Measuring the Democracy-Repression Nexus

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Abstract

A considerable amount of time and intellectual energy has been expended detailing the nature of the relationship between democracy and a state's use of repressive force against its citizens. This article moves the discussion forward both methodologically and substantively. I use a fully Bayesian structural model with latent variables to mitigate the effects of measurement error in both democracy and repression. Further, I estimate two models, one treating democracy as a single overarching concept, similar to the strategy followed by Davenport and Armstrong (2004), Poe and Tate (1994) and one treating democracy as two-dimensional (voice and veto) as suggested by Davenport (2007*b*). I find that the two models, though closely related offer substantively different predictions. Statistical measures of fit favor the two-dimensional model. Further, I find that the effects of voice and veto are each strongly conditioned by the other.

Certainly in the post-War period and undoubtedly before, an intuition has pervaded the thinking of social scientists and policy makers – namely that democracy should, in general, lead to "better" circumstances for a country's citizens with respect to human rights. A relatively large amount of intellectual energy has been devoted to examining the extent to which empirical evidence supports this claim. While these efforts have generated overwhelming empirical support for this proposition, they have often done so in a manner that confirms the general suspicion without shedding much light on the underlying mechanisms involved.

The theoretical and empirical work relating various facets of democracy to state repression has proceeded in one of two ways. The majority of work, considers the effects of *democracy* as a single overarching concept. It offers a number of theoretical avenues whereby democracy *could*, and perhaps should, influence a state's repressive policy choice. However, the empirical portion of the investigation generally utilizes a single variable (or a few variables in separate equations for "robustness") measuring democracy [e.g., Polity IV(Marshall and Jaggers 2001), Vanhanen(Vanhanen 2000), or Freedom House(Piano and Puddington 2008)] rather than the specific aspects of democracy identified by the various theoretical routes to democratic pacification (Davenport 1996*a*, 1999, 2004, Fein 1995, Mitchell and McCormick 1988, Poe and Tate 1994, Poe, Tate and Keith 1999, Regan and Henderson 2002). This work is interesting, in that it provides empirical support for an intuitively reasonable proposition. However, empirically it falls short of supporting any particular theory about *why* democracy matters. Another growing body of work attempts to consider the effects of these various facets of democracy on repression (Armstrong and Davenport 2003, Bueno de Mesquita et al. 2005, Davenport 2007*b*,*a*). While this literature has moved the discussion forward, it has done so without giving serious consideration to measurement or providing interesting tests of the difference between using a single variable and multiple variables both statistically and substantively. Below I remedy these problems.

One of the main problems in this literature is that very few empirical pieces take measure-

ment seriously. As the measurement of variables is so fundamentally important to the results we obtain and inferences we make, this seems an unsustainable situation. I use a fully Bayesian structural model to build a set of confirmatory factor analyses for democracy and repression and then include those measurements in a predictive statistical model. These show what the conventional wisdom has suggested - that democracy *can* be well represented by a single dimension. When broken into two different dimensions (namely voice and veto), the two indicators exhibit high correlations (around 0.9). While many would use this to argue that democracy *is* unidimensional, I will show that maintaining these two distinct, though closely related dimensions is, in fact, better. Further, there are substantively interesting differences in the predictions of each model makes.

Another potential problem is that when different democracy variables are used in the same model, they are often not allowed to interact - they are simply entered additively into the model. I show below that this is a mistake - that the effects of both types of democracy (here, voice and veto) are conditional on the values of the other. Confirming the findings of Davenport and Armstrong (2004), I find that moves toward democracy only prove fruitful for human rights when other elements of democracy are in place. This is a much more nuanced view than that suggested by Bueno de Mesquita et al. (2005) where all democratic components were entered additively.

I proceed in four sections. Next I provide a brief history of the literature on the domestic democratic peace, focusing on the contribution of Davenport (2007*b*) wherein he takes stock of and consolidates our knowledge on the subject. Following that, I discuss the variables used to operationalize the various different theoretical constructs in the model. In section 3, I discuss the models and provide their results. I conclude in section 4 with some suggestions for future research in this area.

1 A Brief History of the Domestic Democratic Peace

The democracy-repression nexus refers to the broad literature that attempts to shed light on the relationship between democracy and state repression or human rights violations.[1] The studies in this literature provide interesting snap-shots of the evolution of both the measurement and understanding of democracy and repression. Scholars here have tended to take an institutional (minimalist) view of democracy and focus on life integrity violations to avoid endogeneity as much as possible. Others offer a theoretical reason for focusing on this relatively small set of rights. As Carleton and Stohl (1985) note - these rights were explicitly singled out as important by the US Congress in the International Development and Food Assistance Act of 1975 and the International Security Assistance and Arms Export Control Act of 1976. Either way, the argument here is that repression cannot cause a set of institutional arrangements.

Studies of state repression proceeded largely on country-by-country or regional basis until the mid-1980's (e.g., Dallin and Breslauer 1970, Duff and McCammant 1976, Fruhling and Woodbridge 1983, Gibson 1988). Lopez and Stohl (1989) and Stohl and Lopez (1984, 1986) aggregated these works in an effort to give some coherence to the subject as a global research agenda. As a discipline, the need to tie these studies together with cross-national research was clear.

In 1994, Poe and Tate wrote what would become the seminal article in the field. There, they hypothesized that either through democratic norms, democratic behavior or democratic institutions, democracy makes states less likely to violate the physical integrity rights of their citizens. Using both the Freedom House political rights measure (Piano and Puddington 2008) and Vanhanen's polyarchy measure (Vanhanen 2000), they found that democracy was one of the most important factors in curbing a state's repressive tendencies. Most of the literature in the ensuing decade would confirm this general finding.

Democracy has continued to receive virtual primacy in the explanations for state repressive

[1] See Davenport (2007*a*) for a nice review of the field.

activity. In fact, as Davenport and Armstrong (2004) state, "Repeatedly, democratic political systems have been found to decrease political bans, censorship, torture, disappearances, and mass killing, doing so in a linear fashion across diverse measurements, methodologies, time-periods, countries and contexts."[2] This key finding was probed and pushed in different directions. Davenport (1996*b*) and Zanger (2000) considers the temporal pattern of respect for civil liberties (censorship and sanctions). Still others, suggested a different functional form of the relationship such as a second-degree polynomial (Fein 1995, Regan and Henderson 2002) or a threshold (Davenport and Armstrong 2004).

Scholars have tended to focus on physical integrity rights to the exclusion of other potentially interesting human rights. The reasons for this generally focus on endogeneity, though there are substantive reasons to privilege these particular rights, which I discuss briefly below. The overwhelming majority of work in this area has used the Political Terror Scale (Gibney and Dalton 1996). This is a five-point scale where increasing values refer to increasing severity and scope of the activities covered - torture, political imprisonment, extrajudicial killing and forced disappearance. Recently, Cingranelli and Richards (2004) released a dataset that disaggregates these various components.

There have been disagreements about dimensionality on both sides of the equation. McCormick and Mitchell (1997) suggest disaggregating the political terror scale into two distinct dimensions, though in a more convincing paper, Cingranelli and Richards (1999) show that the observed physical integrity rights indicators are well-explained by a single dimension. The more interesting discussion of dimensionality occurs on the democracy side. Both Bueno de Mesquita et al. (2005) and Armstrong and Davenport (2003) suggest disaggregating the the Polity IV variable into individual components, though they each take slightly different approaches to this. Neither approach was theoretical in nature (i.e., there was no attempt to test a disaggregate theory of democratic pacification). Davenport (2007*b*), in the most rigorous and

[2]There are few studies that say democracy does not matter, but one in this vein is Franklin (1997) who shows that IMF conditionality matters for state repression, but that democracy (in the form of Political Rights) does not have a significant effect on state repression.

empirically ambitious piece of work on the subject attempted to tease out the differential effects of *voice* (electoral accountability of democratic leaders) and *veto* (institutional constraints on policy choice) on repressive behavior. Here, all models were estimated with only one democratic concept in them. The model statistics do not offer convincing advice on which model is best, so there is no real ability to consider the extent to which different types of democracy are substitutes for each other, or whether they are necessary conditions for each other.

The remainder of this work will be aimed at pushing Davenport's (2007*b*) forward by estimating measurement models for voice, veto and repression and using a full structural model to predict the extent to which repression responds to democracy.

2 Operationalizing Voice, Veto and State Repression

In this section, I discuss the the data used to obtain the best possible estimates of the main concepts of interest - voice, veto and state repression. The method used below is a fully Bayesian structural model with latent variables (Lee 2007). This will allow me to not only use confirmatory factor analysis to estimate better underlying dimensions of voice, veto and repression, but to include these new measures in a predictive model.

2.1 Voice

The theoretical behind the "voice" argument is quite simple - a hallmark of democracy is that leaders face periodic elections where their electoral fate is decided by the voters. Even the more minimal definitions of contemporary democracy require free and fair elections (Schumpeter 1962). As Davenport (2007*b*) suggests, leaders understand that if they want to maintain their elected positions, they must, in general, support and enact policies that are in line with the preferences of at least a plurality of the voters. So, the fear of an inevitable electoral sanction will keep democratic leaders from enacting harshly repressive policies. For voice to have an

impact on repression, then, there must be widespread suffrage and multiple political parties competing for votes in free and fair elections.

Davenport (2007*b*) uses two indicators of voice. The first is the measure of suffrage developed by Bollen and Paxton (2000). This simply records the proportion of the adult population with the right to vote. He also uses the modification to the Vanhanen (2000) polyarchy measure discussed by Gates et al. (2006), which I also use below. Rather than combining these two measures, Davenport estimates different models. Any difference in the results will presumably not be owing to a difference in the country's *true* voice, rather it will be due to a difference in the measurement strategies for these particular variables and measurement error. The measure I present below mitigates the effect of measurement error.

I use five indicators to operationalize voice. The first two come from the Polity IV project (Marshall and Jaggers 2001) - competitiveness of executive recruitment (`xrcomp`) and the competitiveness of political participation (`parcomp`). Competitiveness of executive recruitment is a three-point ordinal scale that ranges from hereditary or similar selection (1) to election (3). Competitiveness of political participation is a five-point scale, ranging from repressed competition (1) to competitive (5). I also use the democracy measure offered by Alvarez et al. (1996), which is a binary measure coded 1 if legislative and executive offices are filled via election, there is more than one party and there has been at least some history of the alternation of power among parties. Also included is the dichotomous measure developed by Bernhard, Nordstrom and Reenock (2001) which involved an original coding effort to operationalize the definition of polyarchy set out by Dahl (1971). Finally, I use the data developed by Vanhanen (2000) and modified by Gates et al. (2006). This measures is multiplicative in competition (the percentage of legislative seats held by all but the largest party) and participation (the percentage of adults who voted). However, countries with competition scores less than 30 automatically score zero on the composite indicator. This indicator is continuous.[3]

[3]The original Vanhanen indicator was simply multiplicative in competition and participation. I use a version (G) that is multiplicative in the proportions as follows, where c is the proportion of seats won by all but the largest

It is not especially difficult to see how each of these variables operationalizes, at least a part of, the underlying idea of voice. They all focus to some extent on competition and participation - the two necessary conditions for citizens to have a voice.

2.2 Veto

The theoretical idea behind the "veto" argument is, again, relatively straightforward. Tsebelis (2002), suggest that there are a number of political actors with the ability to veto legislation (either beforehand in the case of the legislature) or after the fact (in the case of an independent judiciary). The preferences of these relevant actors and the rules governing the votes necessary for legislation to pass are sufficient to partition the policy space into a set of policies preferable to the status quo and the set of policies not preferred to the status quo. It is only policies in the former set that would pass. Applying this to the democracy-repression nexus, Davenport (2007*b*) suggests that changes in repressive policy would have to be preferred to the status quo by a number of relevant actors. Thus, chief executives would be generally unable to make unilateral changes in repressive policy. Further, any changes that are made would necessarily be relatively small, therefore it would be difficult for democracies to choose harshly repressive strategies.

Davenport (2007*b*) uses two measures of veto in his models. The first is the *checks* measure from Keefer (2002). This measures not only the number of institutional checks on the executive, but also the nature of those checks (e.g., cohesiveness of governing coalitions and

party and p is the proportion of adults voting in the population:

$$G = c \times I_{30}(c) \times p \tag{1}$$

Here, $I_{30}(c)$ is an indicator function that takes value one if $c > 0.3$ and zero otherwise. Since the resulting measure is a product of proportions, it will also have the range [0,1], though the observed upper range will generally be much less than one. I use the logit transform to put the variable G theoretically on the whole real number line:

$$lG = \log\left(\frac{G + .01}{1 - (G + .01)}\right) \tag{2}$$

It is the lG measure I use in the measurement model.

ideological distance between the government and opposition parties). This is widely thought to be a very reliable measure of the number of checks on the executive (Keefer and Stasavage 2003). Davenport also uses the executive constraints variable from the Polity IV project (Marshall and Jaggers 2001). This variable is a seven-point scale ranging from unconstrained executive (0) to executive parity with or subordination to the legislature (7).

I use five measures of veto for the measurement model. In addition to the two mentioned above that Davenport uses, I use three additional variables. The first is the `polconiii` measure developed by Henisz (2002). This variable measures the "feasibility of policy change," by considering the position of the legislative house(s) and the executive. This is a continuous variable ranging from zero to one. I also use the sub-federal veto identified in this same dataset. Though it is perhaps slightly less relevant here, the variable still captures the extent to which the executive can be stymied by other institutional actors. The third variable I add is the Law and Order variable from the The PRS Group (2009). This variable basically captures the effectiveness and institutionalization of the legal system - an important check on the chief executive.

Again, it is not difficult to see the connection between data and theory here. Each measure attempts to capture constraints overall (as in the `checks`, executive constraints (`xconst`) and `polconiii` variables) or some important aspect of checks such as the legal system. By taking all of this information, I can provide a "better" sense of where each country is on the underlying scale of veto.

2.3 Repression

The literature has been basically unanimous in its use of physical integrity rights as the dependent variable in models of the democracy-repression nexus. The one important dissenter is Davenport (2007*b*) who uses a combination of integrity rights and civil liberties from Freedom House (Piano and Puddington 2008). I return to the familiar territory of physical integrity

rights by using the data developed by Cingranelli and Richards (2004). These data are a publicly available extension of the earlier work done by Cingranelli and Richards (1999). Here, the authors found that the four aspects of physical integrity rights were well-described by a uni-dimensional cumulative scale. I use a parametric version of that model here.

Each aspect of physical integrity rights - torture, political imprisonment, forced disappearances and extrajudicial killing, is measured by one variable. Each of the four variables ranges on a three point scale: no incidents (0), 1-49 incidents (1), ≥ 50 incidents (2). These directly operationalize the four aspects commonly mentioned in the literature and measured by the more commonly used Political Terror Scale (PTS) (Gibney and Dalton 1996).[4]

3 Models and Results

The empirical model consists of two parts - a set of measurement models relating the observed indicators of voice, veto and repression to their latent counterparts and a structural model that captures the dependence of repression on voice, veto and a number of other control variables. Both parts of this model are estimated simultaneously in the Bayesian framework. I estimate the following model that keeps voice and veto as distinct concepts:

$$\begin{aligned} \text{Integrity Rights} = \beta_0 + \beta_1 \text{Integrity Rights}_{t-1} + \beta_2 \text{Voice} + \beta_3 \text{Veto} \\ + \beta_4 \text{voice} \times \text{veto} + \gamma \boldsymbol{X} + e \end{aligned} \tag{3}$$

where $\boldsymbol{X}$ refers to a set of control variables that will be discussed in greater detail below. I also estimate another model that treats both voice and veto indicators as being caused by the same

[4]Since the model assumes conditional independence of the indicators given the latent variable, I choose not to use the PTS codings of Amnesty International and State Department country reports. The reason is because the CIRI variables use the same source material so conditional independence is unlikely. While the aims of the two indicators are not perfectly overlapping (the PTS also codes some violence by non-state actors), they are sufficiently close to warrant not using the PTS variables.

underlying latent factor, called democracy:

$$\begin{aligned}\text{Integrity Rights} = \beta_0^* + \beta_1^*\text{Integrity Rights}_{t-1} + \beta_2^*\text{Democracy} \\ + \beta_3^*\text{Democracy}^2 + \beta_4^*\text{Democracy}^3\gamma^*\boldsymbol{X} + e\end{aligned} \tag{4}$$

Both model specifications are meant to operationalize the idea discussed in Davenport and Armstrong (2004). This is the idea that increases in democracy will only effect changes in repression when there is already a modicum of institutionalized democracy in place. That is to say as a full autocracy becoming slightly less autocratic (e.g., through sham elections or token political opposition) this should do very little to change a state's repressiveness.

The control variables used here in $\boldsymbol{X}$ are GDP/capita and the natural log of population, both coming from Gleditsch (2002). Also included are dichotomous measures of interstate and civil war from Gleditsch et al. (2002).

3.1 Measurement Models

Each measurement model will take roughly the same form, so I develop the model in its most general form here and apply it to each set of indicators mentioned above. Here, let $\boldsymbol{Y}$ refer to the matrix $N \times k$ matrix of observed variables (think of this as the four repression variables if you like). The underlying measurement model, then suggests:

$$\boldsymbol{Y} = f(latent) \tag{5}$$

Thus, the idea is not especially difficult to grasp. However, the particulars get a bit more complicated. First, the nature of $f(\cdot)$ changes with the observed variables. Continuous variables will be a linear function of the latent variable, binary variables will be a logistic function of the

latent variable and ordinal variables will be an ordered logistic function of the latent variable.[5] All three types of data exist in the models mentioned here. Further there are two different measurement models - one where the voice and veto indicators are separately predicted by their own latent variables and one where both sets of indicators are predicted by a single democracy latent variable.

The latent variables all have the same structure. In the first period (i.e., the first year the independent state appears in the dataset), the country's latent variable score (θ_{ijt})is drawn from a normal distribution with mean zero and precision τ_{j1}, where i indexes country, t indexes time and j refers to the latent variables; $j = \{\text{veto, voice, democracy, repression}\}$. In the subsequent periods, autoregressive priors are used such that the country's latent variable score is drawn from a normal distribution with mean $\mu_{ijt} = \rho_j \theta_{ijt-1}$ and precision τ_{j2}. The precisions are all given Gamma(1,1) priors and the various autoregressive parameters are given uniform priors over the range [-1,1].

In the measurement model, the coefficients relating the latent variable to the observed variables (i.e., the λ's) are given normal priors with mean zero and unit variance and are constrained to be positive, to prevent an equally good mirror image solution. To se the scale of the latent variable, the coefficient on the first variable is set to 1 and its corresponding intercept is set to zero. It will be obvious from the results which coefficients are fixed for identification purposes. In the ordered logit models, the threshold parameters (κ's) are drawn from truncated normal distributions in such a way as to preserve the appropriate ordering. For example, for a variable

[5]For continuous indicators,

$$Y_i^{\text{continuous}} = \lambda_0 + \lambda_1 \text{Latent}_i + e_i \tag{6}$$

for binary indicators,

$$Pr(Y_i^{\text{binary}} = 1) = \frac{1}{1 + exp(-(\lambda_0 + \lambda_1 \text{Latent}_i))} \tag{7}$$

and for ordinal indicators,

$$Pr(Y_i^{\text{ordinal}} = m) = \frac{1}{1 + exp(-(\kappa_m - \lambda_1 \text{Latent}_i))} - \frac{1}{1 + exp(-(\kappa_{m-1} - \lambda_1 \text{Latent}_i))} \tag{8}$$

with four ordered categories, κ_0 is set to $-\infty$ and κ_4 is set to ∞. κ_1 is drawn from a distribution that has an upper bound of κ_2. κ_2 is drawn from a distribution that has a lower bound of κ_1 and an upper bound of κ_3 and so on.

The results of the measurement model are presented in Table 1. In all of these models, the coefficients are significantly different from zero, suggesting that the latent variable is at least a moderately good predictor of the observed variables. At first glance, the coefficients, especially for the democracy model versus voice and veto look quite different. However, this is reasonable because the variance of these variables is quite different. You can see, the coefficients on the veto variable are bigger than they are on the democracy variable by a factor of about 6, which is roughly the ratio of the variances of the democracy latent variable to the veto latent variable, so this seems quite reasonable. The posterior means of voice and veto correlate at roughly 0.9, so there is definitely a strong relationship there. However, they are not perfectly related. The posterior means of the democracy latent variable is correlated with voice at 0.98 and veto at 0.94, so there is clearly some strong inter-dependence here.

Despite the quite high inter-correlations here, the DIC for the overall structural models is unambiguous. DIC, in a similar fashion to AIC, is an information theoretic measure that penalizes model fit for model complexity. As Spiegelhalter et al. (2002, 584) suggest of more conventional penalized fit measures, "... in complex hierarchical models parameters may outnumber observations and these methods [referring to AIC and BIC] clearly cannot be directly applied." The DIC clearly favors the less parsimonious model here, suggesting that the added complexity of estimating another latent variable is compensated by increased model fit.

[Table 1 about here.]

3.2 The Predictive Models

Now, I investigate how these two different measurement models interact with the predictive statistical models mentioned in equations 3 and 4. Table 2 presents the coefficients from the

predictive part of the model. All of the variables are significant here, save interstate war which is equally insignificant in both models. The coefficient for voice is not statistically significant, but this is only the coefficient for voice when veto is equal to zero. As I show below, there is a big range of veto for which the conditional coefficients for voice are statistically significant. The results here are consistent with previous results in the literature (e.g., Davenport and Armstrong 2004, Poe and Tate 1994).

[Table 2 about here.]

I started the investigation by suggesting that the models here would bring new insight into how interdependent pieces of democracy work together to lower a country's expected level of integrity rights violations. As has been well established, with interaction terms, especially interactions between continuous variables, the conditional coefficients should be plotted rather than trying to interpret the coefficients in the model directly (Brambor, Clark and Golder 2006, Braumoeller 2004, Kam and Franzese 2007). Panels (a) and (b) show the conditional coefficients and 95% credible intervals for voice and veto, respectively. As you can see here, the conditional effects of both variables are only significantly different from zero when the other takes on higher values. This provides a more nuanced picture of what Davenport and Armstrong (2004) suggest. Namely, that a number of aspects of democracy must be in place before further democratization has any significant marginal effect.

It is possible, using the parameters of the measurement model, to recover the values of the observed variables that correspond to the point where at which the marginal effect becomes significant. For voice, in panel (a), the critical value of veto is around 0.16. For values of veto bigger than 0.16, the effect of voice is negative and statistically significant. A value of 0.16 on veto, corresponds to values on the observed veto indicators approximately equal to the values listed in column 1 of Table 3, in the rows labeled "voice." That is to say, when veto equals 0.16, we would expect checks to be around 1 (the lowest value on this variable, but one occupied by about 45% of the observations). Political constraints (`polconiii`) would be around 0.123,

or roughly at its 45^{th} percentile.[6] This can be interpreted to mean that the effect of voice is not significant until political constraints are greater than those in roughly 45% of the country-years in the dataset. When veto = 0.16, the model would predict executive constraints at 3, meaning, "slight to moderate limitation on executive authority" (Marshall and Jaggers 2001, 23).[7] A value of 0.16 on veto corresponds to a value of 3 on the law and order variable. This would be a country with either nonzero, but still incomplete, impartiality of the legal system or nonzero, but still incomplete, popular respect for the law.[8]

The other half of column 1 (Table 3) refers to the predicted value of the voice indicators for the mean value of voice (roughly - 2.5) when veto is at least 0.16.[9] The values in the "voice" portion of column 1 are the predicted values of the voice indicators when the voice latent variable is - 2.5. The top three indicators are essentially probabilities whose range is [0,1]. The range of competitiveness of executive recruitment is [1,4] and for competitiveness of participation it is [1,5]. This suggests that movement from Gates values of [0,0.074] should not result in significant changes in repression. The others can be read in a similar fashion. Countries whose human rights could be expected to benefit immediately from even small amounts of democratization on the voice dimension are those with veto values bigger than 0.16 and with voice values bigger than -2.5. The countries that fit this bill (with $-2.5 < \text{voice} < -2$), are Kenya (1993-1995), South Africa (1982-1986) and Zimbabwe (1987-1988).

The second column of Table 3 can be read the same way, though the interpretation is flipped. Here, those values in the "voice" section of column 2 refer to the values of the voice indicators above which a change in veto will be statistically significant. The values of veto in column 2 represent the values of the veto indicators at the expected value of veto at the critical value

[6]Examples of countries with values around 0.123 on the political constraints variable are Brazil throughout the 1990's, Poland (1991-1993) and Botswana in the early 1980's and early 1990's).

[7]Examples of countries with executive constraints equal to 3 are China throughout the 1980's, Kenya throughout the 1980's and 1990's, and South Korea in the early 1980's.

[8]Examples of countries in this situation with respect to law and order are Argentina in the late 1980's and early 1990's, Mexico in the late 1980's through the late 1990's and Turkey in the mid-late 1980's.

[9]To find this, I simply ran an OLS regression of the posterior means of voice on the posterior means of veto and generated the prediction of voice when veto = 0.16. The relationship between the two variables is sufficiently linear to make this a reasonable strategy.

of voice (i.e., the value of voice at which the veto conditional coefficients turn negative and significant). There are similarly a number of countries poised at the edge of productive democratization on the veto dimension. These are countries whose values on voice are sufficiently high that the veto coefficient is significant and negative *and* have values on veto that are at the expected value for the critical value of voice (-1.38). A few examples are Albania in the early 1990's, Georgia (1991-1999) and Honduras through the late 1980's and early 1990's.

[Table 3 about here.]

Panel (c) of Figure 1 shows the interactive surface (β_2Voice + β_3Veto + β_4Voice $\times$ Veto). The lightest color represents the entire surface. The next darkest shade represents the areas where 1) the predicted surface is significantly different from zero and 2) the density evaluated at the center corner of the lower-right grid cell is in the highest 75% of all of the densities at the lower-left corners of all the grid cells. The darkest region is similar to the above, except only the highest 50% of the densities are used. The biggest effects can be seen when both veto and voice take on high values. There is no significant effect when either veto or voice takes on low values. This is completely reasonable given that there are very few data points in the asymmetric extremes (i.e., high voice-low veto or high veto-low voice).

It is also possible to find the countries here that are poised to start to feel the effects of democratic pacification. These are countries whose voice and veto values are both less than their respective 65^{th} percentile values, but whose values are sufficiently high that they are at least in the medium-gray shaded area in panel (c) of Figure 1. A few examples are Albania in the late 1990's, Georgia in the late 1990's and Honduras in the late 1980's and late 1990's.

[Figure 1 about here.]

Column 2 of Table 2 shows the effects when we consider democracy as one single variable rather than two. Its effect is modeled with a third-degree polynomial to allow for effects similar to those found by Davenport and Armstrong (2004). The results are roughly similar, though the

depart on one important point. Figure 2 shows the conditional effect of democracy on repression. Here, there is some modest level of democratic pacification gained as the most autocratic countries begin to democratize. Then, there is a significant plateau at which point no gains are felt to democratization. Then, as countries reach roughly the upper quarter of the democracy scores, democratization starts to bear fruit again with respect to integrity rights. There are a number of countries roughly on the verge of democratic pacification here as well. However, they are a set of countries quite different from the ones mentioned above. Of the 147 country-years found to be "poised" on the brink of democratic pacification above when considering voice and veto, none of them reach the critical value of democracy required by model 2. All of the countries found to be poised on the brink of pacification here (e.g., Argentina (1984-1989), India (1984-1991) and South Korea (1989-1995)) have either higher voice or veto scores than those countries found in the previous discussion.

Finally, what of Davenport's (2007*b*, 179) claim that, "... results consistently reveal that *Voice* ... exceeds the influence of *Veto*." Because the effects are conditional here, it is a more difficult task to assess this claim that it might seem. To get a sense of what this might look like, I did the following. I will discuss this in terms of the overall effect of veto, but I also performed the mirror image of this process for voice. First, make a sequence of 100 evenly spaced points from the minimum to the maximum of voice, call this voice_0. Then, for each point in voice_0, I found the nearest 50 posterior means of the voice latent variable.[10] I then calculated the standard deviation of *veto* for each of these 50 points. I repeat this for each of the points in turn, which results in a column vector of 100 standard deviations, call it σ^{veto}. Then, I took the last 5000 chain values for the predictive model coefficients β_3 and β_4 from equation 3, call this β_0^{veto}, which is a 5000×2 matrix. Next, I made the matrix:

[10]The basic result holds regardless of the number of points chosen.

$$x_0 = \begin{bmatrix} 1 & \text{voice}_{0,1} \\ 1 & \text{voice}_{0,2} \\ \vdots & \\ 1 & \text{voice}_{0,100} \end{bmatrix}$$

Then, calculate the total effect as $\theta_{\text{veto}} = (\beta_0^{\text{veto}} x_0') \, \sigma^{\text{veto}}$, which is now a 5000×1 vector of effects, the quantiles of which can be taken to form a 95% credible interval. The idea here is to acknowledge that in places where the conditional coefficients are extreme (e.g., in the extreme values of voice for the conditional effect of veto and in the extreme values of veto, for the conditional effect of voice), there may be very little data or the data that is there might have very low variance. This is an attempt to account for the various amounts of variance at the different levels of the conditioning variable. This was done for both variables with the following results - the total effect of veto is -2.56 with a 95% interval of (-4.87, -0.45) and the total effect of voice is -4.06 with a 95% interval of (-6.76, -1.62). Davenport's claim is then borne out, though with the caveat that the difference in the two total effects calculated this way is not statistically different from zero.

[Figure 2 about here.]

4 Conclusion

The results above have important implications on both substantive and methodological grounds. From a methodological point of view, this research is a rather large step forward for the democracy-repression nexus. Until now, researchers have not been taking full advantage of the wealth of data that exists on the various aspects of democracy. By pooling these measures together, it allows the strengths of each to shine through while eliminating or at least mitigating the measurement errors. I demonstrated above that even though one measure for

voice and one measure for veto are obtained, it is possible to look back at the values of the indicators that would be expected by certain values of the measurement model. Often when dimension reduction techniques are used, we abstract from the underlying substance that generated the latent variable. This practice is clearly to our detriment. It is not necessary that the specifics of the substantive indicators completely give way to a more abstract, conceptual definition. Both the abstract and the concrete are useful here.

Substantively, this is also an interesting step forward. Though others have considered this type of strategy in a less sophisticated way (e.g., Bueno de Mesquita et al. 2005, Davenport 1997, 2007*b*, Davenport and Armstrong 2004), they have often done so without investigating or even acknowledging the inter-relatedness of these various aspects of democracy. This work shows that these two concepts are not independent of each other. It does not make sense to think inferentially about a country with low voice and high veto because such countries are very rare if not completely unobserved. When considering which countries are most likely to benefit from democratization either on voice, veto or both, it is important to consider which countries have values likely to be in the range where democratization can help.

The results above suggest that the operationalization of democracy does matter. Even though the substantive effects are quite similar (i.e., that democratic pacification happens only when multiple aspects of democracy already exist), the implications for which countries are most likely to benefit from democratization is quite different. The threshold when considering both voice and veto seems considerably lower than the threshold when considering a single democracy variable. Further research outside the scope of this paper will be required to investigate the extent to which one is more plausible than the other, but the model fit statistics suggest the voice-veto model is superior.

	Model 1			Model 2	
	Voice	Veto	Repression	Democracy	Repression
log(Gates)	1.000 NA			1.000 NA	
Alvarez et al	2.754 (2.418, 3.144)			2.239 (2.021, 2.480)	
Bernhard et al	1.252 (1.135, 1.378)			1.169 (1.068, 1.274)	
Competitiveness of Exec. Recruitment	1.503 (1.405, 1.600)			1.788 (1.677, 1.903)	
Competitiveness of Participation	2.184 (2.046, 2.339)			1.927 (1.819, 2.040)	
log(Checks)		1.000 NA		0.249 (0.239, 0.260)	
Political Constraints (III)		0.506 (0.466, 0.547)		0.083 (0.081, 0.085)	
Executive Constraints		6.637 (6.142, 7.131)		0.959 (0.938, 0.981)	
Law & Order		2.186 (1.982, 2.398)		0.357 (0.337, 0.379)	
Sub-Federal Veto		3.181 (2.618, 3.794)		0.559 (0.463, 0.659)	
Torture			1.000 NA		1.000 NA
Extrajudicial Killing			1.885 (1.626, 2.186)		1.896 (1.698, 2.114)
Forced Disappearance			1.587 (1.357, 1.856)		1.663 (1.473, 1.877)
Political Imprisonment			1.330 (1.140, 1.545)		1.331 (1.194, 1.484)
SD(Posterior Means)	2.225	0.346	1.718	2.215	1.758
DIC		47285.9		48108	

* Main entries are the coefficients on the latent variables (think factor pattern coefficients or "loadings"). Below are 95% credible intervals. The intercepts and threshold parameters are omitted in the interest of space, but are available from the author upon request.

Table 1: Measurement Model Results*

	Model 1	Model 2
Intercept	-0.429	-0.396
	(-0.654, -0.223)	(-0.565, -0.243)
Repression$_{t-1}$	0.836	0.865
	(0.802, 0.867)	(0.837, 0.891)
Voice	-0.015	
	(-0.047, 0.016)	
Veto	-0.306	
	(-0.522, -0.102)	
Voice$\times$Veto	-0.087	
	(-0.144, -0.035)	
Democracy		-0.075
		(-0.106, -0.046)
Democracy^2		-0.046
		(-0.065, -0.027)
Democracy^3		-0.008
		(-0.012, -0.004)
GDP/capita (in $10,000)	-0.116	-0.055
	(-0.177, -0.059)	(-0.102, -0.008)
log(Population) (in 1,000)	0.053	0.042
	(0.033, 0.075)	(0.026, 0.059)
Civil War	0.385	0.269
	(0.219, 0.572)	(0.127, 0.416)
Interstate War	0.086	0.086
	(-0.065, 0.237)	(-0.04, 0.215)

* Main entries are posterior means of the regression coefficients in the predictive piece of the structural model. The entries below are 95% credible intervals.

Table 2: Predictive Model Results*

		Voice	Veto
Voice	Gates	0.074	0.202
	Pr(Alvarez et al = 1)	0.015	0.261
	Pr(Bernhard et al = 1)	0.032	0.122
	Competitiveness of Exec. Recruitment	2	3
	Competitiveness of Participation	2	3
Veto	Checks	1	1
	Political Constraints (III)	0.123	0.218
	Executive Constraints	3	4
	Law & Order	3	4
	Pr(Sub-Federal Veto = 1)	0.025	0.044

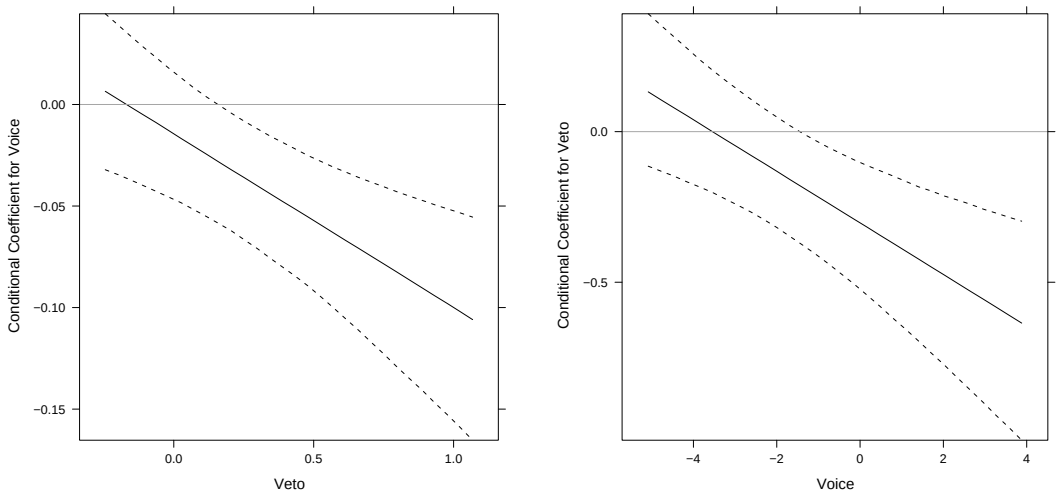
* Entries in this table represent the values of the observed variables at the thresholds of democratic pacification. These represent the expected values of the observed values at the point where the conditional coefficient for voice (first column) and veto (second column) become statistically significant.

Table 3: Substantive Thresholds*

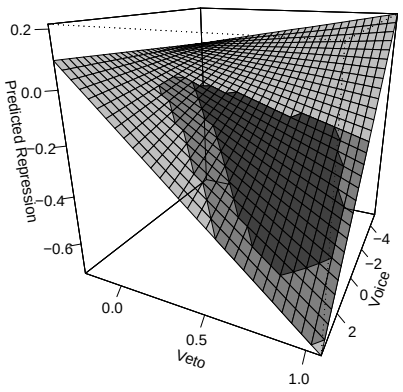
Figure 1: Conditional Effects of Voice and Veto*

(a) Voice

(b) Veto

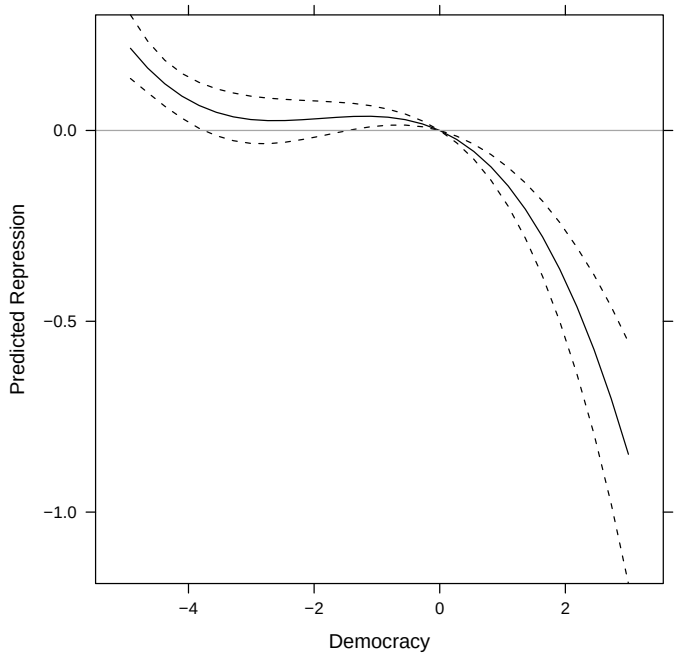


(c) Predicted Surface



* Panels (a) and (b) show the conditional coefficients and 95% credible intervals for voice and veto, respectively. Panel (c) shows the interactive surface ($\beta_2 \text{Voice} + \beta_3 \text{Veto} + \beta_4 \text{Voice} \times \text{Veto}$). The lightest color represents the entire surface. The next darkest shade represents the areas where 1) the predicted surface is significantly different from zero and 2) the density evaluated at the center corner of the lower-right grid cell is in the highest 75% of all of the densities at the lower-left corners of all the grid cells. The darkest region is similar to the above, except only the highest 50% of the densities are used.

Figure 2: Predictions as a function of Democracy



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