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 US 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 American 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, 2004). 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, US 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, 2004) 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), we also recognize the important role played by international organizations. While democratic institutions help spread conflict management norms, their distinctive contribution is in helping 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 more likely to be successful when those disputants have bought into international organizations with pacific ideals. Thus the presence of strong institutions buttresses compliance with any agreements reached.

Our empirical analyses employ Western Hemisphere data on territorial, maritime, and cross-border river claims collected by the Issue Correlates of War (ICOW) Project (Hensel, 2001; Hensel, Mitchell, & Sowers, 2004). For analyses in this paper, the universe of cases includes all peaceful attempts to settle a contentious issue claim (n = 1021). These peaceful attempts can either be bilateral negotiations or can involve third parties in binding (arbitration and adjudication) or non-binding (mediation, inquiry, conciliation, etc.) ways. Our first dependent variable, *3PCM*, indicates when third parties are employed in peaceful settlement attempts. 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 overall 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 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 –6.85 to 9.69, 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,[2] we counted the number of joint memberships the claimants had in international organizations whose charters call for the pacific settlement of disputes.

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, 3) *ProcSA*, which accounts for settlements that merely identified procedures for future negotiations over the contested issue (e.g., agreeing to mediation), and 4) *FuncSA*, which records situations where the parties could agree only about functional issues, such as fishing in disputed waters or troop placement, rather than the overall issue at stake.

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 agreements (Table 3) when the democratic community is

strong. However, the democratic community does not seem to influence whether these agreements end contention over the issue at stake (Table 4) or whether disputants comply with them (Table 5). Resolution of issues and compliance are instead achieved 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[3], 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's 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, 2004), 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*.[4] 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. Given the relatively low correlation between these two variables in the entire sample ($\rho = 0.1991$), 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 agreements ending the overall claim (Table 4). Increases in the strength of the democratic community enhance the likelihood that agreements are struck, while joint institutions have no effect. These results are robust across various model specifications. With respect to compliance, we do see slightly different results depending on model specification. In the full original model, which included four control variables (Model 1 of Table 5), democratic community strength was negatively and significantly related to compliance (contrary to our theory). Joint institutions, on the other hand, had a positive and significant effect. When we eliminate the control variables (Model 2 in Table 5), the *DemCom* parameter becomes indistinguishable from zero, suggesting that the democratic community's deleterious effect on compliance may have been merely an artifact of model specification.

In general, however, our original results seem to be supported. A strong democratic community enhances the use of third party conflict management and the likelihood that such efforts will produce agreements, while joint institutions encourage both the use of 3PCM and compliance with agreements reached. 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 distinct 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, namely 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 1900-2001, *TotalIOs*. This is the yearly number of state memberships in institutions that call for peaceful dispute settlement.[5] 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.[6]

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 slightly different role in the realization of a Kantian world. While a strong democratic community spurs the use of third parties as mediators, institutions help enforce the agreements reached by such means. 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,"[7] 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 American 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 use the Correlates of War (COW) project's composite indicator of national capabilities (CINC) for the United States.[8] The resulting variable is named *Hegemony*.

If the US pressures states to join international 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, we find that *Hegemony* and *JointIOs* are only mildly correlated ($\rho = .153$). Moreover, *JointIOs* has a positive and statistically significant effect on *3PCM* in our original model (Model 1 in Table 2), and this relationship is stable across specifications that include *Hegemony* (Models 2 through 5 in

Table 2). Also unchanged is the contribution of pacific institutions toward the success of agreements that are brokered by third parties. A comparison of the original model with those that incorporate US strength (Model 5 in Tables 3, 4, and 5) indicates that *JointIOs'* performance as a predictor of success changes only once. When predicting issue resolution with *Hegemony* and the standard controls (Model 5 in Table 4), *JointIOs* loses its significance. We conclude that *Hegemony* is complementary, rather than confounding, to joint institutional membership as a cause of third party mediation and success.

At first blush, the hegemony argument might also seem to counter our hypotheses concerning the contributions of a strong democratic community. But because our theory reasons that a strong democratic hegemon can contribute to a vigorous democratic community, the hegemonic effects argument suggests a complementary factor. The *Hegemony* variable is highly correlated with *DemCom* (ρ = .7123). This is not an epiphany because the *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, violates Tenet 4. Although our theory portrays *Hegemony* as a complementary cause, we expect its inclusion in the model to introduce multicollinearity due to its mathematical relationship with *DemCom*, and thereby weaken the democratic community's effect on mediation.

What actually happens when *Hegemony* enters our statistical models? In every specification where *Hegemony* and *DemCom* are both predictors of third parties as mediators, *DemCom* is no longer significant (see Table 2). Equally problematic, though

in different ways, are the consequences for predicting the three success outcomes. Despite *Hegemony*'s insignificant effect on the realization of agreements when *DemCom* is not in the model (Model 8 in Table 3), it becomes negative and statistically significant when sharing the explanatory task with the strength of the democratic community (Models 5, 6, and 7 in Table 3). Clearly, American power does not bring agreements to fruition. Rather, the strength of the democratic community, whose coefficient is positive and statistically significant across all specifications in Table 3, achieves that outcome. For ending claims, the measure of US might remains positive and significant across all four models (Models 5 through 8 of Table 4), but *DemCom*'s contribution shifts from being insignificant to having a disturbing negative and statistically significant impact. Turning to compliance, we note that neither *Hegemony* nor *DemCom* plays a predictive role in isolation from the other (model 3 and model 8[9] in Table 5). Without controls, accounting for both *Hegemony* and *DemCom* in the same model does not improve the performance of either (Model 7 in Table 5), suggesting again that enforcement of agreements lies uniquely in the domain of international organizations. Because neither the dominant state nor the democratic community brings about compliance, our results are unchanged. However, when we add *Hegemony* to our original model (model 5 of Table 5), two troubling findings appear. American power now seemingly compels compliance, and the multilateral features of a strong democratic community instead appear to discourage it. Yet given the mathematical relationship between *Hegemony* and *DemCom*, we are reluctant to put much faith in substantive conclusions drawn from models including both as explanatory factors.

An overall assessment of the relative potency of American 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 as mediators, their effects on success are quite different. Joint membership in pacific institutions uniquely drives compliance; neither *DemCom* nor *Hegemony* has an effect. A strong democratic community alone presses disputants to reach agreements via third parties: *JointIOs* and *Hegemony* have no input. Hegemony, however, plays no distinctive role. With *JointIOs*, it shares the task of explaining the remaining success variable, whether agreements resolve underlying issues. 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. Virtually without effect on international organizations' contribution to third party use and success, it offers no contest. Hegemony also does not vie with a strong democratic community: our theory subsumes a *Pax Americana* explanation. Because the hegemon's role is not "clearly distinguished theoretically" (Ray, 2003, 10), its inclusion in a model that also uses *DemCom* is unwarranted.

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 argues that Tenet 3 is 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" (Ray, 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).[10]

Our research seems to be problematic on both fronts, because we include more than three independent variables (we have six) 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 preprocess the data before parametric techniques are applied; the

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

Given the limits of our time and the difficulties with 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 estimated models. Ranges that vary wildly across models demonstrate uncertainty about the inferences the reader should draw from the analyses.[11] Furthermore, the inclusion of intervening or competing explanatory variables in the model will only heighten model sensitivity problems.

We demonstrate this simple approach by comparing models for third party settlement attempts with three possible independent variables: *DemCom*, *JointIOs*, and *Hegemony*. 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 -0.058 to 0.086 across all seven models, the estimates for *JointIOs* vary from 0.103 to 0.117, and the estimates for *Hegemony* vary from 5.03 to 7.14. The narrow range of the estimate for *JointIOs* indicates that its positive influence on the use of third parties is robust. However, the

high correlation between *DemCom* and *Hegemony* produces very sensitive estimates for their parameters.

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. For our particular three-variable model, we find *DemCom*'s worst possible effect is to decrease the likelihood of third party management by .1758 as it moves from its minimum to its maximum. At best, *DemCom* increases the probability of third party management by .2761. Increasing *JointIOs* from its minimum to its maximum results in a corresponding rise in the likelihood of third party usage of between 0.2684 and 0.3033. Doing the same for *Hegemony* improves the chances of third party management by between 0.8253 and 0.901.[12] These results signal to the reader that the effects of *JointIOs* and *Hegemony* are fairly consistent, while the effect of *DemCom* varies depending on the model specification selected (although as we showed above, this is due to the high correlation between *DemCom* and *Hegemony*).

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, or developing more theoretically rigorous formal models. Doing so more carefully addresses the various problems raised by Ray (2003) and Achen (2002, 2004). 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. 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 US CINC scores partially comprise *DemCom*. Similarly egregious would be the inclusion of two measures of systemic democracy, *PropDem* and *DemCom* in the same model.[13] 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 1 demonstrates what happens when both are included as independent variables. Because *PropDem* and *DemCom* are highly correlated ($\rho = 0.87$), the sign for *DemCom* flips from positive to negative. Thus we would errantly conclude that the strength of the democratic community makes third party settlement attempts significantly less likely. 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, US 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 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*	0.095***	0.060**	0.086***	
		(0.031)	(0.029)	(0.026)	
	JointIOs	0.137***	0.117***		0.110***
		(0.021)	(0.019)		(0.018)
Control Variables	*DemDyad*	-0.553***			
		(0.200)			
	Salience	0.095***			
		(0.035)			
	ProcSA	-0.309**			
		(0.163)			
	FuncSA	-0.348*			
		(0.216)			
	Constant	-1.953***	-1.440***	-1.102***	-1.299***
		(0.290)	(0.097)	(0.076)	(0.088)

* 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*	-0.026	-0.058	-0.034		-0.222***
		(0.044)	(0.041)	(0.039)		(0.058)
	JointIOs	0.135***	0.117***		0.103***	0.137***
		(0.021)	(0.019)		(0.018)	(0.020)
	Hegemony (US CINC)	6.722***	7.140***	7.104***	5.035***	
		(1.813)	(1.687)	(1.649)	(1.206)	
	PropDem					9.250***
						(1.644)
Control Variables	*DemDyad*	-0.338*				
		(0.199)				
	Salience	0.109***				
		(0.035)				
	ProcSA	-0.329**				
		(0.165)				
	FuncSA	-0.258				
		(0.213)				
	Constant	-3.147***	-2.568***	-2.218***	-2.143***	-4.085***
		(0.439)	(0.294)	(0.276)	(0.229)	(0.493)

* 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*	0.055**	0.065**	0.062**		0.122***	0.112***	0.109***	
		(0.027)	(0.026)	(0.025)		(0.041)	(0.037)	(0.037)	
	JointIOs	-0.011	-0.011		0.005	-0.010	-0.010		0.002
		(0.020)	(0.019)		(0.018)	(.020)	(0.019)		(0.018)
	Hegemony (US CINC)					-3.567**	-2.642*	-2.600*	0.826
						(1.656)	(1.554)	(1.549)	(1.083)
Control Variables	*DemDyad*	-0.385**				-0.482***			
		(0.170)				(0.175)			
	Salience	-0.099***				-0.104***			
		(0.030)				(0.030)			
	ProcSA	0.363***				0.370**			
		(0.147)				(0.147)			
	FuncSA	0.838***				0.786**			
		(0.200)				(0.199)			
	Constant	0.923**	0.378***	0.345***	0.356***	1.535***	0.784***	0.746***	0.224
		(0.244)	(0.084)	(0.068)	(0.078)	(0.376)	(0.254)	(0.249)	(0.190)

* 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*	-0.03	-0.012	0.009		-0.216***	-0.170**	-0.149*	
		(0.052)	(0.051)	(0.049)		(0.083)	(0.085)	(0.081)	
	JointIOs	0.064*	0.067*		0.069**	0.061	0.066*		0.059*
		(0.036)	(0.036)		(0.035)	(0.038)	(0.038)		(0.036)
	Hegemony (US CINC)					10.594***	9.414***	9.381***	3.942*
						(3.556)	(3.588)	(3.442)	(2.275)
Control Variables	*DemDyad*	0.698*				0.900**			
		(0.390)				(0.415)			
	Salience	-0.087				-0.093			
		(0.062)				(0.065)			
	Constant	0.215	-0.274	-0.091	-0.268*	-1.407**	-1.737***	-1.553***	-0.899**
		(0.443)	(0.168)	(0.135)	(0.164)	(0.674)	(0.590)	(0.552)	(0.408)

* 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*	-0.067**	-0.016	0.013		-0.159***	-0.049	-0.018	
		(0.040)	(0.035)	(0.036)		(0.056)	(0.046)	(0.044)	
	JointIOs	0.127***	0.133***		0.119***	0.126***	0.134***		0.118***
		(0.032)	(0.033)		(0.030)	(0.032)	(0.033)		(0.030)
	Hegemony (US CINC)					5.397**	2.218	2.124	0.462
						(2.470)	(2.109)	(2.012)	(1.577)
Control Variables	*DemDyad*	0.647**				0.839**			
		(0.303)				(0.338)			
	Salience	-0.105***				-0.099**			
		(0.040)				(0.040)			
	ProcSA	0.379**				0.356*			
		(0.212)				(0.210)			
	FuncSA	1.050***				1.138***			
		(0.286)				(0.303)			
	Constant	1.050***	0.653***	0.952***	0.720***	0.160	0.31	0.625*	0.645**
		(0.309)	(0.117)	(0.098)	(0.109)	(0.506)	(0.352)	(0.327)	(0.280)

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

Bibliography

Achen, Christopher H. 2004. Let's put garbage-can regressions and garbage-can probits where they belong. Paper presented at the Annual Meeting of the Peace Science Society, Houston, TX.

Crescenzi, Mark J.C. and Andrew J. Enterline. 1999. Ripples from the waves? A systemic, time-series analysis of democracy, democratization, and interstate war. *Journal of Peace Research* 36: 75-94.

Fortna, Virginia Page. 2004. *Peace time: Cease-fire agreements and the durability of peace.* Princeton, N.J.: Princeton University Press.

Gates, Scott, Torbjorn L. Knutsen, and Jonathon W. Moses. 1996. Democracy and peace: A more skeptical view. *Journal of Peace Research* 33: 1-10.

Gleditsch, Nils Petter and Håvard Hegre. 1997. Peace and democracy: Three levels of analysis. *Journal of Conflict Resolution* 41: 283-310.

Hensel, Paul R. 2001. Contentious issues and world politics: The management of territorial claims in the Americas, 1816-1992. *International Studies Quarterly* 45: 81-109.

Hensel, Paul R., Sara McLaughlin Mitchell, and Thomas E. Sowers II. 2004. Bones of contention: Comparing territorial, maritime, and river issues in the Western Hemisphere. Working paper available at www.icow.org.

James, Patrick, Eric Solberg, and Murray Wolfson. 1999. An identified systemic model of the democracy-peace nexus. *Defence and Peace Economics* 10: 1-37.

Kadera, Kelly M., Mark, J.C. Crescenzi, and Megan L. Shannon. 2003. Democratic survival, peace, and war in the international system. *American Journal of Political Science* 47: 234-247.

King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing social inquiry: Scientific inference in qualitative research*. Princeton, NJ: Princeton University Press.

Maoz, Zeev. 1996. *Domestic sources of global change*. Ann Arbor, MI: University of Michigan Press.

Mitchell, Sara McLaughlin. 2002. A Kantian system? Democracy and third-party conflict resolution. *American Journal of Political Science* 46: 749-759.

Mitchell, Sara McLaughlin, Gates, Scott, and Håvard Hegre. 1999. Evolution in democracy-war dynamics. *Journal of Conflict Resolution* 43: 771-792.

Mitchell, Sara McLaughlin, Kelly M. Kadera, and Mark J.C. Crescenzi. 2004. Practicing democratic community norms: Third party conflict management and success. Working paper available at http://saramitchell.org.

Oneal, John M. and Bruce Russett. 1999. The Kantian peace: The pacific benefits of democracy, interdependence, and international organizations, 1885-1992. *World Politics* 52: 1-37.

Pevehouse, Jon. 2002a. Democracy from the outside-in? International organizations and democratization. *International Organization* 56: 515-549.

Pevehouse, Jon. 2002b. With a little help from my friends? Regional organizations and the consolidation of democracy. *American Journal of Political Science* 46: 611-626.

Rasler, Karen and William Thompson. 2004. The democratic peace and a sequential, reciprocal, causal arrow hypothesis. *Comparative Political Studies* 37: 879-908.

Ray, James Lee. 2003. Explaining interstate conflict and war: What should we control for? *Conflict Management and Peace Science* 20: 1-31.

Russett, Bruce and John M. Oneal. 2001. *Triangulating peace: Democracy, interdependence, and international organizations*. New York: Norton.

Shannon, Megan. 2004. The democratic community and the expansion of international organizations. Paper presented at the Journeys in World Politics Workshop, October 28-31, University of Iowa, Iowa City, IA.

Starr, Harvey. 1992. Why don't democracies fight one another—Evaluating the theory-findings feedback loop. *Jerusalem Journal of International Relations* 14: 41-59.

Thompson, William. 1996. Democracy and peace: Putting the cart before the horse? *International Organization* 50: 141-174.

Walter, Barbara. 2001. *Committing to peace: The successful settlement of civil wars*. Princeton, N.J.: Princeton University Press.

Zinnes, Dina. 1980. Three puzzles in search of a researcher: Presidential address. *International Studies Quarterly* 24: 315-342.

Endnotes

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

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

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

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

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

[6] 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).

[7] Emphasis in original.

[8] We also used Britain's CINC score and a measure that replaced Britain's score with the US's score in 1900. In addition, we controlled for claims that involved either Britain or the U.S. as a challenger or target. The results are similar.

[9] Because *Hegemony* and *JointIOs* are not highly correlated, we can consider *Hegemony*'s performance in this model to parallel that in a bivariate setup.

[10] Achen (2004) 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.

[11] An even simpler version of this 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.

[12] 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).

[13] Recall that *PropDem* calculates the percentage of COW system members per year that score six or higher on the Polity IV democracy scale.