HEEDING RAY'S ADVICE:
An Exegesis on Control Variables in Systemic Democratic Peace Research*

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Abstract:

In the holy interest of Science, we submit our recent systemic democratic peace research to the control variable doctrine of James Lee Ray, as codified in his 2003 treatise. In particular, we seek to determine whether international institutions intervene in the relationship between the democratic community's strength and the use and effectiveness of third party conflict management, whether hegemony is a competing explanation of third party settlement, and whether our extant model is robust when several control variables are specified. Two important conclusions are reached: 1) the democratic community's strength and institutional vitality promote third party mediation and its success; regardless of hegemonic might and other controls, and 2) Ray's teaching is properly understood as an exhortation for scholars to more carefully consider the theoretical role of each control variable and its proper treatment in statistical models, not as an edict banning the use of control variables.

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Introduction

In the holy interest of Science, we herein submit our recent systemic democratic peace research to the control variable doctrine of James Lee Ray, as exposited in his 2002 Presidential Address to the Peace Science Society (International) and codified in his subsequent treatise (2003). Our purposes are to provide a concrete example of the application of Ray's doctrine, to demonstrate the consequences for adherents and heretics, and to inform a broader research agenda on the systemic origins of Kant's perpetual peace.[1]

Ray (2003) exhorts followers of Science to adhere to five tenets when using control variables:

- Do not control for intervening variables (p. 4).
- Distinguish between complementary and competing explanatory factors (p. 6).
- Do not introduce factors as control variables merely on the grounds that they have an impact on the dependent variable (p. 13).
- Do not control for variables that are related to each other or the key explanatory factor by definition (p. 15).
- Control for possible differences between across space and over time relationships (p. 20).

We follow Ray's advice by applying these guidelines to our own systemic democratic peace work (Mitchell, Kadera, & Crescenzi, 2005). In particular, we seek to determine whether international institutions intervene in the relationship between the democratic community's strength and the use and effectiveness of third party conflict management. We also explore one important alternative explanation for our findings, hegemony. Next, we provide information about the robustness of our findings across various model specifications. Finally, we offer conclusions regarding the realization of global democratic peace as well as general lessons for following the precepts of good research.

Previous Research on the Systemic Democratic Peace

Recent scholarship identifies a systemic relationship between democracy and conflict (Crescenzi & Enterline, 1999; Gleditsch & Hegre, 1997; Kadera, Crescenzi, & Shannon, 2003; Mitchell, Gates, & Hegre, 1999; Oneal & Russett, 1999; Starr, 1992). As was the case for research on dyadic democratic peace, the robustness of the empirical finding invokes deeper questions about the causal processes underlying the phenomenon. Our research (Mitchell, Kadera, & Crescenzi, 2005) emphasizes third party conflict management as an important causal mechanism producing systemic peace.

Our theory builds upon ideas developed by Mitchell (2002) and Kadera, Crescenzi, and Shannon (2003). The crux of our argument is that democracies are better able to promote their norms of interaction in the international system when the democratic community is powerful. Like Mitchell (2002), we focus on one important democratic norm, the willingness to involve third parties in the conflict management process. We contend that a strong democratic community enhances the chances for third party involvement and bolsters the effectiveness of such conflict management efforts. Third party conflict management becomes more likely and more effective because a strong democratic community reduces contractual uncertainty and establishes expectations about the sanctity of contracts.

Following Russett and Oneal (1999, 2001) and Shannon (2005), we also recognize the important role played by international organizations. While democratic institutions help spread conflict management norms, they also help third parties generate durable and conclusive agreements. Although a strong democratic community can use its muscle to encourage disputants to accept third party conflict management, resulting

agreements are even more likely to be successful when those disputants have also bought into international organizations with pacific ideals (Mitchell, Kadera, & Crescenzi 2005). Thus the presence of strong institutions buttresses compliance with any agreements reached. In short, third party conflict management will be more frequent and more successful when the democratic community and its institutions are strong.

Empirical analyses to test these propositions employ data (version 1.0) on territorial, maritime, and cross-border river claims collected by the Issue Correlates of War (ICOW) Project (Hensel, 2001; Hensel, Mitchell, & Sowers, 2004). The spatial-temporal domain of the data is the set of all qualifying claims to territory from 1816 to 2001, maritime zones from 1900 to 2001, and cross-border rivers from 1900 to 2001 in the Western Hemisphere (North America, Central America, South America, and the Caribbean), Western Europe, and the Middle East.[2] Our analyses focus on all peaceful attempts to settle contentious issue claims (n = 1444); these settlements take the form of bilateral negotiations or involve third parties in binding (arbitration and adjudication) or non-binding (mediation, good offices, inquiry, conciliation, etc.) ways. Our first dependent variable, *3PCM*, indicates when third parties are employed in peaceful settlement attempts (zero represents bilateral negotiations between the contending parties). We also use three measures for the success of third party efforts: whether the contending parties reach an agreement, whether any agreement reached is complied with within five years, and whether any agreement reached ends the contentious issue at stake.

To operationalize systemic democracy, we used *DemCom*, a variable created by Kadera, Crescenzi, and Shannon (2003). Construction of this variable begins by multiplying each state's composite indicator of national capabilities (CINC) score

(Singer, Bremer, & Stuckey, 1972) by its Polity 4 democracy score (Marshall & Jaggers, 2000). The products are then summed over all states in the international system during each year, creating an aggregate measure of the democratic community's strength. This composite indicator not only accounts for the number of democracies relative to the number of autocracies in the international system, but also captures the strength of democracies relative to the strength of autocracies and the intensity of liberal democratic regimes relative to autocratic regimes. The measure ranges from –4.998 to 5.604, with the democratic community becoming stronger as the variable's value increases. We also use another common measure of systemic democracy, *PropDem*, or the proportion of democracies in the world in any given year.

A variable named *JointIOs* accounts for the role played by the democratic community's institutions. Using the MTOPS (Multilateral Treaty of Pacific Settlements) data,[3] we count the number of joint memberships the claimants had in international organizations whose charters call for the pacific settlement of disputes. This variable ranges from zero to eleven.

Like many scholars before us, we included several control variables thought to influence the use and effectiveness of third party conflict management. Our original choice of control variables was motivated by Mitchell's previous work on third party mediation (2002) and on analyses of the ICOW dataset (e.g., Hensel, 2001; Hensel, Mitchell, & Sowers, 2004). We included four control variables: 1) *DemDyad*, which reflects regime type at the dyadic level (as opposed to the systemic environment captured by *DemCom*), 2) *Issue Salience*, which captures the importance of the contested territory, maritime area, or cross-border river to both sides[4], and 3) *Proc/FuncSA*, which accounts

for settlements that merely identified procedures for future negotiations over the contested issue (e.g., agreeing to mediation) or situations where the parties could agree only about functional issues, such as fishing in disputed waters or troop placement, rather than the underlying issue at stake.[5]

Our original models are presented in the first columns of Tables 1, 3, 4, and 5. These initial results suggest that third party conflict management is more frequent (Table 1) and more likely to produce durable agreements (Table 5) when the democratic community and its institutions are strong. However, the democratic community does not seem to influence whether the parties are able to reach agreements (Table 3), and has only a weak effect on ending contention over the issue at stake (Table 4). Resolution of issues and compliance are promoted through disputants' membership in international organizations with pacific principles (Tables 4 and 5).

We wondered to what extent our results would be altered if we took seriously the guidelines put forward by Ray (2003). In the remainder of the paper, we discuss each guideline, save one[6], identify ways to address each issue in the context of our own research, and then present empirical findings on each point.

Tenet #1: Do not control for intervening variables.

Drawing on a standard lesson from the foundational social science literature (e.g., Blalock, 1964), Ray first warns us not to include an intervening variable in a statistical model. A variable, Z, intervenes in the relationship between X and Y if X → Z → Y. "One should not control for a factor that is (1) a consequence of a key causal variable, and which then in turn (2) has an impact on the outcome variable" (Ray, 2003, 5). Any

observed relationship between X and Y may be washed out by inclusion of the intervening factor.

In our research, for example, it might be possible that international institutions intervene in the relationship between democratic community strength and third party conflict management: *DemCom* → *JointIOs* → *3PCM*. Alternatively, if international organizations are effective agents for the promotion of democratic norms and institutions (e.g. Pevehouse, 2002a, 2002b; Shannon, 2005), it is possible for the relationship to be reversed, namely that the strength of the democratic community intervenes in the relationship between *JointIOs* and *3PCM*, or *JointIOs* → *DemCom* → *3PCM*.[7] In both cases, inclusion of the two variables in the same model could diminish the effects of either one.

To get a handle on this, we estimate three models for third party conflict management use and success: 1) a model with *DemCom* and *JointIOs*, 2) a model with *DemCom* alone, and 3) a model with only *JointIOs*. The results for the likelihood of third party conflict management are presented in Table 1. Institutions and democratic community strength both have significant and positive effects on third party settlement attempts (although the effect for *DemCom* is insignificant in Model 2). Given the relatively modest correlation between these two variables in the entire sample (ρ = 0.3419), this is not surprising. Thus, it does not matter whether the variables are modeled individually or jointly; the effects are the same.

We see a similar pattern for two of the three success measures, reaching agreements (Table 3) and compliance with agreements (Table 5). Neither the strength of the democratic community nor membership in peace promoting institutions influences the

parties' ability to strike agreements. These results are insignificant no matter what model specification is employed (Models 1-8 in Table 3), consistent with our initial findings. On the other hand, the effects of *DemCom* and *JointIOs* are significant and robust with respect to enhancing the chances for compliance with any agreements that are struck (Models 1-8 in Table 5). With respect to whether an agreement reached ends the overall issue claim, we do see slightly different results depending on model specification. In the full original model, which included two control variables (Model 1 of Table 4), the parameters for democratic community strength and joint institutions had the correct signs (positive), but neither was significantly different from zero. We can see that each of these variables significantly influences claim end when modeled bivariately (Models 3 and 4). Furthermore, the effects are stronger when a measure for hegemony is included in the model (Models 5-8).

In general, however, our original results are robust. A strong democratic community and joint membership in peace promoting institutions enhance the use of third party conflict management and the likelihood that any agreements reached will be successful. Consistent with recent arguments about institutions creating durable peace (e.g. Fortna, 2004; Walter, 2001), institutions seem to play an important role in enforcement.

Identifying the complementary role of international organizations does not fully solve the chicken-and-egg problem we initially identified. The question remains: does the democratic community gain strength and then create institutions to foster cooperation and spread its norms; or do international organizations come first, managing conflict and creating a tranquil environment which nurtures a vigorous democratic community?

Several scholars make a similar reverse-causality argument, reasoning that peace provides a milieu in which democratic regimes flourish (Gates, Knutsen, & Moses 1996; James, Solberg, & Wolfson 1999; Thompson 1996; Rasler & Thompson 2004). In an additional attempt to establish whether we have an intervening variable at work, we created a system level time series from 1900 to 2001, *TotalIOs*. This is the yearly number of state memberships in institutions that call for peaceful dispute settlement.[8] We then conduct Granger causality tests in both directions to determine if *DemCom* → *TotalIOs*, *TotalIOs* → *DemCom*, or both. Due to non-stationarity problems, we utilize the first differenced series.[9]

The results indicate that *TotalIOs* Granger cause *DemCom* ($F = 3.7009$, $p = .0078$), but *DemCom* does not Granger cause *TotalIOs* ($F = 0.80461$, $p = 0.5255$). In other words, the growth in institutions that promotes peaceful dispute settlement precedes the growth in the democratic community's strength, at least at the systemic level. Perhaps this is not too surprising when one considers the Hague Conference of 1899 and the subsequent flurry of institutions created early in the 20th century to manage conflict. It does suggest an interesting question for future exploration: were early international organizations essential for pushing the system closer to Kantian peace (see, e.g., Russett & Oneal, 2001)?

Our consciences relieved, we conclude that international institutions do not seem to intervene in the relationship between *DemCom* and *3PCM*. First, international organizations play a supporting role in the realization of a Kantian world. Together with a strong democratic community, they spur the use of third parties as mediators and help ensure that the agreements reached by such means succeed. Second, if there is an

intervening variable, our key independent variable, *DemCom*, is the more likely culprit. Regardless, our primary results are not altered by inclusion of both *DemCom* and *JointIOs* in the same empirical models.

Tenet #2: Distinguish between complementary and competing explanatory factors.

Careful consideration of the relationship between "*alternative* causes,"[10] the theory's key explanatory variable, and the dependent variable forms the core of Ray's (2003) second piece of advice. In particular, he urges researchers to differentiate between alternative causes that are complementary and those that are competing. Complementary causes of the phenomenon under investigation do not rival the theory's central explanation. In principle, controlling for such variables should increase the model's goodness of fit. The relative contributions of the central and complementary factors can then be compared by assessing the substantive effect of each on the dependent variable. Competing causes, on the other hand, directly challenge the main independent variable's ability to account for the dependent variable's variance. Specifying models that include these competing, or confounding, factors along with the main independent variable(s) weakens the goodness of fit. Such factors should be investigated in separate analyses.

For much of our audience, the devilish Hegemon provides an alluring alternative explanation of third party mediation usage and success. Almost without fail, an audience member or reviewer asks what we now refer to as the "What about the hegemon?" question. Skeptical of the virtues of an international democratic community and its institutions, scholars wonder if a selfishly motivated hegemon might not instead muscle disputants into mediation. We therefore consider the possibility that hegemonic

dominance competes with both the disputants' shared membership in pacifically-minded organizations and with the democratic community as a promoter of third party management. To measure the hegemon's might, we splice the Correlates of War (COW) project's composite indicator of national capabilities (CINC) for the United Kingdom (1816-1899) with the United States' CINC score (1900-2001).[11] The resulting variable is named *Hegemony*. It is interesting to note that while *DemCom* and *JointIOs* are positively correlated in our sample (ρ = .34), hegemony is inversely related to both the strength of the democratic community (ρ = -.36) and the number of shared memberships in peace promoting institutions (ρ = -.37).

A typical theoretical argument focused on hegemony would contend that the leading state (e.g., the UK or US) serves as an entrepreneur, often creating new international organizations, especially in the aftermath of large wars (Ikenberry, 2001). If a leading state pressures other states into joining these organizations, then *Hegemony* should be highly correlated with *JointIOs* and the predictive ability of a model that jointly includes them as explanatory factors for third parties should be weaker than that of a model that uses one in isolation. Instead, as noted above, we find a negative correlation between *Hegemony* and *JointIOs*. But what happens when we include this potentially competing theoretical variable in our empirical models? If *Hegemony* were a competing cause, it would explain the same variance in *3PCM* use and success that *DemCom* and *JointIOs* account for. As a result, the inclusion of *Hegemony* would weaken the effects of *DemCom* and/or *JointIOs*.

Starting with the frequency of third party conflict management, recall that *JointIOs* and *DemCom* had a positive and statistically significant effect on *3PCM* in our

original models (Model 1 in Table 2). We see that these relationships are stable across specifications that include *Hegemony* (Models 2 through 4 in Table 2). In fact, all three variables have a significant and positive effect on third party settlement, which suggests that *Hegemony* is a complementary, not competing cause for this particular dependent variable.

Tables 3-5 present logit analyses for the three measures of *3PCM* success: reaching agreements, agreements ending overall claim, and compliance with agreements reached. Our initial results for reaching agreements (Table 3) did not provide support for our theory; the estimated parameters for *JointIOs* and *DemCom* were not statistically significant. The inclusion of *Hegemony* does not alter these results; *Hegemony* does not seem to promote agreements either (in Model 7 the effect is negative & significant). Table 4 adds *Hegemony* to the model predicting whether agreements reached end the overall issue at stake. Hegemony has little systematic impact on the results, although it is interesting to note that *JointIOs* has a significant and positive effect only in the bivariate model (Model 4) or the models including *Hegemony*. Finally, the results for compliance (Table 5) are not altered when *Hegemony* is included (Models 5-8); we still find a positive and significant influence for *JointIOs* and *DemCom*. In short, none of our empirical results is altered when we include a measure of hegemony in our models. If anything, we would conclude that *Hegemony* is complementary, rather than confounding, to joint institutional membership and democratic community strength as a cause of third party mediation use and success. This makes sense given our theoretical argument, which reasons that a strong democratic hegemon can contribute to a vigorous democratic community.[12]

An overall assessment of the relative potency of hegemony on the one hand, and the democratic community and its institutions on the other hand, can be done by recapping the relevant solo performances. While *DemCom*, *JointIOs*, and *Hegemony* each independently raises the likelihood of third parties settlement, their effects on success are quite different. Joint membership in pacific institutions does not help contending parties reach agreements, but does promote successful agreements with high rates of compliance and higher chances for issue claim resolution. A strong democratic community also has little efficacy in pressing disputants to reach agreements via third parties, but it also contributes to the signing of durable and effective agreements. Hegemony, however, plays no distinctive role. Like *JointIOs* and *DemCom*, a strong hegemon promotes the use of third party conflict management, but the hegemon's strength offers no explanatory power for understanding *3PCM* success. Those interested in a comparison of the substantive effects of *Hegemony*, *DemCom*, and *JointIOs* are directed to the discussion of Tenet 3.

We renounce hegemony as a competing explanation for democratic peace. While it appears to have a complementary effect on the use of third parties, it plays virtually no role in promoting their mediation success.

Tenet #3: Do not introduce factors as control variables merely on the grounds that they have an impact on the dependent variable.

According to Ray, decisions such as ours to include a battery of control variables are unwise and particularly egregious when the rationale is "brief and cryptic" (2003, 13). Ray presents Tenet 3 as a corollary of Tenets 1 and 2: throwing everything into a model except the kitchen sink "obscures the distinctions between confounding variables,

intervening variables, and alternative causal factors" (2003, 13). Even the faithful might wonder if the line separating carefully theorized explanatory variables from ad hoc control variables is blurred. Achen seeks to clarify the distinction by advocating the "Rule of Three," which limits researchers to no more than three explanatory variables, particularly if the theory is verbal and not based on a formal model (2002).[13]

Our research seems to be problematic on both fronts, because we include more than three independent variables (we have five) and our theory is constructed verbally (although it does build upon a dynamic mathematical model in Kadera, Crescenzi, & Shannon, 2003). Being schooled in the King, Keohane, and Verba (1994) approach to research design, our first reaction was "what about omitted variable bias?" Suppose, for example, that we exclude issue salience, that this variable was correlated with our key independent variables, and that it also made a significant contribution toward explaining the dependent variable. Neglecting to include such a variable might result in estimating a biased relationship between *DemCom, JointIOs*, and *3PCM*. Such bias might be particularly important if we were interested in reporting the substantive significance, or "oomph" for our key variables of interest.

Ho, Imai, King, and Stuart (2004) propose a solution to this problem of model specification. As they note, scholars typically run a series of models, pick the best fitting ones, and publish these stellar results in academic journals. "The problem for researchers is how to convince readers that we picked the right specification or at least a representative one rather than the one that most supported our favorite hypothesis" (Ho et al., 2004, 1). Ho and his colleagues advocate the use of nonparametric techniques (matching) to process the data before parametric techniques are applied; the pre-

processed data are less sensitive to particular choices of model specifications. The authors provide a computer program, MatchIt, to implement their new methodological approach.

Given the limits of our time and the difficulties of teaching old sinners the path of righteousness (e.g., learning R), we contemplated a simpler solution. Our approach is similar in spirit to Leamer's (1983) extreme bounds analysis (EBA). EBA involves 1) formulating a general family of models, 2) identifying prior distributions for the parameters of interest, 3) analyzing the sensitivity of inferences on the parameters of interest to the choice of the prior distributions, and 4) obtaining a narrower range for inferences (Pagan, 1990, 104-105; see also Leamer, 1983 and Leamer & Leonard, 1983). A straightforward sensitivity test for model specification is to present the range of parameters and substantive effects for all possible models. Ranges that vary wildly across models demonstrate uncertainty about the inferences the reader should draw from the analyses.[14] Furthermore, the inclusion of intervening or competing explanatory variables in the model will only heighten model sensitivity problems.[15]

We demonstrate this simple approach by comparing models for third party settlement attempts with three possible independent variables: *DemCom*, *JointIOs*, and *Hegemony* (akin to Table 2, Model 2). Seven model specifications are possible: three bivariate models, three models with two independent variables each, and one model with all three independent variables. The estimated parameters for *DemCom* vary from 0.046 to 0.095 across all seven models, the estimates for *JointIOs* vary from 0.049 to 0.090, and the estimates for *Hegemony* vary from 2.14 to 4.43. All of the estimated parameters retain their expected sign and the estimates do not exhibit a large amount of variance.

Similarly, we can report the sensitivity of our substantive effects. Suppose, for example, that we report the change in the predicted probability of a third party settlement attempt as we increase each variable from its minimum to its maximum value, while holding the other variables at their means. We would then calculate these substantive effects for each possible model and report the range in predicted probabilities for each variable. Across our seven models, we find *DemCom*'s weakest effect is to increase the likelihood of third party management by .0996 as it moves from its minimum to its maximum. At best, *DemCom* increases the probability of third party management by .1962. Increasing *JointIOs* from its minimum to its maximum results in a corresponding rise in the likelihood of third party usage of between 0.1182 and 0.2227. Doing the same for *Hegemony* improves the chances of third party management by between 0.1181 and 0.2487.[16] These results signal to the reader that the effects of all three variables are fairly consistent, although the size of the effect for a particular variable does depend on the model specification selected.

Reporting the range of estimated parameters and predicted probabilities for all possible models obviously becomes more difficult and time-consuming as the number of independent variables increases. Users of more complex models might find redemption by employing MatchIt (Ho et al., 2004), simplifying their statistical models, developing more theoretically rigorous formal models, or considering the domains within which theories apply (see also Starr in this volume). Doing so more carefully addresses the various problems raised by Ray (2003, and in this volume), Clarke (this volume), and Achen (2002 and in this volume). At a minimum, though, providing information about

the sensitivity of results to model specification would be better than merely reporting the "best" model.

Tenet #4: Do not control for variables that are related to each other or the key explanatory factor by definition.

Ray (2003) argues that common violations of this tenet occur when IR scholars include contiguity and distance or political similarity and regime type in the same empirical model. This is problematic because "the model containing both factors as control variables creates a background for the examination of empirical connections between other variables that is artifactually different from the 'real world' background in which the causal processes in question take place" (Ray, 2003, 18). A model that includes both contiguity and distance, for example, produces artificial results because both are geographic features, and hence are related conceptually (see also Oneal and Russett's and Starr's papers in this volume). Ray gives dispensation to include two control variables related by definition in the same model only when one wants to examine interaction effects (2003, 18-19).

By this logic, inclusion of *Hegemony* and *DemCom* in the same model would be unwise given that the hegemon's CINC score partially comprises *DemCom*. Similarly egregious would be the inclusion of two measures of systemic democracy, *PropDem* (the proportion of democracies in the international system) and *DemCom* in the same model.[17] Both are indicators of the same concept, although only the latter takes into account state capabilities and intensity of regime scores. Model 5 in Table 2 demonstrates what happens when both are included as independent variables. Because *PropDem* and *DemCom* are highly correlated ($\rho = 0.92$), the sign for *DemCom* flips from positive to

negative and becomes statistically insignificant. Thus we would errantly conclude that the strength of the democratic community has no effect on third party settlement attempts. This again illustrates why it is so essential to think carefully about the relationships among the independent variables in our models.

Benediction

Self-examination and reflection on Ray's tenets led us to several conclusions concerning the strength of the democratic community, its institutions, and peaceful dispute resolution. First, international organizations proved unconvincing as an intervening factor in the democratic community's causal connection to third party mediation. Instead, the strength of the democratic community may intervene in these institutions' promotion of peaceful settlement techniques. Likewise, hegemony does not play the role that many commonly speculate it does, namely as a rival explanation for democratic peace. Instead, hegemony is a complementary explanation: American (or British) muscle may *also* bring about third party mediation and success, but it does not do so *in place of* a strong democratic community and its institutions. Last, incorporation of control variables, provided that they are not related by definition to any of our key independent variables, has little effect on the latter's performance. The democratic community's strength and institutional vitality promote third party mediation and its success; and this finding persists when we control for the joint regime type of the disputants, the salience of the issue at hand, and whether the agreements that are reached are merely functional or procedural.

Doctrinal lessons beyond those already laid out in Ray's tenets also arose from this exercise. Most important is the eternal primacy of theory (also see Zinnes 1980).

Meticulous theorizing enables scholars to separate key independent variables from mere "controls," sort complementary causes from competing causes, and identify intervening variables. In addition, adherence to Ray's guidelines can be achieved using certain practical techniques. Granger causality analyses, for instance, helps researchers detect intervening variables. Furthermore, exploration of the sensitivity of both parameter estimates and substantive effects to model specification (whether done with software programs such as R or MatchIt or by more conventional methods) allows us to gauge the robustness of a key explanatory variable's performance in the company of control variables. Whether one views these recommendations as penance for the contrite or as (de)vices of the unorthodox is irrelevant. Ray's teaching is properly understood as an exhortation for scholars to more carefully consider the theoretical role of each control variable and its proper treatment in statistical models, not as an edict banning the use of control variables.

Table 1: Third Party Settlement Attempt Models with *DemCom* and *JointIOs* Together or Alone

		Model 1: Original Model	Model 2: No Controls	Model 3: *DemCom*, No Controls	Model 4: *JointIOs*, No Controls
Key Variables	*DemCom*	0.078**	0.046	0.068**	
		(0.035)	(0.030)	(0.028)	
	JointIOs	0.084***	0.049**		0.060***
		(0.022)	(0.020)		(0.019)
Control Variables	*DemDyad*	-0.641***			
		(0.148)			
	Salience	0.096***			
		(0.030)			
	Proc/Func SA	-0.648***			
		(0.127)			
	Constant	-1.468***	-1.067***	-0.979***	-1.002***
		(0.246)	(0.090)	(0.0836)	(0.077)
	N	1320	1444	1444	1444

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 2: Third Party Settlement Attempt Models with Hegemony as Additional Independent Variable

		Model 1: Original + *Hegemony*	Model 2: No Controls	Model 3: No *JointIOs* No Controls	Model 4: No *DemCom* No Controls	Model 5: *PropDem* & *DemCom*, No Controls
Key Variables	*DemCom*	0.093***	0.072**	0.095***		-0.009
		(0.032)	(0.028)	(0.028)		(0.068)
	JointIOs	0.113***	0.076***		0.090***	0.053***
		(0.023)	(0.021)		(0.020)	(0.021)
	Hegemony	4.972***	4.430***	4.430***	3.804***	
		(1.208)	(1.084)	(1.008)	(1.059)	
	PropDem					1.288
						(1.406)
Control Variables	*DemDyad*	-0.579***				
		(0.149)				
	Salience	0.099***				
		(0.029)				
	Proc/Func SA	-0.611***				
		(0.128)				
	Constant	-2.667***	-2.115***	-1.726***	-1.875***	-1.383***
		(0.390)	(0.278)	(0.246)	(0.261)	(0.3593)
	N	1320	1444	1444	1444	1444

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 3: Reaching Agreements

		Model 1: Original Model	Model 2: *DemCom* & *JointIOs*	Model 3: *DemCom* Alone	Model 4: *JointIOs* Alone	Model 5: Original + *Hegemony*	Model 6: Original + *Hegemony*, No Controls	Model 7: *DemCom* , *Hegemony* , No Controls	Model 8: *JointIOs* , *Hegemony* , No Controls
Key Variables	*DemCom*	-0.029	0.006	0.018		-0.035	-0.004	0.001	
		(0.030)	(0.024)	(0.023)		(0.030)	(0.025)	(0.025)	
	JointIOs	0.021	0.027		0.029	0.013	0.018		0.018
		(0.021)	(0.019)		(0.018)	(.022)	(0.020)		(0.020)
	Hegemony					-1.275	-1.498	-1.745*	-1.455
						(1.110)	(0.965)	(0.923)	(0.931)
Control Variables	*DemDyad*	-0.250*				-0.269**			
		(0.133)				(0.134)			
	Salience	-0.062**				-0.063**			
		(0.026)				(0.026)			
	Proc/Func SA	0.734***				0.720***			
		(0.118)				(0.118)			
	Constant	0.551***	0.212***	0.259***	0.220**	0.862**	0.567**	0.654**	0.552**
		(0.209)	(0.077)	(0.070)	(0.070)	(0.345)	(0.241)	(0.220)	(0.224)
	N	1320	1444	1444	1444	1320	1444	1444	1444

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 4: Agreement Ends Issue Claim

		Model 1: Original Model	Model 2: No Controls	Model 3: *DemCom*, No Controls	Model 4: *JointIOs*, No Controls	Model 5: Original + *Hegemony*	Model 6: Original + *Hegemony*, No Controls	Model 7: *DemCom*, *Hegemony*, No Controls	Model 8: *JointIOs*, *Hegemony*, No Controls
Key Variables	*DemCom*	0.043	0.061	0.082**		0.060	0.077*	0.098**	
		(0.050)	(0.042)	(0.040)		(0.050)	(0.043)	(0.042)	
	JointIOs	0.057	0.048		0.065*	0.077**	0.071*		0.087**
		(0.036)	(0.036)		(0.033)	(0.039)	(0.039)		(0.038)
	Hegemony					3.059	3.107*	2.031	2.429
						(1.891)	(1.758)	(1.638)	(1.698)
Control Variables	*DemDyad*	0.042				-.000			
		(0.265)				(0.267)			
	Salience	-0.099**				-0.107**			
		(0.045)				(0.045)			
	Constant	0.192	-0.444***	-0.351**	-0.389**	-0.471	-1.197**	-0.811**	-0.970**
		(0.345)	(0.138)	(0.120)	(0.132)	(0.534)	(0.451)	(0.394)	(0.430)
	N	376	397	397	397	376	397	397	397

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 5: Claimants Comply With Agreement

		Model 1: Original Model	Model 2: *DemCom* & *JointIOs*	Model 3: *DemCom* Alone	Model 4: *JointIOs* Alone	Model 5: Original Model + *Hegemony*	Model 6: *DemCom*, *JointIOs*, *Hegemony*, No Controls	Model 7: *DemCom*, *Hegemony*, No Controls	Model 8: *JointIOs*, *Hegemony*, No Controls
Key Variables	*DemCom*	0.079*	0.081**	0.127***		0.080*	0.087**	0.118**	
		(0.043)	(0.036)	(0.035)		(0.045)	(0.039)	(0.038)	
	JointIOs	0.093***	0.108***		0.135***	0.095**	0.113***		0.132***
		(0.033)	(0.033)		(0.033)	(0.035)	(0.035)		(0.035)
	Hegemony					0.165	0.694	-0.840	-0.310
						(1.637)	(1.509)	(1.407)	(1.383)
Control Variables	*DemDyad*	0.596***				0.596**			
		(0.231)				(0.230)			
	Salience	-0.117***				-0.118***			
		(0.035)				(0.035)			
	Proc/Func SA	0.463***				0.465**			
		(0.178)				(0.180)			
	Constant	1.181***	0.704***	0.875***	0.794***	1.143**	0.540	1.065***	0.865**
		(0.283)	(0.111)	(0.101)	(0.105)	(0.478)	(0.373)	(0.334)	(0.332)
	N	768	826	826	826	768	826	826	826

* $p < .10$, ** $p < .05$, *** $p < .01$

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Endnotes

[1] Ray (2004) applies his recommendations to the dyadic democratic research program, examining bilateral militarized conflict. Our application is different because we focus on the use and effectiveness of third party conflict management and our theory emphasizes systemic factors, such as the strength of the democratic community.

[2] The data for Western Europe includes territorial and river claims, while the data for the Middle East only codes river claims.

[3] Paul Hensel collected these data, which are available at www.icow.org.

[4] Six indicators construct the general measure of territorial claim salience: (1) territory that is claimed by the state as homeland territory, rather than as a colonial or dependent possession, (2) territory located on the mainland rather than an offshore island, (3) territory that is contiguous to the nearest portion of the state, (4) territory that is known or suspected to contain potentially valuable resources, (5) territory with a militarily or economically strategic location, and (6) presence of an explicit ethnic, religious, or other identity basis for the claim. Six indicators measure river claim salience: (1) river location in the state's homeland territory rather than in colonial or dependent territory, (2) navigational value of the river, (3) size of the population served by the river, (4) presence of a fishing or other resource extraction industry on the river, (5) hydroelectric power generation along the river, and (6) irrigational value of the river. And six indicators tap maritime claim salience: (1) maritime borders extending from homeland rather than colonial or dependent territory, (2) a strategic location of the claimed maritime zone, (3) fishing resources within the maritime zone, (4) migratory fishing stocks crossing the maritime zone, (5) known or suspected presence of oil resources within the maritime

zone, and (6) relation of the maritime claim to an ongoing territorial claim (involving maritime areas extending beyond either claimed coastal territory or a claimed island).

[5] See Mitchell, Kadera, and Crescenzi (2005) for a detailed description of each measure.

[6] Because our theory and analyses focus on the systemic level, and because we presently only have data for a few regions, we do not address Tenet 5's recommendation to distinguish between across space and over time relationships.

[7] It is also possible for the relationship to be endogenous, as Russett and Oneal (2001) suggest in their work on the Kantian triangle.

[8] These data also come from Hensel's MTOPS dataset.

[9] We employed the Augmented Dickey Fuller test for non-stationarity with four lags. The Granger Causality tests were generated from an ADL model with four lags per variable. When we estimated Granger Causality tests for the series in levels, the results were similar, although the effect of *IOs* on *DemCom* was much weaker (p = .107).

[10] Emphasis in original.

[11] We also employed an alternative measure of hegemony, the systemic concentration score developed by Singer, Bremer, and Stuckey (1972). The results presented in this paper are nearly identical to models using this alternative measure.

[12] In terms of operationalization, *DemCom* variable is partially comprised of the hegemon's CINC score. If a democratic hegemon's CINC score rises; *DemCom* must also rise (*ceteris paribus*), given its functional form. Including *DemCom* and *Hegemony* in the same model, therefore, is a potential violation of Ray's Tenet 4. Yet, because high levels of *DemCom* can be realized without a democratic hegemon, *DemCom* and

Hegemony are not necessarily correlated. In fact, in our dataset, they are inversely related.

[13] Achen (this volume) demonstrates that problems can exist even with few independent variables. If the relationships between the Xs and Y exhibit even small levels of nonlinearity, severely biased parameter estimates result.

[14] An even simpler procedure involves reporting a series of models in the same table, as we do in Tables 1 through 5. It may be better to report the "best" model and then provide information about the range of parameters/predicted probabilities for all other possible models. Choosing a few models out of the set of possible models is still arbitrary.

[15] Levine and Renelt (1992) develop a more complex methodology based on an extreme-bounds test. They estimate a model (to explain economic growth) with a key set of variables that appear in typical regressions (initial level of income, investment rate, secondary school enrollment rate, and population growth rate) in the economic literature, include up to three additional control variables, and then examine the variance in the estimates of a key *z* variable. They conclude that if the lower extreme bound is negative, while the upper extreme bound is positive, then the variable *z*'s effect is not robust. Sala-I-Martin (1997) critiques this approach and argues that we need to focus on the distribution of estimates, rather than the extremes. His alternative method demonstrates that many independent variables have a robust effect on economic growth.

[16] In reporting these substantive effects, we adhere to Ray's recommendation to use "simple changes in probabilities on a scale from 0 to 1" instead of "percents of percents" (2003: 12).

[17] *PropDem* calculates the annual percent of COW system members scoring six or higher on the Polity IV democracy scale.