

External Threat and Alliance Formation

RESEARCH NOTE

JESSE C. JOHNSON
University of Kentucky

Scholars generally believe that external threats drive military alliances. However, existing statistical studies of alliance formation fail to find a consistent relationship between the two. In this research note, I argue that this is because they do not correctly proxy for the existence of an external threat. Previous studies employ measures based on past militarized disputes, but a valid measure must capture expectations of *future* militarized disputes. To identify a better indicator of external threat, I situate alliance formation in crisis bargaining theory. The framework suggests that a target will be more likely to seek an alliance as its challenger's probability of winning in war increases. I test this hypothesis and find a positive relationship between external threat and alliance formation. My analysis provides support for a central pillar of alliance theorizing. Additionally, it suggests that any pacifying effects of alliances may be difficult to uncover, as alliances form when the probability of conflict is already high.

Introduction

Theories of military alliances commonly understand alliances as responses to external threats. When states design and form military alliances, they coordinate joint responses for times of war. This coordination increases the members' war-fighting abilities beyond what they would be capable of alone—or accomplish together in the absence of a formal alliance (Morrow 2000). Alliance members, as a result, become less susceptible to the coercive military strategies of other states. This makes entering into a military alliance an attractive option for states facing external threats.

This general understanding of military alliances suggests that the presence of an external threat should increase the probability of observing alliance formation. However, large-*N* tests of this relationship provide inconsistent support for a relationship between the two. Some studies report results that suggest external threat increases the probability of alliance formation (Lai and Reiter 2000; Leeds et al. 2002; Gibler and Sarkees 2004; Gibler and Rider 2004; Gibler and Wolford 2006; Kimball 2010). However, some of these same studies—as well as other scholarships—report results that suggest external threat is unrelated to alliance formation or even *decreases* the probability of alliance formation (Reiter 1994; Lai and Reiter 2000; Leeds et al. 2002; Gibler and Sarkees 2004; Gibler and Wolford 2006; Gibler 2008; Kimball 2010).

In this research note, I argue that these inconsistent findings result from invalid measures of external threat. Many statistical studies of alliance formation employ a measure of external threat derived from the militarized interstate dispute history of potential allies. However, if alliances are formed to mitigate external threats, this suggests states form alliances to *prevent* events such as militarized interstate disputes. This implies that alliances should form prior to militarized interstate disputes and in response to conditions that make militarized interstate disputes and similar events more likely.

To identify the conditions under which a state will face an external threat and seek an alliance, I draw on crisis bargaining theory. This framework generates a specific version of the external threat hypothesis: a target state will be more likely to enter into an alliance as the probability of the challenger winning in war increases. This is because as the challenger's probability of winning increases, it can expect to obtain more in crisis bargaining. In consequence, the target will prove more willing to seek an alliance in an effort to deter—or limit—the challenger's demand. Importantly, this suggests an alternative measure of external threat: one that captures the potential for a *future* militarized dispute rather than one based on past militarized disputes. Employing this alternative measure of external threat, I find a positive relationship with alliance formation across a variety of model specifications. This finding brings statistical research on alliance formation in line with a key facet of alliance theorizing.

External Threat and Alliance Formation

External threat plays a prominent role in theories of alliance formation. States use alliance agreements to prepare to coordinate in the event of war in order to become a more formidable fighting force. This is commonly referred to as the capability aggregation function of military alliances. External threat is often understood as the motivation for capability aggregation. Early theoretical

Jesse C. Johnson is assistant professor of political science at the University of Kentucky. His research focuses on international security, international institutions, and conflict processes. His articles have appeared in *International Organization*, *Journal of Politics*, *International Studies Quarterly*, *Journal of Peace Research*, *Conflict Management and Peace Science*, *International Interactions*, and *Foreign Policy Analysis*.

Authors' note: An earlier version of this project was presented at the Annual Meeting of the American Political Science Association, Washington, DC, August 28, 2014. I thank Daina Chiba, Ashley Leeds, Michaela Mattes, and Justin Wedeking for helpful comments on this research.

treatments of alliance politics view alliances as a tool states use to maintain a balance of power (see [Morgenthau 1948](#); [Gulick 1955](#); [Waltz 1979](#)). According to balance of power arguments, alliances form to balance against or oppose relatively powerful states in order to prevent hegemony over the international system. [Walt \(1987\)](#) refined this perspective by suggesting that states do not balance and form alliances in response to all leading powers, but only those that actually pose a threat. Building on balance of power and balance of threat arguments, scholars have attempted to clarify the conditions under which a leading state presents a threat that provokes balancing ([Levy and Thompson 2005, 2010](#)).

Formal models of extended deterrence provide a more general focus of external threat and alliance formation ([Morrow 1994](#); [Smith 1995, 1998](#)). Rather than focusing only on the threat posed by a leading state or potential hegemon, these models consider any threat to the status quo. In these models, two states decide whether to form an alliance while anticipating a potential attack from a third state. The models suggest that it is the characteristics of this third state, a potential challenger, that determine whether an external threat exists. Importantly, according to these models, alliance formation is driven, in part, by the external threat created by the potential challenger.

Even in models of alliance formation that go beyond the capability aggregation role of alliances and incorporate non-security motivations for alliance formation, external threat plays a crucial role. For example, [Morrow's \(1991\)](#) autonomy-security trade-off model advances a view of alliances where one state provides another with security in exchange for policy concessions. While one state is motivated to form the alliance for the policy concessions, the other state is motivated to make the concessions because of a desire for an increase in security from the alliance. This implies that at least one state in the alliance is facing an external threat. The presence of an external threat is what makes the mutually beneficial exchange (i.e., security for autonomy) possible.

Existing statistical studies of alliance formation are largely disconnected from these theoretical models of alliance formation that emphasize an external threat. A number of statistical studies of alliance formation closely follow the research design developed by [Lai and Reiter \(2000\)](#). Lai and Reiter's study, however, is not designed to examine the relationship between external threat and alliance formation. The purpose of their study is to evaluate the relationship between the regime types of the potential allies and alliance behavior. As a result, they utilize a research design that focuses on the characteristics of the potential allies. For example, they largely focus on a variable that codes whether the potential allies are jointly democratic and another variable that measures the regime similarity of the potential allies.

While not the focus of their study, [Lai and Reiter \(2000, 214\)](#) develop a measure to control for the amount of external threat the potential allies faced. Their dyadic measure of external threat is the number of militarized interstate disputes each state has participated in over the past 10 years. They conduct probit analyses of whether a dyad is allied in a given year and report inconsistent results regarding the effect of their threat measure. Some models indicate that threat increases the probability of being allied, but other models suggest threat decreases the probability of being allied. [Leeds et al. \(2002\)](#) and [Gibler and Sarkees \(2004\)](#) replicate Lai and Reiter's analysis using updated alliance data and also report

inconsistent results regarding the relationship between threat and the presence of an alliance.

More recent studies, which include the same measure of threat but analyze a dependent variable that indicates whether two states formed an alliance in a given year and not just whether the states were allied, also fail to find a consistent relationship between external threat and forming an alliance. [Gibler and Wolford \(2006, 142\)](#) report one model that suggests external threat increases the probability of two states forming an alliance and two models that suggest external threat decreases the probability of alliance formation.¹ [Gibler \(2008, 442\)](#) reports a consistent relationship between external threat and alliance formation, but all four models reported indicate that external threat decreases the probability of alliance formation.

These inconsistent findings are problematic for a large body of alliance theory. Previous studies, however, were not designed to estimate the relationship between external threat and alliance formation. As a result, they employ a measure of external threat that is not the most suitable for evaluating the relationship. The inadequacy in the measure based on past militarized interstate disputes is that if alliances are motivated by external threat, then they are formed to prevent events such as militarized interstate disputes. Therefore, we should not necessarily observe alliance formation after militarized interstate disputes but in response to conditions that make militarized interstate disputes and similar events more likely. In the next section, I situate alliance formation in crisis bargaining theory to identify such conditions.

Crisis Bargaining and Alliance Formation

In order to identify conditions under which a state will want to form an alliance in response to an external threat, I draw on bargaining theory. Bargaining theory has proved to be a useful framework for understanding interstate crisis behavior. It has helped scholars clarify the conditions under which states will attempt to revise the status quo backed by the threat to use force, when these attempts will result in war, and when wars will end ([Powell 2002](#)). In this section, I utilize the bargaining framework to explain when states will seek alliance partners. This approach suggests a measure of external threat that is different than those employed in previous statistical studies of alliance formation.

A defining feature of the crisis bargaining approach is that states strategically choose whether to make demands to revise the status quo and the size of any demands made. These strategic decisions are driven by the states' expected outcome of a potential war. This is because in addition to revising the status quo through mutual agreement, states are assumed to be able to revise the status quo through the use of force. In other words, war is treated as an outside option. As a result, any bargained outcome must give both sides at least as much as they can obtain from the outside option of war. If not, the proposed deal will be rejected by the actor that will be better off going to war.

A state's payoff from war is often defined as its probability of winning a war and obtaining the good minus its costs of war. Given that war is costly, it has been well established that there is always a negotiated settlement that both sides would prefer to war ([Fearon 1995](#)). Whether a

¹See [Leeds \(2015\)](#) for a broader assessment of empirical research on alliance formation.

state will want to enter into crisis bargaining to negotiate a revision of the status quo, however, will depend on its value of the status quo compared to its expected payoff from war. If a state's expected payoff from war is greater than its value for the status quo, it will have an incentive to make a demand of the other side backed by the threat to use force. If both states' expected payoff from war is less than the status quo, on the other hand, neither side can credibly threaten to exercise the outside option of war to revise the status quo.

This framework provides a precise way of establishing when a state faces an external threat. An external threat emerges when a potential challenger can credibly threaten to go to war if the status quo is not revised in its favor. Under this condition, the challenger will attempt to make the largest demand that the target state will accept. If the challenger knows the target's value for war, there will be no war and the target will concede something of value to the challenger. However, if the challenger is not fully informed of the target's value for war, it is possible for the challenger to make a demand that gets rejected and results in war. If war occurs, the target's expected division of the good will be better than the division proposed by its adversary, but it will not be better than the status quo that the challenger seeks to revise. In either case, the target will obtain an outcome that is worse than the status quo when faced with an external threat.

To identify when a state faces an external threat, the bargaining framework suggests one must identify when a potential challenger will value war more than the current status quo division of the disputed good. As mentioned above, a key factor in determining a state's value for war is its probability of defeating its opponent in a potential war. As a state's probability of winning increases, its value for war will increase. Thus, as a state's probability of winning in war increases, it will be more likely to value war more than the status quo. This implies that when a state faces a potential challenger with a high probability of winning in war, it is more likely to be faced with an external threat than when its potential challenger has a lower probability of winning in war. In other words, a state is more likely to have the status quo revised unfavorably in the former case than the latter case.

Focusing on how the potential challenger's probability of winning in war influences external threat naturally links external threat and alliance formation. As discussed in the previous section, a large body of alliance research highlights the capability aggregation function of military alliances. This function increases the members' probability of winning wars and decreases the probability of winning for any potential challengers to the alliance. This suggests one way a state can respond to an external threat, as defined above, is by entering into a military alliance. A potential challenger may value war more than the status quo when its target is unallied. However, if the target enters into an alliance, the challenger's probability of winning will decrease and it may no longer value war more than the status quo. As a result, the challenger will be deterred from making a demand to revise the status quo.

Notably, this logic of alliance formation differs from the balance of power and balance of threat perspectives discussed above. In a crisis bargaining framework, the target is not necessarily trying to achieve a balance of capabilities with the challenger. Rather, the target is attempting to amass a level of capabilities where the challenger will prefer the status quo to war and be deterred from making a demand.

Even if entering into a military alliance does not lower the challenger's probability of winning enough to make the challenger prefer the status quo to war, it will still reduce the demand the challenger will make. The worse a challenger expects to do in war, the less it can credibly demand. Thus, by entering into a military alliance and decreasing the challenger's probability of winning in war, a target can reduce the size of any demands it may face. As a result, a military alliance can be beneficial to a state even if it does not completely deter challengers.

A final factor to consider is the cost of alliance formation. Alliance negotiations are time consuming, and maintenance of alliances can involve costly military and policy coordination (Morrow 2000). Therefore, a state will be reluctant to enter into a military alliance unless it expects a challenger to make a demand. If the challenger prefers the status quo to war, the status quo will prevail whether the state pays the cost to enter into an alliance or not. Therefore, in this case, a state will avoid the costs of alliance formation and remain unallied. In other words, in the absence of an external threat, a state will not form an alliance. However, when the conditions for an external threat are met, there is some cost a state is willing to pay to enter into an alliance and deter or reduce the challenger's demand. Thus, crisis bargaining theory suggests the following hypothesis regarding external threat and alliance formation:

External Threat Hypothesis: *Increases in the probability of the challenger defeating the target in war increase the probability of the target forming an alliance.*

The measure of external threat suggested by bargaining theory is one that is related to the challenger's willingness to initiate events such as militarized interstate disputes against a state in the future. This is a clear departure from previous measures of external threat based on a count of past militarized interstate disputes. In the next section, I discuss how I construct a research design to test the External Threat Hypothesis.

However, before proceeding to the research design, it is worth noting that the theoretical focus on the crisis bargaining interaction ignores the bargaining that occurs between potential allies to form an alliance. The decision to focus on the former bargaining interaction is motivated by the desire to better conceptualize external threat and reconcile inconsistent findings in the alliance literature. This choice of focus assumes threatened states have the opportunity to form alliances in response to external threats. Such a focus excludes the possibility of other states being reluctant to ally with the threatened state due to concerns of entrapment (Snyder 1997), the threatened state being unable to compensate potential partners for a promise of defense (Johnson 2015), or other factors impeding the alliance formation process (Wohlfarth et al. 2007). The theoretical focus also precludes challengers from taking foreign policy actions that may prevent the target from finding willing alliance partners (Hui 2004; Goddard 2009). Not accounting for these processes, however, biases against finding support for the External Threat Hypothesis and, thus, makes the analysis below a more conservative test.

Research Design

Testing the External Threat Hypothesis requires identifying a sample of dyads where crisis bargaining could occur.

That is, one needs to identify a sample of dyads that disagree over the division of a good and one side would be willing to make a demand backed by a threat to use force. This strategy diverges from previous statistical studies of alliance formation where the potential allies are the unit of analysis. The reason for this divergence is that the above formulation of the External Threat Hypothesis indicates that the characteristics of the potential challenger are essential to the relationship between external threat and alliance formation.

Identifying an appropriate sample of dyads, however, is not straightforward. Some decision rules for identifying a sample of dyads where crisis bargaining could occur are more inclusive and include a higher proportion of dyads where crisis bargaining is unlikely. Other decision rules are more restrictive and exclude dyads where crisis bargaining is possible. In response to this challenge, I test the hypothesis using two samples. I employ one sample, all directed dyad-years, that is more inclusive, and a second sample, territorial disputes, that is more restrictive. Employing two samples that represent distinctly different strategies for identifying an appropriate sample increases confidence that this research design decision is not driving the results. I will elaborate on each sample below.

The first sample is challenger-target directed dyad-years from 1816 to 2003. The sample of states used to generate the directed dyad-years is based on the state system membership list from the Correlates of War project. I utilize directed dyads rather than non-directed dyads in order to identify the actor in the dyad forming the alliance. This is important because a proper test of the External Threat Hypothesis needs to distinguish between cases where the threatened state enters into an alliance and cases where the state posing the threat enters into an alliance.

The second sample is territorial disputes from 1816 to 2001. The sample of territorial disputes certainly includes a higher proportion of dyads where crisis bargaining could occur. It is well documented that territorial disputes are prone to the threat and use of militarized force (see Vasquez 1995; Vasquez and Henehan 2001; Senese 2005; Gibler 2012). However, a territorial dispute is certainly not a necessary condition for crisis bargaining to occur. In addition to disagreements about the division of territory, states threaten the use of force over a wide variety of policy issues. The advantage of using territorial disputes is that systematic data on territorial disputes exists for a large spatial and temporal domain.

Data on territorial disputes are obtained from the Issue Correlates of War (ICOW) project (Hensel 2001). The ICOW project has collected data on territorial claims for the entire world from 1816 to 2001. The data identify a target and challenger for each territorial dispute. Targets are those states that control the territory. Challengers are those states making claims to the territory and would prefer to change the status quo. I use this information and create a directed dyad-year dataset that includes those directed dyads that had a territorial dispute in the given year. If a target and challenger had multiple territorial disputes in a year, those disputes are collapsed into one dispute.

The dependent variable for the analysis codes whether the potential target of the directed dyad entered into an alliance in the given year. Data from the Alliance Treaty Obligations and Provisions (ATOP) project are used to code the variable (Leeds et al. 2002). However, not all instances of alliance formation by the potential target are captured by the dependent variable. Two conditions must

be met for an instance of alliance formation to be relevant to a test of the External Threat Hypothesis.

First, to be coded as an instance of alliance formation, the alliance formed by the potential target must include a defensive obligation. That is, the target's allies must promise to provide military assistance in the event of attack on the target's sovereignty or territorial integrity. The alliance can include other obligations, such as offensive or neutrality obligations, but it must also include a defensive obligation. Other types of alliance obligations would not require the target's allies to defend it against an attack by the challenger. These other obligations, therefore, are distinct from the notion of an alliance contained in the theoretical argument developed above and should not be considered in the analysis.

Second, only instances of alliance formation where an attack by the challenger would invoke the defensive obligation of the treaty are captured by the dependent variable. When forming alliances, states often identify specific conditions under which the alliance is invoked. This can include agreeing to defend an alliance partner only against a particular state or states. For example, at the end of 1893, France and Russia formed a defense pact in which they agreed to defend one another in the event of an attack by Germany, Italy, and/or Austria-Hungary. As a result, the coding of the dependent variable does not code France as forming an alliance in 1893 that is applicable to its ongoing territorial dispute with the Netherlands. Thus, the analysis does not attribute instances of alliance formation to threats explicitly ruled out by the alliance members.

This process identifies all the observation years where the target of the dyad entered into an alliance in which its partner(s) agreed to defend it against the challenger in the dyad. Only the year where the target enters into the alliance is coded as an instance of alliance formation. Directed dyad-years where the potential target formed multiple alliances are treated as a single instance of alliance formation. The years where the target was unallied are considered non-events and are coded "0" on the dependent variable.

How to deal with years where the target was allied is less straightforward. The issue is that once the target enters into an alliance, there may be less of a need to form another alliance against the challenger. It is certainly possible for a target to still be under threat after entering into an alliance, but it will be difficult to capture because one must accurately take into account how the target's existing allies may alter the level of threat it faces. Therefore, to avoid the noise these cases will introduce, the main analysis presented below drops directed dyad-years from both samples where the potential target had an existing alliance that is applicable to a conflict with the potential challenger.

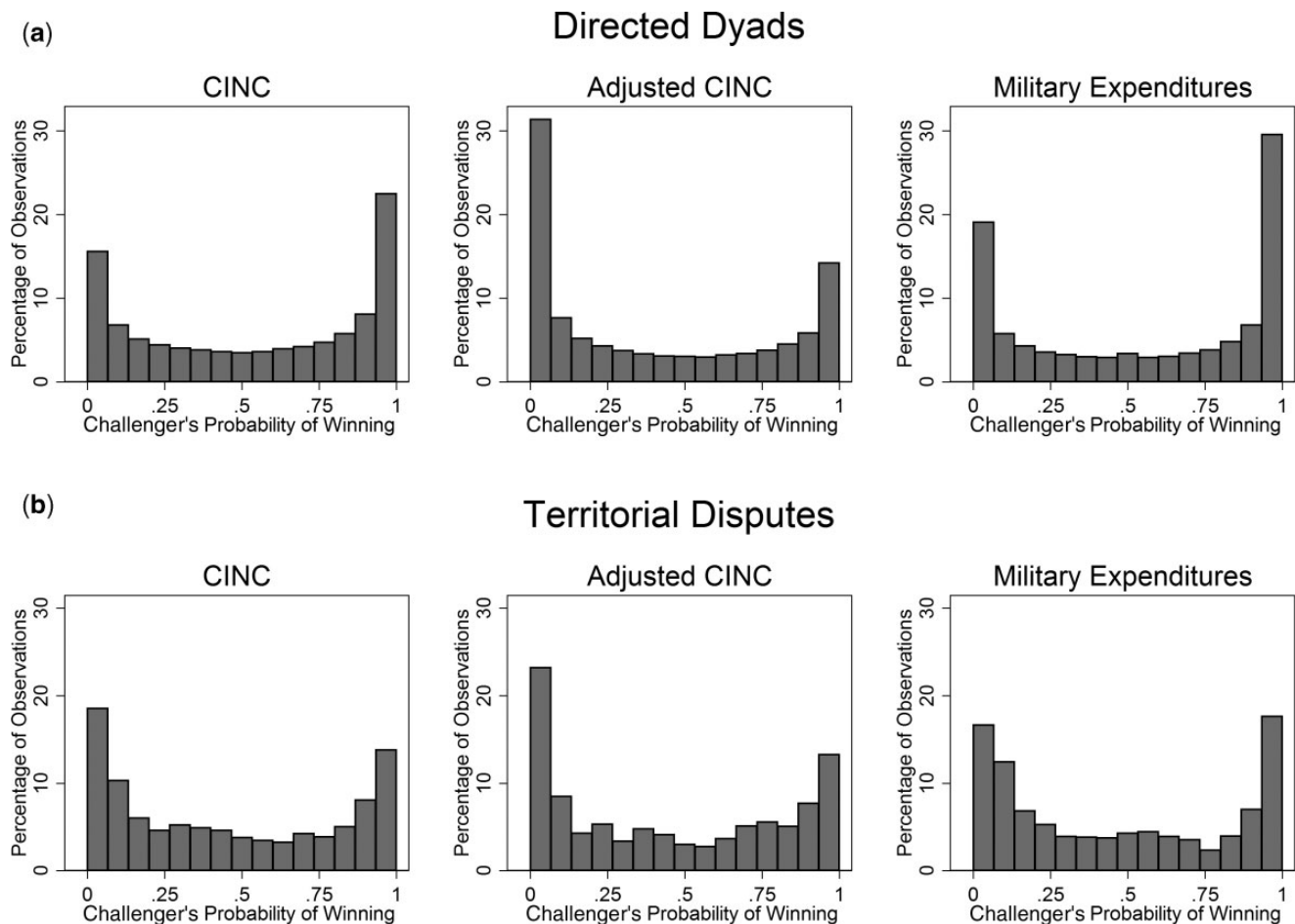
The frequency of alliance formation in the two samples analyzed is presented in Table 1. It shows the number (percent) of instances of alliance formation for all years as well as the pre-Cold War, Cold War, and post-Cold War periods.

The key independent variable suggested by crisis bargaining theory that identifies the level of external threat the target faces from the challenger in the dyad is the challenger's probability of defeating the target in war. To provide a thorough test of the hypothesis, I employ three different measures of the challenger's probability of winning a war against the target. The distributions of the

Table 1. Frequency of alliance formation

<i>Sample</i>	<i>All years</i>	<i>Pre–Cold War</i>	<i>Cold War</i>	<i>Post–Cold War</i>
Directed dyads	16,955 (2.5%)	2,255 (1.2%)	9,182 (3.6%)	5,518 (2.4%)
Territorial disputes	139 (2.1%)	67 (1.4%)	48 (4.3%)	24 (5.6%)

Note: This table shows the frequency of alliance formation for the samples analyzed. Observations missing data on the other variables in the analysis are excluded.

**Figure 1.** Distributions of the challenger's probability of winning

Note: This figure shows the distribution of each measure of the challenger's probability of winning for both samples analyzed.

measures that will be explained below are displayed in Figure 1.

The first measure employed is based on the standard ratio contest-success function. That is, I divide the challenger's capabilities by the sum of the target and challenger's capabilities. This capability ratio is utilized in various statistical studies of deterrence (see Danilovic 2001; Leeds 2003b; Fuhrmann and Sechser 2014, etc.) and war outcomes (see Reiter and Stam 1998; Sullivan 2007; Croco 2011). Consistent with the aforementioned studies, the actors' composite index of national capabilities (CINC) scores from the Correlates of War (COW) project are used to measure their military capabilities (Singer, Bremer, and Stuckey 1972). The variable is bounded between 0 and 1, where values closer to 1 indicate higher probabilities of the challenger defeating the target in war.

The second measure takes into account distance between the target and challenger. This measure attempts to capture the idea that the further the challenger is from

the target, the more the strength of a potential attack on the target will decrease (Boulding 1962). To capture this notion, I rely on the measure advanced by Bueno de Mesquita (1981, 101–8). His measure allows a state's capability to decrease with distance, but the rate of decline decreases over time. Time is incorporated because distance may have been more of an obstacle in earlier eras than more recent eras. However, it is important to note that these adjustments are only made for the challenger's capabilities because distance will only be an issue for the challenger in an attack on the target's sovereignty or territorial integrity. Once these adjustments are made to the challenger's capabilities, the ratio contest-success function described above is used to generate the measure.

The final measure uses the ratio contest-success function to compute the challenger's probability of winning relying only on the military expenditures component of the CINC score. I extract this component of the CINC score because military expenditures are a key determinant

Table 2. Probit regressions of alliance formation

	Directed dyads			Territorial disputes		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Challenger's probability of winning (CINC)	0.116** (0.010)			0.314* (0.128)		
Challenger's probability of winning (Adjusted CINC)		0.117** (0.009)			0.351** (0.133)	
Challenger's probability of winning (Expenditures)			0.148** (0.010)			0.349* (0.149)
Target major power	0.507** (0.018)	0.493** (0.018)	0.562** (0.021)	0.751** (0.128)	0.765** (0.129)	0.886** (0.157)
Challenger-target contiguity	0.131** (0.019)	0.108** (0.019)	0.130** (0.021)	0.236* (0.099)	0.220* (0.099)	0.179 (0.114)
Challenger alliance	-0.275** (0.008)	-0.279** (0.008)	-0.248** (0.009)	0.298** (0.094)	0.297** (0.094)	0.213 [†] (0.114)
Pre-Cold War period	-0.467** (0.011)	-0.463** (0.011)	-0.360** (0.014)	-0.872** (0.126)	-0.853** (0.126)	-0.884** (0.159)
Cold War period	0.032** (0.008)	0.032** (0.008)	0.131** (0.009)	-0.283* (0.130)	-0.288* (0.130)	-0.183 (0.144)
Years since last formation	-0.039** (0.001)	-0.039** (0.001)	-0.036** (0.001)	-0.040** (0.009)	-0.039** (0.009)	-0.045** (0.010)
Years since last formation ²	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)
Years since last formation ³	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Constant	-1.510** (0.011)	-1.495** (0.011)	-1.647** (0.013)	-1.536** (0.182)	-1.568** (0.185)	-1.497** (0.211)
Observations	668,944	668,944	537,282	6,512	6,512	4,512
Log-likelihood	-75174.517	-75166.917	-59760.475	-594.710	-594.169	-438.608
AIC	150369.033	150353.833	119540.950	1209.421	1208.337	897.216

Standard errors in parentheses. [†] $p < .1$, * $p < .05$, ** $p < .01$.

of the current quality of a military and may be the most salient factor for a state assessing its chances of victory against a given opponent. However, the argument is not that the other components of the CINC score are irrelevant, but analyzing a more direct measure of military capability is a worthwhile robustness check. Therefore, the statistical analysis does not exclusively rely on the measure based only on military expenditures but incorporates it into a larger set of tests.

When testing the External Threat Hypothesis, I also include several control variables. More specifically, I include variables that are expected to be related to alliance formation and the key independent variable, the challenger's probability of winning. Including these variables increases confidence that the relationships observed between external threat and alliance formation are not spurious relationships. I will briefly describe each variable below.

First, I control for the major power status of the target. This is important to control for because major powers tend to face fewer external threats (i.e., challengers of major power targets will tend to have a lower probability of winning) and existing research suggests at least two reasons why major power status would be related to alliance formation. The first is that major powers can be more desirable alliance partners due to their greater material capabilities. Research suggests that states with more powerful allies are less likely to be the target of militarized disputes (Johnson, Leeds, and Wu 2015). According to this reasoning, major power targets may be more likely to enter into alliances despite not facing external threats. The other possibility is that states may avoid allying with

major powers due to concerns of their reliability. Research suggests that major powers are less likely to honor alliance commitments in times of war due to their lower costs for reneging (Leeds 2003a; Langlois 2012). This reasoning would imply that major power targets are less likely to enter into alliances while being less likely to face external threats. I use the COW coding of major power status and obtain it from the EUGene data-generation software (Bennett and Stam 2000).

Second, I control for whether the challenger in the dyad has an alliance applicable to an attack on the target. An alliance may be more attractive to a target if the challenger has formed alliances against it. Furthermore, the alliance will increase the challenger's probability of winning. To code this variable, I use the presence of a relevant offense alliance in a dyad from Johnson and Leeds (2011, 55), which is based on information from the ATOP data.

Third, I control for whether the challenger is contiguous to the target. This is because disputes between contiguous states are much more contentious and volatile (Reed and Chiba 2010) and, as a result, having an alliance may be more beneficial for the target if it shares a border with its challenger. In addition, targets that face contiguous challengers may invest more heavily in military capabilities, reducing the challenger's probability of winning. I also use EUGene for data on contiguity.

In addition to these three control variables, I also include dummy variables for the pre-Cold War and Cold War periods. The post-Cold War period is the reference period. These models are important because previous alliance research emphasizes the effects of time periods on

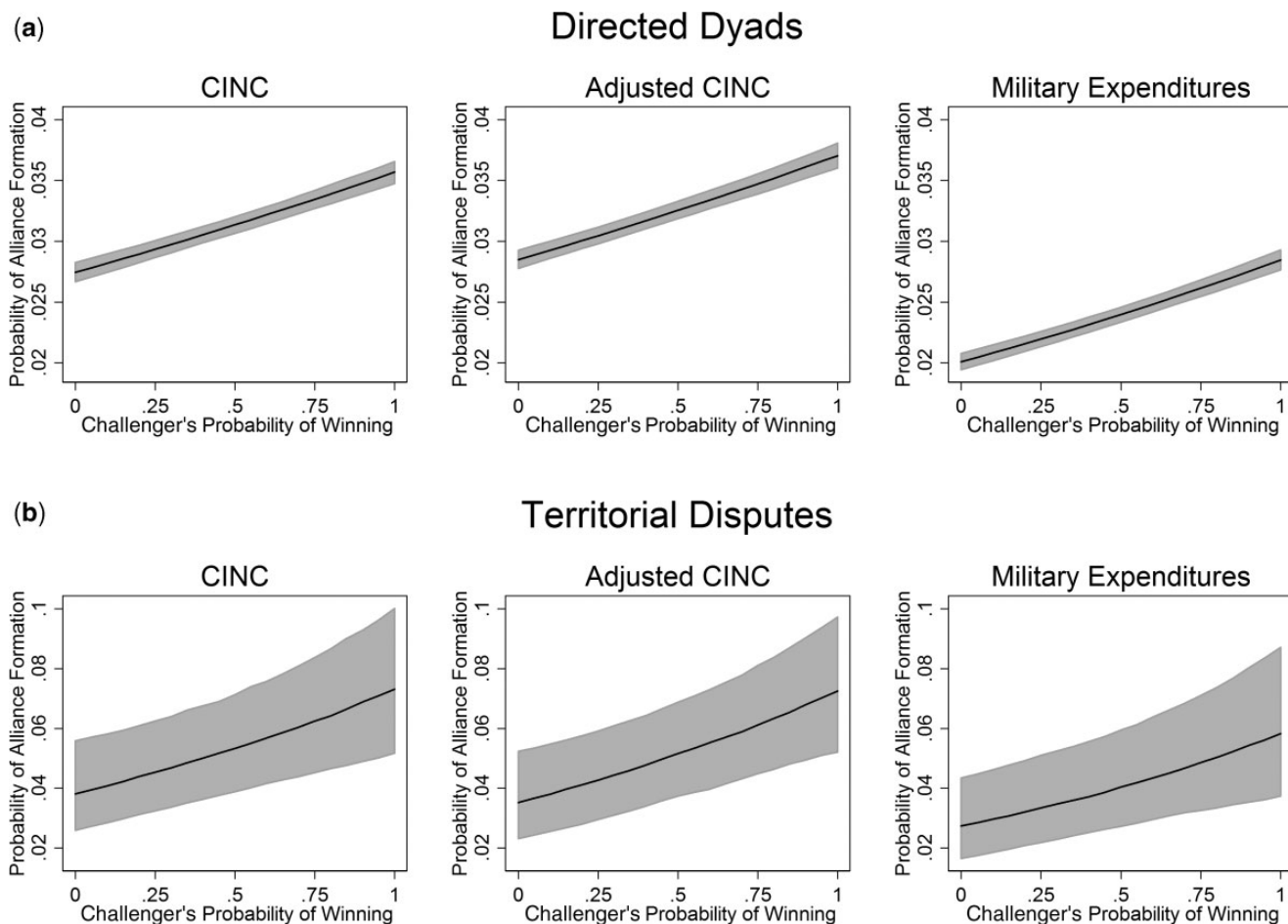


Figure 2. The effect of the challenger's probability of winning on the probability of target alliance formation

Note: This figure graphs predicted probabilities of target alliance formation with 95% confidence intervals across different values of each measure of the challenger's probability of winning in war. The predicted probabilities and confidence intervals were generated using Clarify (King, Tomz, and Wittenberg 2000) while holding the dichotomous control variables at their modes and the continuous control variables at their means. The time period variables are set at "0," producing predicted probabilities for the post-Cold War period.

alliance behavior, and Table 1 is suggestive of these effects as well. Therefore, I test the External Threat Hypothesis while these time period effects are held constant.

Finally, I control for temporal dependence using the procedure prescribed by Carter and Signorino (2010). More specifically, a variable that codes the number of years since the last time the target formed an alliance applicable to the challenger is included in the models as well as the squared and cubed term of the variable.

Results

Table 2 presents the results from six probit regressions of alliance formation.² I estimate Models 1–3 using a sample of directed dyad-years where the target is not allied. Models 4–6 restrict the sample to the subset of directed dyad-years that have an ongoing territorial dispute. I include the three different measures of the key independent variable discussed above in separate models for both samples.³ Since the measures attempt to capture the same

concept, more than one of the measures is never included in the same model.

The results show that all six models support the External Threat Hypothesis. This is demonstrated by the positive significant coefficient associated with the challenger's probability of winning in all six models. As the challenger's probability of winning increases, the target is more likely to form an alliance. This result holds for all three measures of the independent variable, and it holds whether or not the sample is restricted to territorial disputes.

While all six models support the External Threat Hypothesis, they produce different substantive effects. Figure 2 reports the predicted probability of the target forming an alliance for every value of the challenger's probability of winning in war for all six models. The estimated effects from the models that restrict the sample to those dyads with an ongoing territorial dispute are larger than the models that do not restrict the sample in this way. For example, an increase from the 25th percentile to 75th percentile on the challenger's probability of winning increases the probability of the target allying by 22% ($= \frac{.035 - .029}{.029}$), 25% ($= \frac{.035 - .028}{.028}$), and 33% ($= \frac{.028 - .021}{.021}$) in Models 1, 2, and 3 respectively. However, this same change increases the probability of the target allying by

²The online appendix associated with the study includes additional empirical analyses.

³As a result of data on military expenditures being sparser than CINC, Models 3 and 6 include fewer observations.

Table 3. Probit regressions of alliance formation

	<i>Directed dyads</i>			<i>Territorial disputes</i>		
	<i>Including allied cases</i>	<i>Excluding large alliances</i>	<i>Excluding influential cases</i>	<i>Including allied cases</i>	<i>Excluding large alliances</i>	<i>Excluding influential cases</i>
	<i>Model 7</i>	<i>Model 8</i>	<i>Model 9</i>	<i>Model 10</i>	<i>Model 11</i>	<i>Model 12</i>
Challenger's probability of winning (CINC)	0.052** (0.006)	0.056** (0.010)	0.116** (0.010)	0.196* (0.084)	0.357** (0.137)	0.355** (0.137)
Target major power	0.400** (0.008)	0.508** (0.018)	0.508** (0.018)	0.720** (0.067)	0.836** (0.134)	0.859** (0.141)
Challenger-target contiguity	0.126** (0.012)	0.141** (0.020)	0.130** (0.019)	0.174** (0.056)	0.337** (0.107)	0.376** (0.112)
Challenger alliance	-0.159** (0.005)	-0.395** (0.009)	-0.275** (0.008)	0.111[†] (0.060)	0.185[†] (0.104)	0.157 (0.104)
Pre-Cold War period	-0.315** (0.008)	-0.462** (0.012)	-0.467** (0.011)	-0.410** (0.079)	-0.805** (0.133)	-0.769** (0.138)
Cold War period	0.049** (0.005)	-0.084** (0.009)	0.032** (0.008)	0.111 (0.077)	-0.322* (0.141)	-0.203 (0.140)
Years since last formation	-0.055** (0.001)	-0.036** (0.001)	-0.040** (0.001)	-0.060** (0.005)	-0.039** (0.009)	-0.048** (0.010)
Years since last formation ²	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)
Years since last formation ³	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000* (0.000)
Constant	-1.402** (0.006)	-1.520** (0.012)	-1.507** (0.011)	-1.570** (0.110)	-1.726** (0.195)	-1.699** (0.199)
Observations	1,381,036	665,472	668,933	11,258	6,493	6,491
Log-likelihood	-197261.070	-62980.950	-75122.916	-1879.012	-532.826	-522.930
AIC	394542.139	125981.901	150265.833	3778.024	1085.652	1065.860

Standard errors in parentheses. [†] $p < .1$, * $p < .05$, ** $p < .01$.**Table 4.** Probit regressions of alliance formation

	<i>Directed dyads</i>			<i>Territorial disputes</i>		
	<i>Model 13</i>	<i>Model 14</i>	<i>Model 15</i>	<i>Model 16</i>	<i>Model 17</i>	<i>Model 18</i>
Number of MID's in the past 10 years	0.001 (0.014)	0.019 (0.014)	0.014 (0.014)	-0.003 (0.026)	-0.019 (0.029)	-0.022 (0.030)
Challenger's probability of winning (CINC)			0.116** (0.010)			0.318* (0.128)
Target major power		0.454** (0.018)	0.506** (0.018)		0.616** (0.114)	0.755** (0.128)
Challenger-target contiguity		0.125** (0.020)	0.126** (0.020)		0.223* (0.099)	0.247* (0.100)
Challenger alliance		-0.272** (0.008)	-0.275** (0.008)		0.321** (0.094)	0.304** (0.094)
Pre-Cold War period		-0.466** (0.011)	-0.468** (0.011)		-0.852** (0.125)	-0.870** (0.126)
Cold War period		0.035** (0.008)	0.032** (0.008)		-0.250[†] (0.131)	-0.265* (0.132)
Years since last formation		-0.040** (0.001)	-0.039** (0.001)		-0.038** (0.009)	-0.039** (0.009)
Years since last formation ²		0.001** (0.000)	0.001** (0.000)		0.001** (0.000)	0.001** (0.000)
Years since last formation ³		-0.000** (0.000)	-0.000** (0.000)		-0.000 (0.000)	-0.000 (0.000)
Constant	-1.954** (0.003)	-1.444** (0.010)	-1.510** (0.011)	-2.025** (0.038)	-1.370** (0.166)	-1.551** (0.183)
Observations	668,944	668,944	668,944	6,512	6,512	6,512
Log-likelihood	-79050.243	-75246.877	-75174.024	-672.222	-597.514	-594.407
AIC	158104.487	150513.754	150370.049	1348.444	1215.029	1210.814

Standard errors in parentheses. [†] $p < .1$, * $p < .05$, ** $p < .01$.

60% ($= \frac{.067-.042}{.042}$), 71% ($= \frac{.065-.038}{.038}$), and 77% ($= \frac{.055-.031}{.031}$) in Models 4, 5, and 6 respectively. Given that the directed dyad sample is overly inclusive and includes observations where crisis bargaining is unlikely, the larger effect associated with the sample of territorial disputes is unsurprising. The presence of observations without an underlying disagreement will attenuate the relationship between the measure of external threat and alliance formation.

Interestingly, support for the External Threat Hypothesis in the sample of territorial disputes suggests further work needs to be done to disentangle the relationship between alliances, territorial disputes, and war. Previous research finds some evidence that territorial disputes that involve outside alliances are more likely to escalate than territorial disputes without outside alliances (see Senese and Vasquez 2004). Future work should sort out whether the outside alliance is causing escalation or, as suggested by the External Threat Hypothesis, disputants enter into outside alliances when they expect a military challenge.

Table 3 investigates the robustness of the results to modifications of both of the samples analyzed. Models 7 and 10 incorporate the set of observations where the target already has an alliance applicable to the challenger. The models show that the External Threat Hypothesis is still supported when these observations are included but, unsurprisingly, due to the noise introduced by these cases, the strength of the relationship weakens. Models 8 and 11 exclude the five largest multilateral alliances in the data that account for a significant portion of the instances of alliance formation.⁴ The results suggest that these observations do not drive the results and that the hypothesis is still supported in the absence of these large multilateral alliances. Models 9 and 12 attempt to more systematically exclude cases. More specifically, these models exclude cases that are the most influential to the coefficient estimates according to Pregibon's (1981) Delta-Beta influential statistic. Continued support for the External Threat Hypothesis in these models demonstrates that support for the hypothesis is not being driven by outlier cases.

Table 4 reports additional analyses employing the standard measure of external threat that is based on past militarized interstate disputes. This additional analysis is important in order to determine whether it is the alternative measure or some other research design decision (for example sample selection, alliance formation coding, etc.) that is producing the positive relationship between external threat and alliance formation. Therefore, Table 4 reports estimates from models that include the external threat measure developed by Lai and Reiter (2000).⁵ The measure is included in models estimated using both samples, with and without control variables, and with and without the external threat measure advanced in this study. These models demonstrate that the conventional external threat measure is not significantly related to alliance formation and the measure suggested by bargaining theory remains positive and significant.

While previous statistical research does not find a consistent relationship between external threat and alliance

formation, the results reported here indicate that external threat increases the probability of alliance formation. The results provide support for the External Threat Hypothesis derived above and a large body of alliance theory. This analysis, thus, brings statistical research on alliance formation in line with central aspects of theoretical work on alliances.

Conclusion

While this research note focuses on the relationship between external threat and alliance formation, the findings have broad implications for the study of alliances. They also suggest a number of productive directions for future research. Demonstrating that external threat increases the probability of alliance formation provides empirical support for a core alliance formation hypothesis. But it raises issues for testing hypotheses regarding the relationship between alliances and conflict. As discussed by Leeds and Johnson (2017), if states form alliances when they expect a military challenge, empirical analyses of alliances and conflict will be biased toward finding that alliances increase conflict. Future work on alliances and conflict should explicitly address this issue.

The findings here also suggest promising directions for future research on alliance formation. I utilize crisis bargaining theory to better understand why states form alliances, but doing so also may help us understand the design of military alliances. The inclusion of certain alliance design features, such as peacetime military coordination, may depend upon the types of demands or challengers states expect to face in the future. Crisis bargaining theory may also help make sense of what alliance partner(s) states choose. That is, the type or number of alliance partners a state seeks may be shaped by characteristics of an anticipated crisis or challenger.

Finally, this study and others (for example Fang, Johnson, and Leeds 2014) suggest that military alliances influence international bargains. These implications, however, remain largely untested because existing alliance studies do not provide statistical analyses of many aspects of crisis negotiations, such as the size of demands or the willingness to offer concessions. Scholars researching alliances should go beyond their focus on militarized conflict and seek out ways to offer large-*N* analyses of the bargaining strategies of alliance members.

Supplemental Information

Supplemental Information is available at *International Studies Quarterly* data archive.

References

- BENNETT, D. SCOTT, AND ALLAN C. STAM. 2000. "EUGene: A Conceptual Manual." *International Interactions* 26 (2): 179–204.
- BOULDING, KENNETH E. 1962. *Conflict and Defense: A General Theory*. New York: Harper & Row.
- BUENO DE MESQUITA, BRUCE. 1981. *The War Trap*. New Haven, CT: Yale University Press.
- CARTER, DAVID B., AND CURTIS S. SIGNORINO. 2010. "Back to the Future: Modeling Time Dependence in Binary Data." *Political Analysis* 18 (3): 271–92.
- CROCO, SARAH E. 2011. "The Decider's Dilemma: Leader Culpability, War Outcomes, and Domestic Punishment." *American Political Science Review* 105 (3): 457–77.
- DANILOVIC, VESNA. 2001. "The Sources of Threat Credibility in Extended Deterrence." *Journal of Conflict Resolution* 45 (3): 341–69.
- FANG, SONGYING, JESSE C. JOHNSON, AND BRETT ASHLEY LEEDS. 2014. "To Concede or to Resist? The Restraining Effect of Military Alliances." *International Organization* 68 (4): 775–809.

⁴The five largest defense pacts in the data are the 1942 Declaration by United Nations, 1948 Organization of American States, 1949 North Atlantic Treaty Organization, 1947 Rio Pact, and 1950 Arab Collective Defense Pact.

⁵More specifically, the variable codes the number of militarized interstate disputes the target has had with the challenger in the past 10 years. The information used to code this variable comes from Maoz's dyadic version of the COW Militarized Interstate Dispute data (Ghosn et al. 2004, Maoz 2005).

- FEARON, JAMES D. 1995. "Rationalist Explanations for War." *International Organization* 49 (3): 379–414.
- FUHRMANN, MATTHEW, AND TODD S. SECHSER. 2014. "Signaling Alliance Commitments: Hand-Tying and Sunk Costs in Extended Nuclear Deterrence." *American Journal of Political Science* 58 (4): 919–35.
- GHOSE, FATEEN, GLENN PALMER, AND STUART BREMER. 2004. "The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description." *Conflict Management and Peace Science* 21 (2): 133–54.
- GIBLER, DOUGLAS M. 2008. "The Costs of Reneging: Reputation and Alliance Formation." *Journal of Conflict Resolution* 52(3): 426–54.
- . 2012. *The Territorial Peace: Borders, State Development, and International Conflict*. New York: Cambridge University Press.
- GIBLER, DOUGLAS M., AND TOBY J. RIDER. 2004. "Prior Commitments: Compatible Interests Versus Capabilities in Alliance Behavior." *International Interactions* 30 (4): 309–29.
- GIBLER, DOUGLAS M., AND MEREDITH REID SARKEES. 2004. "Measuring Alliances: The Correlates of War Formal Interstate Alliance Dataset, 1816–2000." *Journal of Peace Research* 41 (2): 211–22.
- GIBLER, DOUGLAS M., AND SCOTT WOLFORD. 2006. "Alliances, Then Democracy: An Examination of the Relationship between Regime Type and Alliance Formation." *Journal of Conflict Resolution* 50 (1): 129–53.
- GODDARD, STACIE E. 2009. "When Right Makes Might: How Prussia Overturned the European Balance of Power." *International Security* 33 (3): 110–42.
- GULICK, EDWARD V. 1955. *Europe's Classical Balance of Power*. New York: W. W. Norton.
- HENSEL, PAUL R. 2001. "Contentious Issues and World Politics: The Management of Territorial Claims in the Americas, 1816–1992." *International Studies Quarterly* 45 (1): 81–109.
- HUI, VICTORIA TIN-BOR. 2004. "Toward a Dynamic Theory of International Politics: Insights from Comparing Ancient China and Early Modern Europe." *International Organization* 58 (1): 175–205.
- JOHNSON, JESSE C. 2015. "The Cost of Security: Foreign Policy Concessions and Military Alliances." *Journal of Peace Research* 52 (5): 665–79.
- JOHNSON, JESSE C., AND BRETT ASHLEY LEEDS. 2011. "Defense Pacts: A Prescription for Peace?" *Foreign Policy Analysis* 7 (1): 45–65.
- JOHNSON, JESSE C., BRETT ASHLEY LEEDS, AND AHRA WU. 2015. "Capability, Credibility, and Extended General Deterrence." *International Interactions* 41 (2): 309–36.
- KIMBALL, ANESSA L. 2010. "Political Survival, Policy Distribution, and Alliance Formation." *Journal of Peace Research* 47 (4): 407–19.
- KING, GARY, MICHAEL TOMZ, AND JASON WITTENBERG. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44 (2): 341–55.
- LAI, BRIAN, AND DAN REITER. 2000. "Democracy, Political Similarity, and International Alliances, 1816–1992." *Journal of Conflict Resolution* 44 (2): 203–27.
- LANGLOIS, CATHERINE C. 2012. "Power and Deterrence in Alliance Relationships: The Ally's Decision to Renege." *Conflict Management and Peace Science* 29 (2): 148–69.
- LEEDS, BRETT ASHLEY. 2003a. "Alliance Reliability in Times of War: Explaining State Decisions to Violate Treaties." *International Organization* 57 (4): 801–27.
- . 2003b. "Do Alliances Deter Aggression? The Influence of Military Alliances on the Initiation of Militarized Interstate Disputes." *American Journal of Political Science* 47 (3): 427–39.
- . 2015. "Why Do States Sign Alliances?" In *Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource*, edited by Robert A. Scott and Stephen Kosslyn, 1–14. Hoboken, NJ: Wiley. DOI: 10.1002/9781118900772.etrds0387
- LEEDS, BRETT ASHLEY, AND JESSE C. JOHNSON. 2017. "Theory, Data, and Deterrence: A Response to Kenwick, Vasquez, and Powers." *Journal of Politics* 79 (1): 335–40.
- LEEDS, BRETT ASHLEY, JEFFREY M. RITTER, SARA McLAUGHLIN MITCHELL, AND ANDREW LONG. 2002. "Alliance Treaty Obligations and Provisions, 1815–1944." *International Interactions* 28 (3): 237–60.
- LEVY, JACK S., AND WILLIAM R. THOMPSON. 2005. "Hegemonic Threats and Great-Power Balancing in Europe, 1495–1999." *Security Studies* 14 (1): 1–33.
- . 2010. "Balancing on Land and at Sea: Do States Ally against the Leading Global Power?" *International Security* 35 (1): 7–43.
- MAOZ, ZEEV. 2005. "Dyadic MID Dataset." Accessed November 7, 2012 <http://vanity.dss.ucdavis.edu/~maoz/dyadmid.html>.
- MORGENTHAU, HANS J. 1948. *Politics among Nations: The Struggle for Power and Peace*. New York: Alfred A. Knopf.
- MORROW, JAMES D. 1991. "Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliances." *American Journal of Political Science* 35 (4): 904–33.
- . 1994. "Alliances, Credibility, and Peacetime Costs." *Journal of Conflict Resolution* 38 (2): 270–97.
- . 2000. "Alliances: Why Write Them Down?" *Annual Review of Political Science* 3 (1): 63–83.
- POWELL, ROBERT. 2002. "Bargaining Theory and International Conflict." *Annual Review of Political Science* 5 (1): 1–30.
- PREGIBON, DARYL. 1981. "Logistic Regression Diagnostics." *Annals of Statistics* 9 (4): 705–24.
- REED, WILLIAM, AND DAINA CHIBA. 2010. "Decomposing the Relationship Between Contiguity and Militarized Conflict." *American Journal of Political Science* 54 (1): 61–73.
- REITER, DAN. 1994. "Learning, Realism, and Alliances: The Weight of the Shadow of the Past." *World Politics* 46 (4): 490–526.
- REITER, DAN, AND ALLAN C. STAM III. 1998. "Democracy, War Initiation, and Victory." *American Political Science Review* 92 (2): 377–89.
- SENESE, PAUL D. 2005. "Territory, Contiguity, and International Conflict: Assessing a New Joint Explanation." *American Journal of Political Science* 49 (4): 769–79.
- SENESE, PAUL D., AND JOHN VASQUEZ. 2004. Alliances, Territorial Disputes, and the Probability of War. In *The Scourge of War: New Extensions on an Old Problem*, edited by Paul F. Diehl, 189–221. Ann Arbor: University of Michigan Press.
- SINGER, J. DAVID, STUART BREMER, AND JOHN STUCKEY. 1972. "Capability Distribution, Uncertainty, and Major Power War, 1820–1965." In *Peace, War, and Numbers*, edited by B. Russett, 19–48. Beverly Hills, CA: Sage.
- SMITH, ALASTAIR. 1995. "Alliance Formation and War." *International Studies Quarterly* 39 (4): 405–26.
- . 1998. "Extended Deterrence and Alliance Formation." *International Interactions* 24 (4): 315–43.
- SNYDER, GLENN H. 1997. *Alliance Politics*. Ithaca, NY: Cornell University Press.
- SULLIVAN, PATRICIA L. 2007. "War Aims and War Outcomes: Why Powerful States Lose Limited Wars." *Journal of Conflict Resolution* 51 (3): 496–524.
- VASQUEZ, JOHN. 1995. "Why Do Neighbors Fight? Proximity, Interaction, or Territoriality." *Journal of Peace Research* 32 (3): 277–93.
- VASQUEZ, JOHN, AND MARIE T. HENEHAN. 2001. "Territorial Disputes and the Probability of War, 1816–1992." *Journal of Peace Research* 38 (2): 123–38.
- WALT, STEPHEN M. 1987. *The Origins of Alliances*. New York: Cornell University Press.
- WALTZ, KENNETH N. 1979. *Theory of International Politics*. Reading: Addison-Wesley Publishing.
- WOHLFORTH, WILLIAM C., RICHARD LITTLE, STUART J. KAUFMAN, DAVID KANG, CHARLES A. JONES, VICTORIA TIN-BOR HUI, ARTHUR ECKSTEIN, DANIEL DEUDNEY, AND WILLIAM L. BRENNER. 2007. "Testing Balance-of-Power Theory in World History." *European Journal of International Relations* 13 (2): 155–85.