Towards a Continuous Specification of the Democracy-Autocracy Connection

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Abstract:

It has recently been argued that apparent peace between democracies may be the result of political similarity rather than joint democracy, and that there may exist an "autocratic peace" which is similar to the democratic peace. If political similarity generally is the cause of peace rather than joint democracy specifically, then the democratic peace is merely a statistical artifact that follows from separating out a selected subset of data. In addition, we do not know whether the autocratic peace or democratic peace is stronger, if they both exist. Existing empirical specifications of the connection between joint regime type and international conflict have not been adequate to assess these arguments. I develop a specification of joint regime-type variables that uses continuous measures without arbitrary cutoffs and allows us to assess a larger set of hypothesized regime-type effects. I find that jointly democratic and jointly autocratic pairs of states are both less conflict prone than other pairings, but that political similarity apart from these extremes has a much smaller effect on the risk of conflict. The results suggest that political similarity between *coherent* regimes (those at extremes of the institutionalized democracy-autocracy scale) encourages dyadic peace. But although there is a lower risk of conflict in both jointly democratic and jointly autocratic dyads, I find that the democratic peace is clearly stronger than the autocratic peace.

INTRODUCTION

Over the past few years, scholars examining the so-called "democratic peace" have noted the possible complementary existence of an "autocratic peace." Most recently, in the American Political Science Review, Peceny, Beer, and Sanchez-Terry (2002) argued explicitly for what they refer to as a "dictatorial peace." Scholars of international relations have in fact noted the apparent existence of such a peace for several years (e.g., Gleditsch and Hegre, 1997; Oneal and Russett, 1997; Raknerud and Hegre, 1997; Beck and Jackman, 1998; Nordstrom, 2000; Werner, 2000; Bennett and Stam, 2004). But although the apparent existence of this alternative peace has been noted, theoretical arguments for *why* it should exist, and empirical analyses that reveal more detail of it, have been underdeveloped. In this article I explore the empirical relationship between the "two peaces" by developing an analytic specification that can help us answer important questions about how the autocratic peace relates to the democratic peace.

The development of theoretical arguments for *why* an autocratic peace may exist has lagged behind the empirical observation of its presence (much as in the early days of the democratic peace literature), with Werner (2000) and Peceny et al. (2002) being the two primary works offering significant theoretical discussion of the autocratic peace vis-à-vis the democratic peace. More importantly for this article, although empirical work has observed that an autocratic peace exists, it has lagged in not examining precisely what the autocratic peace looks like in relation to the democratic peace. If the autocratic peace is stronger than the democratic peace, for instance (if the probability of conflict is lower between two autocracies than between two democracies), then it suggests we rethink the desirability of the democratic peace (at least on purely pragmatic conflict grounds). Alternatively, if only a narrow and identifiable set of autocratic states are more peaceful than a broad range of democracies, then this suggests a new pattern to be further explained. And if both the autocratic and democratic peaces can be subsumed empirically under the broader category of "political similarity peace," then we should be looking for a single broad theoretical formulation. However, analyses of the regime type-conflict relationship have not used a statistical specification that can adequately reveal details of the comparative

relationship. I argue in this article that a new (and thoroughly explored) statistical specification is needed to help us answer questions such as

- Are joint democracy and joint autocracy separate pacifying conditions, or is "political similarity" (more generally) pacifying?

- Is the relationship between joint regime type (joint democracy or joint autocracy) and peace linear? If so, over what ranges of the data? If not, what form does the non-linearity take?

- Is the democratic or autocratic peace stronger?

- Are there targeting effects whereby democratic regimes are more likely to target autocratic regimes, or vice versa?

In keeping with its research agenda, the democratic peace literature has focused on attributes of democracies that should lead them to behave differently toward one another than they do toward more autocratic regimes. In this literature, it is typical for autocracies below some arbitrary cutoff on various democracy scales to be lumped together in a residual category, both theoretically and empirically. Peceny et al. (2002) offer a better-grounded discussion, giving us new theoretical reasons to think that autocracies might behave differently towards one another than they do towards democracies. Their discussion complements that of Werner (2000), who argues that political similarity across the spectrum of polity types is critical to both the democratic and autocratic peace, as political similarity gives regimes incentives to avoid military conflict. The Peceny et al. analysis further disaggregates autocratic regimes into types that might have differing reasons to interact with one another more or less peacefully. But the disaggregation of autocracy and addition of political similarity measures have not yet provided a specification of the democracy-autocracy-peace relationship which can answer the broader questions above. Specifically, these studies have not examined whether similar regimes with mixed democratic/autocratic characteristics are as conflict-prone as jointly-democratic or jointly-autocratic dyads, or whether only extremely different types of regimes are prone to conflict. They have also not studied whether joint autocracy is just as good as joint democracy at maintaining peace, or if joint

democracy has a more pacifying effect (as democratic peace proponents would likely argue). To answer these questions, we need a new, more comprehensive analytic specification to sort out several different possible relationships between democracy, autocracy, mixed-regimes, [1] and peace.

Here, I develop a new combination of continuous regime type variables that allows us to evaluate more fully the relationship between regime types and international conflict. The resulting model permits us to examine the effects of democracy without making arbitrary classifications of states in our data into dichotomous categories. I find that even once we control for political similarity, jointly more-democratic dyads are the least conflict prone in the international system. More importantly, the relationship between political similarity and peace does not hold across all combinations of regime types, but only for states at the extremes of the autocracy/democracy distribution. The findings also corroborate Reiter and Stam's (2003) finding that autocratic states are more likely to initiate conflicts with democratic states than vice versa. I suggest a new empirical finding for the relationship between regime type and peace, namely that "joint coherence" of institutionally similar regime types is necessary to reduce the probability of militarized conflict in interstate dyads.

ARGUMENTS ABOUT DEMOCRACY, POLITICAL SIMILARITY, AND INTERNATIONAL CONFLICT

The Democratic Peace

The large body of literature on the so-called "democratic peace" emerges from the simple empirical observation that democracies have rarely, if ever, fought a war against each other. Explanations have been developed based on Kant's idea of perpetual peace among liberal states, shared norms of compromise, and the presence of restraining democratic institutions that prevent democracies from fighting one another. The democratic peace proposition has taken root in policy circles, being cited by U.S. Presidents for over a decade as a justification for U.S. efforts to promote democracy, and at times for

U.S. military involvement abroad. Initial empirical observations of the relationship between democracy and war were made as early as the 1960s and 1970s (e.g., Babst, 1964; Small and Singer, 1976), with supporting theoretical arguments about the relationship between democracy and war developed by Doyle (1983), Russett (1990), and Maoz and Russett (1993). The argument has extended beyond the outbreak of war to the outbreak of lower-level conflicts, with empirical evidence commonly based on the occurrence of "militarized interstate disputes" (MIDs) (Jones, Bremer, and Singer, 1997; Ghosn, Palmer, and Bremer, 2004). The democratic peace proposition has been supported in the majority of quantitative analyses looking at the question, and has perhaps been explored most thoroughly in many studies by Oneal and Russett (e.g., 1997, 1999a).

The democratic peace has generated extensive reaction and comment (e.g., Ray, 1995), and increasingly sophisticated statistical approaches, controls, and elaborations have been applied to the problem (e.g., Bremer, 1992; Senese, 1997; Beck, Katz, and Tucker, 1998; Raknerud and Hegre, 1997; Bennett and Stam, 2004). The dominant evidence continues to be that democratic dyads are much less conflict prone than other dyads, both at the level of war and lower-level disputes, even when the analysis is conducted with varying research designs and assumptions (Bennett and Stam, 2000a). Nevertheless, arguments over alternative explanations and variants continue. Common theoretical counter-arguments suggest that the democratic peace is a coincidence of alliance, the Cold War, trade, or other common interests (e.g., Gowa, 1999; Gartzke, 1998, 2000; but see Oneal and Russett, 1999b, 2001 for evidence counter to these alternative explanations). Other analysts varying particular parts of the research designs still question the basic empirical relationship (see, e.g., Henderson, 2002). Finally, some empirical work has found that democracy does not exert the same pacifying effect for all types of dispute outbreaks and levels of dispute escalation as it does for wars (Senese, 1997; Partell and Palmer, 1999), and that it may have different effects across types of states (e.g., Mousseau, 2000). This points to a more complex relationship than a straightforward extension of the democracy and war finding to disputes might suggest.

The Autocratic Peace and the Role of Political Similarity

Starting in the late 1990s (e.g., Gleditsch and Hegre, 1997; Raknerud and Hegre, 1997), some analysts of the role of regime type began to identify and examine the existence of a so-called "autocratic peace." The most sophisticated analyses to date on this question have continued to find evidence of an autocratic as well as a democratic peace, even when using hazard models rather than more familiar logit/probit setups (Nordstrom, 2000; Werner, 2000). Werner (2000) also began the exploration of the concept of "political similarity" (rather than joint autocracy and joint democracy as totally separate concepts) more generally. Werner (2000) developed an initial theoretical argument for why political similarity should be an important influence on conflict behavior, which could potentially encompasses both the democratic and autocratic peace.[2] Werner argues that political similarity may have an effect on conflict because domestic affairs are themselves often at issue in international relations. That is, regime type and the management of domestic affairs are not just intervening factors mediating between underlying issues such as power or economic relations. This may be because the composition of a state's government influences foreign policy preferences, because the actions of other governments may affect a leader's own domestic position, or because the rules governing domestic affairs may directly affect the other states' interests (through movement and treatment of money, people, trade, and so on) (Werner, 2000:346-348). This argument is clearly wider than either the democratic or autocratic peace, as it is about the similarity in the way that states manage their domestic affairs across the range.

Peceny et al. add further arguments about the likely sources of peace among subsets of autocratic states. Along with hypothesizing that homogenous dyads in general (both democratic or both autocratic) are less likely to engage in war than mixed dyads, they also note that "shared institutional constraints may provide the foundation for a separate peace among personalist dictatorships, while shared identities and normative values may generate peaceful relations among single-party regimes" (Peceny et al., 2002:20). Clearly, there are now theoretical arguments to explain why autocratic regimes may experience a disproportionate amount of peace, paralleling democracies in this way.

Political Similarity AND the Democratic Peace?

The argument that political similarity is driving peace may be a counter-theory to the mechanisms proposed to underpin the democratic peace. While the democratic peace is one of the most robust empirical findings in international relations, critics have portrayed it as either entirely or partially an artifact, arguing that there is nothing special about either monadic or joint democracy. If it turned out that political similarity was the sole regime-type influence explaining international conflict, then it would "wipe out" the separate finding of the democratic peace, because the democratic peace would be a result of misspecification. That is, since "similar democracies" are just a subset of "similar regimes," if regime similarity is the true source of less conflict, then joint democracy is just a mis-identified subset of peaceful cases, and the relationship between democracy and conflict is merely incidental.

Luckily for scholars of the democratic peace, Werner's empirical findings suggest that in fact the relationship between political similarity and conflict does not completely replace the democratic peace effect. Rather, it is an *additional* story *on top of* the democratic peace. Specifically, Werner finds that both joint democracy and political similarity are negatively related to interstate dispute onset, suggesting that "of all politically similar pairs, similar democratic pairs tend to be particularly pacific" (2000:362). The democratic peace is clearly a part of political similarity, but there are hints that it is separable and may have independent empirical effects. Work attempting to cast the argument as "democratic peace vs. political similarity" ignores this possibility.

If we have an initial empirical finding that both political similarity and joint democracy effects exist, what is the theoretical explanation? Is there a theoretical reason that similar regimes are less likely to have militarized conflict with one another, and also that jointly democratic pairs of states are less conflict-prone than jointly autocratic pairs? It is not difficult to build an argument about this combined relationship. First, we have Werner's contention that political similarity between governments of all types may mean that they do not need to confront issues of intrastate politics. We also have Ray's (2000,

6

2001) argument that an increasing number of democracies in the international system may generate a counter-reaction from autocratic regimes, with clashes between democracies and autocracies over spreading democracy through the system. Alone, though, these arguments are about removing some possible sources of conflict between similar regimes without providing any positive or "pulling" ties between states that would differentiate democracies from autocracies. Existing arguments about democratic-democratic interactions provide several possible positive cooperative linkages. Democratic norms of compromise and respect for difference (developing through the peculiar institutions and values of democracies) may lower the probabilities of conflict escalating to the level of severe military conflict. If audience costs are more easily realized in democracies than autocracies (e.g., Fearon, 1994; Schultz, 2001), then accurate signaling may be more likely in democracies than other similar dyads (see also Gartzke, 1998). Finally, if leaders in democracies are responsible to a larger selectorate than those in autocracies, must develop policies more beneficial to the state population as a whole (Bueno de Mesquita, Smith, Siverson, and Morrow, 2004), and must practice good policy linked to avoiding costly and unnecessary military competition, then we would similarly expect to see democracies avoiding conflict at a differential rate than autocracies. These factors act above and beyond political similarity; together the arguments suggest an absence of conflictual factors in all similar dyads, and additional positive factors in jointly democratic dyads.

While the linkage of these arguments is plausible, however, and while Werner's study is suggestive, additional empirical work must be done to examine specifically whether both similarity and joint democracy have an effect on international conflict, whether that effect is consistent across the range of regimes, and by how much one effect is stronger. Below, I proceed by developing a new model specification that uses a combination of several continuous regime variables to gain a more thorough understanding of the problem.

LIMITATIONS OF COMMON REGIME TYPE SPECIFICATIONS

The way in which regime type variables have been specified in existing studies of conflict poses a limitation on exploring the relationship between joint democracy, political similarity, and conflict. In particular, specifications of democracy and joint regime type have varied considerably between studies. The major commonality is that most studies employ the Polity data set (Jaggers and Gurr, 1995) to measure regime characteristics,[3] and focus on the polity type or "dem" measure created by subtracting "institutionalized autocracy" (variable "autoc") from "institutionalized democracy (variable "democ"). But the "dem" score (reported in current versions of the polity data set as the variable "polity") is then used in a variety of final variables in different models. Operationalizations seen in final model analyses include composite measures of joint regime type, "demhigh" and "demlow," and dummy variables that code whether neither, one, or both states in a dyad are democratic according to a specified cut point.[4] Different models then include varying combinations of democracy variables, for instance, one or both of "demhigh" and "demlow," or varying combinations of a "joint democracy" dummy, "demlow," "joint autocracy," and "political similarity."[5]

The varying operationalizations and specifications of these studies pose a problem for understanding the general relationship between regime type and conflict. While the general finding that democracy reduces conflict holds through these studies, it is unknown precisely how much difference in specification (dummy codings and various combinations of variables) has affected coefficient estimates and apparent relationships between democracy and other variables. Theoretically, whether an analyst should even make a dichotomous coding of democracy ("democratic" vs. "non-democratic") or employ a continuous measure of level of democracy ("dem" or even "demhigh" or "demlow") depends in part on whether democracy is seen as a continuum with degrees, or whether "democracy" is a qualitatively different regime type than others (for some arguments on this point, see Przeworski et al., 1997, 2000). Dichotomizing the range of democracy into dummy variables throws away information by splitting the data into a limited number of stark categories. If there is a range of values of democracy, and an underlying continuum of "democraticness," then it may not be possible (or even desirable) to precisely

define "how much is enough." Moreover, even if "democracy" is a qualitatively different category than "non-democracy," it is difficult to defend any cut point down to the specific integer.[6]

Figure 1 about here

Perhaps more importantly, most of the specifications used in the literature have allowed study only of the democratic peace. Specifications with just combinations of demhigh and demlow do not allow an exploration of the autocratic peace.[7] Alternatively, studies that substitute "political similarity" for individual or joint measures of democracy do not allow us to explore the possibility of an additional effect of joint democracy. Thus, most existing models (Werner, 2000 being an exception) do not allow us to examine the links between these two main concepts. The studies mentioned above also share the common feature that the unit of analysis in each is *non-directed*, and so the analysis must study the *onset* of militarized disputes or wars without focusing on who started the conflict. In non-directed dyadic studies, it is necessary to convert inherently monadic information (individual "dem" scores) into non-directional dyadic variables such as "demlow" and "demhigh" or joint dummy measures, and the assumptions behind such transformations (e.g., the weakest link) are rarely tested. As Reiter and Stam (2003) note, however, it is often of great interest who starts conflicts; *directed* analyses allow us to study this. Since the identities of the conflict initiator and conflict target are known in directed analysis, we can use inherently monadic variables without losing information, for instance by including the (potential) initiator's regime type and the (potential) target's regime type separately. Directed analysis thus has the advantage of not requiring a transformation of any type to include final monadic variables (see Bennett and Stam, 2000a for additional discussion; see also Ray, 1999).

In the specification advanced below, I avoid arbitrary cutoffs for democracy and autocracy. I assume that there is a continuum of regime type; if arguments about shared institutions, shared norms, or shared goals are correct and are related to democracy, then we should observe conflict patterns related to regime type across a range of values, and not just in specific categories. I also develop a new

specification to examine just how much of the "democratic peace" is explained by political similarity, and how much separately by joint democracy as a subtype of similar regimes. Finally, I conduct analyses using both directed and non-directed dyad datasets. I turn next to developing this specification.

A BROADER SPECIFICATION OF THE DEMOCRACY-AUTOCRACY-PEACE CONNECTION

A better variable specification for examining democracy, autocracy, and peace should have several features. First, it should employ continuous measures of regime type to avoid the possible problems associated with specifying arbitrary democracy cutoffs. Second, it should allow for several possible relationships to be revealed in a single analysis, as we can determine which patterns linking regime type to peace are correct only if all of the hypothetical relationships are modeled in one equation. That is, when testing either the democratic peace or political similarity explanations, we must allow and control for the other possible relationship. Third, in a directed-dyad setting, the specification should allow detection of targeting effects. I suggest a specification consisting of several variables to capture 1) linear, monadic effects of democracy on each side of a dyad, 2) in a directed analysis, targeting effects, 3) the effects of political similarity, 4) the separate effects of joint democracy, and 5) curvilinearity in the relationship over a range of continuous values.[8]

The new specification starts with the individual regime scores of the two states as separate variables. With a non-directed unit of analysis, these individual regime scores will be taken as "demhigh" and "demlow;" where the unit of analysis is directed, the variables will be the regime types of the (potential) conflict initiator and (potential) target. Including individual regime scores will allow examination of any monadic and linear conflict propensities of either the initiator or the target. In directed analysis, the initiator's regime type alone will capture whether democracies initiate disputes at a different rate than autocracies, while the target's regime type alone will capture whether democracies are the target of conflictual actions more or less often than autocracies. The individual regime type scores for each state in a dyad are measured using the variable "polity2" from the Polity IV data set. Referred to as

"dem" above, this variable is a state's democracy score ("democ") minus the autocracy score ("autoc") in the given year (Jaggers and Gurr, 1995; polity IV data is available for download via http://www.bsos.umd.edu/cidcm/inscr/). This index ranges from –10, indicating states with low democracy and high autocracy, to +10, indicating states with the opposite. The "polity2" variable further interpolates data in many instances in which they were missing due to regime transitions, interruptions, or interregnums.[9]

Exploring arguments about the democratic peace or political *similarity* requires an interaction that indicates when both states in a dyad are similar, and exploring the democratic peace separately requires a measure identifying only jointly democratic pairs. In keeping with my arguments above, I do not want to compute a dichotomization of jointly democratic states, and instead I seek continuous measures. I build three multiplicative interactions of the states' individual, untransformed regime "dem" scores and a linear similarity measure. In combination with monadic variables and one other interaction below, these variables allow us to examine all the effects with which we are concerned.[10]

The first interactive similarity variable is constructed by multiplying the initiator's dem score by the target's dem score.[11] Given dem scores ranging from –10 to +10, this multiplicative similarity variable will be high (large and positive, to a maximum of +100) for jointly autocratic *and* jointly democratic pairs. Similarity will be in a middle range, around 0, for pairs of mixed regimes (a dem score for either state near 0 produces a joint similarity score near 0). Similarity takes on its lowest values (to a minimum of –100) for pairs of dissimilar states (with a +10 and –10 dem score combination). If it is similar regimes that do not fight rather than jointly democratic pairs, then this variable will have a negative effect on conflict while other variables do not.

The second interactive similarity indicator is obtained by squaring the above regime similarity variable. This similarity^2 term is necessary to allow for either 1) *only* a democratic peace, or 2) *both* a democratic and autocratic peace. If it is only joint democracy that matters, or if joint democracy matters more than joint autocracy, the similarity^2 term in combination with similarity and a constant in estimation will allow us to observe an inverted-U shaped relationship between similarity and conflict that is not

centered at 0. This allows us to find that jointly democratic and jointly autocratic pairs may have lower

conflict probabilities than middle pairs, but also the democratic peace might be found to be stronger than

the autocratic peace (or vice versa). We can thus find that only jointly democratic dyads have peace, that

jointly democratic and autocratic dyads have peace, that both have peace, or that neither have peace. In

combination with other variables, we can also find that the entire range of similar regimes (similar

autocracies through similar mixed regimes through similar democracies) is more peaceful than the set of

dissimilar regimes.

Finally, in order to judge targeting effects in a directed-dyad setting (to test whether democracies

or autocracies are different in whether they initiate and escalate disputes against similar types of states), I

interact the initiator's regime type with a linear regime similarity measure. I construct the linear

similarity measure as $20\text{-}|\text{Dem}_{\text{Initiator}} - \text{Dem}_{\text{Target}}|$, mainly for clarity in the final operationalization (it is

highly correlated with the multiplicative similarity measure; see note 11). At the heart of this equation is

the absolute value of the difference in the regime scores, which ranges from 0 for similar regimes to 20

for dissimilar regimes. I subtract the value from 20 so that similar regimes have a score of 20 and

dissimilar regimes have a score of 0. I then interact similarity with the initiator's regime type. But for

this interaction, I do not interact the initiator's raw dem score (which ranges from –10 to +10) with

similarity (which ranges from 0 to 20), but instead the dem score plus 10 (making it range from 0 to +20).

This ensures that the interaction is consistently higher for more similar states and more democratic

initiators.[12] In sum, then, the targeting variable is equal to $(\text{Dem}_{\text{Initiator}} + 10) * 20\text{-}|\text{Dem}_{\text{Initiator}} - \text{Dem}_{\text{Target}}|$.

Because the identity of the potential initiator is of course undetermined in a nondirected dyad setting, this

interaction will be omitted from analysis on the set of nondirected dyads.

In summary, I use two equations (one for directed-dyadic and one for nondirected-dyadic

analysis) to evaluate the combined effects of political similarity and joint democracy on interstate

conflict:[13]

Directed-dyad analysis:

$$P(\text{Conflict}) \quad = \alpha + \beta_1 \, \text{Dem}_{\text{Initiator}} + \beta_2 \, \text{Dem}_{\text{Target}} + \beta_3 \, (\text{Dem}_{\text{Initiator}}*\text{Dem}_{\text{Target}}) + \beta_4$$

$$(\text{Dem}_{\text{Initiator}}*\text{Dem}_{\text{Target}})^2 + \beta_5 \, [(\text{Dem}_{\text{Initiator}} + 10) * \text{Similarity}]$$

$$= \alpha + \beta_1 \, \text{Dem}_{\text{Initiator}} + \beta_2 \, \text{Dem}_{\text{Target}} + \beta_3 \, (\text{Dem}_{\text{Initiator}}*\text{Dem}_{\text{Target}}) + \beta_4$$

$$(\text{Dem}_{\text{Initiator}}*\text{Dem}_{\text{Target}})^2 + \beta_5 \, [(\text{Dem}_{\text{Initiator}} + 10) * (20 - |\text{Dem}_{\text{Initiator}} - \text{Dem}_{\text{Target}}|)]$$

Nondirected-dyad analysis:

$$P(\text{Conflict}) \quad = \alpha + \beta_1 \, \text{Dem}_{\text{Low}} + \beta_2 \, \text{Dem}_{\text{High}} + \beta_3 \, (\text{Dem}_{\text{Low}}*\text{Dem}_{\text{High}}) + \beta_4 \, (\text{Dem}_{\text{Low}}*\text{Dem}_{\text{High}})^2$$

Judging the range of captured patterns

It is critically important that this specification allow discovery of all of the various empirical patterns that we speculate could exist in the real world. However, the probability of conflict is a net result of several interactions of the regime-type and political similarity variables in this model, and the way in which the variables interact may not be obvious (it is certainly not straightforward). As a result, before I turn to my analysis of actual data, I illustrate by simulation that the specification I have identified in fact can find any of the combinations of empirical reality that we wish to explore. Because I am primarily interested in the full specification including targeting, and because of space limitations, I illustrate this using only the directed-dyad specification.

Figure 2 shows the range of results that empirical analysis could find using the above specification. In each case, I manipulated coefficients to generate hypothetical patterns. The figures are in effect "existence proofs" that particular patterns and relationships could be found in actual data; when it comes time for actual data analysis, maximum likelihood estimation will produce coefficients, and the resulting pattern of predicted probabilities will be plotted to produce similar figures that show the actual "probability landscape." Model 1 shows a hypothetical situation in which political similarity is the dominant factor in influencing conflict. With these coefficients, there is both a democratic and autocratic peace, and both are equally strong. Here, extremes of shared democracy and shared autocracy are much

safer than middle values of mixed dyads; the similarity of mixed-type regimes also reduces the

probability of conflict, but the effect is stronger at the extremes. Mixed dyads of extremely different

regime types are the most dangerous, and similarity at the extremes is most stable. In this instance, there

is also no difference in conflict behavior by regimes against particular targets.

Figure 2 about here

Figure 2 Model 2 shows a hypothetical situation in which there is again both a democratic and an

autocratic peace, but the democratic peace is stronger. That is, the presence of two democracies (the

10,10 combination in one corner of the figure) is more pacifying than the presence of two autocracies (the

–10, -10 combination). Non-democracies also initiate conflict at a higher rate; the circumstance of a non-

democratic (potential) initiator against a democratic target is the most dangerous situation.

Figure 2 Model 3 shows another hypothetical situation where similarity is the major factor

affecting the risk of conflict, but it is not limited to democratic or autocratic extremes. In this case, mixed

dyads are always the most dangerous; when regimes are similar, the risk of conflict is comparable

whether the regimes are both autocratic, both democratic, or both at middle levels of democracy.

Certainly any differences between joint democracy, joint autocracy, and joint mid-level democracy are

minor relative to the effect of being a mixed dyad.

Finally, Figure 2 Model 4 illustrates a situation in which political similarity is not found to be a

dominant factor influencing the probability of conflict. Here, there is a strong democratic peace effect

(the only lower-risk area develops as the dyad moves toward joint democracy), but joint autocracy does

not reduce the probability of conflict. In addition, regime similarity has little effect on the risk of conflict

by itself.

The figure illustrates that this specification will allow us to detect a range of patterns in our real-

world data. Empirical estimation using that data (plus additional controls) will of course determine the

actual values of these parameters, and hence, which of these (or some other) patterns is closest to that

seen in reality. I turn next to other necessary details of the research design and variable operationalization of included controls.

RESEARCH DESIGN

Methods: Event History Modeling, Logit

The main analysis employs an event history approach (also referred to in different literatures as hazard, duration, or survival models) to model the hazard of conflict rather than its direct probability and to take into account the possibility of duration dependence in peace over time (see, e.g., Allison, 1984; Lancaster, 1990; Box-Steffensmeier and Jones, 2004).[14] The results of analysis emerging from such an approach have a direct interpretation in conflict probability, but the duration model approach adds considerable flexibility in specification and assumptions. The measured dependent variable in these analyses is the duration of peace, defined as the absence of militarized disputes; the underlying, conceptual dependent variable is the unobserved *hazard rate*, which is the instantaneous rate at which events (here, peace) terminate at duration *t*, given that they have survived until time *t*. The hazard rate of peace ending is analogous to the probability of conflict breaking out. I use parametric hazard models for the analysis, utilizing the Akaike Information Criterion (Akaike, 1974) to assist in model selection and verifying that neither the selection of a specific model form nor the use of a Cox proportional hazards model affects the substantive conclusions.[15] I present the coefficients from the hazard models in accelerated-failure time form. In this form, positive coefficients correspond to a longer duration of peace (increasing the time to failure), while negative coefficients correspond to shorter durations. I employ Werner's (2000) correction for the "left-censoring" of peace spells in dyadic conflict data, giving dyads an accurate "peace duration" as of 1816.[16] In all analyses, I employ robust standard errors clustered by dyad.

As one of several comparison checks, I also conduct logit analyses employing "peaceyears" splines (Beck, Katz, and Tucker, 1998). Such splines are intended to partially correct for time dependence in our data, as do event history methods. I employ this method because the results in terms of conflict probability are more directly interpretable, and because they have a better analogue to reality when using directed dyads (see below). The results generated by the two analysis methods are similar.

Directed Dyadic Analysis. I first conduct analysis using a dataset of all directed dyad years from 1816-2000. The structure of the data is a cross-sectional time-series of directed dyads; each observation is one directed dyad year (e.g., "Britain-France 1823," "France-Britain 1823," "Britain-France 1824," and so on). It is only possible to examine hypotheses about the targeting behavior of democratic and autocratic states when directed dyads are used, as pointed out by Reiter and Stam (2003). If no differences exist in whether democratic or autocratic states target particular regime types, then the results of this analysis should closely parallel those of the non-directed dyad analysis (below). However, if differences do exist, then this should be reflected in different probabilities of conflict (or expected peace duration) between a democratic-autocratic directed dyad and an autocratic-democratic directed dyad. In each year, I identify whether a new MID is initiated in the directed-dyad-year, whether a MID is ongoing, or whether there is no MID. I employ the Correlates of War militarized interstate dispute data set, v3.0, to identify the occurrence of MIDs in a dyad.[17]

In the logit analysis of directed dyads, the dependent variable marks the initiation of a militarized dispute against the potential target.[18] In the event history/duration analysis, a failure in a directed-dyad occurs when the potential initiator initiates a MID against the potential target. For the reverse directed dyad, however (e.g., the USSR-US dyad when the US initiates against the USSR), the end of the peace spell is treated differently. When a state is targeted by another state in a MID, it does not count as a failure in the *directed* dyad, as the state did not start a dispute. In such cases the spell of peace ends, but the end of the spell occurs by censoring rather than a new dispute outcome (since the target was targeted, the dyad exits the spell of peace, but not in a manner explained or expected by the directed theory). Spell length is reset in this case, but the end of the spell is censored so that the failure of peace does not

contribute to the likelihood failure as a "directed death" event. If I were to treat the initiation of a MID by either state in a dyad as constituting a failure event, then the analysis would not differentiate between the initiation by and targeting of a state, and the data set would in effect be simply a doubling of the non-directed dataset. This would be increasing sample size without adding new information, an inappropriate choice. In all analyses, dyad-years with ongoing MIDs are dropped from analysis, with spells of peace beginning again at duration 0 only after a MID or war ends. When a spell of peace is ongoing at the end of the data set (i.e. in 2000), the end of that spell is treated as right-censored. The main data set is generated with *EUGene* v3.04 (Bennett and Stam, 2000b).

Non-directed Dyadic Analysis. The non-directed dyad research design employs a dataset of all non-directed dyad years from 1816 to 2000. In this dataset, each observation is one non-directed dyad year (for instance, "Britain-France 1823," "Britain-France 1824"). In each year, I identify whether a new MID occurs between the two states, whether a MID is ongoing, or whether there is no MID. For the logit analysis, "dispute onset" is used as the dependent variable when a new MID begins. For the event history analysis, each string of dyad-years without a MID constitutes a "spell" of peace. When a MID occurs between the two states in the dyad (as either dispute originators or dispute joiners), the spell ends.

Control Variables

I include a standard set of variables controlling for several factors commonly believed to influence international conflict, all of which may be correlated with regime-type and should thus be in the analysis. For comparison, I generally employ the same set of control variables as Werner (2000). Data on these variables are generated by *EUGene* v3.04 (Bennett and Stam, 2000b).

National Capabilities: I include variables measuring the capabilities of each state in a dyad separately, based on the Correlates of War Project's composite national capability (CINC) score. States with greater capabilities should have more ability to engage in international conflict, and with more distant states, than states with lesser capabilities. I do not use major power status as an indicator of this

17

potential to engage in conflict because major power status has been defined in part based on state's

engagement in international affairs, including conflict, raising the possibility of tautology. The

capabilities of the states are included separately in keeping with Werner (2000), although they are also

combined in the measure of parity (below). I do not take the natural log of the CINC score (Werner

does), so the variables are in their natural form.[19]

Distance: States should find it easier to engage in conflict with geographically proximate states

due to the difficult requirements of projecting power over long distances. I include the natural log of

distance between the states in the dyad, measured as the distance between national capitals.

Alliance: I include a dummy variable marking whether the two states in a dyad are formally

allied through a defense, neutrality, or entente agreement.

Prior Disputes: I include a variable constructed following Werner's procedure of measuring the

proportion of years in which a MID began from 1816 to any given observation year. This reflects the past

dispute history in a dyad; we would expect that some dyads have little to fight about, and this variable

(along with peace years splines in the logit analyses and the duration dependence parameters in event

history analyses) helps to distinguish dyads with little historical animosity from those with frequent and

contentious issues.

Parity: Parity in terms of capabilities is measured as the ratio of the weaker state's capabilities to

the stronger state's capabilities in the dyad. The measure varies between 0, where one state has no

capabilities, to 1, when the two states have equal capabilities. The variable allows the evaluation of the

common balance of power hypothesis that conflict is less likely when states are relatively equal in power,

along with the power preponderance argument that conflict is less likely when there is a clearly dominant

state (in terms of capabilities) in a dyad.

Interpretation of Results

18

As in the hypothetical models, the predicted probability of conflict (or in the case of hazard/duration models, predicted duration) is a function of complicated interactions of several regime-type variables. As a result, rather than directly interpreting coefficients on the separate regime variables, I construct predicted probabilities of conflict (or predicted duration) for all possible dyadic combinations of regime types. I then display the results graphically and interpret the resulting figures. To compute the predicted probabilities, I apply the "method of recycled predictions." Generally, the method of recycled predictions fixes the values on most independent variables at their original actual values for all cases in the data set, and then manipulates the value of the regime-type variables on all cases to compute predicted probabilities.[20] According to the political similarity argument, dyads where the regimes are close in type should have a lower probability of conflict and longer expected duration of peace; according to the democratic peace argument, dyads where both regimes are closer to extreme levels of democracy should have a lower probability of conflict and longer expected duration of peace. Note that the direction of effect in the figures is reversed between the logit analyses and the duration analyses. The analyses using duration/event history models predict the expected duration of peace (so higher values in the figure reflect less frequent conflict behavior), while the logit models directly predict the probability of conflict (so higher values reflect more conflict).

Because some of the "bends" and slight differences in probabilities are hard to discern in the 2-dimensional representations of the 3-dimensional space, I also present tables with the actual expected probabilities/durations and the resulting computed *relative risk* of conflict at extreme combinations of regime type. In these tables, the risk ratios show the amount that the probability of conflict changes when the regime type is a particular combination, relative to if it were a mixed-mixed dyad. So for instance, if we look at Table 2 of the results, the .864 risk ratio in the 2nd column for the "Autocratic-Autocratic" row indicates that the risk of a dispute is .864 times as likely (or, 14% less likely) for autocratic-autocratic dyads than a dyad where both states are of mixed/middle regime type.

ANALYSIS

Initial Specification Checks

I first replicated Werner's (2000) basic results concerning political similarity and joint democracy using my variable modifications to ensure that these modifications were not distorting the findings and any comparison of them (again, modifications included employing the aggregate regime type scores rather than decomposing individual "democ" and "autoc" measures, interpolating democracy scores and computing political similarity without a disaggregated Euclidean distance method). The results continue to show that both political similarity and joint democracy appear associated with a reduction in conflict, suggesting not only that joint democracy has a stronger effect than joint autocracy or joint "mixed-regimes," but also that those other pairings reduced the probability of conflict relative to mixed dyads.

I also conducted several analyses to explore whether any results were affected by assuming a particular functional form for the parametric duration model. The hazard models I present require the specification of an underlying functional form for the hazard function. However, because I have no theoretical priors about the underlying form of duration dependence in this model, I ran models with several underlying functional forms and used the Akaike Information Criterion (AIC) to assist in base model selection (Akaike, 1974). By this criterion, the log-normal was the best fitting underlying specification, and I report estimation from log-normal models here. Most importantly, the shape of the predicted durations over regime-type is very similar regardless of the functional form used.[21] Finally, I ran a check of the initial model using a Cox proportional hazard model rather than a parametric model and found it to yield no important differences from the reported models.

With these preliminary steps completed, I turn to the main analyses.

Directed-Dyad Analysis

20

I ran two variant models to assess the effects of regime-type on conflict within directed dyads, a logit model with peace-year splines (Model 1), and a log-normal hazard model (Model 2). Coefficients for the models appear in Table 1, while the resulting predicted conflict probabilities and peace durations are contained in Figures 3 and 4. The analysis and a subsequent likelihood-ratio test reveal that the set of included regime variables are highly important statistically, and also have a large substantive impact on the duration of peace / probability of conflict. Because there are several interactive regime variables in the model, it is difficult to assess the individual statistical significance because of high inter-correlations. When I conduct a block likelihood-ratio test by dropping the set of democracy variables, the log-likelihood of the models (either the logit or hazard model) drops dramatically, suggesting that the block of variables improves the model (P null < 0.001). Figure 3 presents the estimated probability of conflict by the regime type of the two states in the dyad, while Figure 4 presents the expected duration of peace in the dyad by the combination of regime type. Specific values of the probability of conflict at the extreme combinations of regime type (e.g., highly autocratic pairs, highly democratic pairs, etc.) are tabulated in Tables 2 and 3.

Tables 1, 2, 3 about here

Figures 3, 4 about here

Looking at Figure 3, the data suggest that *the lowest probability of conflict exists when both states are highly democratic* (the front-right corner of the graph). As both states become more autocratic (moving toward the back left corner of the graph), the probability of conflict rises, then falls as both states become quite autocratic. There is thus a weaker autocratic peace effect in addition to a democratic peace effect, but importantly, *there is little evidence for a general effect of political similarity across the full range of regime types.* Rather, jointly autocratic and jointly democratic dyads are more peaceful than

dyads where both states have mixed regime type, and much more peaceful than dyads where one state is towards the democratic end of the spectrum and the other towards the autocratic. The analysis reveals that the democratic peace is much stronger than the autocratic peace. Table 2 shows that the probability of conflict is almost 50% higher in autocratic-autocratic dyads than in democratic-democratic dyads, although both appear safer than dyads where both states are mixed regimes.

The analysis also suggests the presence of some important targeting effects in dyads where the two states have different regime types. The *most dangerous directed dyads appear to be those with an autocratic initiator and a democratic target* (those at the front left corner of Figure 3). When autocrats consider challenging democrats, the risk of conflict is about 65% higher than when both states are of a mixed regime type. Somewhat safer are dyads where the (potential) initiator is democratic and the target is autocratic; in these cases the risk of conflict appears to be about 45% higher than when both states have a mixed regime type. But neither of the situations where the two states have different and extreme regime types is as safe as a dyad where the states share a clear autocratic or democratic regime type.

In combination, these patterns suggest that there is only partial validity to the argument that political similarity influences the risk of conflict. It is only the case that the similarity of clearly defined, "extreme" regime types reduces the risk of conflict. The most dangerous dyads are mixed dyads with potential autocratic initiators and democratic targets. Similar-regime dyads anywhere in the range of regime scores are better than this particular mixed type, but are not as safe combinations as similar pairs of either democratic or autocratic states, which have the most to do with lowering the risk of MIDs.[22]

The lognormal hazard analysis (Figure 4) suggests a similar empirical pattern of risks. Democratic-democratic dyads have the longest predicted peace durations (deriving from a lower hazard, or instantaneous probability of conflict given peace to that point), with autocratic-autocratic dyads also expected to have relatively long periods of peace. Again, the autocratic peace effect is smaller than the democratic peace effect, with the expected duration of peace estimated to be about 35% longer in democratic-democratic dyads than in autocratic-autocratic pairs. But in this analysis, both types of dyad are estimated to be more peaceful than mixed-mixed dyads by a much greater margin than the logit

analysis suggested. Autocratic-autocratic pairs are estimated here to have peace durations about 2 ½ times that of mixed-mixed dyads, while democratic-democratic pairs are estimated here to have peace durations about 3 ½ times longer. Similarity alone makes some difference, but the extremes of shared regime type make much more.

This lognormal analysis also finds targeting effects, but the pattern is subtly different than that estimated using the logit. The estimation here continues to suggest that democratic-initiator vs. autocratic target dyads are safer than autocratic-initiator vs. democratic-target pairs. What is slightly different in this analysis, which is taking duration dependence into account better than the logit, is that the expected duration of peace in democratic-initiator vs. autocratic-target dyads is approximately equal to that in mixed-mixed dyads. In the figure, the graph is quite flat from the middle region (mixed-mixed dyads) towards the democratic-initiator vs. autocratic-target dyad section. In essence, the location of the inflection point in the curve of probability of conflict over politically similar regimes is shifted in this analysis. It is clear, though, that directed dyads where the potential initiator is democratic and the potential target is autocratic have a lower risk of conflict initiation (so, longer expected spells of peace) than directed dyads where the initiator is autocratic and the target democratic.

Note that the expected durations shown in the figure look artificially long, but this is understandable as an artifact of the rarity of conflict and the rarity of dyads with the opportunity for militarized conflict. This figure shows estimates of the duration of peace in dyads ranging in the thousands of years. This is because most dyads in fact will never experience conflict; the estimated median expected duration of peace for all dyads is 7800 years, which corresponds to an [accurate] probability of conflict about .01% in a dyad-year. If we stratify the population of cases, we find that the median expected duration of peace for directly contiguous dyads is 500 years (0.2% chance per year) versus 8200 years for states more than 500 miles apart. Other independent variables of course bring the expected duration down much further for a subset of dyads. While these numbers look large, it is because of the shift in the hazard notation to the expected duration in years rather than an annual probability.

NonDirected-Dyad Analysis

While the directed-dyad analysis offers the most direct tests of hypotheses including those about the directionality of conflict targeting by states, I also ran analysis on the set of non-directed dyads, both to more closely match Werner (2000) and to examine broad patterns without assuming that our codings of initiation are accurate. The coefficient estimates for these models appear in Table 1, with the resulting predicted probabilities of conflict and peace duration plotted in Figures 5 and 6 and printed in Table 3.

Figures 5, 6 about here

With the exception of targeting (which cannot be examined in this analysis), the results of the non-directed analysis are quite similar to those from the directed analysis. Figures 5 and 6 suggest both a democratic and an autocratic peace, the democratic peace being much stronger than the autocratic peace. Table 3 suggests that in the logit analysis, autocratic-autocratic pairs are about 35% less likely to experience dispute onset than are mixed-mixed dyads, while democratic-democratic pairs are about 55% less likely. As in the directed-dyad analysis, the effects are estimated as even stronger in the duration analysis. From that estimation, autocratic-autocratic pairs are expected to have about 3 ½ times the duration of peace than mixed-mixed dyads, while democratic-democratic pairs are expected to have over 5 times the length of peace. But while both analyses agree that the safest situation is joint democracy, they differ as to the most dangerous situation. The logit analysis suggests that the most dangerous situation is an extreme autocracy paired with an extreme democracy, with the risk of conflict about 25% higher than for two mixed-regime-type states. But the hazard analysis actually finds mixed-mixed dyads to be slightly more dangerous than the situation of extreme autocracy vs. extreme democracy, which is found to be the second-most dangerous circumstance.

24

The non-directed dyad analysis does again suggest only a small similarity effect, less so than did the directed-dyad analysis. Moving in Figure 5 along the path of joint similarity (from the front left to the back right corner of the figure) leads to changing probabilities of conflicts that are comparable to independent shifts of regime type in either one of the two states in a dyad. In Figure 6, moving along the path of joint similarity leads to similarly changing probabilities. The logit and hazard models disagree slightly on the height of the peaks, though, and thus whether pairs of mixed regime types are actually any safer than pairs of very different states. The flat "trough" in Figure 6 (the hazard model) suggests that mixed-mixed dyads are just as dangerous as democratic-autocratic dyads, while the logit model suggests that mixed-mixed dyads are slightly, but only slightly, safer than the most dangerous democratic-autocratic dyads. Again, recall that in the directed-dyad analysis, political similarity was revealed to have some apparent effect on conflict through the range of regime types. The non-directed analysis raises some doubt about the relationship. Regardless, this effect is small relative to the effect of shared democracy or shared autocracy at the extremes.

Sensitivity Analysis – "Dangerous" MIDs

The analyses above employ any type of MID to mark the dependent variables (either the initiation/onset of a MID in the logits, or the time until MID onset in the hazard analyses) in order to encompass as much data as possible in a relatively demanding analysis with several interactive variables. But the democratic peace has its origin (and has gained most of its policy leverage) through a stark observation about the risk of *war* rather than the risk of *disputes,* which could be quite minor. In addition, Braithwaite and Palmer (2005) find that there is no guarantee that factors that influence MID escalation defined in one metric (e.g., as fatalities) will similarly influence MID escalation when it is defined differently (e.g., as hostility level). As a result, in an imperfect test to examine whether the results are driven by the least important MIDs, I conducted a secondary analysis of the nondirected dyad data in which I recoded the dependent variable to mark MID onset only if the MID: 1) reached a hostility level of

4 or 5 (use of force or war); 2) led to any fatalities for the involved states; or 3) led to a hostility level of 5 (war).[23] About 70% of all MID onsets in this analysis resulted in a MID that reached a 4 or 5 hostility level, so the analysis involving hostility recodes about 30% of the MID onsets as not serious enough to merit a "1" on the dependent variable. Only about 30% of the MID onsets in this data resulted in a MID with fatalities, so analysis using fatalities recodes almost 70% of the MID onsets as not serious enough to merit a "1" on the dependent variable. Finally, only about 15% of dyad-years with a MID onset reached a level 5 (war).

The results of the sensitivity analyses suggest that the patterns revealed in Figures 5 and 6 hold even more strongly when the set of MID onsets are restricted to more serious MIDs (the detailed results are available with the paper's replication materials). In all three new analyses, the most dangerous pairs of states (those with the highest risk of high hostility MIDs, MIDs with fatalities, or wars) are highly democratic-highly autocratic pairs. Political similarity does not yield peace in general, as only the combinations of joint autocracy and joint democracy have lower probabilities of MIDs. Perhaps most interestingly, the re-analyses suggest that the benefit of the democratic peace over the autocratic peace is much clearer among serious MIDs than in the set of all MIDs. Earlier analysis suggested that the risk of a MID between two democracies (with polity scores of 10) was 33% less than the risk of a MID between two autocracies (polity scores of -10). The new analysis suggests that the risk of a MID that reaches a level 4 or 5 hostility is 52% less between democracies than between autocracies. Moreover, the risk of a MID with fatalities is 62% less between democracies than between autocracies, and the risk of war is 82% less.[24] I present just one figure to show this effect among more serious MIDs; Figure 7 presents the predicted probability of a MID that reaches a level 5 hostility as a function of regime type. As we restrict the domain to more serious MIDs, the core finding that joint democracy has more of an effect on such MIDs than does joint autocracy receives more support. In addition, political similarity appears to have a very similar effect among MIDs that go to war as all MIDs. More generally, these results of partitioning the MIDs by type are in keeping with Senese's (1997) finding that regime type does not affect all MID levels equally, but here affect the probability of highly violent MIDs the most.

Figure 7 about here

INTERPRETATION

We can interpret the results of this analysis in several ways. First, the results offer *little support*

to the argument that political similarity matters across the range of regime types. Rather, the dominant

effect in the model is that *dyads where both states share an extreme regime type are much less conflict*

prone than either dyads with two mixed/middle regimes, or where the two states differ in regime type.

The effect on conflict at the extremes of joint democracy and joint autocracy is larger than any other

empirical relationship in the model, and joint mixed-regime dyads are safer only than pairings of

democracies and autocracies. One interpretation of this finding is that it is not similar regimes that are

less likely to have conflict, but only similar *coherent* regimes. "Coherent" regimes (using Gurr's

terminology) are those at the extremes of the autocracy-democracy scale that share all or most of the

institutional characteristics of autocracy or democracy. By contrast, the mixed attributes of middle

regime-type states might suggest an uneasy balance of limited democratic institutionalization with

substantial autocratic power. The results here thus suggest that it is "joint coherence" or "joint

consistency" rather than either political similarity or joint democracy/autocracy that lowers the risk of

conflict. This is somewhat at odds with Werner's (2000) interpretation of political similarity as running

through regime types, but fits with literature on democratization and conflict (e.g., Ward and Gleditsch,

1998). If states in the middle-range of regime types have an uneasy institutional balance that is likely to

eventually move towards coherence in either direction, and if regime *change* contributes to conflict, this

could explain some of the dangers present in mixed-regime dyads.

Second, in addition to joint coherence, *joint coherent democracy* appears to be a particularly

pacifying condition when it comes to the outbreak of militarized disputes. While extreme autocratic-

27

autocratic dyads are estimated as 30-40% less likely to experience conflict than joint mixed-regime dyads, democratic dyads are another 30-35% less likely to experience conflict. The arguments and findings of the democratic peace literature are not superseded by arguments about the autocratic peace or political similarity; instead, these new findings must be better integrated with them in a way that allows democracy to have the strongest effects. This effect is strengthened if we look at only the outbreak of those MIDs that become the most serious, either with high hostility levels, or fatalities.

Third, in keeping with Reiter and Stam (2003) and Bennett and Stam (2004), *there appear to be clear targeting effects in dyads*, and so adding directed-dyadic analysis to typical non-directed studies of the democratic peace is beneficial. The magnitude of the targeting effect does appear smaller than the effect of joint regime type, and so we should continue to focus on the broad effects of joint regime type along with targeting, though.

Finally, note that these patterns have been found using a more complete specification of joint regime type not used in studies including Werner (2000) and Bennett and Stam (2004), and indeed could not have been found using prior specifications. Without variables allowing the "middle range" of politically similar dyads to drop out, analyses using straight political similarity measures find significant results on similarity. But this result misstates the actual relationship between similarity and conflict, and a more complicated specification is required to find the more complicated relationship. While there may be other specifications of regime-type to be explored, this specification has allowed examination of both our prior hypotheses and the development of new ones.

CONCLUSIONS

This paper began by suggesting that existing empirical specifications of the connection between joint regime type and international conflict were not adequate to assess arguments about the effects of political similarity, joint democracy, and joint autocracy. Varying and somewhat arbitrary specifications have been used in the empirical literature on the topic, and interactions between similarity and joint

democracy/autocracy have not been examined. In addition, possible targeting effects of states towards regimes of different types have not been adequately examined. The more complicated specification of regime-type variables used here was designed to use continuous measures and to allow for a variety of joint effects to be found.

The new regime-type specification did in fact find empirical patterns unlike those that have been discussed previously in the literature. Most importantly, it appears that neither the democratic peace nor the political similarity argument explains the full range of relationships between regime-type and international conflict; certainly, the political similarity argument does not hold up as a single comprehensive explanation. Rather, if we were to suggest one theory linking the empirical relationships found here, it would be that "joint coherence" in similar regime types reduces the risk of conflict in dyads, a result apparently unanticipated by existing arguments. An alternative, less parsimonious explanation for these findings might be built on two theories, one explaining the democratic peace and one the autocratic peace (Peceny et al., 2002 move in this direction).

If we are looking to decrease the risk of international conflict, this analysis suggests that we may look toward joint coherence as a way of doing so. However, we should also be aware that while joint autocracy appears to be a local minimum in terms of dyadic dispute behavior, the global minimum appears to lie at joint democracy. This analysis suggests that if the transition from the local minimum to the global passes through a period of mixed-regime for a time, that period may experience a higher probability of increased international conflict, which will eventually be offset by lower levels of conflict. While additional work will certainly clarify the relationships revealed here, these findings suggest an interesting wrinkle and a possible new theoretical direction in the study of the relationship between regime-type and conflict.

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[1] I do not use the term "anocracy" to refer to a state that is in the middle of the range between highly democratic and highly autocratic. The term "anocracy" (from the Greek "ano" and "kratos") may be properly interpreted as "no rule" or "no law." This is quite different from the intended meaning as a regime sharing institutional characteristics of both democracy and autocracy.

[2] See also Souva (2004), who makes a similar argument, but includes the similarity of economic as well as political institutions and conducts testing on a 15 year period of data.

[3] For some exceptions, see Chan (1984), Bremer (1993), Ray (1995) and Rioux (1998).

[4] Early studies employed composite measures of joint regime type, such as the "joinreg" measure used in Maoz and Russett (1993). "Demhigh" and "demlow" identify the higher and lower of the two democracy scores in a dyad, respectively. Studies using these variables follow the "weakest link" assumption first articulated by Dixon (1993, 1994), which suggests that the democracy level of the lower-democracy state should drive the regime-type relationship in any dyad. Dummy variables that code whether neither, one, or both states in a dyad are democratic apply specific cutpoints to "dem" scores. Several different cutpoints have been used in various studies, including three (Gleditsch and Hegre, 1997), five (Lai and Reiter, 2000), six (Oneal and Russett, 1997; Raknerud and Hegre, 1997; Hegre, 2000), and seven (Werner, 2000).

[5] Studies including both demhigh and demlow in the analysis include Oneal and Russett (1997), Mousseau (1998), and Gartzke (2000). Studies with demlow alone include Beck, Katz, and Tucker (1998), Oneal and Russett (1999a) and Mousseau (2000). Studies including joint autocracy and joint democracy include Raknerud and Hegre (1997) and Hegre (2000). Studies with political similarity and joint democracy include Lai and Reiter (2000) and Werner (2000). At least one study includes joint democracy and demlow (Oneal and Russett, 1999c). Undoubtedly, there are other combinations out there in the large empirical literature on the democratic peace. One additional specification recently seen in print is that of de Marchi, Gelpi, and Grynaviski (2004), which includes individual democracy scores, their interaction, and the square of the interaction. Beck, King and Zeng (2004) doubt this specification (particularly the squared term), questioning whether it is in fact a standard specification and arguing that it specifies only one possible set of relationships among the democracy variables. The de Marchi et al. specification is a partial version of the form ultimately used here, which is itself a follow-on to Bennett and Stam (2004) and earlier related papers. Below, I will explicitly justify/defend the functional form used here as allowing

testing of applicable theoretical arguments; the squared term is actually particularly useful because it allows for curvilinearity across the range of the interaction term.

[6] Luckily, basic findings on the democratic peace appear to be relatively insensitive to the cutoffs used. Figure 1 may explain why. Figure 1 shows the distribution of regime types over all interstate dyads from 1816-1992. The figure shows that "dem" scores tend to cluster at the extremes of the distribution (there are fewer states with scores between –5 and +5 than below/above those levels). As a result, the combinations of regime types cluster into a large number of dyads where both states have fairly high "dem" scores (both 6 or higher), a large number of dyads where both states have low "dem" scores (both –6 or lower), and a large group of very different states (one below –6 and one above +6). Given that relatively few states are being changed in their categorization as democracies/non-democracies by shifts between 3 and 7, we would expect findings to remain similar across shifts of cutoff. But the problems that 1) there is no theoretical way to determine precisely what empirical cutoff to use and 2) there is no well-established paradigm for specification, still raise issues of consistency across studies. Scholars have certainly chosen cutoffs that are "reasonable," but with no obvious empirical breakpoint in Figure 1, the "reasonable" cutoff must still be defined somewhat arbitrarily.

[7] Another problem with using demlow and demhigh (even if the democratic peace is the only concern) is that the construction of these variables builds artificially correlated variables into the analysis, an artificial correlation that statistical estimation cannot recognize and account for. That is, while the set of all dyads starts off with the democracy score of state 1 and state 2 theoretically uncorrelated (because "state 1" and "state 2" are arbitrarily ordered), in the transformed measures demhigh is always greater than or equal to demlow by construction, and the values will be positively correlated. Moreover, with this transformation we also build a constraint into the range of data on "demhigh," since demhigh must be greater than or equal to demlow; this limited range is directly correlated with demlow. However, statistical estimators do not know that demhigh is constrained in a fashion dependent on demlow, and the variables are treated as truly independent (less direct correlation, of course).

[8] The intent of the analysis here parallels the intent of Beck and Jackman (1998), which explored the democratic peace as one application of generalized additive models (GAMs), but the variable specification differs in important ways to allow for all of the list effects to be found. Beck and Jackman note that current theory (in 1998) does not strongly specify a functional form for the democratic peace, and includes the democracy of the two states in a dyad as separate variables along with their interaction in a GAM. Their analysis only examined nondirected

dyads, so it does not allow for an investigation of targeting effects. Moreover, while GAMs do explore a smooth of variables included, the appropriate interactions to allow for the effects under exploration must be included in the model. The additional terms are included in the model here to allow for more exploration of arguments about political similarity in particular.

[9] In a variation, I also interpolated democracy levels manually by setting each missing value to the average of the closest point on each side of a gap, as long as that gap was not greater than 5 years in either direction. The "polity2" variable in the polity IV data set computes values each year in a stepwise fashion (so if the original series were [1, missing, missing, 4] for 4 years, the "polity2" variable would contain [1, 2, 3, 4], while my variant contained 1, 2.5, 2.5, 4]). Using either interpolated regime type variable rather than an uninterpolated variant has little effect on my initial replication of Werner's (2000) results, and minimal effects on any other analysis, but results in a several thousand more cases being included in dyadic analysis. The results are nearly identical between the two interpolated versions.

[10] For simplicity, and in keeping with most literature, I employ transformations of the "dem" score rather than Werner's (2000) operationalization, which disaggregates the democ and autoc scores into components and then takes the Euclidean distance between the individual component scores. Initial replication tests and follow-ons revealed that this change had no effect on substantive conclusions about the effects of democracy and similarity in her model.

[11] This measure is highly correlated with an alternative construction of similarity, namely the difference between the two regime scores; the results are not affected if I use a multiplicative or linear version of this measure. I also examined a linear (non-multiplicative) version of this similarity measure (which is already used below in a third interactive measure), computed as $20-|Dem_{Initiator} - Dem_{Target}|$. The linear version is correlated in the actual dataset at 0.94 with the multiplicative interaction, in part because the distribution of regime types across is not uniform (in practice, there are many more dyads with at least one extremely democratic or autocratic value than there are jointly "medium" regimes). The linear formulation has the advantage that we can differentiate between different dyads where one state has a 0 dem score but the other does not (in the multiplicative version, all dyads where either state has a 0 score receives a 0 similarity score). It has the disadvantages of equating all degrees of similarity as equal (rather than allowing the differentiation of only the extremes, which the democratic peace literature implicitly argues are the critical combinations) and of being solely positive, rather than running from a

large negative to large positive value. The range from negative to positive, and the inclusion of a further squared term, helps to measure and differentiate between the extreme democratic and autocratic pairs. In alternative analyses, I employed both similarity measures and obtained similar results.

[12] The initiator's dem score is transformed to range 0 through 20 to ensure that the interaction is entirely positive and thus consistently higher when a more democratic state is the initiator and a more similar state is the target. Autocratic initiators and dissimilar pairs always have a low value on the variable.

[13] The set of variables included is similar to that in Bennett and Stam (2004), but with one important difference. Bennett and Stam (2004) includes a linear similarity measure along with the multiplicative measure included here, but it does not interact this variable with the initiator's democracy. As suggested above, the specification is different here because the linear and multiplicative similarity measures are highly correlated (they do not need to be separate) and because studying targeting is central to this analysis (this requires the initiator's democracy score to be interacted with similarity to better judge targeting effects).

[14] Hazard/event history models are superior to logit models in analyzing the dichotomous occurrence of a MID because they take better account of time-dependent effects in the data, specifically duration dependence. Duration dependence occurs if the probability of an event (a MID, or the failure of peace) is related to the time that has passed since the previous event. While we may use independent variables/covariates to capture changing factors that influence the occurrence of MIDs, if there is the chance that peace (or conflict) may become institutionalized, then we should use hazard models.

[15] The semiparametric Cox model has the advantage of not risking misspecification by requiring an underlying functional form of the hazard rate to be specified before undertaking analysis; the drawback is that it does not allow us to directly examine any duration dependence present in the process under consideration. Box-Steffensmeier and Jones (1997, 2004) lean towards using Cox models; Bennett (1999) differs.

[16] Most quantitative analyses of international conflict begin in 1816 because of data availability. It has been typical when using event history methods to set all dyads to a "0" peace duration in 1816. But by doing so, we are actually censoring the true duration of peace in dyads that existed before 1816. Such dyads actually had varying periods of prior peace as of 1816; some did not have disputes with one another for a long period (e.g., Britain and Portugal), while others had disputes in 1815 (e.g., Britain and France). Consulting a variety of sources, Werner

identifies the occurrence of the previous conflict in each dyad prior to 1816, tracing each dyad to either the time it actually had a dispute, or to 1648 if no evidence of a dispute could be obtained.

[17] Although the democratic peace and its policy application have captured attention because of the absence of wars, I am not confident using our limited data to assess this model only on the set of dyads that went to war rather than peace. In addition, if we want to study just serious MIDs we should model escalatory processes directly rather than just analyze subsets of the data. As a result, I use the outbreak of MIDs rather than wars as the dependent variable in the main analyses I present. But the results continue to hold when I conduct sensitivity analysis using only more serious MIDs (those with high hostility levels, and fatalities) and MIDs that go to war, and so the results are very suggestive that the effects on the probability of MID occurrence parallel the probability of war occurrence.

[18] There are questions as to how good the MID data are at accurately or appropriately capturing the "initiation" of a dispute. MIDs code, which state takes the first militarized action; this state (designated in the MID data set as on "Side A") is coded as the initiator. See Bennett and Stam (2000a, 2004) for an extended discussion of some of the issues, and benefits, involving with using directed dyadic analysis and a dependent variable coded as "initiation" from the MID data set.

[19] The results are robust to this change.

[20] Specifically, I start with the initial set of data and the set of coefficients estimated in the model. I then change the values of the regime types of the two sides to a particular combination of values and recompute derived variables (e.g., setting minimum "dem" scores and recomputing interaction terms). Using the coefficients from the model, I compute predicted probabilities of conflict (or predicted durations) for each case in the data set. At this point, each case has associated probabilities computed *as if* the case had the specified combination of regime types, with all other variables kept at their actual measured values. I then compute the average probability of conflict across the data set; this probability (or estimated duration in the hazard analyses) is plotted in figures 6-9.

[21] Specifically, the AIC is computed as –2 * (model log-likelihood) + 2 * (number of parameters in model). In the directed-dyad design, the AIC suggested that the log-normal was the best model by a large margin among the Weibull, log-normal, log-logistic, and Gompertz specifications; a gamma model did not converge in either set of data. In the nondirected design, the log-normal and log-logistic models were extremely close, with the log-logistic

barely outperforming the lognormal. For consistency, I show the results from the log-normal estimation for both designs.

[22] To check the results for sensitivity to extreme cases, I also re-ran the logit analysis dropping cases outside the –7 to +7 range, and again dropping cases outside the –8 to +8 range. While the specifics vary some, the dominant pattern was maintained, namely that jointly autocratic or jointly democratic pairs were safer than dyads with two mixed regimes, or dyads where the states differed in regime type.

[23] The test is imperfect because the process by which a MID moves from onset to a final level of hostility or fatalities is itself worthy of detailed study, and because there could be a variety of selection effects at work (states may be less likely to start a MID if they believe it will escalate to war, for example). In this sensitivity analysis, I am coding the onset variable based on ex post information about the MID's outcome (hostility level or fatalities). However, I know of no model at present that could examine both the onset and escalation of MIDs in one framework to conduct the analysis I have executed here. A larger more unified model of this process, perhaps using the new incident level data of the COW MID 3.0 data set, remains for future development.

[24] No dyads with polity scores of [10, 10] reach a level 5 hostility. However, a few dyads where the lower democracy score is 7, 8, or 9 do, allowing estimation and extrapolation of the effects of joint democracy on the probability of MIDs with wars.

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Table 1: Models of Political Similarity, Joint Democracy, and Conflict

Variables	Model 1: Directed Logit			Model 2: Directed Hazard			Model 3: Non-Directed Logit			Model 4: Non-Directed Hazard		
	coef.	s.e.	signif.	coef.	s.e.	signif.	coef.	s.e.	signif.	coef.	s.e.	signif.
$Democracy_{Initiator}$	-0.011	0.012	0.33	0.03	0.010024	< 0.01	--	--	--	--	--	--
$Democracy_{Target}$	-0.0024	0.0072996	0.74	0.012	0.00641	0.068	--	--	--	--	--	--
$Democracy_{Initiator}$ * Similarity	-0.00041	0.0011	0.7	-0.0013	0.000878	0.13	--	--	--	--	--	--
$Democracy_{Initiator}$ * $Democracy_{Target}$	-0.0039	0.0013	< 0.01	0.0071	0.001148	< 0.01	--	--	--	--	--	--
$(Democracy_{Initiator}$ * $Democracy_{Target})^2$	0.00000026	0.0000095	0.98	0.000038	0.000010	< 0.01	--	--	--	--	--	--
$Democracy_{Low}$	--	--	--	--	--	--	0.015	0.022	0.49	-0.046	0.016	< 0.01
$Democracy_{High}$	--	--	--	--	--	--	-0.035	0.019	0.068	0.065	0.015	< 0.01
$Democracy_{Low}$ * $Democracy_{High}$	--	--	--	--	--	--	-0.0074	0.0023	< 0.01	0.012	0.0018	< 0.01
$(Democracy_{Low}$ * $Democracy_{High})^2$	--	--	--	--	--	--	0.000004	0.00001	0.73	0.00003	0.00001	< 0.01
State 1 Power	9.79	0.57	< 0.01	-18.22	0.54	< 0.01	8.35	0.65	< 0.01	-16.26	0.53	< 0.01
State 2 Power	7.72	0.59	< 0.01	-14.46	0.54	< 0.01	10.54	0.72	< 0.01	-16.27	0.65	< 0.01
ln(Distance)	-0.68	0.040	< 0.01	1.18	0.031	< 0.01	-0.71	0.04797	< 0.01	1.15	0.032	< 0.01
Alliance	0.38	0.087	< 0.01	-0.58	0.092	< 0.01	0.38	0.096	< 0.01	-0.63	0.092	< 0.01
Prior Disputes	5.03	0.23	< 0.01	-7.23	0.22	< 0.01	5.54	0.33	< 0.01	-6.42	0.23	< 0.01
Parity	0.22	0.12	0.06	-0.24	0.099	0.016	0.14	0.13	0.28	-0.15	0.099	0.13
Peace Years	-0.35	0.017	< 0.01	--	--	--	-0.33	0.01799	< 0.01	--	--	--
Peace Years Spline 1	-0.002	0.00015	< 0.01	--	--	--	-0.0019	0.00015	< 0.01	--	--	--
Peace Years Spline 2	0.00093	0.000082	< 0.01	--	--	--	0.00089	0.00008	< 0.01	--	--	--
Peace Years Spline 3	-0.000055	0.000012	< 0.01	--	--	--	-0.000053	0.00001	< 0.01	--	--	--
Constant	0.51	0.34	0.13	-1.35	0.26	< 0.01	1.47	0.42	< 0.01	-3.05	0.27	< 0.01
ln(Sigma)	--	--	--	0.87	0.015	< 0.01	--	--	--	0.71	0.015	< 0.01
Log-Likelihood	-14840.0			-10345.2			-12665.9			-8336.7		
n	1065755			1065755			534189			534189		
Number of Dyads				35429						18045		
Number of failures				2843						2762		
Pseudo R^2	0.246						0.268					
Unit of Analysis	Directed Dyad-Year			Directed Spell/Dyad-Year			Nondirected Dyad-Year			Nondirected Spell/Dyad-Year		
Model	Logit			LogNormal Duration			Logit			LogNormal Duration		
Display	Logit Coefficients			AFT Coefficients			Logit Coefficients			AFT Coefficients		

Table 2: Risk of Conflict by Selected Regime-type Combinations, Directed Dyad Analysis

Regime Type (Initiator, Target)	Probability of MID Initiation (Model 1)	Risk Relative to Mixed-Mixed Dyad (Model 1)	Expected Peace Duration (Model 2)	Expected Duration Relative to Mixed-Mixed Dyad (Model 2)
Autocratic-Autocratic (-10, -10)	0.0021	0.854	9466	2.555
Autocratic-Mixed (-10, 0)	0.0029	1.194	3591	0.969
Autocratic-Democratic (-10, 10)	0.0041	1.674	2908	0.785
Mixed-Autocratic (0, -10)	0.0026	1.061	3762	1.015
Mixed-Mixed (0, 0)	0.0025	1.000	3705	1.000
Mixed-Democratic (0, 10)	0.0025	1.016	4754	1.283
Democratic-Autocratic (10, -10)	0.0035	1.424	4160	1.123
Democratic-Mixed (10, 0)	0.0022	0.902	4981	1.344
Democratic-Democratic (10, 10)	0.0014	0.571	12740	3.438

Table 3: Risk of Conflict by Selected Regime-type Combinations, Non-Directed Dyad Analysis

Regime Type (Low, High)	Probability of MID Onset (Model 3)	Risk Relative to Mixed-Mixed Dyad (Model 3)	Expected Peace Duration (Model 4)	Expected Duration Relative to Mixed-Mixed Dyad (Model 4)
Autocratic-Autocratic (-10, -10)	0.0037	0.643	21272	3.651
Autocratic-Mixed (-10, 0)	0.0051	0.876	9193	1.578
Autocratic-Democratic (-10, 10)	0.0074	1.279	7468	1.282
Mixed-Mixed (0, 0)	0.0058	1.000	5826	1.000
Mixed-Democratic (0, 10)	0.0043	0.735	11181	1.919
Democratic-Democratic (10, 10)	0.0026	0.451	31462	5.400

Figure 1: Joint Distribution of Regime Type ("Dem" Scores), All NonDirected Dyads 1816-1992
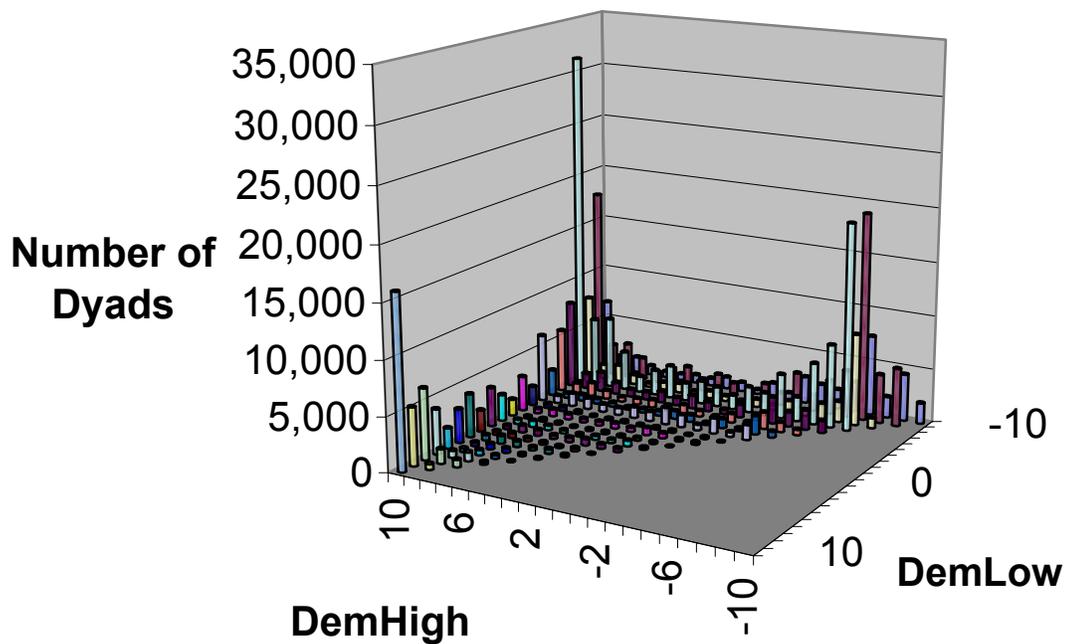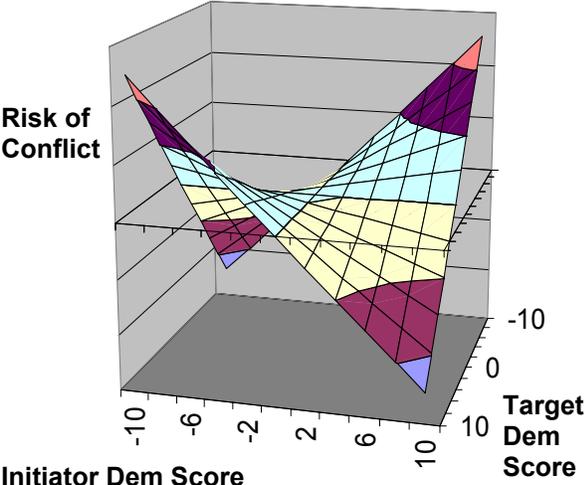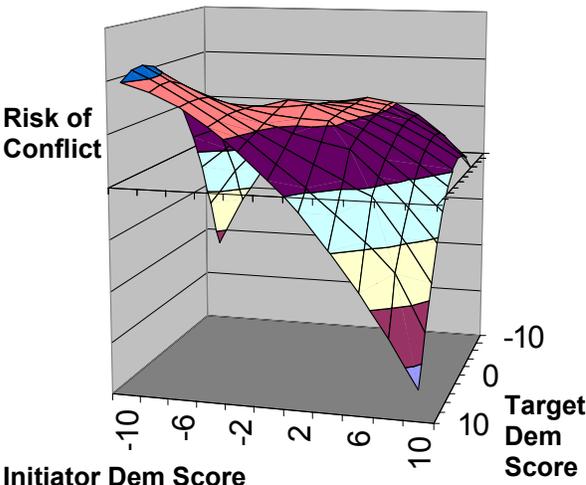
Figure 2: Risk of Conflict from Varying Hypothetical Regime-Type Specifications
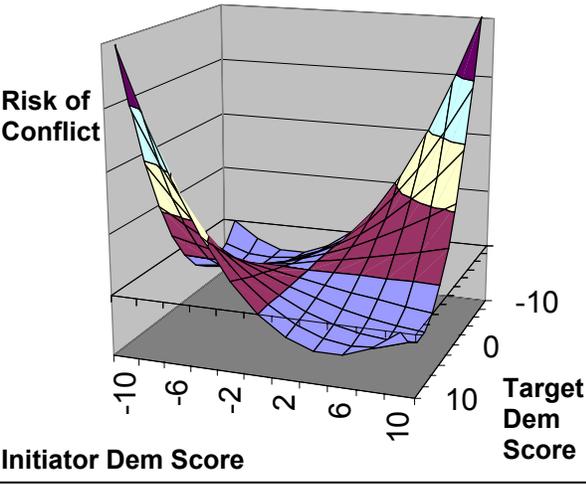
Model 1

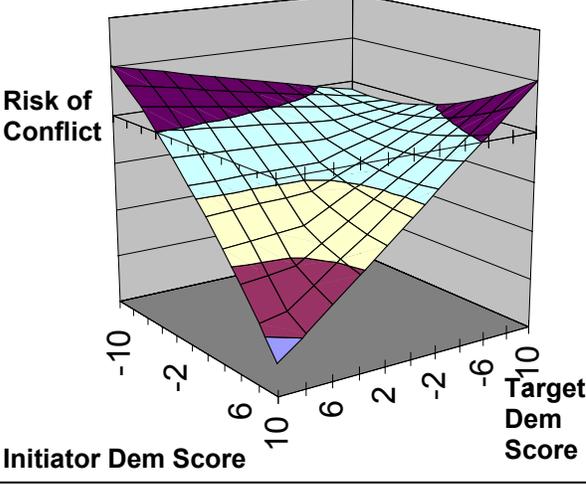**Model 1 coefficients:**
0, 0, 0, 0, -5, 0.001*

Model 2

Model 2 coefficients:
0, -3, -0.7, 0.13, -0.5, -0.0033*

Model 3

Model 3 coefficients:
0, 0, 0, 0, -10, 0.1*

Model 4

Model 4 coefficients:
0, -20, -20, -2, -5, 0.001*

*Note:
  Model coefficients are as follows for the variables (respectively): Constant, Initiator Democracy, Target Democracy, (Initiator Democracy +10) * Regime Similarity, Initiator Democracy * Target Democracy, and (Initiator Democracy * Target Democracy)2

Figure 3: Probability of Conflict, Directed Dyads, Logit Model
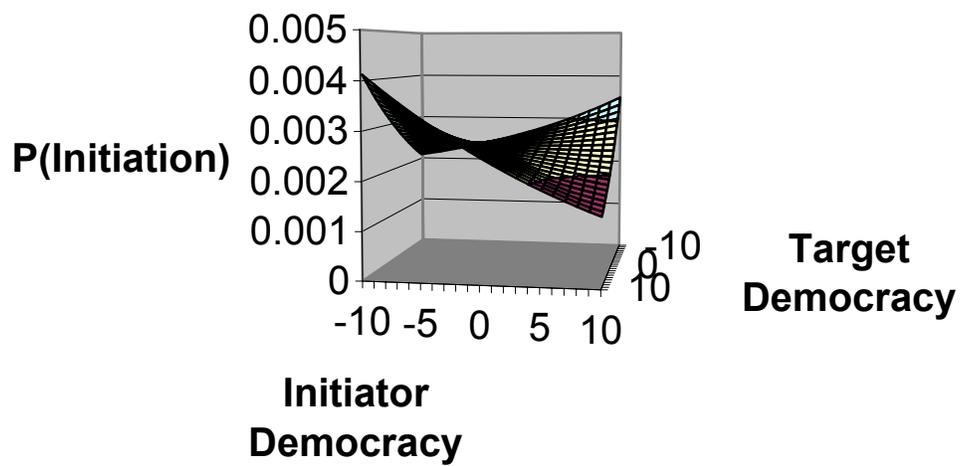
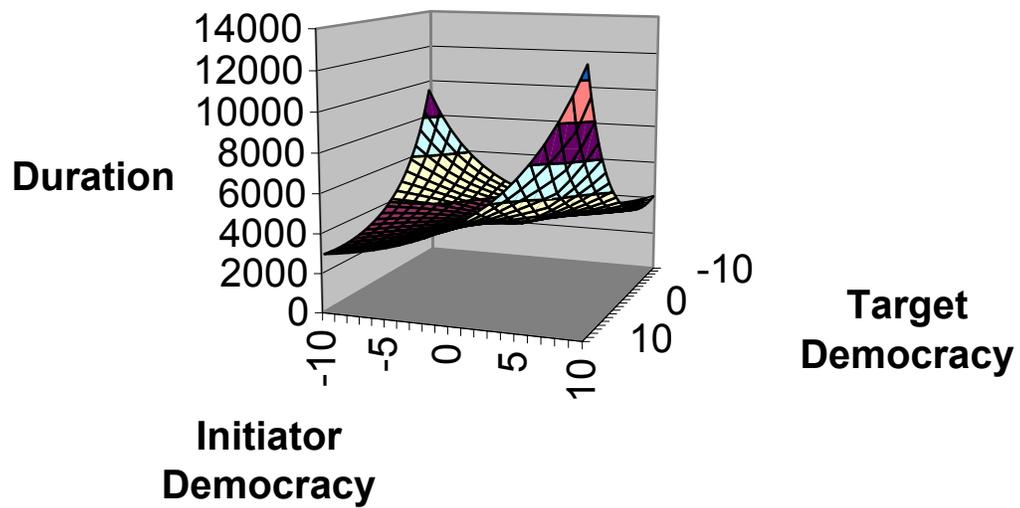Figure 4: Predicted Peace Duration, Directed Dyads, LogNormal Hazard Model

Figure 5: Predicted Conflict Probabilities, Non-directed Dyads, Logit Analysis
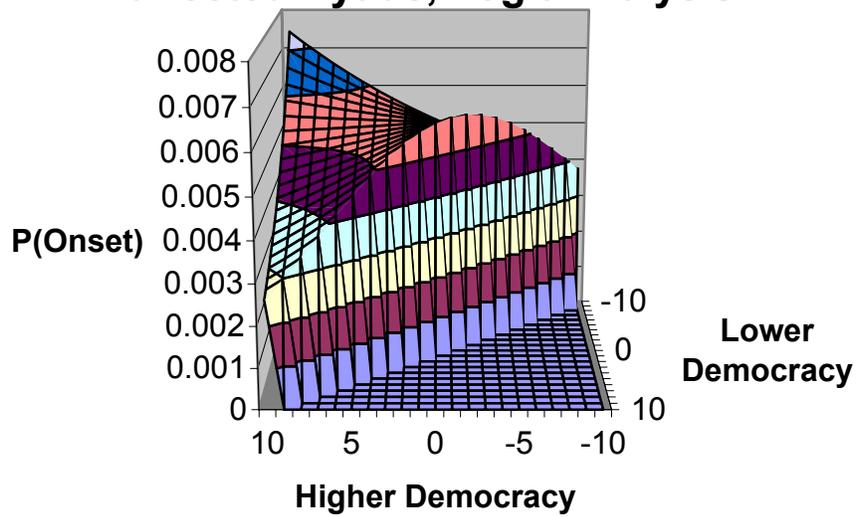
Figure 6: Predicted Peace Duration, Non-directed Dyads, LogNormal Hazard Model
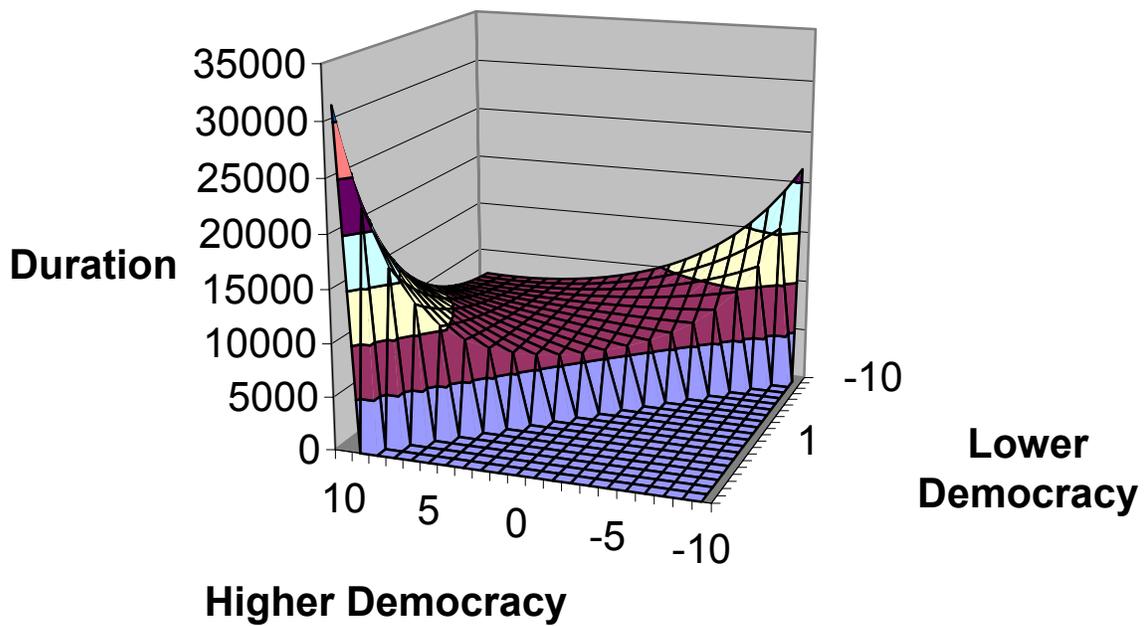
Figure 7: Predicted Conflict Probabilities, Non-directed Dyads, Logit Analysis, MIDs with War Only