Diplomatic Relations and Conflict Management: A Dynamic Analysis*

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Work in progress.
For the most recent version, see http://bkenkel.com/data/dyndip.pdf.

Abstract

Do formal diplomatic relations have a role in international crisis prevention and management? Policymakers tout diplomatic exchange as a force for peace, while rationalist theories of diplomacy as cheap talk are more skeptical. In this paper, I develop a unified theoretical and statistical model of diplomatic relations and international conflict in order to estimate how diplomacy affects crisis management. The model situates the decision to establish or cut off relations within a dynamic decision problem, explicitly incorporating the possibility that expectations of future conflict influence present decisions. To estimate the model, I collect fine-grained data on the dates of changes in American diplomatic representation abroad. I find that diplomacy indeed has a pacific effect, particularly in increasing the incentive to de-escalate an ongoing crisis. At the same time, I also identify the reverse effect—active hostilities increase the likelihood of severing diplomatic ties.

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> "[I]f you don't fund the State Department fully, then I'm going to need to buy more ammunition ultimately."
>
> Gen. James Mattis (United States Senate Committee on Armed Services 2013)

Do diplomatic relations make a difference in international conflict management? At least since Schelling (1966), international relations scholars have been preoccupied with how the most coercive forms of statecraft affect conflict onset and outcomes.[1] Regular and ongoing diplomatic efforts—the kind of diplomacy carried out by diplomats—have received comparatively little attention.[2] Yet policymakers evidently see diplomatic relations as a means of conflict prevention. The United States State Department, which defines conflict management and prevention as one of its top priorities (United States Department of State 2015), spends about 20 percent of its annual budget, or 8 billion USD, on embassies and consulates (United States Department of State 2016). Is Gen. Mattis (quoted above) correct that an investment in diplomacy now may lead to a lower chance of conflict later?

The clearest case for skepticism comes from the rationalist literature on crisis management. Rationalist models treat diplomacy as cheap talk—a form of signaling in which it is just as easy to lie about one's intentions or capabilities as it is to tell the truth, resulting in high barriers to credibility (Crawford and Sobel 1982; Farrell and Rabin 1996). Formal theories of cheap talk in conflict management provide little support for the idea of peace through diplomacy. In the workhorse model of crisis bargaining, diplomacy has no effect on crisis outcomes, as the universal incentive for states to overstate their resolve undermines the credibility of cheap talk (Fearon 1995). And even in some subsequent models in which states can credibly reveal information through cheap talk, the probability of conflict is greater when states communicate than when they do not (Sartori 2002; Ramsay 2011). Only with considerable changes to the workhorse bargaining framework, such as assuming issue indivisibility (Trager 2010) or allowing for positive-sum negotiating outcomes (Bils and

[1] For a recent review of the coercive diplomacy literature, see Slantchev (2011).

[2] In the formal theoretical literature, Lindsey (2017) is, to my knowledge, the only study specifically of diplomacy as practiced by professionals.

Spaniel 2017), do scholars find diplomatic cheap talk as a cause of peace.

In this paper, I use a novel empirical analysis to clarify our understanding of the links between diplomatic relations, international crises, and war. At the core of the analysis is a unified theoretical and statistical model of the United States' diplomatic relations with and military hostility toward each other country in the international system between 1816 and 2007. I treat the United States as a rational, forward-looking actor and, using techniques developed by Rust (1987), estimate its utility for diplomatic and military activities toward each other country as a function of its current diplomatic relations and level of dispute (if any) with that country. I also estimate the effects of, and thereby control for, country-specific characteristics that may affect the US's payoff from diplomatic relations or military conflict, such as the country's material capabilities and regime type.

On the whole, the results of the analysis support the view that diplomacy breeds peace and contradict the idea of diplomacy as epiphenomenal cheap talk. Equally importantly, I identify where in the conflict process the effects of diplomacy are strongest. Diplomatic relations have a small but detectable effect, on average a 0.2% reduction in any given month, on the probability that the US will initiate a crisis with a country it is currently at peace with. The effect of formal diplomatic ties is much stronger on the probability of the US backing down from an ongoing crisis—about a 6.6% increase in any given month. At the same time, I cannot reject the null hypothesis that diplomacy has no effect on the chance that the US will choose to escalate an ongoing crisis into war. This null finding may appear to provide partial support for the theory that cheap talk diplomacy is ineffective in crisis bargaining, but it may also merely be an artifact of low statistical power in the analysis of escalation decisions.

In the course of obtaining these estimates, my analysis makes progress on two broader problems in the empirical study of diplomacy and conflict management. The first is the problem of reverse causality in estimating the effect of diplomacy on dispute onset. If it is economically or politically costly to maintain a permanent diplomatic presence in a country in times of crisis or war, then anticipated future hostility may cause the severing of relations. I explicitly account for this possibility by modeling the choice of diplomatic relations as a dynamic decision problem,

in which the US's expectations about future diplomatic relations and military hostility shape its present decisions. The dynamic structural analysis allows me to separately identify the effect of diplomatic relations on the payoff to military escalation and the effect of current crisis status on the cost of maintaining diplomatic relations. I further discuss these issues in the next section.

The second issue for the empirical study of diplomacy that this study helps tackle is data availability. The existing state of the art for data on diplomatic exchange is Bayer (2006), which codes diplomatic exchange only at roughly five-year intervals. Other recent empirical analyses of the diplomatic network rely on this dataset (Kinne 2014; Renshon 2016). However, such a coarse window does not allow for an accurate analysis of the temporal relationship between diplomatic relations and international disputes. In order to enable such an analysis, I collect day-level data on the status of American diplomatic representation with every other country in the international system from 1776 to 2016.[3] Although we still lack global data at this level of granularity, the collection here represents a clear, if incomplete, improvement on the state of the art. The focus on the United States is in keeping with the empirical literature on diplomacy, in which the US has received disproportionate attention (Goldsmith and Horiuchi 2009; McManus 2014; Lebovic and Saunders 2016).

Previous empirical studies on the links between diplomacy and conflict behavior have focused on the role of high-profile actors, typically the president of the United States. Using a large-scale content analysis, McManus (2014) finds that public statements of resolve by presidents are associated with American success in international disputes. In a survey experiment, Trager and Vavreck (2011) find declines in approval for presidents who back down from public threats, as predicted by theories of domestic audience costs as a source of credibility in coercive diplomacy (Fearon 1994). Hall and Yarhi-Milo (2012), in a series of case studies, find that face-to-face interactions between state leaders may shape their assessments of each other's intentions in tense geopolitical moments. Less directly related to conflict, Goldsmith and Horiuchi (2009) identify conditions under which public visits by American presidents increase or decrease foreign public

[3]Data currently available on request from the author and will be made publicly available at or before publication of this study.

opinion of the United States.

While diplomacy conducted at the highest levels is obviously influential, there are compelling reasons to believe that career diplomats also play a role in crisis management. New research at the intersection of international relations and political psychology argues that face-to-face contact allows diplomatic actors to credibly signal their intentions (Hall and Yarhi-Milo 2012; Holmes 2013), even in settings where cheap talk models would predict no effect. Since a state's leader or foreign minister can only be in one place at a time, stationed diplomats have far more opportunities to make this critical type of contact. And at least in the American context, crisis situations do not appear to affect the propensity of high-level political officials to make diplomatic visits (Lebovic and Saunders 2016), so the potential role of career diplomats is not limited to mundane affairs.

The present analysis also draws from—and contributes to—the empirical literature on the determinants of formal diplomatic ties between countries. In an early study, Russett and Curtis Lamb (1969) identify regional proximity and great power status as predictors of diplomatic exchange. More recently, Neumayer (2008) confirms the importance of geography and military power, while also finding that ideological affinity predicts the formation of diplomatic ties between states. Kinne (2014) analyzes the network structure of the diplomatic system and finds significant interdependencies: where states establish relations is largely a function of where other states have done so. I innovate on these studies by considering the reciprocal relationship between formal diplomatic representation and conflict behavior, including the effects of expectations of future conflict on the establishment of diplomatic ties. A limitation of my study compared to these is that, due to data availability, I only consider diplomatic ties with the United States.

1 Reverse Causality and the Study of Diplomacy

Like many important political decisions, the choice to establish, maintain, or sever diplomatic ties is not made at random. Consequently, it is difficult to identify the causal effect of diplomatic relations on any political outcome of interest. The difficulty is even greater when studying the effects

of diplomacy on the onset and severity of militarized disputes, since military hostility may very well affect diplomatic relations as well. States manipulate diplomatic ties for symbolic reasons, including to express displeasure with another state (Kinne 2014). An active military engagement with another country might also threaten the physical security of diplomats stationed there, increasing the imperative to recall one's diplomatic staff. Scholars must take care to isolate the effect of diplomatic relations on military hostility from any reverse effects.

In social settings in which actual experimental manipulation is infeasible, the now-standard approach to causal identification is to find an exogenous source of variation in the variable of interest, such as an instrumental variable (Angrist and Pischke 2009). The quasi-experimental approach has been a major source of empirical progress in the social sciences (Angrist and Pischke 2010), but like any methodology it has limitations—which are particularly clear in the study of diplomacy and conflict. Decisions about diplomatic representation and the initiation or escalation of conflict are made at high political levels, leaving little room for observable sources of truly exogenous variation. In addition, changes in diplomatic status and the escalation of conflict are both rare events, as Tables 2 and 3 below show. In combination, these mean that valid instruments would be hard to find and, even if found, would likely be too weak to support precise causal inferences.

Consequently, I eschew the quasi-experimental approach in favor of model-based inference.[4] I develop a behavioral model that accounts for the main threat to causal inference—in this case, the effect of expectations about future hostility on present diplomatic decisions—and use this model for estimation. Specifically, by modeling the US as an expected utility maximizer in a Markovian dynamic decision problem (Rust 1987), I am able to separately identify the effect of diplomatic relations on dispute escalation and the reverse effect.

Of course, the model-based approach to inference has its own drawbacks. Inferences about the causal relationship between diplomatic relations and interstate disputes will depend critically on assumptions about the shape of the decision-making process. Insofar as the true data-generating

[4]For a defense of structural approaches to causal inference, see Heckman (2005).

process differs from the statistical model, the parameter estimates will tell an inaccurate story, even when the sample size is large. If there were a well-established collection of robust, nonparametrically identified estimates of how diplomacy affects conflict, the marginal value of a model-dependent analysis might be low. Given that such a body of evidence does not (yet) exist, the analysis here, however imperfect, represents a meaningful improvement on the state of the art.

The use of structural models to solve tricky inferential problems has precedents in the international conflict literature, though this is the first such paper to focus on formal diplomatic relations specifically. In the first application of structural econometrics to international conflict, Signorino (1999) demonstrates how off-the-shelf statistical models might be biased in the presence of strategic interdependency. Structural models have been particularly popular in the study of signaling and other forms of coercive diplomacy in crisis bargaining (Lewis and Schultz 2003; McLean and Whang 2010; Kurizaki and Whang 2015). The work closest to this paper is that of Crisman-Cox and Gibilisco (2017), who use a similar model of dispute escalation as an infinite-horizon dynamic optimization problem in order to estimate audience costs (see Fearon 1994). I build on their work by also modeling choices about the establishment and maintenance of formal diplomatic ties, albeit in the context of a single-player decision problem that is simpler than the dynamic game they estimate.

2 Formal and Statistical Model

I model the United States' choice of diplomatic relations and conflict behavior with each other country in the international system as a stochastic dynamic programming problem.[5] Across numerous points in time, the US decides whether to make or break diplomatic relations and whether to initiate, escalate, or de-escalate conflict with the other country. The key assumption is that the US rationally accounts for the effects of each choice on its own future welfare when making a decision. For example, if breaking diplomatic relations today increases the chances of conflict

[5]For an introduction to dynamic programming, see Stokey, Lucas and Prescott (1989).

escalating tomorrow, that will enter the US's decision calculus.

The US takes diplomatic and military actions toward each of a set of other countries, denoted $m = 1, \ldots, M$. For each country, we observe a vector $x^m \in \mathbb{R}^K$ of covariates that affect the US's payoffs from the relationship with m. The interaction with each country m takes place across an infinite sequence of discrete time periods, $t = 0, 1, \ldots, \infty$, which we observe up to $t = T_m$.[6] The US discounts the future at a fixed rate $\delta \in (0, 1)$. In the estimation of the model, I fix $\delta = 0.95$.

At the beginning of each time period, the current status of the relationship is characterized by an observable *state* variable S_t^m. The state variable records, for each period, whether the US has a permanent diplomatic mission in m and the level of military hostility between the US and m. The diplomatic component is denoted $R_t^m \in \{0, 1\}$, where 1 represents a diplomatic presence and 0 represents none. The military hostility component is denoted $H_t^m \in \{0, 1, 2\}$, corresponding to peace, crisis, and war, respectively. The *state space* is the set of all (six) possible states, $\mathcal{S} = \{0, 1\} \times \{0, 1, 2\}$, so that each $S_t^m = (R_t^m, H_t^m) \in \mathcal{S}$. The *initial state* $S_0^m = (R_0^m, H_0^m)$ is exogenous, while all future states $\{S_t^m\}_{t=1}^{\infty}$ are endogenous to the choices the US makes.

In each period, the US makes a pair of decisions about diplomatic relations and military escalation, both of which are observed by the analyst. Let $a_t^m = (r_t^m, h_t^m)$ denote the US's actions toward m at time t, where r_t^m denotes diplomatic relations and h_t^m denotes the hostility level. These actions correspond to the respective states, so $r_t^m \in \{0, 1\}$ (no relations, no relations) and $h_t^m \in \{0, 1, 2\}$ (peace, crisis, war). Let $\mathcal{A} = \{0, 1\} \times \{0, 1, 2\}$ denote the action space, and for each $(R, H) \in \mathcal{S}$ let $\mathcal{A}(R, H) \subseteq \mathcal{A}$ denote the actions available to the US in state (R, H). The US is never constrained in its choice about diplomatic relations, r_t^m. However, in line with the observed data (see Table 2 below), I assume the US cannot escalate directly from peace to war:

$$\mathcal{A}(R, H) = \begin{cases} \{(0,0), (0,1), (1,0), (1,1)\} & H = 0, \\ \{(0,0), (0,1), (0,2), (1,0), (1,1), (1,2)\} & H > 0. \end{cases}$$

[6] Because countries enter and leave the international system at different times, the value of t is not comparable across time series.

After making its decisions in each period, the US receives an immediate payoff that depends on the current state and its own actions. The payoffs are characterized by a parameter vector $\theta \in \mathbb{R}^L$; the goal of the empirical analysis is to estimate θ. The immediate, or static, payoff from choosing $a_t^m = (r_t^m, h_t^m)$ in state $S_t^m = (R_t^m, H_t^m)$ consists of four additively separable components:

1. $\sigma_R(R_t^m \mid x^m, \theta)$: Baseline utility from being in diplomatic state R_t^m.
2. $\sigma_H(H_t^m \mid x^m, \theta)$: Baseline utility from being in hostility state H_t^m.
3. $\alpha_r(r_t^m \mid S_t^m, \theta)$: State-dependent utility from taking diplomatic action r_t^m.
4. $\alpha_h(h_t^m \mid S_t^m, \theta)$: State-dependent utility from taking hostility action h_t^m.

Therefore, the US's *static utility* function is

$$u(S_t^m, a_t^m \mid x^m, \theta) = \underbrace{\sigma_R(R_t^m \mid x^m, \theta) + \sigma_H(H_t^m \mid x^m, \theta)}_{\text{state-specific}} + \underbrace{\alpha_r(r_t^m \mid S_t^m, \theta) + \alpha_h(h_t^m \mid S_t^m, \theta)}_{\text{action-specific}}. \tag{1}$$

The division of the static utility into these components entails some implicit restrictions on the nature of the payoffs, which I make in order to simplify the estimation process and the interpretation of the results. The first is that the covariates affect only the payoffs from being in a particular state, not the action-specific payoffs. The second is that the payoff to the diplomatic (hostility) action may depend on the hostility (diplomatic) state, but not the hostility (diplomatic) action. Finally, though it is not explicit in (1), I assume each component function is linear in θ. Identification then follows from the usual full-rank condition.

In each period, the US receives a random shock to its static payoff for each action. Let $\epsilon_t^m(a) \in \mathbb{R}$ denote the shock to action a at time t in the relationship with country m. These shocks represent unobservable (to the analyst) influences on the US's behavior that vary over time. I assume that each $\epsilon_t^m(a)$ is independent and identically distributed across actions, time, and countries and that the US does not observe the value of $\epsilon_t^m(a)$ until period t. Moreover, following standard practice for this kind of model (Rust 1987, 1988), I assume the shocks follow a type 1 extreme value distribution. The inclusion of stochastic shocks like these is a standard way to enable structural estimation of an otherwise deterministic model (Rust 1987; Signorino 1999).

Besides yielding these immediate payoffs, the US's actions at time t also help determine the state variable at time $t+1$. For each pair of states $S, S' \in \mathcal{S}$ and action $a \in \mathcal{A}(S)$, let $\pi(S' \mid S, a)$ denote the probability of transitioning to S' when the US chooses a in S. Transitions are Markovian, in that the distribution of states at $t+1$ directly depends only on the state and action at t. I assume that the US's relations action always "succeeds"; i.e., $R_{t+1} = r_t$ with probability one. However, due to actions by m (which is not modeled as a strategic actor here), the US may end up in a higher or lower state of military hostility than what it chooses. In the empirical analysis, I fix the probability of each hostility transition to equal the observed distribution.[7] In the majority of cases, this means $H_{t+1} = h_t$ with probability very close to one. For the full transition function, see the Appendix.

The US's objective each period is to choose the action that maximizes its present discounted utility, accounting for both the choice's immediate payoff and its effect on future payoffs via the state transition. Formally, each period it faces the problem

$$\max_{a \in \mathcal{A}(S_t^m)} \{u(S_t^m, a \mid x^m, \theta) + \epsilon_t^m(a) + \delta EV(S_t^m, a \mid x^m, \theta), \} \tag{2}$$

where $EV(S, a \mid x^m, \theta)$ denotes the US's expected future payoff following a choice of a in state S. Under the assumption that the action-specific payoff shocks have a type 1 extreme value distribution, the US's decision rule is optimal if and only if $EV(\cdot, \cdot \mid x^m, \theta)$ is the unique solution to the functional equation

$$EV(S, a \mid x^m, \theta) = \sum_{S' \in \mathcal{S}} \log \left[\sum_{a' \in \mathcal{A}(S')} \exp\left(u(S', a' \mid x^m, \theta) + \delta EV(S', a' \mid x^m, \theta)\right) \right] \pi(S' \mid S, a) \tag{3}$$

(Rust 1987). In addition, the conditional probability of the US choosing a in state S, which I denote by $P(a \mid S, x^m, \theta)$, takes the form of a multinomial logit:

$$P(a \mid S, x^m, \theta) = \frac{\exp\left(u(S, a \mid x^m, \theta) + \delta EV(S, a \mid x^m, \theta)\right)}{\sum_{a' \in \mathcal{A}(S)} \exp\left(u(S, a' \mid x^m, \theta) + \delta EV(S, a' \mid x^m, \theta)\right)}. \tag{4}$$

[7] In principle, the transition function could be estimated as well, namely by parameterizing it as a function of covariates. In the present application, because of the sparsity of data in the highest-hostility state, a fixed transition function is more appropriate.

Therefore, for a fixed set of covariates and parameters, we can characterize optimal dynamic decision-making by the US and solve for the conditional choice probabilities in (4) by solving the fixed-point problem of (3).

I take a maximum likelihood approach to the estimation of θ. Given observed sequences of states $\mathbf{S} = (S_t^m)_{m=1,\ldots,M;t=0,\ldots,T_m}$, actions $\mathbf{a} = (a_t^m)_{m=1,\ldots,M;t=0,\ldots,T_m}$, and covariates $\mathbf{x} = (x^m)_{m=1,\ldots,M}$, the likelihood of the parameter vector θ is[8]

$$\ell(\theta \mid \mathbf{S}, \mathbf{a}, \mathbf{x}) = \prod_{m=1}^{M} \prod_{t=0}^{T_m} P(a_t^m \mid S_t^m, x^m, \theta). \tag{5}$$

The main difficulty in the maximization of the corresponding log-likelihood function is the evaluation of the conditional choice probabilities. To calculate the maximum likelihood estimate, I apply the nested fixed point algorithm introduced by Rust (1987). At each candidate value of θ, for each country m, I calculate the continuation values $EV(\cdot, \cdot \mid x^m, \theta)$ that correspond to optimal behavior toward m by solving for the unique fixed point of (3). I then plug these values into (4) to calculate the conditional choice probabilities and thereby the log-likelihood of θ. To calculate derivatives of the log-likelihood function, I use the formulas provided by Rust (1988).

It is worth remarking on the main difference between the model here and most existing formal models of international conflict—namely, that the US is the only strategic decision-maker. This simplifying assumption is motivated by practical concerns. The first is data availability: to my knowledge, no existing dataset covers the dates of worldwide diplomatic transitions at a level granular enough for the structural analysis. As I detail in the next section, I was able to collect granular data for US embassy presence abroad from State Department records, but these sources do not systematically detail foreign diplomatic presence in the US.

The second motivation for the simplification to a single-player optimization problem is computational. Dynamic games typically admit multiple equilibria, creating indeterminacies in the likelihood function and associated computational problems.[9] By contrast, the single-player dynamic

[8] I drop the state transition probabilities $\pi(S_t^m \mid S_{t-1}^m, a_{t-1}^m)$ from the likelihood function since they do not depend on θ.

[9] See Aguirregabiria and Mira (2007), Pesendorfer and Schmidt-Dengler (2008), and Su and Judd (2012) for ap-

programming problem analyzed here always has a unique solution (Rust 1988, Theorem 3.3).

3 Data and Specification

The unit of observation is the country–month. The data contain each country in the international system between January 1816 and November 2007, according to the Correlates of War State System Membership data, v2016 (Correlates of War Project 2017), comprising 214 countries besides the United States. Countries that leave and re-enter the international system within the time frame are treated as separate countries for purposes of analysis,[10] resulting in $M = 240$ time series. The panel is unbalanced, with just eight countries appearing in the international system for all 2,303 possible months.[11] In total, there are 166,316 country–month observations.

3.1 States and Actions

Diplomatic representation. To code the status of US diplomatic representation in each country–month, I collect comprehensive data from the records of the Office of the Historian of the US State Department (United States Department of State 2018). For each country with which the US has ever had formal diplomatic contact, the Office of the Historian has a digital page recording the dates of recognition, the opening of diplomatic relations, and the establishment or closure of permanent missions like consulates, legations, and embassies. These documents are not quite well structured enough for machine coding to be reliable, so my research assistants and I hand-code the date and nature of each change in status with each country. For details on the mapping between the State Department identifiers and the Correlates of War country codes, see the Appendix.

I dichotomize the diplomatic relations variable by coding relations as present, or $R_t^m = 1$, whenever the US has an embassy or legation open in the country's capital, or when the head of

proaches to the estimation of dynamic games. For an application to the estimation of audience costs, see Crisman-Cox and Gibilisco (2017).

[10]For example, Estonia leaves the international system in June 1940 and re-enters in September 1991. Without separating Estonia into two time series, I would have to treat the transition between these months like any normal month-to-month transition.

[11]These are Italy, Portugal, Russia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

another American embassy or legation has been designated to represent the US with m. Otherwise, $R_t^m = 0$. When the status changes during a particular month, for example due to an embassy closure, the minimal value is used. Consulates and interests sections, which handle commercial matters and the concerns of US nationals traveling abroad (Berridge 2010), do not allow for direct discussion of sensitive political matters and thus are not coded as diplomatic relations for the purposes of this analysis. Diplomatic relations are coded as present in about 86% of the country–months in the data. The US has diplomatic relations for at least one month with 225, or 94%, of the 240 countries in the data. For additional details on the coding of diplomatic status, see the Appendix.

The coding of relations actions r_t^m follows immediately from that of relations states R_t^m. In particular, each $r_t^m = R_{t+1}^m$.

Military hostility. To code times at which the US is at war with a country, I use the Correlates of War dataset of Interstate Wars, v4.0 (Sarkees and Wayman 2010). I code $H_t^m = 2$ for any month t in which the US and country m are participants on different sides of the same war, even if for only part of the month. Only 0.3% of country–months are coded as wars; the US has at least one month of war with 17, or 7%, of the countries in the data.

I code the US as being in a crisis with another country if there is an ongoing militarized dispute between them but no war. I use the set of Militarized Interstate Disputes (MIDs) and the dates of involvement compiled by Gibler, Miller and Little (2016), v2.02. I code $H_t^m = 1$ for any month t in which the US is involved in a MID with m, including for only part of the month, and is not involved in a war with m. Crises comprise 1.1% of country–months, and the US is involved in at least one crisis with 61, or 25%, of the countries in the sample. For the remaining country-months, in which there is neither crisis nor war, I code $H_t^m = 0$.

I determine hostility actions h_t^m according to the presence of ongoing hostilities, as well as the initiators and victors of those hostilities. To summarize, the US is coded as escalating ($h_t^m > H_t^m$) when it is listed as an initiator of a higher level of hostility that begins the next month. It is listed as de-escalating ($h_t^m < H_t^m$) when it is listed as non-victorious in a crisis or war that ceases the

next month. Otherwise, the US's action is assumed to continue the status quo ($h_t^m = H_t^m$). The Appendix lists the coding rules in full detail.

3.2 State-Specific Payoffs

Recall that the immediate payoff to being in relations state R_t^m with country m is given by the function $\sigma_R(R_t^m \mid x^m, \theta)$, where x^m is a set of country-level covariates and θ is the set of parameters we wish to estimate. Similarly, $\sigma_H(H_t^m \mid x^m, \theta)$ gives the payoff for being in hostility state H_t^m. I assume each of these payoffs is a linear function of the parameters θ and the covariates x^m. In order to ensure that the statistical model is identified (see Lewis and Schultz 2003), I impose the normalizations $\sigma_R(0 \mid x^m, \theta) = 0$ and $\sigma_H(0 \mid x^m, \theta) = 0$. The estimated relations payoff function $\sigma_R(1 \mid \cdot)$ therefore represents the incremental utility to having relations as opposed to not. Similarly, the hostility payoff functions $\sigma_H(1 \mid \cdot)$ and $\sigma_H(2 \mid \cdot)$ represent the difference in payoffs between the given state and peace.

I include the same set of covariates (with one exception) in each of the three estimated state-specific payoff equations. These covariates represent potential sources of confounding variation—factors that prior studies have identified as determinants of both diplomatic ties and military hostility. However, in a departure from usual practice in empirical conflict research, each covariate in x^m must be time-invariant. In terms of the underlying formal model, any time-varying covariate would have to be considered part of the state space, exponentially increasing the computational burden of estimating the model. Therefore, I follow Crisman-Cox and Gibilisco (2017) in calculating the fixed characteristics x^m from averages or similar summaries of time-varying state characteristics. Table 1 provides descriptive statistics for each covariate.

Distance. Naturally, states are disproportionately likely to interact—positively and negatively—with their neighbors and other nearby states. Diplomatic networks are relatively dense within geographical regions (Russett and Curtis Lamb 1969), and the probability of a bilateral diplomatic tie decreases with the distance between states (Neumayer 2008; Kinne 2014). However, wars are

Variable	Units	Min	Max	Mean	SD
Distance	logged miles plus one	0.00	9.15	8.39	0.89
Major Power	binary	0.00	1.00	0.05	0.21
Alignment	correlation	−0.50	0.88	0.23	0.28
Capabilities	logged ratio	−13.23	0.69	−5.30	2.60
Has Polity	binary	0.00	1.00	0.85	0.35
Polity	Polity IV index	−10.00	10.00	−0.62	5.96

Table 1. Descriptive statistics for each covariate.

also much more likely between proximate states than between distant ones (Bremer 1992).

To adjust for the effects of distance on both diplomatic relations and military hostility, I include a distance variable in the specification. I use the capital-to-capital distance between the US and country *m* in miles, as calculated by the NewGene software, v1.0.1 (Bennett, Poast and Stam 2017). For states that share a land border with the US, namely Canada and Mexico, the distance is coded as zero. For cases in which the distance changes due to the capital moving, I use the minimum distance across the sample period. The *Distance* variable in the analysis is the natural logarithm of this distance (plus one to account for the contiguous countries).

Major Power and Capabilities. Whereas minor powers tend to interact mainly within regional networks, major powers have a global reach. Diplomatic ties are disproportionately likely between major powers (Russett and Curtis Lamb 1969; Kinne 2014), as are wars (Bremer 1992). I code major power status according to the Correlates of War designation (Correlates of War Project 2017). *Major Power* is an indicator for whether *m* is ever a major power during the sample period.[12] From most of the sample period (1898 onward), the US itself is a major power.

I also include a continuous measure of *m*'s military power using the Composite Index of National Capabilities (CINC) scores from the Correlates of War National Material Capabilities data, v5.0 (Singer, Bremer and Stuckey 1972). For each year in the sample, I calculate the ratio of *m*'s CINC score to that of the US. The variable *Capabilities* is the natural logarithm of the average annual ratio of CINC scores.

[12]The major powers are Austria, China, France, Germany, Italy, Japan, Russia, and the United Kingdom.

Alignment. Whereas geographical proximity and major power status are thought to increase states' propensity for both diplomatic contact and militarized conflict, ideological affinity should have opposite effects. Prior empirical work yields mixed results on the effects of shared interests on bilateral diplomatic ties, with Neumayer (2008) finding a positive effect and Kinne (2014) obtaining a null result. I use the standard measure of ideological affinity, namely alliance portfolio similarity. For each year in the sample, I calculate the S-score (Signorino and Ritter 1999) between the alliance membership portfolios of the US and m. Alliance ties are taken from the Correlates of War Formal Alliances data, v4.1 (Gibler 2009) and are weighted by each alliance partner's CINC score. The variable *Alignment* is the average annual S-score.

Polity. One of the clearest stylized facts in the study of international conflict is that disputes and wars are disproportionately unlikely between democracies (Oneal and Russett 2001). Democracies also tend to exchange diplomats with each other at a greater rate than other pairs of countries (Kinne 2014). I measure regime type via the standard "polity2" index from the Polity IV project, v2016 (Marshall, Gurr and Jaggers 2017). The variable *Polity* is m's average annual score on this index for years in which it is available. The variable *Has Polity* is an indicator for whether m ever receives a Polity score, as the project does not track states with a population below 500,000. I include *Has Polity* and its interaction with *Polity* in the equation for $\sigma_R(1 \mid \cdot)$, the payoff to the US for having diplomatic relations. Because of the rarity of conflict between the US and states below the Polity IV project's population threshold, I drop the *Has Polity* indicator from the equations for hostility payoffs so as to avoid collinearity-induced identification problems.

3.3 Action-Specific Payoffs

Recall that the immediate payoff to taking diplomatic action r_t^m with country m in state S_t^m is given by the function $\alpha_r(r_t^m \mid S_t^m, \theta)$. The immediate payoffs to hostility actions are similarly denoted $\alpha_h(h_t^m \mid S_t^m, \theta)$. As with the state-specific payoffs, a normalization is necessary to ensure identification. I normalize the immediate payoff from maintaining the current status of diplomatic relations,

$r_t^m = R_t^m$, to zero. Similarly, I normalize the immediate payoff from $h_t^m = H_t^m$ to zero. Estimates of other payoffs therefore reflect the value of those actions relative to keeping the status quo.

In the equation for the relations action, I estimate the baseline values of establishing new relations ($r_t^m = 1$ when $R_t^m = 0$) and of cutting off existing relations ($r_t^m = 0$ when $R_t^m = 1$). I interact each of these baseline terms with an indicator for whether there is currently a crisis or war between the US and m, i.e., $H_t^m > 1$. The baseline coefficients therefore represent the peacetime values of establishing and cutting off relations; the interaction terms represent how these change in times of crisis. If the coefficients on these interactions are statistically discernible from zero, we may infer that military hostility affects the US's choice of diplomatic ties.

The specification for the hostility actions is analogous. I estimate baseline payoffs for each hostility action that does not match the current state:

- Crisis initiation: $h_t^m = 1$ when $H_t^m = 0$
- Crisis de-escalation: $h_t^m = 0$ when $H_t^m = 1$
- Crisis escalation: $h_t^m = 2$ when $H_t^m = 1$
- War de-escalation to crisis: $h_t^m = 1$ when $H_t^m = 2$
- War de-escalation to peace: $h_t^m = 0$ when $H_t^m = 1$

For the first three of these—those that take place in a state of peace or crisis—I include an interaction with whether there are currently diplomatic relations between the US and m, i.e., $R_t^m = 1$. These interactions are the key to the causal analysis of the effects of diplomacy on conflict management. For example, a negative (and statistically significant) coefficient on the interaction between the first of these terms and the presence of diplomatic relations indicates that diplomatic ties decrease the US's propensity to initiate a crisis. Because there are so few country–months with an ongoing war and diplomatic relations present (see Table 2 below), I do not estimate the effects of diplomatic relations on wartime hostility decisions.

4 Results

In this section, I present the results of the empirical analysis. I find robust support for the existence of a causal effect of diplomatic relations on conflict behavior. Diplomacy does indeed appear to matter for the maintenance of peace. The influence of formal diplomatic ties is strongest on the probability that the US chooses to de-escalate an ongoing crisis. Diplomatic relations also have a discernible but substantively small negative effect on the chance of the US initiating a crisis, but no discernible effect on the chance of escalating a crisis into war.

I also find evidence of the reverse relationship—a causal effect of military hostility on the maintenance of diplomatic ties. Naturally, an ongoing dispute or war has a negative effect on the probability that the US establishes new relations and a positive effect on its chance of severing relations; these effects are roughly equal in magnitude. In sum, the answer to "Does diplomacy cause peace, or does peace cause diplomacy?" is yes.

4.1 Descriptive Analysis

Before presenting the structural estimation results, I briefly examine the raw data on the relationship between diplomatic ties and military hostility. The raw patterns are broadly consistent with what I find in the full analysis.

R_t	H_t	$h_t = 0$	$h_t = 1$	$h_t = 2$
0	0	21948 (99.7%)	57 (0.3%)	0 (0.0%)
1	0	141795 (99.9%)	99 (0.1%)	0 (0.0%)
0	1	85 (8.7%)	884 (90.8%)	5 (0.5%)
1	1	163 (17.9%)	745 (81.9%)	2 (0.2%)
0	2	3 (0.6%)	2 (0.4%)	489 (99.0%)
1	2	0 (0.0%)	0 (0.0%)	39 (100.0%)

Table 2. Cross-tabulation of hostility actions by current state, with row percentages in parentheses.

I begin by examining the US's choice of hostility action as a function of the current state, as tabulated in Table 2. Unsurprisingly, in the vast majority of cases the US chooses to maintain the prevailing level of hostility. In peacetime, having diplomatic relations is associated with a

small (0.2%) decrease in the chance of the US initiating a crisis. The apparent pacific effect of diplomatic relations is much stronger for the de-escalation of crises. The US is about 9% more likely to back down from a crisis with a diplomatic partner than from one with a state with which it lacks diplomatic relations. On the other hand, the difference in the chance of escalating a crisis to war is just 0.3%. Even that number should be taken with caution, given the small number of cases involved.

R_t	H_t	$r_t = 0$	$r_t = 1$
0	0	21828 (99.20%)	177 (0.80%)
0	1	972 (99.79%)	2 (0.21%)
0	2	494 (100.00%)	0 (0.00%)
1	0	49 (0.03%)	141845 (99.97%)
1	1	12 (1.32%)	898 (98.68%)
1	2	2 (5.13%)	37 (94.87%)

Table 3. Cross-tabulation of diplomatic actions by current state, with row percentages in parentheses.

The raw data also provide suggestive evidence that current hostility affects US decisions on diplomatic ties. Table 3 presents relations decisions as a function of the current state. Once again, maintenance of the status quo is the most likely outcome. The establishment of new relations is improbable even in peacetime, but slightly more so in times of crisis. New relations are never established during wars. Military hostility appears to have a stronger relationship with the severance of diplomatic ties. Whereas the US almost never cuts off diplomatic relations in peacetime, it severs relations in about 1% of crisis months and 5% of war months.

4.2 Structural Estimation Results

I estimate four specifications of the model. A baseline specification simply includes a scalar payoff for each state. The next two specifications separately add covariates to the state-specific payoff functions and introduce action-specific payoffs. The full specification combines these. All results are listed in Table 4. Because the covariates only vary at the country level, I estimate clustered standard errors via leave-one-country-out jackknife (Lipsitz and Parzen 1996). As the patterns of

signs and statistical significance are broadly similar across specifications, I focus on the full model in the subsequent analysis.

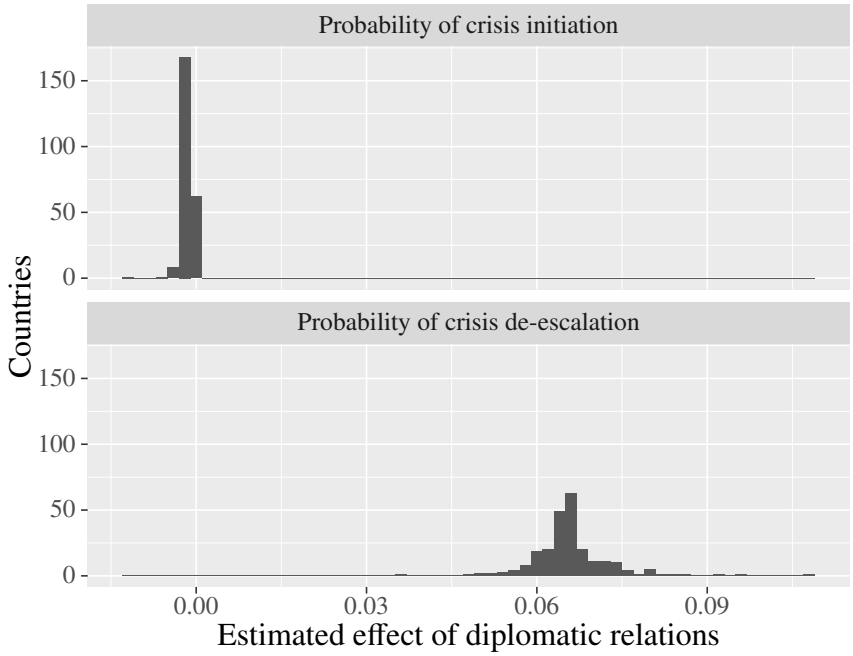
A consistent pattern in the results is that changing the status quo is costly in the short run. The baseline coefficient for each change in relations or hostility is negative and statistically significant. The most costly transition is the escalation of a crisis into war. However, perhaps surprisingly, the short-term costs to the establishment of new diplomatic relations or the severance of existing relations are almost as high. According to these results, the US would choose to alter the diplomatic or military status quo only because of a beneficial long-run effect on its state payoffs or because the short-term idiosyncratic benefit to doing so, $\epsilon_t^m(a)$, is unusually high.

For determining the causal effects of diplomatic ties on military hostility (and vice versa), the key terms are the interactions in the action payoff equations, listed in the bottom half of Table 4. These terms represent how the current state of relations (hostility) affects the payoff from taking a particular hostility (relations) action. To aid interpretation, I convert the interactive specification results into the level of payoff to each action as a function of the state in Table 5. Other than the effect of diplomatic relations on the payoff from escalating a crisis to war—which is difficult to estimate precisely given how few American war initiations we observe—each of these terms is statistically significant and in the natural direction. Diplomatic ties decrease the payoff to initiating a crisis and increase the payoff to backing down from a crisis. At the same time, an active crisis or war decreases the payoff to establishing new diplomatic relations and increases the payoff to cutting off existing diplomatic ties.

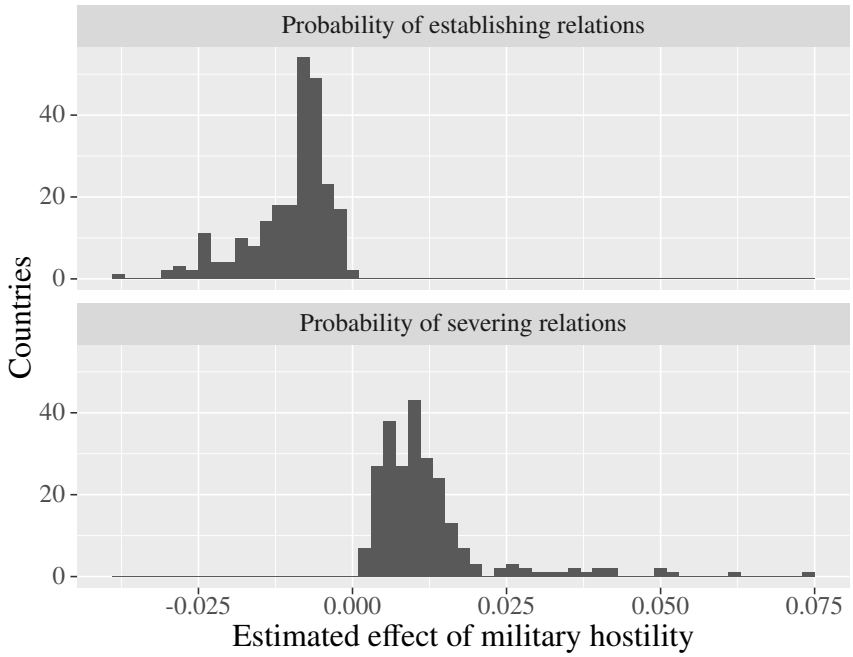
How do these differences in payoffs translate into differences in the distribution of actions by the US? Since the payoff to being in any given diplomatic or hostility state with m depends on country-specific covariates, the distribution of expected future benefits from each action differs from country to country. Therefore, even though the difference in action-specific payoffs is the same for each m, the effect of this difference on the US's action may vary slightly from country to country. 1 shows the variation across countries in the estimated effect of current relations (hostility) on the US's choice of hostility (relations).

	Baseline	Covariates	Actions	All
State payoff: Relations				
$\sigma_R(1)$: Intercept	**1.91 (0.15)**	1.83 (2.69)	**0.09 (0.01)**	0.13 (0.09)
$\sigma_R(1)$: Distance		−0.31 (0.27)		−0.01 (0.01)
$\sigma_R(1)$: Major Power		1.18 (0.72)		0.03 (0.03)
$\sigma_R(1)$: Alignment		−0.84 (0.66)		**−0.07 (0.02)**
$\sigma_R(1)$: Capabilities		**−0.24 (0.09)**		**−0.01 (0.00)**
$\sigma_R(1)$: Has Polity		**2.52 (0.59)**		**0.05 (0.02)**
$\sigma_R(1)$: Has Polity × Polity		**0.21 (0.05)**		**0.01 (0.00)**
State payoff: Hostility				
$\sigma_H(1)$: Intercept	**−5.06 (0.33)**	−1.05 (2.20)	−0.07 (0.04)	0.20 (0.15)
$\sigma_H(1)$: Distance		−0.36 (0.20)		**−0.04 (0.01)**
$\sigma_H(1)$: Major Power		−0.08 (1.35)		0.04 (0.11)
$\sigma_H(1)$: Alignment		−2.30 (1.69)		−0.15 (0.13)
$\sigma_H(1)$: Capabilities		0.33 (0.23)		0.01 (0.02)
$\sigma_H(1)$: Has Polity × Polity		**−0.18 (0.05)**		**−0.01 (0.00)**
$\sigma_H(2)$: Intercept	**−1.74 (0.32)**	−2.38 (7.12)	**0.16 (0.03)**	0.50 (0.29)
$\sigma_H(2)$: Distance		0.14 (0.82)		−0.02 (0.03)
$\sigma_H(2)$: Major Power		−0.02 (1.28)		−0.09 (0.11)
$\sigma_H(2)$: Alignment		−0.33 (1.13)		−0.02 (0.10)
$\sigma_H(2)$: Capabilities		0.07 (0.22)		0.04 (0.03)
$\sigma_H(2)$: Has Polity × Polity		0.06 (0.07)		0.01 (0.00)
Action payoff: Relations				
$\alpha_r(0)$: $R_t^m = 1$			**−6.40 (0.11)**	**−6.33 (0.11)**
$\alpha_r(0)$: $R_t^m = 1$ and $H_t^m > 0$			**4.50 (0.33)**	**4.33 (0.38)**
$\alpha_r(1)$: $R_t^m = 0$			**−6.40 (0.11)**	**−6.33 (0.11)**
$\alpha_r(1)$: $R_t^m = 0$ and $H_t^m > 0$			**−2.62 (1.10)**	**−2.40 (1.03)**
Action payoff: Hostility				
$\alpha_h(0)$: $H_t^m = 1$			**−1.77 (0.23)**	**−1.63 (0.23)**
$\alpha_h(0)$: $H_t^m = 1$ and $R_t^m = 1$			**1.77 (0.55)**	**1.59 (0.57)**
$\alpha_h(0)$: $H_t^m = 2$			**−3.13 (0.51)**	**−3.08 (0.50)**
$\alpha_h(1)$: $H_t^m = 0$			**−6.50 (0.23)**	**−6.26 (0.26)**
$\alpha_h(1)$: $H_t^m = 0$ and $R_t^m = 1$			**−2.48 (0.53)**	**−2.35 (0.45)**
$\alpha_h(1)$: $H_t^m = 2$			**−3.84 (0.68)**	**−3.81 (0.67)**
$\alpha_h(2)$: $H_t^m = 1$			**−6.65 (0.44)**	**−6.55 (0.46)**
$\alpha_h(2)$: $H_t^m = 1$ and $R_t^m = 1$			−0.22 (1.28)	−1.14 (1.58)
Log-likelihood	−78585	−67241	−3572	−3468
Observations	166,316	166,316	166,316	166,316
Clusters	240	240	240	240

Table 4. Estimation results for each model specification. Standard errors estimated via cluster jackknife are in parentheses. Estimates in boldface are statistically significant at the 0.05 level.



(a) Difference between $R_t^m = 1$ and $R_t^m = 0$.



(b) Difference between $H_t^m > 0$ and $H_t^m = 0$.

Figure 1. Distribution across countries of estimated effects of the current state on the US's choice of action.

R_t^m	H_t^m	$\alpha_r(0)$	$\alpha_r(1)$
0	0	0.00	−6.33
0	1	0.00	−8.72
0	2	0.00	−8.72
1	0	−6.33	0.00
1	1	−2.00	0.00
1	2	−2.00	0.00

(a) Relations actions.

R_t^m	H_t^m	$\alpha_h(0)$	$\alpha_h(1)$	$\alpha_h(2)$
0	0	0.00	−6.26	
1	0	0.00	−8.60	
0	1	−1.63	0.00	−6.55
1	1	−0.04	0.00	−7.68
0	2	−3.08	−3.81	0.00
0	2	−3.08	−3.81	0.00

(b) Hostility actions.

Table 5. Estimated action-specific payoffs as a function of current state in the full model.

Diplomatic relations have a discernible but small effect on the probability that the US will initiate a crisis with a country with which it is currently at peace. In any given month, the US is on average 0.2% less likely to initiate a crisis with a diplomatic partner than with a non-partner. The truly notable effect of diplomatic relations is on the probability that the US will back down from an ongoing crisis. In each month of an ongoing crisis, the probability that the US will choose to de-escalate is 6.6% greater if it has diplomatic relations with the other country in the dispute. With an effect of this size, we should expect crises with diplomatic partners to be significantly briefer than other crises. Diplomatic relations may thus indirectly reduce the long-run chances of war between the US and another country, even if the direct effect of relations on the immediate payoff to war is indistinguishable from zero.

At the same time, an ongoing dispute meaningfully threatens the stability of diplomatic ties. On average, the US is 1.2% more likely to sever diplomatic relations with a country during a crisis or war than during peacetime. The effect of active hostilities on the establishment of new diplomatic relations is about the same size, but in the opposite direction—a 1.0% reduction.

While my main interest is in the reciprocal effects of diplomatic relations and military hostility, it is worth briefly remarking on how the country-specific covariates affect the state payoffs. Each covariate besides *Major Power* has a statistically significant effect on the payoffs from diplomatic relations or crisis status.[13] In line with previous findings, the negative coefficient on *Distance* in

[13]None of the coefficients in the equation for the war state payoff are statistically discernible from zero. Once again, this likely reflects the scarcity of observations in this condition.

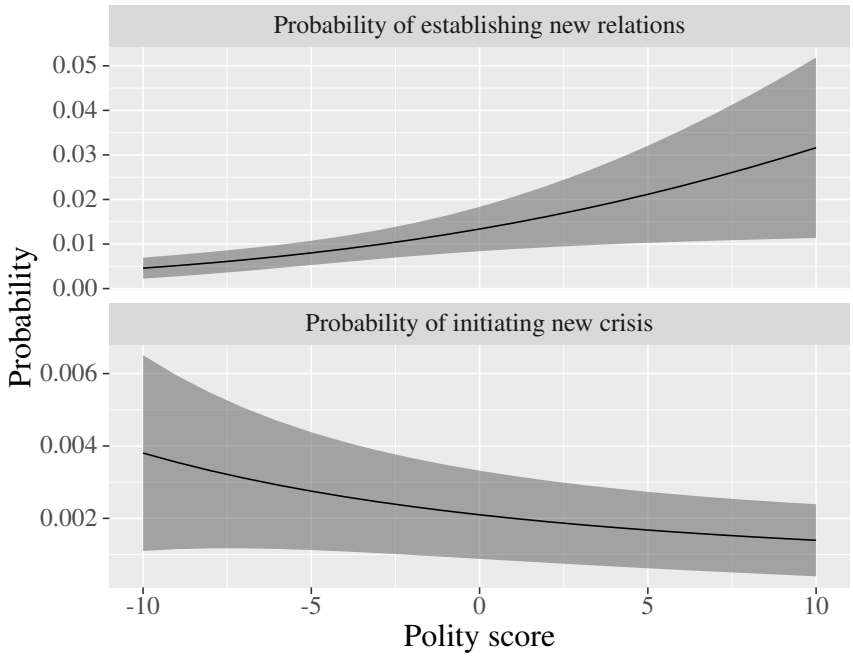


Figure 2. Estimated relationship between *Polity* and diplomatic and hostility actions, with 95% confidence intervals via jackknife-clustered standard errors.

the crisis payoff indicates that it is even worse for the US to be in a state of hostility with a distant state than with a proximate one. As a country's material *Capabilities* increase, the US's payoff from ongoing diplomatic relations with that country decrease. More surprisingly, *Alignment* also appears to reduce the payoff from ongoing relations.

Regime type, as measured by *Polity*, is the only covariate that significantly affects the US's payoffs to both diplomatic relations and crisis status. The effects go in predictable directions: the US benefits more from relations with democracies, and all else equal would prefer a crisis with an autocracy to one with a democracy. As the coefficients are not easily interpretable on their own, Figure 2 plots average conditional choice probabilities for relations establishment and crisis initiation as a function of *Polity*.[14] The substantive magnitude of the effect appears to be strongest for diplomatic relations, with the US about 3% more likely to establish relations with a democracy than an autocracy in any given month.

[14]These predicted probabilities and their standard errors are calculated via the "observed value" method advocated by Hanmer and Kalkan (2013).

5 Conclusion

Do formal diplomatic relations affect international crisis management? Using newly collected data on American diplomatic representation abroad in conjunction with a novel structural estimation approach, this paper comes to the conclusion that diplomatic relations may indeed be an effective tool for the prevention and limiting international crises.

More broadly, the results of the analysis pose interesting questions for rationalist theories of diplomacy and crisis bargaining. Obviously, the headline findings challenge the idea that diplomatic "cheap talk" is ineffective (Fearon 1995) or raises the probability of war (Sartori 2002; Ramsay 2011). But even beyond that, international relations theorists would do well to develop more granular theories of how crises originate, why they persist, and what role communication plays at each stage. Theoretical models of diplomatic communication and conflict usually take a state of crisis as given. If our models do not explain why crises arise in the first place, we cannot explain—for example—why diplomatic relations have a much stronger effect on the de-escalation of crises than on their initiation.

There are also many remaining empirical questions. One limitation of studying only the American case is that the US has not been involved in many wars and has initiated even fewer of them. Consequently, the statistical analysis here suffers from a lack of precision in the estimates of parameters related to a state of war. An analysis with broader country coverage would help reduce these precision issues, in addition to greater overall external validity. Another important empirical problem is to identify the mechanisms through which the pacific effects of diplomacy operate, which have been black-boxed in the present analysis. For example, in order to better identify the circumstances in which diplomacy would be most effective at promoting peace, it would be useful to know whether the reduction in crisis duration can be traced to intelligence gathering by diplomatic personnel, actual persuasion via diplomatic discourse, or some other means.

References

Aguirregabiria, Victor and Pedro Mira. 2007. "Sequential Estimation of Dynamic Discrete Games." *Econometrica* 75(1):1–53.

Angrist, Joshua D. and Jörn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con out of Econometrics." *Journal of Economic Perspectives* 24(2):3–30.

Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton: Princeton University Press.

Bayer, Reşat. 2006. "Diplomatic Exchange Data set, v2006.1.".
URL: http://www.correlatesofwar.org/data-sets/diplomatic-exchange

Bennett, Scott D., Paul Poast and Allan C. Stam. 2017. "NewGene: A Conceptual Manual." SSRN working paper.
URL: http://dx.doi.org/10.2139/ssrn.2596297

Berridge, G. R. 2010. *Diplomacy: Theory and Practice*. 4 ed. New York: Palgrave Macmillan.

Bils, Peter and William Spaniel. 2017. "Policy Bargaining and Militarized Conflict." *Journal of Theoretical Politics* .

Bremer, Stuart A. 1992. "Dangerous Dyads: Conditions Affecting the Likelihood of Interstate War, 1816–1965." *Journal of Conflict Resolution* 36(2):309–341.

Correlates of War Project. 2017. "State System Membership List, v2016.".
URL: http://www.correlatesofwar.org/data-sets/state-system-membership

Crawford, Vincent P. and Joel Sobel. 1982. "Strategic Information Transmission." *Econometrica* pp. 1431–1451.

Crisman-Cox, Casey and Michael Gibilisco. 2017. "Audience Costs and the Dynamics of War and Peace." Forthcoming in *American Journal of Political Science*.
URL: http://michaelgibilisco.com/papers/IRMPEC22.pdf

Farrell, Joseph and Matthew Rabin. 1996. "Cheap Talk." *Journal of Economic Perspectives* 10(3):103–118.

Fearon, James D. 1994. "Domestic Political Audiences and the Escalation of International Disputes." *American Political Science Review* 88(3):577–592.

Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49(3):379–414.

Gibler, Douglas M. 2009. *International Military Alliances, 1648–2008*. Washington, D.C.: CQ Press.

Gibler, Douglas M., Steven V. Miller and Erin K. Little. 2016. "An Analysis of the Militarized Interstate Dispute (MID) Dataset, 1816–2001." *International Studies Quarterly* 60(4):719–730.

Goldsmith, Benjamin E. and Yusaku Horiuchi. 2009. "Spinning the Globe? U.S. Public Diplomacy and Foreign Public Opinion." *Journal of Politics* 71(3):863–875.

Hall, Todd and Keren Yarhi-Milo. 2012. "The Personal Touch: Leaders' Impressions, Costly Signaling, and Assessments of Sincerity in International Affairs." *International Studies Quarterly* 56(3):560–573.

Hanmer, Michael J. and Kerem Ozan Kalkan. 2013. "Behind the Curve: Clarifying the Best Approach to Calculating Predicted Probabilities and Marginal Effects from Limited Dependent Variable Models." *American Journal of Political Science* 57(1):263–277.

Heckman, James J. 2005. "The Scientific Model of Causality." *Sociological Methodology* 35(1):1–97.

Holmes, Marcus. 2013. "The Force of Face-to-Face Diplomacy: Mirror Neurons and the Problem of Intentions." *International Organization* 67(4):829–861.

Kinne, Brandon J. 2014. "Dependent Diplomacy: Signaling, Strategy, and Prestige in the Diplomatic Network." *International Studies Quarterly* 58(2):247–259.

Kurizaki, Shuhei and Taehee Whang. 2015. "Detecting Audience Costs in International Disputes." *International Organization* 69(4):949–980.

Lebovic, James H. and Elizabeth N. Saunders. 2016. "The Diplomatic Core: How the United States Employs High-Level Visits as a Scarce Resource." *International Studies Quarterly* 60(1):107–23.

Lewis, Jeffrey B. and Kenneth A. Schultz. 2003. "Revealing Preferences: Empirical Estimation of a Crisis Bargaining Game with Incomplete Information." *Political Analysis* 11(4):345–367.

Lindsey, David. 2017. "Diplomacy Through Agents." *International Studies Quarterly* 61(3):544–556.

Lipsitz, Stuart R. and Michael Parzen. 1996. "A Jackknife Estimator of Variance for Cox Regression for Correlated Survival Data." *Biometrics* pp. 291–298.

Marshall, Monty G., Ted Robert Gurr and Keith Jaggers. 2017. "Polity IV Project: Political Regime Characteristics and Transitions, 1800–2016.". Dataset users' manual.
URL: http://www.systemicpeace.org/inscrdata.html

McLean, Elena V. and Taehee Whang. 2010. "Friends or Foes? Major Trading Partners and the Success of Economic Sanctions." *International Studies Quarterly* 54(2):427–447.

McManus, Roseanne W. 2014. "Fighting Words: The Effectiveness of Statements of Resolve in International Conflict." *Journal of Peace Research* 51(6):726–740.

Neumayer, Eric. 2008. "Distance, Power and Ideology: Diplomatic Representation in a World of Nation-States." *Area* 40(2):228–236.

Oneal, John R. and Bruce Russett. 2001. *Triangulating Peace: Democracy, Interdependence, and International Organizations*. New York: Norton.

Pesendorfer, Martin and Philipp Schmidt-Dengler. 2008. "Asymptotic Least Squares Estimators for Dynamic Games." *Review of Economic Studies* 75(3):901–928.

Ramsay, Kristopher W. 2011. "Cheap Talk Diplomacy, Voluntary Negotiations, and Variable Bargaining Power." *International Studies Quarterly* 55(4):1003–1023.

Renshon, Jonathan. 2016. "Status Deficits and War." *International Organization* 70(3):513–550.

Russett, Bruce M. and W. Curtis Lamb. 1969. "Global Patterns of Diplomatic Exchange, 1963–64." *Journal of Peace Research* 6(1):37–54.

Rust, John. 1987. "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher." *Econometrica* pp. 999–1033.

Rust, John. 1988. "Maximum Likelihood Estimation of Discrete Control Processes." *SIAM Journal on Control and Optimization* 26(5):1006–1024.

Sarkees, Meredith Reid and Frank Wayman. 2010. *Resort to War: 1816–2007*. Washington, D.C.: CQ Press.

Sartori, Anne E. 2002. "The Might of the Pen: A Reputational Theory of Communication in International Disputes." *International Organization* 56(1):121–149.

Schelling, Thomas. 1966. *Arms and Influence*. New Haven: Yale University Press.

Signorino, Curtis S. 1999. "Strategic Interaction and the Statistical Analysis of International Conflict." *American Political Science Review* 93(2):279–297.

Signorino, Curtis S. and Jeffrey M. Ritter. 1999. "Tau-b or Not Tau-b: Measuring the Similarity of Foreign Policy Positions." *International Studies Quarterly* 43(1):115–144.

Singer, J. David, Stuart Bremer and John Stuckey. 1972. Capability Distribution, Uncertainty, and Major Power War, 1820–1965. In *Peace, War, and Numbers*, ed. Bruce Russett. Beverly Hills: Sage pp. 19–48.

Slantchev, Branislav L. 2011. *Military Threats: The Costs of Coercion and the Price of Peace*. Cambridge: Cambridge University Press.

Stokey, Nancy L., Robert E. Lucas, Jr. and Edward C. Prescott. 1989. *Recursive Methods in Economic Dynamics*. Cambridge: Harvard University Press.

Su, Che-Lin and Kenneth L Judd. 2012. "Constrained Optimization Approaches to Estimation of Structural Models." *Econometrica* 80(5):2213–2230.

Trager, Robert F. 2010. "Diplomatic Calculus in Anarchy: How Communication Matters." *American Political Science Review* 104(2):347–368.

Trager, Robert F. and Lynn Vavreck. 2011. "The Political Costs of Crisis Bargaining: Presidential Rhetoric and the Role of Party." *American Journal of Political Science* 55(3):526–545.

United States Department of State. 2015. "Quadrennial Diplomacy and Development Review: Enduring Leadership in a Dynamic World.".
URL: https://www.state.gov/documents/organization/267396.pdf

United States Department of State. 2016. "Congressional Budget Justification: Department of State, Foreign Operations, and Related Programs, Fiscal Year 2017.".
URL: https://www.state.gov/documents/organization/252179.pdf

United States Department of State. 2018. "Guide to Country Recognition and Relations.".
URL: https://history.state.gov/countries

United States Senate Committee on Armed Services. 2013. "Department of Defense Authorization of Appropriations for Fiscal Year 2014 and the Future Years Defense Program: US Central Command and US Special Operations Command.". Congressional hearing on 5 March 2013.
URL: https://www.armed-services.senate.gov/hearings/oversight-us-central-command-and-us-special-operations-command

A Supplemental Appendix

A.1 Transition Function

Recall that $\pi(S' \mid S, a)$ is the probability distribution over states S' after choosing action a in state S. As noted in the text, I fix $\pi((R', H') \mid (R, H), (r, h)) = 0$ whenever $R' \neq r$. Transition probabilities for the hostility actions are coded according to the empirical conditional probabilities, yielding the transition function

$$\pi((R', H') \mid (R, H), (r, h)) = \begin{cases} \dfrac{\sum_{m=1}^{M} \sum_{t=1}^{T_m} \mathbf{1}\{H_t^m = H', H_{t-1}^m = H, h_{t-1}^m = h\}}{\sum_{m=1}^{M} \sum_{t=1}^{T_m} \mathbf{1}\{H_{t-1}^m = H, h_{t-1}^m = h\}} & R' = r, \\ 0 & R' \neq r. \end{cases} \tag{6}$$

Table 6 gives the values calculated from (6).

A.2 Coding of Diplomatic Status

The raw data (available on request) codes transitions in the highest level of American diplomatic representation in each other country. The set of levels from least to greatest is as follows:

1. None
2. Interests section
3. Liaison office
4. Consulate (or nonresident consul general)
5. Legation (or nonresident envoy)
6. Embassy (or nonresident ambassador)

These are coded according to the *Guide to the United States' History of Recognition, Diplomatic, and Consular Relations, by Country, since 1776*. When this guide contains ambiguities in dates or status, I also consult the guide on *Principal Offices and Chiefs of Mission* for supplemental information.

An electronic version history of the source records is available at https://github.com/HistoryAtState/rdcr. The codings here are based on the records as of 16 May 2016 (commit hash beginning with `d70219`).

Some relevant coding rules and judgment calls are as follows:

- In the analysis in this paper, only the two greatest statuses (embassy and legation) are coded as diplomatic relations, $R_t^m = 1$. All lower statuses are coded as $R_t^m = 0$.
- Whenever the records note the specific date of an embassy, legation, or consulate general opening, that is used as the transition date. If a specific date is not provided, I use the date of presentation of credentials by the first chief of mission.
- "Missions" (e.g., to France and Prussia in the 1700s) are coded as legations.
- "Office of the U.S. Representative" (e.g., Marshall Islands) and "Diplomatic Agent" (e.g., Morocco) are coded as liaison offices.

S	a	$(0,0)$	$(0,1)$	$(0,2)$	$(1,0)$	$(1,1)$	$(1,2)$
$(0,0)$	$(0,0)$	0.999	0.001	2.4e-5			
$(0,0)$	$(0,1)$		0.974	0.026			
$(0,0)$	$(1,0)$				0.999	0.001	2.4e-5
$(0,0)$	$(1,1)$					0.974	0.026
$(0,1)$	$(0,0)$	0.992	0.008				
$(0,1)$	$(0,1)$	0.022	0.975	0.004			
$(0,1)$	$(0,2)$			1.000			
$(0,1)$	$(1,0)$				0.992	0.008	
$(0,1)$	$(1,1)$				0.022	0.975	0.004
$(0,1)$	$(1,2)$						1.000
$(0,2)$	$(0,0)$	1.000					
$(0,2)$	$(0,1)$	0.500	0.500				
$(0,2)$	$(0,2)$	0.017	0.008	0.975			
$(0,2)$	$(1,0)$				1.000		
$(0,2)$	$(1,1)$				0.500	0.500	
$(0,2)$	$(1,2)$				0.017	0.008	0.975
$(1,0)$	$(0,0)$	0.999	0.001	2.4e-5			
$(1,0)$	$(0,1)$		0.974	0.026			
$(1,0)$	$(1,0)$				0.999	0.001	2.4e-5
$(1,0)$	$(1,1)$					0.974	0.026
$(1,1)$	$(0,0)$	0.992	0.008				
$(1,1)$	$(0,1)$	0.022	0.975	0.004			
$(1,1)$	$(0,2)$			1.000			
$(1,1)$	$(1,0)$				0.992	0.008	
$(1,1)$	$(1,1)$				0.022	0.975	0.004
$(1,1)$	$(1,2)$						1.000
$(1,2)$	$(0,0)$	1.000					
$(1,2)$	$(0,1)$	0.500	0.500				
$(1,2)$	$(0,2)$	0.017	0.008	0.975			
$(1,2)$	$(1,0)$				1.000		
$(1,2)$	$(1,1)$				0.500	0.500	
$(1,2)$	$(1,2)$				0.017	0.008	0.975

Table 6. Each value of the transition function $\pi(S' \mid S, a)$. A blank entry corresponds to probability zero.

- Nonresident charges d'affaires (e.g., Dominican Republic) and ministers (e.g., Estonia) are coded as nonresident envoys.
- For governments in exile during World War II, an "embassy near the government" is treated as an embassy.

A.3 State System Membership and Country Names

Table 7 records the mapping between the Correlates of War State System Membership data (Correlates of War Project 2017) and the State Department Office of the Historian records (United States Department of State 2018) for countries that have different names in the two sources. Countries with which the US never has relations are missing in the State Department data, indicated by a dot (.) in the table. Taiwan is indicated with an asterisk (*) as it is a special case. Under the One-China Policy, the US does not officially recognize Taiwan as a separate sovereign entity from mainland China. Consequently, historical US diplomatic relations with Taiwan are recorded in the document for China.

A.4 Hostility Action Coding Rules

- In a peaceful state, $H_t^m = 0$, I code $h_t^m = 1$ if and only if there is a MID the next month, $H_{t+1}^m = 1$, of which the US is coded on "Side A." As noted above, I rule out choosing the war action in a peaceful state.
- In a crisis state, $H_t^m = 1$, I code $h_t^m = 0$ if and only if the MID is over the next month, $H_{t+1}^m = 0$, and the US is not listed as a victor according to the "Outcome" variable. In other words, from a crisis state, the peaceful action represents backing down and accepting loss. I code $h_t^m = 2$ if and only if there is a war the next month, $H_{t+1}^m = 2$, of which the US is coded as an initiator. In all other cases, I code $h_t^m = 1$.
- In a war state, $H_t^m = 2$, I code $h_t^m = 2$ if and only if the war continues to the next month, $H_{t+1}^m = 2$, or the war ceases the next month and the US is listed as a victor according to the "Outcome" variable. Hostility actions in non-victorious final months of war are coded as $h_t^m = 0$ if $H_{t+1}^m = 0$ and as $h_t^m = 1$ if $H_{t+1}^m = 1$.

Code	Name	Start	End	Dept. State name
31	Bahamas	1973-07-10	2011-12-31	The Bahamas
56	St. Lucia	1979-02-22	2011-12-31	Saint Lucia
57	St. Vincent and the Grenadines	1979-10-27	2011-12-31	Saint Vincent and the Grenadines
58	Antigua & Barbuda	1981-11-01	2011-12-31	Antigua and Barbuda
60	St. Kitts and Nevis	1983-09-19	2011-12-31	Saint Kitts and Nevis
200	United Kingdom	1816-01-01	2011-12-31	The United Kingdom
210	Netherlands	1816-01-01	1940-07-14	The Netherlands
210	Netherlands	1945-06-26	2011-12-31	The Netherlands
265	German Democratic Republic	1954-03-25	1990-10-02	East Germany
269	Saxony	1816-01-01	1867-04-17	.
271	Wuerttemburg	1816-01-01	1871-01-18	Wurttemberg
273	Hesse Electoral	1816-01-01	1866-07-26	.
275	Hesse Grand Ducal	1816-01-01	1867-04-17	Hesse
280	Mecklenburg Schwerin	1843-01-01	1867-04-17	Mecklenburg-Schwerin
300	Austria-Hungary	1816-01-01	1918-11-12	Austrian Empire
316	Czech Republic	1993-01-01	2011-12-31	The Czech Republic
332	Modena	1842-01-01	1860-03-15	.
335	Parma	1851-01-01	1860-03-15	The Duchy of Parma
337	Tuscany	1816-01-01	1860-03-15	The Grand Duchy of Tuscany
345	Yugoslavia	1878-07-13	1941-04-20	Kingdom of Serbia/Yugoslavia
345	Yugoslavia	1944-10-20	2011-12-31	Kingdom of Serbia/Yugoslavia
346	Bosnia and Herzegovina	1992-04-07	2011-12-31	Bosnia-Herzegovina
420	Gambia	1965-02-18	2011-12-31	The Gambia
437	Ivory Coast	1960-08-07	2011-12-31	Cote D'Ivoire
484	Congo	1960-08-15	2011-12-31	Republic of the Congo
511	Zanzibar	1963-12-19	1964-04-26	.
678	Yemen Arab Republic	1926-09-02	1990-05-21	Yemen
696	United Arab Emirates	1971-12-02	2011-12-31	The United Arab Emirates
713	Taiwan	1949-12-08	2011-12-31	*
731	North Korea	1948-09-09	2011-12-31	.
732	South Korea	1949-06-29	2011-12-31	Republic of Korea
760	Bhutan	1971-09-21	2011-12-31	.
775	Myanmar	1948-01-04	2011-12-31	Burma
816	Vietnam	1954-07-21	1975-04-30	.
817	Republic of Vietnam	1954-06-04	1975-04-30	Vietnam
860	East Timor	2002-09-27	2011-12-31	Timor-Leste
940	Solomon Islands	1978-07-07	2011-12-31	The Solomon Islands
987	Federated States of Micronesia	1991-09-17	2011-12-31	Micronesia

Table 7. Mapping from Correlates of War state system entries into State Department records for cases in which the country names differ.