excluding them from the analyses does not significantly affect the results reported below.
[17] Admittedly, any definition focused on militarized conflict between two adversaries is likely to miss important non-militarized dimensions of competition between them. Especially if the evolutionary model is more accurate than the punctuated equilibrium model, with its emphasis on sudden changes or shocks as sources of rivalry, we might expect that many rivalries are preceded by some period of non-militarized competition before the adversaries first employ militarized means. Current data availability prevents any meaningful attempt to study these non-militarized competitions, although data from the Issue Correlates of War (ICOW) project (Hensel, 2001) appears to offer one prospect for future analyses. In any case, our focus is on militarized conflict, so this inability to measure non-militarized relations is not a great limitation.
[18] Several other types of shocks used by Goertz and Diehl, periods of rapid power change or widespread territorial change in the international system, were removed from the analysis due to high correlations with these shocks or other variables in the model; these three shocks were more closely associated with the origins of rivalries in Goertz and Diehl (1995) than were the other types that we have excluded. Shocks were identified using the latest versions of the Correlates of War Project data sets on interstate system membership, interstate wars, and civil wars respectively. Accordingly, our shocks are not identical to the list employed in Goertz and Diehl (1995).
[19] Additional tests were run to measure the number of outcomes of each type in the previous two or three confrontations and the average severity level of the previous two or three confrontations, rather than the single previous dispute; the results were substantially the same as reported here.
[20] This result of declining severity levels in the advanced rivalry phase could also be consistent with the evolutionary model if two adversaries that have reached the advanced phase come to recognize the danger inherent in their relationship and attempt to manage their conflicts at relatively low levels (for a similar point see Hensel and McLaughlin, 1996).
[21] These wars are dyadic disaggregations from the overall militarized dispute data set, with each war representing two states that were on opposite sides of the war, that were both active in the war at the same time, and that were both coded as active war participants (i.e., with a "level of hostility" code of five, indicating full-scale war involvement rather than simply threatening, displaying, or using force or simply being the target of another belligerent's threats or displays).
[22] Similar results are obtained in analyses excluding multilateral wars or wars begun between 1914-18 or 1939-45, in order to avoid swamping the analyses with a large number of dyadic wars resulting from the world wars or similar large wars with numerous participants on at least one side. Eventual proto-rivals account for a somewhat higher percentage of wars in the early phase, and eventual enduring rivals account for almost half of all wars in the intermediate phase, but the results are certainly not strong enough to give us any confidence in predicting eventual rivalry status based on early war experience.
[23] When the shock variables are reconfigured to indicate disputes beginning within ten years of the shock rather than rivalries beginning within ten years of the shock, world war shocks become

statistically significant ($p<.01$ or better) in every analysis, while the other shock types remain far from significance. Thus, world war shocks appear to have a strong, immediate, short-term (ten-year) effect on dispute severity that weakens later -- which is initially consistent with the punctuated equilibrium model's argument about exogenous sources of basic rivalry levels, although suggesting the possibility that relations between the adversaries (or other factors) drive later rivalry behavior.

[24] This effect of past dispute severity is not driven primarily by the most severe disputes. Quite similar results were obtained from an analysis using separate interaction terms to measure severity for full-scale wars and for sub-war disputes. Additionally, the impact of the other evolutionary factors does not change meaningfully if past dispute severity is excluded from the model.

[25] Proponents of the punctuated equilibrium model might suggest that past severity actually captures the rivalry's BRL, making this measure more consistent with that model than with the evolutionary model. Yet even proponents of the punctuated equilibrium model recognize that the severity level of any given dispute will vary around the disputants' general dyadic BRL (whether the sources of this variation are random or follow evolutionary trends), while the BRL itself remains constant. Dispute-to-dispute severity levels show too much short-term fluctuation for the severity of the single most recent dispute to provide an accurate measure of a dyadic BRL, particularly for large-scale fluctuations such as full-scale wars. As a result, this measure of previous dispute severity is more consistent with the evolutionary approach.

[26] Because of the relatively small number of cases that would be available for an analysis based exclusively at the intermediate rivalry phase, this table includes both the intermediate and advanced rivalry phases, while excluding the early phase because it is used to determine whether or not there is an early war.

[27] It is worth noting that Leng's analyses use a smaller set of interstate crises, which are typically much more severe than the average militarized dispute used in our analyses. It appears that political shocks or past interactions lead to the outbreak of a variety of low-intensity militarized disputes, but that some other domestic or international factors account for the escalation of certain of these disputes to the level of Leng's full-fledged crises.