

# The Sources of Alliance Treaty Depth

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## Abstract

Why do states form deep alliances? Deep treaties add defense coordination and cooperation to promises of military support. I argue that symmetric alliances between democracies are especially likely to include high treaty depth. In these alliances, members use treaty depth as a substitute for commitments of unconditional military support. Using several statistical models, I show that decisions to include depth and unconditional military support in alliance treaties are correlated. Moreover, I find that as the average democracy of alliance members at the time of formation increases, treaty depth increases, but the probability the treaty offers unconditional military support decreases. The argument and findings have important implications for our understanding of the process and consequences of alliance treaty design.

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# 1 Introduction

Why do states make deep alliance treaties? While some alliance treaties include only a promise of military support, others supplement military support with commitments of extensive defense cooperation. To give a well-known example, the formal NATO treaty commits to setting up a formal international organization to govern the alliance.

Depth is a common part of alliances and varies greatly across treaties. At least half of all ATOP alliances with offensive or defense obligations have at least one source of treaty depth. Moreover, the prevalence of deep alliances increased after 1945.

Adding formal treaty depth to an alliance has important consequences. Deep alliances encourage reduced military spending by non-major power members because treaty depth increases alliance credibility. On the other hand, participation in shallow alliances increases military spending because partners can use the threat of abandonment as bargaining leverage. Figure 1 shows this relationship. Therefore, treaty depth affects alliance politics by shaping treaty credibility and the distribution of military spending burdens among members.

Despite the consequences of alliance treaty depth, we know little about when states add depth to their alliances.<sup>1</sup> In this paper, I explain when states form deep alliances. I argue that alliance member characteristics shape conditions on military support in the treaty, which then affect treaty depth. Alliance negotiations center on whether prospective members will offer military support and conditions on that support (Poast, 2019). When alliance members are unwilling to offer unconditional military support, they can use depth as a substitute source of reliability.<sup>2</sup>

Because democracies tend to offer alliances with conditional obligations (Mattes, 2012; Chiba, Johnson and Leeds, 2015), they also increase treaty depth. Democracies make conditional promises because leaders fear audience costs of violation, and limited commitments are harder to violate. At the same time, these limited alliances can increase other alliance partners' fear of abandon-

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<sup>1</sup>Mattes (2012) examines a few possible causes of military institutionalization.

<sup>2</sup>Depth could also complement promises of unconditional military support in alliances among autocracies.

Treaty Depth and the Impact of Alliance on Non-Major Power Military Spending: 1816-2007

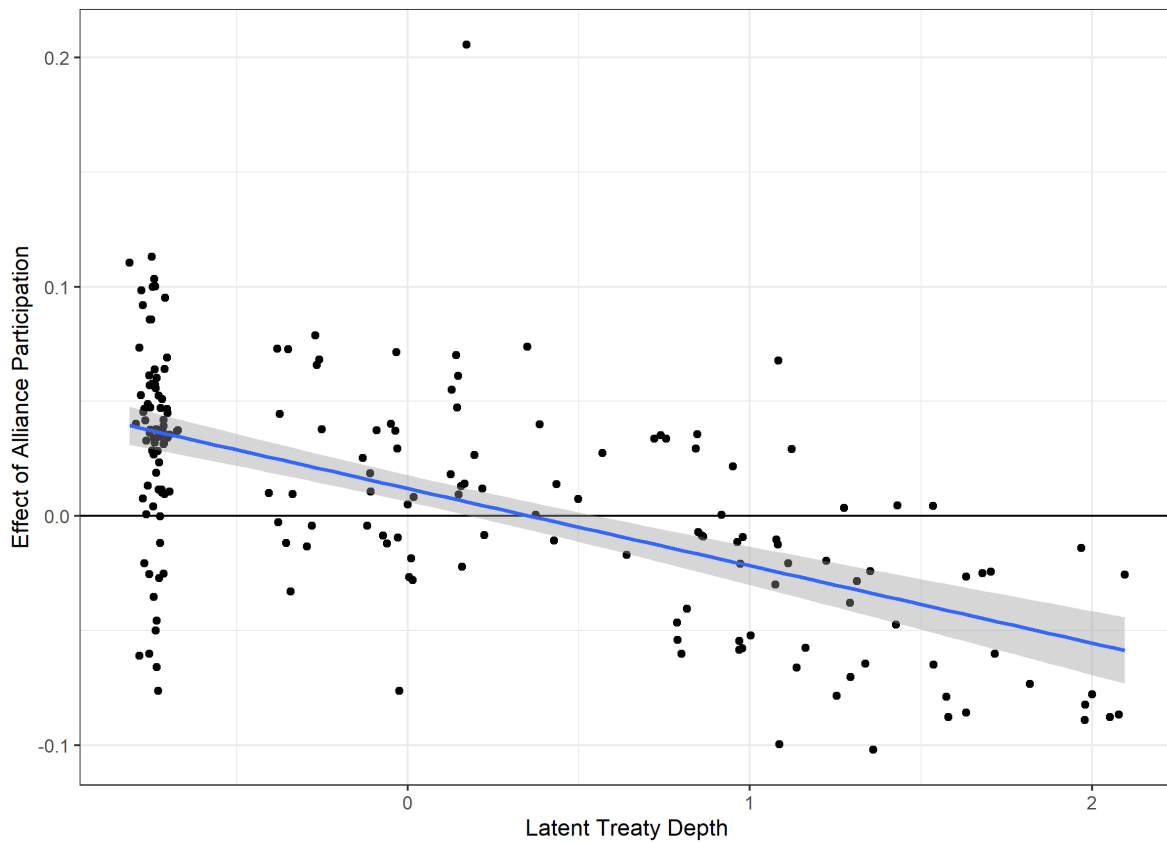


Figure 1: This scatter plot shows that the impact of alliance participation on non-major power military spending falls as treaty depth increases. I created this measure of depth measure using a latent variable model. Values around -0.8 are alliances with no depth, so larger values imply the treaty has at least some depth.

ment. Therefore, democracies can use costly provisions in deep alliances as an alternative source of credibility.

I test this argument with a series of statistical models and an illustrative case studies. The statistical models employ multiple equations to approximate the alliance negotiation process as well as the correlation between depth and unconditional military support. The case studies check the theoretical process and statistical results (Seawright and Gerring, 2008; Seawright, 2016). I find consistent evidence that as alliance members become more democratic, treaty depth increases and unconditional military support is less likely.

My argument and findings have important consequences for our understanding of alliance treaty design. Existing scholarship considers individual parts of treaty design in isolation (Benson, 2012; Mattes, 2012; Chiba, Johnson and Leeds, 2015). My argument shows that sources of credibility in alliance treaty design are connected. Theorizing about and modeling different alliance characteristics in isolation may generate misleading conclusions. Previous estimates of the connection between democracy and treaty depth have led to null findings, in large part because previous models do not consider the association between depth and conditions on military support.

This paper adds to knowledge of how democracy and domestic politics shape alliance politics. Scholars have long acknowledged that democracy and alliances are connected (Lai and Reiter, 2000; Gibler and Wolford, 2006; Warren, 2016; McManus and Yarhi-Milo, 2017). Democratic commitments are often seen as more credible due to audience costs (DiGiuseppe and Poast, 2016). My argument suggests that although democracies do screen the scope of their commitments carefully, they form deeper alliances on other dimensions.

The paper proceeds as follows. In the next section, I lay out the argument and hypothesis. Then I describe the data and research design

## 2 Argument

In this argument, I start by establishing a definition of treaty depth. Then, I show that treaty depth is understudied with a brief review of existing work on alliance treaty design. After that, I describe a general model of the process of alliance treaty negotiations. Finally, I describe how alliance negotiations between non-major powers tend to lead to higher treaty depth.

Alliance depth is the extent of defense cooperation formalized in the treaty. Deep alliances require additional military policy coordination and military cooperation. While shallow alliances stipulate more arms-length ties between members, deep treaties lead to closer cooperation through intermediate commitments that fall between no alliance and military intervention. Defense cooperation in a deep alliance takes many forms. Allies can form an integrated military command, provide military aid, commit to a common defense policy, provide basing rights, set up an international organization or undertake companion military agreements.

Depth is therefore an important part of alliance treaty design. In general, alliances can be thought of as self-enforcing contracts or institutions (Leeds et al., 2002; Morrow, 2000). Given external threats in an anarchic international system, states form alliances to aggregate military capability and secure their foreign policy interests (Altfield, 1984; Smith, 1995; Snyder, 1997; Fordham and Poast, 2014).

Potential alliance members can design a wide range of treaties (Leeds, Long and Mitchell, 2000; Leeds et al., 2002; Benson, 2012; Benson and Clinton, 2016). Design considerations shape the costs and benefits of treaty participation. Beyond the benefit of potential military support and deterrence, alliances also clarify international alignments (Snyder, 1990) and support economic ties (Gowa, 1995; Li, 2003; Long, 2003; Fordham, 2010; Wolford and Kim, 2017). The costs of alliances include lost foreign policy autonomy (Altfield, 1984; Morrow, 2000; Johnson, 2015), as well as the risk of opportunistic behavior. Potential opportunism in alliances includes abandonment, or the failure of alliance members to honor their commitments (Berkemeier and Fuhrmann,

2018), entrapment in unwanted conflicts (Snyder, 1984), and free-riding (Morrow, 2000).

Treaty design can address reliability concerns and the risk of entrapment, but the process of alliance treaty design is understudied (Poast, 2019). Mattes (2012) offered an early study of alliance treaty design by using symmetry of capability and history of violation to explain conditions on military support, issue linkages, and military institutionalization in bilateral alliances. She argues that all three design considerations increase treaty reliability. Benson (2012) shows that foreign policy disagreements and revisionist protege states increase the likelihood of limited military support commitments. Last, (Chiba, Johnson and Leeds, 2015) added to to existing work on limited obligations by showing that democracies are more likely to form alliances with conditional military support or consultation. Other work by Poast (2012, 2013) establishes that states often use issue linkages to facilitate alliance formation.

None of these works directly study depth. Mattes (2012) studies military institutionalization, but does not connect alliance conditionality with treaty depth. Rather, she treats depth and institutionalization as independent. Because states can use different foreign policy instruments as substitutes or complements (Starr, 2000; Morgan and Palmer, 2000), these different sources of reliability are probably related. My argument builds in part on Mattes (2012) by placing depth and conditions on military support in a unified theoretical and empirical framework. I now describe the general framework behind the argument.

## **2.1 Alliance Negotiations and Obligations**

Alliance treaty design is determined by negotiations between members (Poast, 2019). Negotiation proceeds in two stages: first by determining the type of military support in the treaty, then by adding depth to the treaty as needed.<sup>3</sup> Both stages address the benefits and costs of alliance participation, along with the risk of opportunism, each in different ways.

Establishing if and when military support will be offered is the primary task of potential alliance

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<sup>3</sup>The alliance formation stage is something I will need to model in a later robustness check.

partners. Promises of military intervention are the essence of alliances. To form an alliance, the members must have sufficient overlap in foreign policy interests, especially their proposed war plans (Morrow, 1991; Smith, 1995; Fordham and Poast, 2014; Poast, 2019).

Promises of military support in an alliance vary widely, however. The extent of shared foreign policy interests shapes whether alliance members offer unconditional or conditional military support. Many alliances limit promises of intervention to particular regions, conflicts, or instances of non-provocation (Leeds, Long and Mitchell, 2000). For example, if alliance members fear entrapment in unwanted conflicts, they will only offer military support in specific circumstances (Kim, 2011; Benson, 2012).<sup>4</sup> Conditional treaties reflect less overlap in foreign policy interests.

On the other hand, offering unconditional military support is a strong signal of shared foreign policy interests. Attaching no conditions to a potential intervention means alliance members hazard the reputational (Gibler, 2008; Crescenzi et al., 2012) and audience (Fearon, 1997) costs of treaty violation as they can be pulled into many conflicts. Accepting these potential costs implies that conflict participation is acceptable—there is less fear of entrapment and many shared foreign policy interests. As a result, unconditional alliances are a key source of credibility.

Having established conditions on military support, alliance partners then negotiate over how to reinforce those promises and put them into action. This second stage of the alliance negotiations determines the depth of the treaty. Depth shapes the perceived reliability of the treaty by providing opportunities for states to fulfill treaty obligations in peacetime. Implementing deep treaty provisions can also enhance the ability of allies to fight together.

Treaty depth depends on member characteristics and conditions on promises of military support from the first stage of the negotiations. First, the presence of unconditional military support shapes formal treaty depth by increasing the need for policy coordination and intermediate signals of treaty reliability.<sup>5</sup> Time-inconsistency problems due to changing foreign policy interests are a

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<sup>4</sup>Such deliberate design of alliances means clear instances of entrapment are rare (Kim, 2011; Beckley, 2015).

<sup>5</sup>A counterargument is that states could use treaty depth to bolster the perceived reliability of conditional alliances.

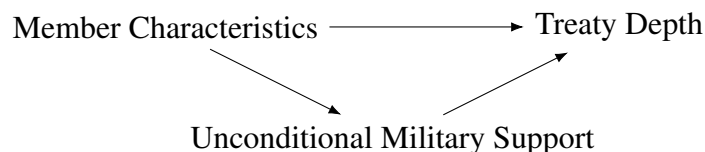


Figure 2: General summary of the theoretical process. Alliance member characteristics affect treaty depth through unconditional military support and directly changing the use of depth to boost treaty reliability.

major threat to alliance fulfillment (Leeds and Savun, 2007). Although unconditional promises of military support are more credible, they are also vulnerable to changing foreign policy interests. Under a deep alliance treaty, members can use implementation of defense cooperation and policy coordination to assess allied reliability. Observing that alliance members adhere to peacetime promises indicates they will also honor promises of military support.

While alliance member characteristics shape conditions on military support, which then affect treaty depth, they also have a direct impact on treaty depth. Though states often make promises they intend to fulfill (Downs, Rocke and Barsoom, 1996; Chiba, Johnson and Leeds, 2015), allies may still have reliability concerns with some states even after observing their promises of military support. This additional demand for reassurance increases alliance treaty depth.

Figure 2 summarizes the process in the argument. Alliance member characteristics could have a direct effect on treaty depth and an indirect effect through conditions on military support. This pattern holds in symmetric alliances between non-major powers, which tend to have higher depth.

## 2.2 Alliances between Non-major Powers

Symmetry of capability in an alliance means all the members have similar military capabilities. Asymmetric alliances include both major and non-major powers, which generates an imbalance in military capabilities and foreign policy interests. Many of asymmetric pacts feature exchanges where the larger partner provides protection in exchange for foreign policy concessions (Morrow,



1991; Johnson, 2015). As such, alliance members often receive different foreign policy goods in asymmetric alliances.<sup>6</sup>

Unlike asymmetric alliances, symmetric pacts between states of similar capability share a common foreign policy aim.<sup>7</sup> Symmetric treaties between major powers are concerned with global balance of power (Walt, 1990), especially in multipolar international systems (Snyder, 1984, 1990; Christensen and Snyder, 1990). These major power alliances are unlikely to include much depth, because the substantial autonomy costs of these treaties provide ample incentives for reliability, and few major power alliances provide unconditional military support.

Alliance negotiations between non-major powers are more likely to produce substantial treaty depth. Non-major power alliances are often deeper because they emphasize regional or local concerns. Conversely, alliances with major power participation are linked with global concerns. Though asymmetric alliances between major and non-major powers also deal with regional issues, they are part of major powers' expansive foreign policy concerns. Major powers also fear entrapment by junior partners.

The limited scope of non-major power foreign policy ambitions attenuates concerns about entrapment. Non-major power alliances often address shared local conflicts. These alliances are often a form of local balancing, as they cannot offset a major power. Non-major powers also lack the power projection capabilities to entangle their partners in distant concerns. As a result, unconditional alliances between non-major powers still enhance credibility, but this obligation has different implications. Given less fear of entrapment, non-major powers will be more likely to include unconditional military support in their alliances.

Unconditional military support in symmetric non-major power alliances will then increase treaty depth. Depth backs unconditional military support by allowing alliance members to provide regular proof of their commitment to the alliance. Adding treaty depth also facilitates plans

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<sup>6</sup>These alliances may have higher depth as major powers use deep obligations to reassure their partners.

<sup>7</sup>Potential foreign policy goals include maintenance or change of the status quo (Morgan and Palmer, 2006).

to provide military support in multiple contingencies. Deep cooperation provides opportunities to show that unconditional promises of military support are reliable.

There is also a direct path between non-major power alliances and treaty depth. Because non-major powers have more limited military capabilities, they could benefit more from policy coordination and defense cooperation. Deep alliances allow non-major powers to maximize the foreign policy benefits of their defense efforts. Rather than duplicate allied efforts, non-major powers can focus on particular issues.

Non-major powers' use of unconditional military support and desire to maximize their limited military resources both increase the depth of their alliance treaties. Of these two mechanisms, the indirect path through unconditional military spending may be more important, because all states have some incentives to reduce the opportunity costs of military spending. The sequence of alliance negotiations indicates that most of the effect of symmetric non-major power membership on treaty depth will operate through the establishment of unconditional military support.

Many non-major power alliances combine unconditional military support and high treaty depth. For example, a 1976 alliance between Egypt and Sudan (ATOPID 3785) commits to unconditional military support, reinforced with a joint defense council and a joint staff command. This alliance grew out of shared regional concerns, especially disagreements with Libya. By promising to military support without restrictions on how or where the conflict began, Sudan and Libya increased their need for joint military planning. To give another example, many regional collective security organizations such as the African Union Common Defense and Security Pact (ATOPID 5055), also supplement unconditional defense promises with formal organizations and defense cooperation.

There is an important caveat to this argument—I am interested in institutional design, not implementation, let alone successful implementation. There are alliances where non-major power aspirations in alliance design are not fully realized, or work poorly. To give one example, several deep Arab alliances never realized their full intention due to internal political divisions.

Based on the argument and these cases, I expect that alliance negotiations between non-major

powers will produce deeper alliance treaties. The main mechanism behind this relationship is unconditional military support, because treaty depth supports unconditional obligations. Non-major powers also use depth to maximize their limited military capabilities. In the next section, I describe how I will test this claim about the association between non-major power membership and treaty depth.

### 3 Research Design

My research design estimates how unconditional military support mediates the relationship between non-major power alliances and treaty depth. I start by describing the key variables in the analysis. Then I provide more detail on the estimation strategy.

To examine my prediction that symmetric alliances between non-major powers often have greater depth, I employ data on alliance treaty design from the Alliance Treaty Obligations and Provisions dataset (Leeds et al., 2002). I focus on 289 alliances with either offensive or defensive obligations, which is the set of treaties with military support. All results in the paper use these 289 alliances as the sample, and I assess robustness to adjusting for non-random selection into alliances in the appendix.

Using the ATOP data, I used a semiparametric mixed factor analysis to measure alliance treaty depth (Murray et al., 2013).<sup>8</sup> This measure of depth is weighted combination of ATOP's defense policy coordination, military aid, integrated military command, formal organization, companion military agreement and bases variables. Each of these individual indicators increases alliance treaty depth, but defense policy coordination and an integrated command have the largest positive association, as shown in the top panel of Figure 3.

Based on these factor loadings, the measurement model predicts the likely value of treaty depth. The distribution of depth is summarized by the bottom panel of Figure 3. There is substantial

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<sup>8</sup>See **this paper** for more details on the measure.

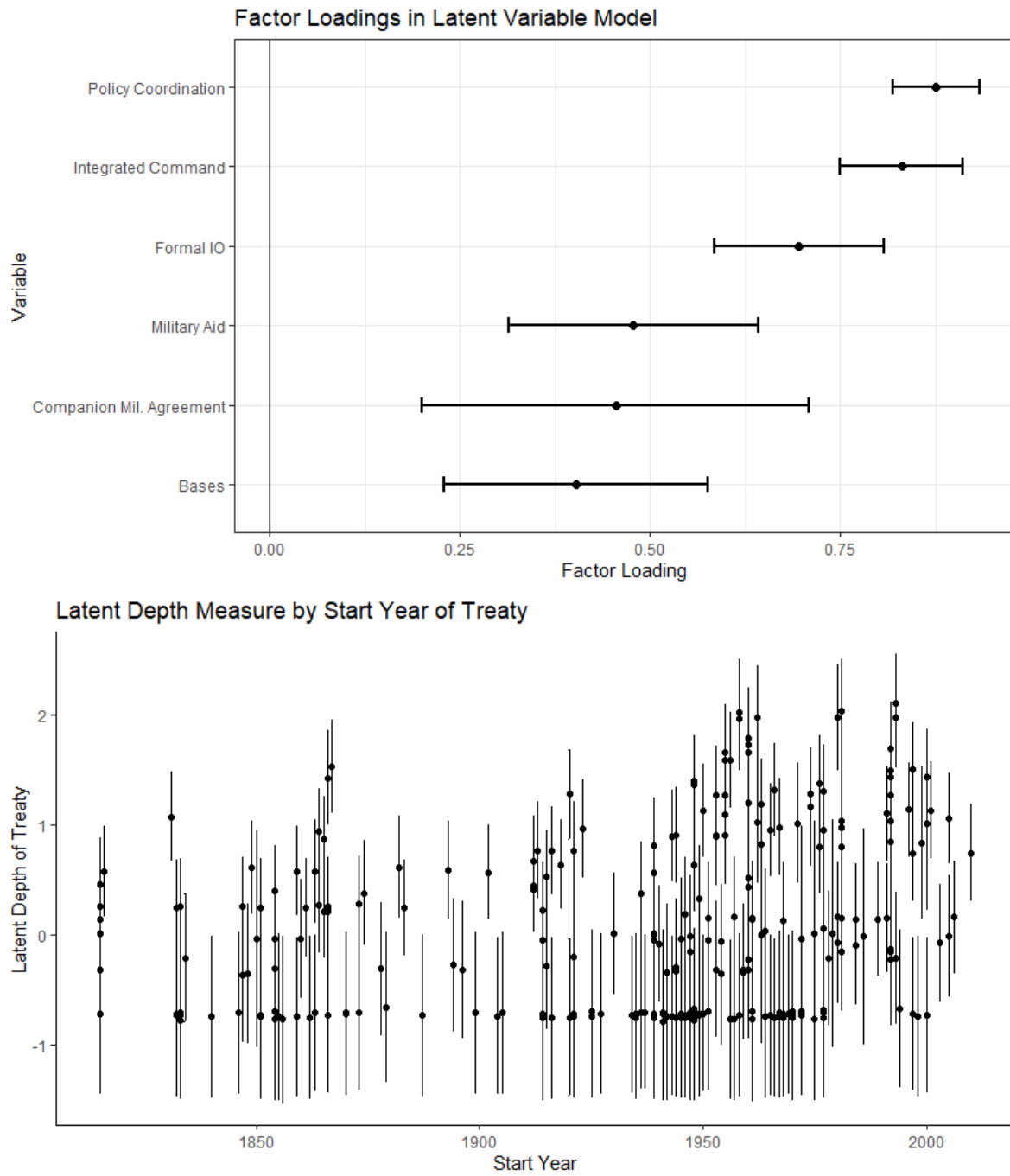


Figure 3: Factor Loadings and posterior distributions of latent alliance treaty depth measure.

variation in alliance treaty depth. Around half of all formal alliance treaties have at least some depth, and once states add some depth, there is a wide range of how much they include.

I measure alliance treaty depth in three ways. First, I take the posterior mean of the latent depth posterior for each alliance. I also fit a statistical model that accounts for posterior uncertainty in the latent measure. Last, I measure alliance treaty depth with a dummy indicator of whether the alliance has greater than median depth. Results from these three measures are very similar.

The key independent variable is a dummy indicator of whether the alliance only has non-major power members. I classify alliance participants as major or non-major powers using data from the Correlates of War project (Singer, 1988). Therefore, the base category is 22 alliances only between major powers and 138 asymmetric alliances between major and non-major powers.<sup>9</sup>

The mediator is an dummy indicator of unconditional military support. Using ATOP's information on whether defensive or offensive promises are conditional on specific locations, adversaries, or non-provocation, I set this variable equal to one if the treaty placed no conditions on military support. 123 of 289 alliances in the data have unconditional military support. I now describe how I estimate the mediation between non-major power alliances, unconditional military support, and treaty depth.

### **3.1 Estimation Strategy**

Mediation analysis is a common strategy for examining causal mechanisms (Imai et al., 2011). But to model treaty depth with the appropriate distribution, I cannot employ common sensitivity tests, which makes assessing the value of causal inferences from these results difficult. Based on my models, I cannot make confident causal claims, though mediation is often connected with causal inference. Therefore I corroborate correlations from the statistical models, through case study evidence that shows how the sequence of alliance negotiations matches my theoretical argu-

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<sup>9</sup>Results are stronger if I include a dummy for asymmetric alliances, thereby removing these alliances in the base category. There is a direct relationship between asymmetric alliances and treaty depth (Mattes, 2012).

ment and the empirical results.

Mediation models have two equations: one to predict values of the mediator and other to predict the outcome of interest. The key independent variable is included in both equations, but the dependent variable is not included in the mediation model. The mediator also predicts the dependent variable. Because mediation approximates a process where changes in the mediator proceed shifts in the dependent variable, this is not a model with reciprocal causation. I specify two models- one where non-major power alliances predict unconditional military support, then a second where unconditional military support and non-major power alliances predict treaty depth.

To model unconditional military support, I fit a binomial model with logistic link function. The non-major power alliance dummy is the key independent variable, and I also control for a range of other factors. All of these variables could be correlated with unconditional military support and non-major power membership. Key controls include a dummy for asymmetric capability (Mattes, 2012) and average alliance democracy at the time of formation (Chiba, Johnson and Leeds, 2015). I also control for foreign policy similarity (Benson, 2012) using the minimum value of Cohen's  $\kappa$  in the alliance (Häge, 2011). Using the ATOP data (Leeds et al., 2002), I control for asymmetric treaty obligations, the number of alliance members, whether any of the members were at war and the year of treaty formation. To capture the role of issue linkages in facilitating alliance agreements (Poast, 2012, 2013), I also include a dummy indicator of whether the alliance addressed economic issues. Last, I include a count of foreign policy concessions in the treaty, because concessions can facilitate alliance negotiations (Johnson, 2015).

The model of treaty depth retains all of the above control variables and the non-major power variable. All these variables could conceivably alter the need for additional reliability from treaty depth. I then add the unconditional military support dummy to this specification. Modeling depth is more complicated because the latent measure is extremely skewed. To facilitate model fitting, I transformed latent depth by transforming the variable to range between zero and one, then used

a beta distribution for outcome.<sup>10</sup> The flexibility of the beta distribution helps predict mean latent depth and facilitates fitting models that account for uncertainty in the latent measure, which I describe in more detail below. As an alternative measure of the outcome, I also fit a model with a dummy variable indicating whether the latent depth of the treaty was greater than the median depth value.

I fit the mediator and outcome models simultaneously using BRMS (Bürkner, 2017). BRMS is an interface to STAN, a probabilistic programming language for Bayesian estimation (Carpenter et al., 2016). Joint Bayesian estimation has the flexibility to incorporate the logistic and beta models and can be easily extended to account for uncertainty in the depth measure. To facilitate interpretation of effects with a binary mediator, I rescaled all continuous independent variables by dividing by two standard deviations (Gelman, 2008). Standard diagnostics suggest that the models converged and the chains adequately explored the posterior distribution.<sup>11</sup>

## 4 Results

My findings are consistent with the claim that symmetric non-major power alliances have higher depth. A large portion of that effect is due to the prevalence of unconditional military support in non-major power treaties. In this section, I first offer some descriptive statistics that are consistent with my claim, before turning to inferences from parametric modeling.

First, unconditional alliances are common among non-major powers. Two-thirds of symmetric non-major power treaties offer unconditional military support. Most unconditional alliances are symmetric treaties between non-major powers. Of 123 alliances with unconditional military support, 80 only involve non-major powers.

Figure 4 shows the mix of unconditional military support and high treaty depth in non-major

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<sup>10</sup>I also considered skew-normal, normal and t-distributions for the outcome, but the skew model had poor credible interval coverage, while the normal and t-distributed models made poor posterior predictions.

<sup>11</sup>Results are based on 2,000 Hamiltonian Monte Carlo iterations from two chains, with 1,000 warmup iterations.

power alliances. Darker points mark symmetric non-major power alliances, a triangles mark unconditional military support. Many of the deepest alliances in the data are unconditional pacts between non-major powers.

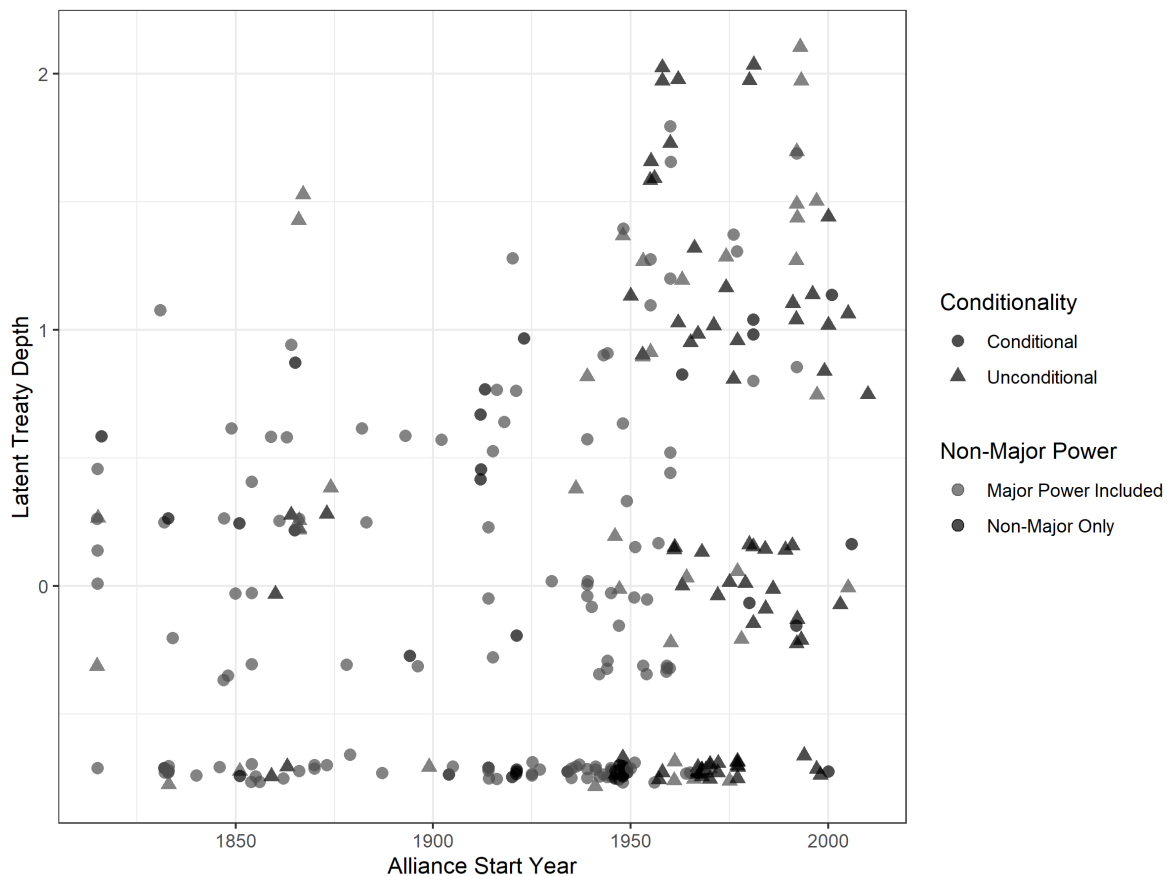


Figure 4: Presence of unconditional military support and depth in non-major power alliances from 1816 to 2016. This scatter plot shows mean latent treaty depth on the y-axis and the start year of the alliance on the x-axis. Darker points are symmetric alliances between non-major powers, and triangular points mark treaties with unconditional military support.

The presence of symmetric alliances between non-major powers increases dramatically after 1945, as more states entered the international system. 20% of pre-1945 alliances only included non-major powers, and 60% of post-1945 treaties are symmetric non-major power pacts. The proliferation of non-major power treaties then increased the prevalence of unconditional military support in alliances. Before 1945, 15% of alliances offered unconditional military support, but



that share jumps to 65% after 1945. Much of the growth in treaty depth after 1945 is driven by unconditional alliance treaties between non-major powers.

Finally, a t-test suggests that treaty depth is higher in unconditional alliances. On the other hand, there is no difference in depth between non-major power alliances and other treaties in a t-test. With the exception of the non-major power alliances t-test, all of these patterns match the argument that treaties between non-major powers are deeper, thanks in part to promises of unconditional military support. But these descriptive statistics do not capture the process of alliance negotiations or adjust for potential confounding factors.

To show the theoretical process, I report the results of the mediation analysis. Mediation results are decomposed into direct and indirect effects. The direct effect is the effect of non-major power symmetry in the alliance on depth that does not work through unconditional military support. The indirect effect is the effect of non-major alliances on depth through unconditional military support. In Figure 5, I plot the direct and indirect effects for three mediation models. For the first model, the mean of latent treaty depth is the outcome. The second model uses the deep alliance dummy as the dependent variable. The last model adjusts for uncertainty in the latent measure.

Figure 5 includes point estimates and 90% credible intervals for the direct, indirect and total effects. Both models show a strong indirect effect of symmetric non-major power capability in an alliance on treaty depth. This corroborates my prediction that non-major powers form deep alliances in large part because they tend to offer unconditional military support.

Results for the direct and total effects are less consistent with the argument. In the model of mean latent treaty depth, most of the 90% credible interval for the direct effect is negative. As a result, though the preponderance of evidence for the total effect is positive, the credible interval ranges from -.123 to .69. In the model of mean latent depth, the strong positive indirect effect is attenuated by the direct effect, such that non-major power alliances are consistent with slightly less depth, no difference in depth, or a substantial positive effect.

The credible interval of the total effect in the model of a deep alliance dummy is uniformly

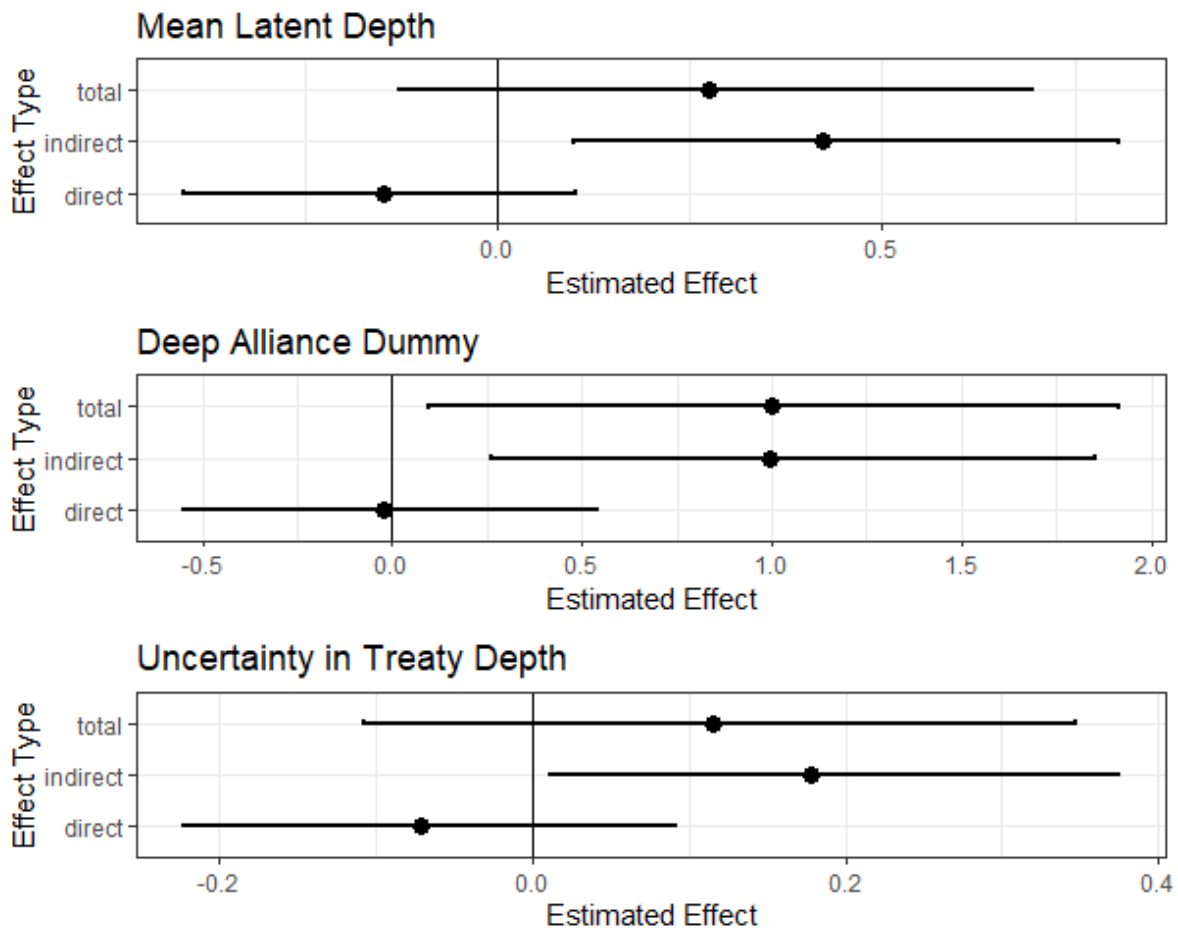


Figure 5: Results from mediation analysis of the relationship between non-major power alliance membership, unconditional military support, and alliance treaty depth. The error bars encapsulate the 90% credible interval. The direct effect captures the impact of symmetric non-major power alliances that does not work through treaty depth. The indirect effect is the effect of symmetric non-major power status on depth through unconditional military support. The total effect aggregates the direct and indirect effects.

positive. This result is more consistent with the theoretical logic, and is the result of a shift in the indirect effect towards zero. As a result, almost all the total effect in the deep alliance dummy model is driven by the indirect effect.<sup>12</sup>

In the last model, I consider how measurement uncertainty shapes inferences about the connection between non-major power alliances and treaty depth. The credible intervals in the bottom panel of Figure 3 show, the latent measure of treaty depth has some uncertainty. This is a reasonable approximation of alliance politics, because alliance treaty depth is not observed with certainty. There are perceptible differences in treaty depth, especially once states add substantial depth to the treaty. Even so, the results from the analysis of mean treaty depth or deep alliance dummy variable may overstate the effect of non-major power membership.

To address the issue of uncertainty over treaty depth, I fit a modification of the joint model. First, I created 1,000 datasets, one for each draw of the posterior distribution of the latent measure. Then I fit the model of mean treaty depth to 500 randomly sampled datasets from those 1,000 to facilitate computation. This produces 500 separate models, which I combine into a single model. With fully Bayesian inference, I can aggregate the posterior draws in a single posterior that accounts for uncertainty in the treaty depth measure.<sup>13</sup> This approach is analogous to common techniques for analyzing missing data, where multiple imputation generates uncertainty about the missing values (Hollenbach et al., 2018). Under these conditions, researchers fit a separate model to each of the imputed datasets and then combine the results.

After accounting for uncertainty over treaty depth, I find weaker substantive effects, but a similar pattern. The mediation estimates from this model are summarized in the bottom panel of Figure 5. The magnitude of the direct and indirect effects falls. Still, the indirect effect has a fairly clear positive effect on treaty depth, while the direct effect has a negative mean and is

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<sup>12</sup>Formally, this is called the proportion mediated, and the point estimate for this is 99%, with a credible interval that ranges from 16% to 184%. Given different directions of the direct and indirect effects, the proportion mediated should not be interpreted in the same way for the model of mean treaty depth.

<sup>13</sup>Standard convergence diagnostics indicate convergence in each of the submodels. Diagnostics like  $\hat{r}$  are less useful for the full posterior, because some of the chains in the submodels do not overlap.

indistinguishable from zero.

The indirect effect works through a positive correlation between non-major power membership and unconditional military support. In all three models, non-major power membership has a large positive association with unconditional military support. This increased use of unconditional military support then leads to greater treaty depth.

Though the results from the three models are not equivalent, there is a common pattern. Unconditional military support is the primary mechanism by which symmetric non-major power alliances lead to greater treaty depth. There is little evidence of a direct link between non-major power alliances and treaty depth. The preponderance of evidence for the direct effects is contrary to my argument. As such, there is partial support for my argument about the connection between non-major power alliances and treaty depth.

Aggregate patterns in the above analyses give some sense of the theoretical process. The statistical models impose a sequence on the data-generating process, however. To show that potential alliance members start by setting conditions on military support before turning to treaty depth, I now offer a brief case study.

## **4.1 Case Study**

The case study examines the alliance negotiation process in two treaties. By tracing the process of alliance negotiations, I show how differences in non-major power participation affect conditions on military support and treaty depth, in that order. I compare the outcomes of negotiations that led to a 1955 alliance between Egypt, Syria and Jordan (ATOPID 3300) and a 1939 pact between France and Turkey (ATOPID 2465).

I selected these cases using matching software, following the recommendations of Nielsen (2016). Case selection is a crucial part of process tracing (Seawright and Gerring, 2008), and matching cases makes selection more transparent and replicable. Moreover, matching cases on observed confounders allows researchers to contend with alternative explanations that are not ad-

dressed by matching (Nielsen, 2016).

Because I am interested in the causal mechanism behind high treaty depth, I matched on the non-major power alliance dummy and treaty depth. I did not include unconditional military support as a matching variable, because it is part of the process. Otherwise, I matched on the control variables in the model of treaty depth. The specific matching pair I chose did not have the minimum Mahalanobis distance, but it had high outcome variance.<sup>14</sup>

## 5 Discussion

The findings from the statistical model (and maybe the case study) are consistent with an indirect effect of non-major power alliances on treaty depth. In the first stage of alliance negotiations, non-major powers tend to produce unconditional military support. After setting conditions on military support, non-major powers use treaty depth to support their obligations.

There is less evidence symmetric non-major power alliance membership has a direct effect on treaty depth. I attributed this effect to the potential efficiency gains of defense coordination and cooperation. Contrary findings may reflect the prevalence of unconditional military support in non-major power treaties. They may also indicate that the benefits of policy coordination and defense cooperation are just as strong in asymmetric alliances. If military institutionalization is a source of credibility in asymmetric treaties (Mattes, 2012), these alliances may also have high depth. Thus, comparing symmetric non-major power treaties with asymmetric alliances and symmetric major power alliances will show few direct differences. Consistent with this logic, the direct effect is more positive when the base category is only symmetric non-major power treaties.

The weak direct effect reduces the total effect of symmetric non-major power alliance membership on treaty depth. Only the deep alliance dummy model has a total effect that does not include zero. This implies that non-major power status has a marginal effect on treaty depth, but we should

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<sup>14</sup>The main sources of imbalance are a slight difference in the democracy of the alliance members and a large gap in the start year of the treaty.

be careful not to overstate it.<sup>15</sup>

My findings show how different aspects of alliance treaty design are related. Benson and Clinton (2016) use measurement models to show this in a descriptive fashion, but my findings give a sense of the process behind different combinations of depth and conditions on military support. Previous research on the causes of alliance treaty design (Benson, 2012; Mattes, 2012; Chiba, Johnson and Leeds, 2015) focused on particular characteristics and treated them as independent. My results suggest that this approach can be informative, but it is incomplete.

Different sources of alliance treaty credibility are thoroughly entangled. Non-major powers use depth to reinforce their promises of unconditional military support. This has important implications for scholarship.

## 6 Conclusion

Understanding the sources of alliance treaty depth helps clarify the how to model the way depth affects other outcomes, such as military spending by alliance participants. The weak total effect implies that controls for asymmetric capability may be unimportant, but that adjusting for unconditional military support is crucial. Moreover, given the sequence of alliance treaty negotiations, neither alliance treaty member characteristics or conditions on military support are post-treatment variables for treaty depth.

Besides showing a source of alliance treaty depth, this paper has three implications for future scholarship. First, although non-major power alliances are common, but we are only beginning to how and why states form these treaties. My argument suggests that non-major power alliances manage regional concerns. Given the emphasis on systemic-level concerns and relations among the great powers in earlier scholarship, these alliances have been relatively neglected. Systemic factors are important, but much of the conflict in the international system is driven by more local

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<sup>15</sup>The total effect is stronger when the base category is symmetric treaties between major powers.

concerns and status (Renshon, 2017).

The second implication for scholarship is that alliance treaty design is the result of a series of correlated decisions. Rather than address each part of treaty design piecemeal, scholars should think about connections between the core aspects of treaty design. For example, future work might examine the connections between conditions on military support, treaty depth, and issue linkages. Debating what promises to include among these core obligations will be a crucial next step. Any discussion of alliance treaty design must also situate these decisions in the sequence of treaty negotiations. As such, my findings support calls to correct the comparative neglect of negotiations in existing scholarship (Poast, 2019).

Last, alliances are an international institution, so some of the lessons from this work may apply to other institutions. There is an extensive literature on the design of international institutions (Downs and Rocke, 1995; Martin and Simmons, 1998; Koremenos, Lipson and Snidal, 2001; Koremenos, 2005; Thompson, 2010). Debates about the tradeoff between breadth and depth (Downs, Rocke and Barsoom, 1998; Gilligan, 2004) reflect correlated design decisions given potential institutional membership. Still, this literature could adopt a similar emphasis on the sequence of negotiations to clarify how different aspects of institutional design are related.

In conclusion, non-major power alliance membership is a source of treaty depth. Symmetric treaties between non-major powers have greater depth because they often promise unconditional military support. This shows the way relative capability shapes the process and outcomes of alliance treaty negotiations.

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