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(Can't Get No) Satisfaction: An Application of Dynamic Loglinear Models with Latent Variables to Declining Satisfaction with Democracy in Mexico

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Abstract

Using two-wave panel data from the National Survey of Political Culture (ENCUP, in Spanish), I explore if declining satisfaction with democracy in Mexico between 2001 and 2003 owes more to political or economic evaluations. I model the data using a useful, but little known, class of statistical models: dynamic loglinear models with latent variables, or "modified LISREL" models. These models combine structural "path" models with latent class models (LCM), a categorical analogue of factor analysis in which multichotomous latent variables are hypothesized to drive multichotomous observed indicators. The analysis shows that worsening perceptions of government economic performance are a significant cause of falling satisfaction with democracy, but citizens' opinions of regime political performance exert even greater influence.

Keywords: Mexico, satisfaction with democracy, loglinear models.

Resumen

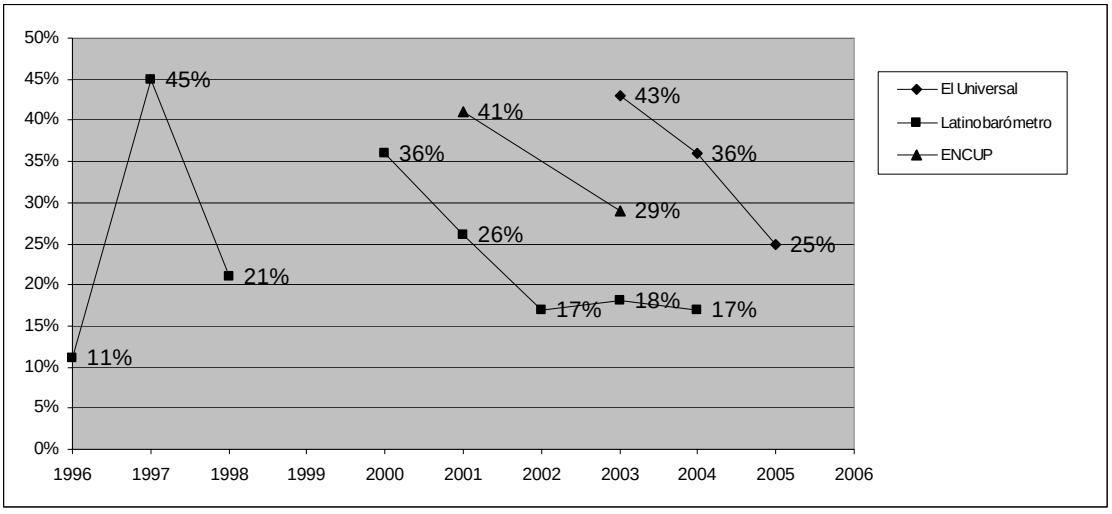
Con datos de la Encuesta Nacional de Cultura Política (ENCUP), indago si el declive en satisfacción con la democracia en México entre 2001 y 2003 se debe más a evaluaciones políticas o económicas. Los datos se modelan con una clase de modelos estadísticos útil, pero poco conocida: modelos loglineales dinámicos con variables latentes, o modelos "LISREL" modificados. Estos modelos combinan modelos estructurales con modelo de clase latente (LCM, en inglés), un análogo categórico del análisis factorial en el que variables latentes multicotómicas subyacen indicadores multicotómicos observados. El análisis demuestra que el empeoramiento de las evaluaciones económicas es una causa significativa del declive de satisfacción con la democracia, pero que las opiniones ciudadanas del desempeño político del régimen influye aún más.

Palabras clave: México, satisfacción con la democracia, modelos loglineales.

Introduction

The decade since Mexican voters ended seven decades of one-party rule in 2000 has witnessed rapid disillusionment with democratic politics. Polls consistently indicate sharp drops in the proportion of Mexicans who are "very" or "fairly satisfied with democracy" in Mexico, an indicator widely used in comparative international studies —and the one used in this study (see Figure 1).

FIGURE 1. % OF MEXICANS WHO REPORT THEMSELVES AS "VERY" OR "FAIRLY" SATISFIED WITH DEMOCRACY IN MEXICO



Source: El Universal, Latinobarómetro, and the National Survey on Political Culture (ENCUP).

What caused this decline? The received wisdom is that most Mexicans —and most Latin Americans— have a "substantive" view of democracy as a "levelling of social relations" (Pereyra, 1990: 85; Latinobarómetro, 2004). For example, Roderic Camp writes: "Mexicans […] view democracy in social and economic, not political, terms" (Camp, 2001: 11, 15-16). If Mexicans are "pocketbook citizens" whose concept of democracy is primarily one of greater economic equity, we would expect Mexicans' satisfaction with democracy to change most according to their economic evaluations.

On the other hand, a growing body of evidence suggests that an increasing number of Mexicans are internalizing a "new political culture". This culture comprises liberal values associated with democracy, such as pluralism, tolerance, and respect for rights (see, e.g., Beltrán, 1996; Flores and Meyenberg, 2000; Peschard, 2002). Durand Ponte finds: "We can already glimpse the tendency […] in which greater participation means greater commitment to democracy […] show[ing] that the spread and acceptance of

democratic values involves marginalized and excluded sectors" (2003: 238). If the "new political culture" hypothesis is true, we might expect political evaluations of how democratic the new regime is to affect Mexicans' satisfaction with democracy most.

This paper's purpose is twofold. In addition to helping resolve the important substantive issue of the relative importance of economic and political evaluations in Mexican attitudes toward democracy, it also presents a class of statistical models that are useful but little known to most political scientists: dynamic loglinear models with latent variables. First, I give an overview of the survey data used in the study. Then, I offer a step-by-step explanation of how to construct, fit, and assess these models' performance. Each step is illustrated with real survey data. Finally, I interpret the results. While Mexicans do expect democracy to redound in economic progress, their satisfaction with democracy appears to have more to do with how they assess the government's *political* performance —that is, the quality of representation it affords and its respect for political rights.

Data, Variables and Methods

To shed light on whether economics or politics motivate Mexican evaluations of democracy, this study uses data from the National Survey of Political Culture and Citizen Practices (ENCUP, in Spanish). The ENCUP is a poll carried out on four occasions (2001, 2003, 2005 and 2008) that measures Mexicans' attitudes toward politics and civic engagement. The first two editions, undertaken in November, 2001, and February, 2003, form a panel in which 2,789 respondents were interviewed on both occasions.[1] The Mexican Interior Ministry (*Secretaría de Gobernación*) commissioned the poll, and the National Institute of Statistics and Geography (INEGI) designed the sample and undertook field work.

Six variables are included in the analysis. The dependent variable is satisfaction with democracy. The independent variables cluster into two groups, evaluations of the Mexican government's democratic performance and retrospective economic evaluations. The six variables are listed here, followed by question wording and response categories:

1. **Satisfaction with democracy** (labelled **SAT**)
   How **satisfied** are you with democracy in Mexico? (Very/Fairly/Not Very/Not at All)

2. Regime **authoritarianism** (**AUT**)

[1] Unfortunately, the panel design was abandoned for the subsequent two editions in 2005 and 2008.

We are closer to an **authoritarian** regime rather than to a democracy (Agree/Disagree)

3. Government **responsiveness** (**IMP**)
   We are closer to a government that **imposes** its will rather than consults (Agree/Disagree)

4. Government **respect for rights** (**VIO**)
   We are closer a government that **violates** citizen rights rather than respect them (Agree/Disagree)

5. **National economic** evaluations (**NAT**)
   Compared to a year ago, has the economy improved or worsened? (Improved/Worsened/ Stayed the Same)

6. **Personal economic** evaluations (**PER**)
   Do you consider your economic situation to be (Good/So-So/Bad)?

Each of these variables is measured on two occasions (2001 and 2003), and each is measured on an ordinal scale. As the response categories make clear, the dependent variable, satisfaction with democracy, has four levels. Of the explanatory variables, regime authoritarianism (AUT), government responsiveness to popular demands (IMP), and government respect for rights (VIO) have two levels each, while evaluations of both the national economy (NAT) and one's personal economy (PER) have three each.

As explained in greater detail below, the regime/government evaluation survey items AUT, IMP, and VIO are taken to be observed indicators of an underlying general evaluation of the government's adherence to democratic values. This unobserved variable, labelled POL, is also categorical and hypothesized to have two "latent classes", just as each of its indicators does. That is, respondents believe that the government is basically democratic or authoritarian, and this belief informs their responses to specific questions.

Similarly, the manifest variables NAT and PER are hypothesized to be overt manifestations of a latent construct, labeled ECO in the model presented below. The latent variable ECO is an overall assessment of the economy and has three values: respondents believe the economy is essentially doing well, so-so, or poorly. As with political evaluations, this core judgment drives responses to individual survey items.

A dynamic loglinear path model with latent variables is appropriate for categorical indicators (AUT, IMP, VIO, NAT, and PER, in this case) whose latent constructs (POL and ECO) are also discrete, and for data that presents repeated categorical measurements (e.g., SAT 2001 and SAT 2003). The next section explains how to put together and evaluate such a model.

Building and Fitting Dynamic Loglinear Path Models with Latent Variables

Loglinear path models with latent variables are also known as "modified LISREL" since they are categorical analogues of LISREL models. Modified LISREL models combine two separate innovations in categorical data analysis: Latent Class Models (LCM; see Lazarsfeld and Henry, 1969; Clogg and Goodman, 1984), the "measurement" component, and modified path models (see Goodman, 1973), the "structural" component. Hagenaars (1993) and Vermunt (1996) proposed methods for merging LCM's and modified path models into a single model, and the latter developed a software package, LEM (very short for "loglinear and event history analysis using the EM algorithm"), specifically for such analysis.[2]

As in factor analysis, LCM's posit that many observed variables may be reduced to several unobserved variables. In contrast to factor analysis, however, both manifest indicators and latent constructs in LCM's are discrete. In other words, rather than assuming a "true" value on some underlying scale, each respondent falls into one of several mutually exclusive categories. Thus, and also differently from factor analysis, the "factor loadings" in an LCM are probabilities rather than scaling factors. Specifically, each factor loading is the probability that an observation of manifest categorical variable A will belong to a given class a, given that it is in latent class x of the underlying variable X (i.e., Pr(A=a|X=x)). The indicators map on to the latent constructs well if one class of indicator A has a high value (close to 1.00) for one latent class of X, and low values for all other classes.[3]

For their part, "modified path models" are categorical adaptations of simultaneous equation models for continuous variables. That is, they are appropriate for data in which two or more categorical variables are endogenous. When, as in this case, the endogenous variables are repeated measures, the model is dynamic. This study attempts to explain the "transition probabilities" produced by cross-classifying satisfaction with democracy in 2001 and 2003. A "transition probability" is simply the probability that a respondent will have a certain level of satisfaction in 2003, given her initial level of satisfaction in 2001 —i.e., the chances that respondents will increase, decline, or maintain their level of satisfaction with democracy over the two survey waves, Pr(SAT03=j | SAT01=i). Table 1 presents the raw transition probabilities (not conditioned on economic and political values) for all respondents.

[2] LEM is available free of charge at http://spitswww.uvt.nl/~vermunt/.
[3] See Goodman and Clogg (1984) for the likelihood functions of LCM's.

TABLE 1. CROSS-CLASSIFICATION OF SATISFACTION WITH DEMOCRACY IN 2001 AND SATISFACTION WITH DEMOCRACY IN 2003

		2003				
		Not at All	A Little	Fairly	Very	
2001	Not at All	22.6%	55.3%	19.6%	2.5%	530 (25.7%)
	A Little	14.4%	60.4%	21.7%	3.5%	695 (33.8%)
	Fairly	13.0%	51.7%	29.7%	5.6%	691 (33.6%)
	Very	14.7%	41.3%	34.3%	9.8%	143 (6.9%)
		331 (16.1%)	1129 (54.8%)	509 (24.7%)	90 (4.4%)	2059

Source: National Survey on Political Culture (ENCUP), 2001 and 2003.

For example, not taking into account her evaluations of the government's political and economic performance, a respondent who is "fairly" satisfied with democracy in 2001 has a 29.7% chance (or transition probability) of remaining "fairly" satisfied with democracy in 2003, a 51.7% chance of decreasing one category to "a little" satisfied in 2003, and just a 5.6% of increasing to "very" satisfied.

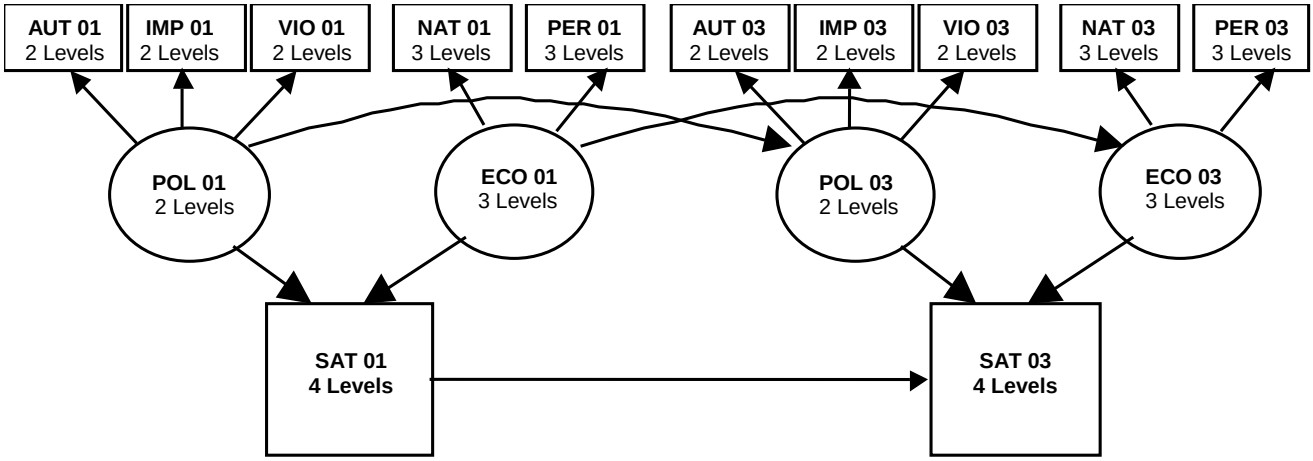
The model then conditions these transition probabilities on economic and political perceptions. This is equivalent to breaking down the cross-classification presented in Table 1 into separate tables for subclasses of respondents grouped by their political and economic perceptions. For example, there will be a table for those who judged the government "democratic" in both 2001 and 2003 and the economy as "good" in both waves; another for those who regarded the government as "democratic" in both waves and the economy as good in the first wave, but only "so-so" in the second wave; yet another for "democratic" in both waves and "good" in the first wave, but "poor" in the second; and so on. In all, there will be 36 conditional cross-classifications, since the latent variable ECO has three levels and is measured on two occasions, and POL has two levels, measured on two occasions (3 x 3 x 2 x 2 = 36).

The following steps explain how to build and fit a modified LISREL model to determine the relative importance of politics vs. economics in shaping Mexican citizens' satisfaction with democracy.

Draw a Path Diagram

The following path diagram represents the hypothesized causality between citizens' perceptions of economic and political performance, on the one hand, and their satisfaction with democracy, on the other.

FIGURE 2. PATH DIAGRAM OF CAUSAL RELATIONSHIPS BETWEEN ECONOMIC AND POLITICAL PERCEPTIONS AND SATISFACTION WITH DEMOCRACY



As is customary in path diagrams, observed variables are represented by squares and latent variables, by ovals. Underlying political evaluations (POL) drive, or "cause", specific responses to survey items about the government's practice of democracy (AUT), its willingness to listen to citizens (IMP), and its respect for citizen rights (VIO) in 2001 and 2003, indicated by the arrows from the ovals to the upper squares. Similarly, an overall assessment of economic progress (ECO) drives answers to items on national economic performance (NAT) and personal economic conditions (PER), also in both waves of the survey. These relationships together constitute the 2001 and 2003 measurement models; note that they are symmetrical.

The substantive model hypothesizes that political (POL01) and economic (ECO01) judgments determine citizens' satisfaction with democracy (SAT01) in 2001. In 2003, respondents' opinions of political (POL03) and economic (ECO03) progress take as their point of departure these same opinions in 2001 (POL01 and ECO01), while satisfaction with democracy in 2003 (SAT03) is a result of second-wave appraisals of government political (POL03) and economic (ECO03) performance, controlling for satisfaction with democracy on the prior measurement occasion (SAT01).

Specify a Suitable Probability Structure

The graphical representation of the model may be embodied in the log-linear probability notation proposed by Clogg and Goodman (1984) as follows:

$$\pi_{ABCDEFGHIJUVWXYZ} = \pi_{Z|YUVWX}\pi_{Y|WX}\pi_{A|U}\pi_{B|U}\pi_{C|U}\pi_{D|V}\pi_{E|V}\pi_{F|W}\pi_{G|W}\pi_{H|W}\pi_{I|X}\pi_{J|X} \quad \text{(Eq. 1)}$$

where A = AUT 01
B = IMP 01
C = VIO 01
D = NAT 01
E = PER 01
F = AUT 03
G = IMP 03
H = VIO 03
I = NAT 03
J = PER 03
U = POL 01 (Latent)
V = ECO 01 (Latent)
W = POL 03 (Latent)
X = ECO 01 (Latent)
Y = SAT 01
Z = SAT 03

In other words the probability that a respondent is simultaneously in class a (of A classes), b (of B classes), c (of C classes), etc., may be decomposed into a multiplicative function of more specific probability statements. Here, these probability statements eliminate many interactions between categorical variables. For example, the model specifies that none of the observed independent variables A through J interact with the observed dependent variables (Y and Z). Rather, the manifest independent variables are distilled into latent variables (U through X) that interact with the dependent variables. Thus, the model simplifies an impossible 14-way interaction into a series of smaller interactions, most of which are two- and three-way (with one six-way interaction).

These smaller interactions, in turn, contain conditional probabilities. For example, satisfaction in 2001 (Y = SAT01) is conditional upon economic (U = ECO01) and political (V = POL01) perceptions. The manifest independent variables of government authoritarianism (A=AUT01), government's willingness to listen to citizens (B=IMP01), and governmental violations of rights (C=VIO01) in 2001 depend upon an underlying evaluation of regime democracy that year (U = POL01).

Unfortunately, the full model is intractable to estimation; the estimating algorithm (EM, Expectation Maximization) fails to converge because there are simply too many parameters. Following Vermunt and Georg (1995), the model was broken down into three submodels: Measurement Model 2001 (MM01), Measurement Model 2003 (MM03), and the Structural Model (SM). Here are the corresponding probability specifications, with further restrictions imposed on multi-way interactions.

MM01

$$\pi_{ABCDEUVY} = \pi_{Y|U}\pi_{Y|V}\pi_{A|U}\pi_{B|U}\pi_{C|U}\pi_{D|V}\pi_{E|V} \quad \text{(Eq. 2)}$$

MM03

$$\pi_{FGHIJWXZ} = \pi_{Z|W}\pi_{Z|X}\pi_{F|W}\pi_{G|W}\pi_{H|W}\pi_{I|X}\pi_{J|X} \quad \text{(Eq. 3)}$$

SM

$$\pi_{UVWXYZ} = \pi_{Z|YUV}\pi_{Z|YWX}\pi_{Y|W}\pi_{Y|X} \quad \text{(Eq. 4)}$$

Refine the Probability Structure with Logit Parameterization and Linear Restrictions

Loglinear models may be expressed as logit models in which one of the variables becomes a dependent variable and the rest are independent variables (see Agresti, 1990; Vermunt and Georg, 1995). This isolates the dependent variable on the left hand side and takes it out of the interactions on the right-hand side. Here, the probability structures are decomposed into series of logit models.

MM01

The probability structure given in Eq. 2 above for the 2001 measurement model may be reparameterized as a series of logistic models as follows:

$$\log\left(\frac{\Pr(Y > y)}{\Pr(Y \leq y)}\right) = \alpha_j + \beta_2^U + \beta_2^V + \beta_3^V$$

,

y = {1=Not at All Satisfied, … , 4=Very Satisfied}

(Eq. 5)

This representation of the model is a standard ordinal logit parameterization. There are *J* – 1 = 3 intercepts that correspond to the cut-points (or thresholds) between the four response categories for satisfaction with democracy in 2001. Dummy variable normalization, in which the parameter for the first category of each of the explanatory variables is restricted to equal 0 (see Powers and Xie, 2000: 108-109), is used to identify the submodel. The independent variables here are the latent classes POL (U, with two categories) and ECO (V, with three categories). The subscript "2" and the superscript "U" mean that the parameter is estimated for the second category of the latent variable

"U". Similarly, the subscripts "2" and "3", combined with the superscript "V", denote the second and third categories, respectively, of the latent variable V.

The following three submodels map the observed values for different political evaluations (the variables AUT, A; IMP, B; and VIO, C) onto the latent construct "U", an overall evaluation of the Mexican regime's political performance. Since each of the manifest variables has only two categories, there is only one intercept per model.

$$\log\left(\frac{\Pr(A = Democratic)}{\Pr(A = Authoritarian)}\right) = \alpha + \beta_2^U$$

(Eq. 6)

$$\log\left(\frac{\Pr(B = Listens)}{\Pr(B = Imposes)}\right) = \alpha + \beta_2^U$$

(Eq. 7)

$$\log\left(\frac{\Pr(C = Respects\ Rights)}{\Pr(C = Violates\ Rights)}\right) = \alpha + \beta_2^U$$

(Eq. 8)

Finally, the following two submodels map the observed values for perceptions of the national and household economies (D and E, respectively) onto the latent variable "V", an overarching judgment of the Mexican economy. There are two intercepts per model, corresponding to the cut-points between the three response categories for the observed variables.

$$\log\left(\frac{\Pr(D > d)}{\Pr(D \le d)}\right) = \alpha_j + \beta_2^V + \beta_3^V,$$

d = {1=Worsened, 2=Same, 3=Improved}

(Eq. 9)

$$\log\left(\frac{\Pr(E > e)}{\Pr(E \le e)}\right) = \alpha_j + \beta_2^V + \beta_3^V,$$

e = {1=Poor, 2=So-So, 3=Good}

(Eq. 10)

The 2001 measurement model is extraordinarily economical: frequency values for some 288 cells in a multi-way table are represented by just 20 parameters. The key to this economy is the assumption of orthogonality between the manifest variables. Since they are assumed to be conditionally

independent of one another, the relationship of each to the latent variables may be described by a series of two-way tables, with no higher-way interactions necessary.

MM03

Since this model is completely symmetrical to MM01, it can be represented by the same equations, *mutatis mutandi* (e.g., substituting AUT03, F, for AUT01, A, etc.).

SM

The structural component of the model is given in Eq. 4 above. It also may be broken down into two constituent cumulative logit submodels, the first for satisfaction with democracy in 2001, the second for 2003:

$$\log\left(\frac{\Pr(Y > y)}{\Pr(Y \leq y)}\right) = \alpha_j + \beta_2^U + \beta_2^V + \beta_3^V \quad \text{(Eq. 11)}$$

$$\log\left(\frac{\Pr(Z > z)}{\Pr(Z \leq z)}\right) = \alpha_j + \beta Y + \beta_{uw}^{UW} + \beta_{vx}^{VX} \quad \text{(Eq. 12)}$$

Again, there are $J - 1 = 3$ intercepts for the thresholds between the four levels of satisfaction with democracy in both 2001 and 2003. Representing satisfaction with democracy in 2001, Y, with just one parameter —i.e., "linearizing" Y —embodies a hypothesis of proportional odds, in which the effect of satisfaction in 2001 is the same across all categories of the outcome variable Z, satisfaction with democracy in 2003. The subscripts "small u" and "small w" refer to specific categories of the latent variables big "U" and "W", as do the subscripts "v" and "x" with respect to "V" and "X". This parameterization also "linearizes" the effects on Z (satisfaction with democracy in 2003) of each of the four possible combinations of U and W (2 x 2 = 4), and each of the nine possible combinations of V and X (3 x 3 = 9). Thus, these combinations' effects can be represented with just one parameter each, 13 in all. The expanded version of Eq. 12 is:

$$\log\left(\frac{\Pr(Z > z)}{\Pr(Z \leq z)}\right) = \alpha_j + \beta Y + \beta_{uw}^{11} + \beta_{uw}^{12} + \beta_{uw}^{21} + \beta_{uw}^{22} + \beta_{vx}^{11} + \beta_{vx}^{12} + \beta_{vx}^{13} + \beta_{vx}^{21} + \beta_{vx}^{22} + \beta_{vx}^{23} + \beta_{vx}^{31} + \beta_{vx}^{32} + \beta_{vx}^{33} \quad \text{(Eq. 13)}$$

Estimate the Model and Get Results

The two measurement models and the structural model were estimated separately in LEM using the Expectation Maximization (EM) algorithm, a two-step, iterative process used for missing data and latent variables. In the E-step, the algorithm calculates the expected likelihood of the observed data (called the Q-function), given the current parameter values and computed conditional distribution of latent variables. The M-step then maximizes the Q-function until the model converges on a maxima.[4]

First, the two measurement models were estimated and the "latent class assignments", recovered for each respondent. That is, based on the response pattern for a set of observed variables, the EM algorithm calculates probabilities that a respondent belongs to a given class of the latent variable. For example, a respondent who perceives the Mexican regime in 2001 as democratic and respectful of rights, but not disposed to take citizen opinions into account in the decision-making process, might have an 87% chance of having a general, underlying opinion of the regime as democratic (latent class two) and a 13% chance of believing the regime to be basically authoritarian (latent class one). That respondent is categorized in latent class two, to which she has the highest probability of belonging. Then, the latent class assignments were plugged into the structural model to obtain the substantive results.

Some results are presented in the following subsections E and F, to wit: the factor loadings for MM01 and MM03, the log-linear parameter estimates for SM, and selected transition probabilities at different levels of POL and ECO.

[4] See Dempsey *et al.* (1977), Vermunt (1997: 5-6) and Zhai (2004) for details on the EM algorithm.

Analyze Factor Loading Patterns

MM01

TABLE 2. FACTOR LOADINGS FOR MEASUREMENT MODEL 2001

	POL01=Undemo	POL01=Demo
Pr(AUT01=Auth)	**0.7679**	0.2321
Pr(AUT01=Demo)	0.0832	**0.9168**
Pr(IMP01=Impose)	**0.8764**	0.1236
Pr(IMP01=Listen)	0.0922	**0.9078**
Pr(VIO01=Violate)	**0.7182**	0.2818
Pr(VIO01=Respect)	0.1189	**0.8811**

	ECO01=Bad	ECO01=So-So	ECO01=Good
Pr(NAT01=Worse)	**0.9995**	0.0005	0.0000
Pr(NAT01=Same)	0.1319	**0.8655**	0.0026
Pr(NAT01=Better)	0.0000	0.0303	**0.9697**
Pr(PER01=Bad)	**0.9851**	0.0000	0.0149
Pr(PER01=So-So)	0.1804	**0.7607**	0.0590
Pr(PER01=Good)	0.0772	0.2878	**0.6351**

Source: ENCUP 2001, 2003.

In assessing how well the observed categorical variables map onto the latent classes, the closer the parameters are to 1.00 or 0.00, the better the latent classes reproduce the observed frequencies . Eyeballing it, we see that most observed data load well onto latent classes. However, Pr(VIO01=1|POL01=1) = .7182, Pr(PER01=2|ECO01=2) = .7607, and especially Pr(VIO01=1|POL01=1) = .6351 are lower than desirable.

MM03

TABLE 3. FACTOR LOADINGS FOR MEASUREMENT MODEL 2003

	POL03=Undemo	POL03=Demo
Pr(AUT03=Auth)	**0.8636**	0.1364
Pr(AUT03=Demo)	0.1630	**0.8056**
Pr(IMP03=Impose)	**0.8924**	0.1076
Pr(IMP03=Listen)	0.1944	**0.8056**
Pr(VIO03=Violate)	**0.8565**	0.1435
Pr(VIO03=Respect)	0.1103	**0.8897**

	ECO03=Bad	ECO03=So-So	ECO03=Good
Pr(NAT03=Worse)	**1.0000**	0.0000	0.0000
Pr(NAT03=Same)	0.1642	**0.8351**	0.0008
Pr(NAT03=Better)	0.0000	0.0033	**0.9967**
Pr(PER03=Bad)	**0.6166**	0.2742	0.1092
Pr(PER03=So-So)	0.1626	**0.6532**	0.1843
Pr(PER03=Good)	0.1052	0.1782	**0.7166**

Source: ENCUP 2001, 2003.

Again, the pattern of separation is acceptable, although respondents' evaluations of their personal economic situations (PER03) don't map

especially well onto the underlying construct ECO03. The fit statistics shown below confirm that, overall, both measurement models describe the observed data quite well.

Look at Parameter Estimates for SM

Table 4 presents the parameter estimates for the structural model contained in Eqs. 11 and 12 above:

TABLE 4. PARAMETER ESTIMATES FOR DYNAMIC STRUCTURAL MODEL

Pr(SAT01 | POL01, ECO01)		
Thresholds	beta	s.e.
1	-0.3822	0.0957
2	1.0410	0.0989
3	3.3925	0.1298
Parameters		
POL01=Undemocratic	--	--
POL01=Democratic	0.5336	0.0851
ECO01=Bad	--	--
ECO01=So-So	0.4266	0.0962
ECO01=Good	0.8338	0.1241

Eq. 12

Pr(S03|(S01),(P03,P01),(E03,E01))		
Thresholds	beta	s.e.
1	-2.3919	0.2335
2	0.5062	0.2197
3	2.9260	0.2320
Parameters		
SAT01 (Linear)	0.2510	0.0506
Unif Assoc (Linear x Linear) Parameters		
POL01=Undemo*POL03=Undemo	-0.0387	0.1314
POL01=Undemo*POL03=Demo	0.7485	0.1305
POL01=Demo*POL03=Undemo	-0.3407	--
POL01=Demo*POL03=Demo	0.5181	-0.3704
ECO01=Bad*ECO03=Bad	-0.8266	0.3404
ECO01=Bad*ECO03=So-So	0.1587	0.2747
ECO01=Bad*ECO03=Good	0.4881	0.2411
ECO01=So-So*ECO03=Bad	-0.9258	0.2554
ECO01=So-So*ECO03=So-So	-0.0683	0.2404
ECO01=So-So*ECO03=Good	0.7472	0.1305
ECO01=Good*ECO03=Bad	-0.8537	--
ECO01=Good*ECO03=So-So	0.2777	0.2781
ECO01=Good*ECO03=Good	0.7252	0.2658

Source: ENCUP 2001, 2003.

The submodels for 2001 and 2003 both have three threshold parameters to fix the distance between the categories of satisfaction with democracy. All the parameters are the natural logarithms of odds ratios. They may be exponentiated to obtain odds ratios, which compare the odds being more satisfied with democracy between two groups —for example, those who believe the Mexican government adheres to democratic values and those who judge the government as undemocratic. In fact, holding perceptions of the economy constant, the former group is almost 70% likelier (1.69 = exp(.53)) to belong to a higher category of satisfaction (say, "Very" or "Somewhat" satisfied, as opposed to "A Little" or "Not at All") than is the latter.

For the 2003 submodel, each of the parameters is a linear-by-linear (or uniform association) parameter. In other words, a single odds ratio describes the transition probabilities for cross-classifications of satisfaction in 2001 and 2003 at each combination of levels of underlying political evaluations across the two panel waves (not taking into account economic judgments) and at each combination of levels of economic judgments in 2001 and 2003 (not taking into account political evaluations). The final section offers a more thorough interpretation of these parameters.

Obtain Transition Probabilities

However, interpretation of parameter estimates in the preceding section is difficult because, among other reasons, the probability estimates result from complex combinations of variables. Constructing cross-classifications of satisfaction in 2001 and 2003 conditional on economic and political judgments to evaluate the transition probabilities —that is, the probability the respondents in a given category of satisfaction with democracy in 2001 (Not at All, Not Very, Somewhat, Very) will change categories in the second-wave measurements —is more intuitively graspable.

As noted above, there are 36 cross-classification tables in all. Each is conditional on POL01, POL03, ECO01 and ECO03, and there is a separate table for each combination of levels for all four latent constructs (2 x 2 x 3 x 3 = 36 subtables in all). Table 5 presents three conditional cross classifications.

TABLE 5. SELECTED TRANSITION PROBABILITIES (CROSS-CLASSIFICATIONS OF SATISFACTION WITH DEMOCRACY IN 2001 AND 2003)

POL: 2001 = Undemocratic, 2003 = Undemocratic
ECO: 2001 = Bad, 2003 = Bad

		2003			
		Not at All	A Little	Somewhat	Very
2001	Not At All	0.3145	0.5782	0.0967	0.0106
	A Little	0.2631	0.6031	0.1202	0.0135
	Somewhat	0.2174	0.6170	0.1482	0.0173
	Very	0.1778	0.6191	0.1810	0.0222

POL: 2001 = Undemocratic, 2003 = Democratic
ECO: 2001 = Bad, 2003 = Bad

		2003			
		Not at All	A Little	Somewhat	Very
2001	Not At All	0.1728	0.6184	0.1895	0.0229
	A Little	0.1398	0.6069	0.2240	0.0293
	Somewhat	0.1123	0.5841	0.2663	0.0373
	Very	0.0896	0.5513	0.3116	0.0475

POL: 2001 = Undemocratic, 2003 = Undemocratic
ECO: 2001 = Bad, 2003 = So-So

		2003			
		Not at All	A Little	Somewhat	Very
2001	Not At All	0.2482	0.6087	0.1285	0.0146
	A Little	0.2044	0.6189	0.1580	0.0187
	Somewhat	0.1666	0.6172	0.1922	0.0239
	Very	0.1346	0.6037	0.2311	0.0306

Source: ENCUP 2001, 2003.

The first cross-classification describes the "worst-case" scenario: a respondent evaluates the Mexican regime as "undemocratic" in both 2001 and 2003 and the economy as "bad" in both of those years. The second varies political judgments in 2003, which go from "undemocratic" in 2001 to "democratic" in 2003, while maintaining evaluations of the economy at "bad". In contrast, the third cross-classifications holds political judgments constant at "undemocratic" while allowing economic perceptions to improve from "bad" to "so-so". The "Results and Discussion" section interprets these tables.

Assess Goodness of Fit

Here, three commonly used statistics are used to assess how close the expected cell counts derived from the model are to the frequencies actually observed: Deviance (frequently denoted by G^2 or L^2), the Bayesian Information Criterion (BIC), and the Dissimilarity Index.

Deviance

$$G^2 = -2(\log L_{FITTED} - \log L_{SATURATED})$$

Smaller G^2, and higher p-values, mean a better fit. The G^2 statistic measures how much the frequencies from a fitted model deviate from observed frequencies (reproduced exactly by the saturated model). The closer the p-value is to 1.00, the more indistinguishable the fitted model is from the saturated model; anything over the conventional level of p = .05 may be considered to fit well. Deviance has an asymptotic X^2 distribution.

BIC

$$BIC = G^2 - DF \log n$$

Lower is better, and a negative statistic means that the fitted model is better than the saturated model.

This approximation to the Bayesian Information Criterion (see Raftery, 1995) rewards more parsimonious models and compensates for the deleterious effects of large sample sizes on fit as measured by G^2 (Deviance). The greater the sample size, the worse the fit will be under the Deviance measure, which is designed to detect the slightest departure from the saturated model. Here, the greater the sample size, the lower the BIC statistic. As for parsimony, the fewer parameters, the greater the degrees of freedom, and the lower the BIC statistic.

Dissimilarity Index

$$D = \sum | np_i - n\hat{\pi}_i | / 2n,$$

where n = sample size, p_i = observed probability for cell i, and $\hat{\pi}$ = fitted probability for cell i.

Smaller values are better. The Dissimilarity Index (DI) measures the closeness of the fitted values to the observed ones by summing up the differences between the two for all cells and dividing by 2n. DI is bounded between 0 and 1, and may be interpreted as the percent of observations misclassified, or that would need to be moved from one cell to another to achieve a perfect fit. Agresti says, "A value of *D* less than about .03 suggests that sample data follow the model pattern quite closely, even though the model is not 'perfect'" (1990: 162).

MM01

G2 Deviance = 309.97 (.022, D.F. = 262)
BIC = -1679.89
Dissimilarity Index = .127

Although by the Deviance statistic, the fitted model is distinguishable from the saturated model, BIC adjusts for the small number of parameters (26, DF=262) and relatively large sample size (N=1,988), indicating an adequate fit. The DI is higher than desirable, but to be expected with such a high number of cells (288). Overall, the model fits fairly well for one so large.

MM03

G2 Deviance = 287.89 (.13, D.F. = 262)
BIC = -1701.97
Dissimilarity Index = .112

Here we have an unambiguously good fit.

SM

G2 Deviance = 538.30 (.25, D.F. = 517)
BIC = -3388.26
Dissimilarity Index = .165

This is also an excellent fitting model, again taking into account that the DI is affected by the large number of cell values.

Results and Discussion: Mexicans Are Not Primarily Pocketbook Citizens

Casting doubt on the prevailing view, the data suggest that Mexicans' evaluations of the regime's democratic performance are at least as important as their perceptions of the economy in influencing satisfaction with their new democratic institutions and rulers are at least. As noted above, in 2001 a citizen who believed the regime was essentially democratic was 70% likelier to be more satisfied with democracy than his skeptical counterpart, holding economic attitudes constant. On the other hand, comparing just respondents within the same category of political evaluations, a citizen who judged the economy as "So-So" in 2001 was only 52% likelier to be more satisfied with democracy than one who thought the economy was "Bad". The improvement in satisfaction with democracy slightly smaller when comparing those who called the economy "Good" to those who felt it was "So-So": the former were 50% likelier to place in a higher category of satisfaction. In both cases, the effect of a positive political assessment was greater than that of favorable economic perceptions.

Political views also influence changes in satisfaction from 2001 to 2003 more than economic assessments. This is seen most clearly in the conditional

cross-classifications presented in Table 5. In the worst-case scenario, in which respondents rate the regime as undemocratic, and the economy as bad, in both survey years, the chances of improving from "not at all" to "somewhat" satisfied were a paltry 9.7%. Under the improved economic scenario (in which respondents who felt the economy was "bad" in 2001 but "so-so" in 2003), this transition probability increases to 12.9%. In the improved political scenario (in which respondents who labelled the regime undemocratic felt it was basically democratic in 2003), however, the figure shoots up to 19%. Similarly, the probability of moving from "a little" to "somewhat" satisfied is 12% under the worst-case scenario, 15% under the improved economic scenario, and an impressive 22% under the improved political scenario. Finally, the probabilities of maintaining one's level of satisfaction over the two survey waves were 15, 19 and 27%, respectively, in the three scenarios. Perusal of the other conditional cross-classifications reveals similar patterns.

Conclusions

In short, panel survey evidence from the ENCUP reveals that, while Mexicans' perception of general economic performance is important in shaping satisfaction with democracy, their perceptions of *political* performance is even more determinative. Satisfaction with democracy declined in the period from 2001 to 2003 more because Mexicans increasingly believed their government to be unresponsive, authoritatarian, and violatory of human rights than because they perceived that their economic fortunes were waning.

If there is a silver lining, it is that Mexicans appear to have given the lie to developmental determinism —the idea that democracy can prosper only insofar as economic growth softens distributional disputes and creates a middle class with democratic aspirations and values. Like everyone everywhere, Mexicans are "pocketbook citizens" to some extent. But they are "civic citizens" to an even greater extent. Economic progress helps, but at least in Mexico, democratic values may apparently be cultivated in its absence.

References

Agresti, Alan (1996), *Introduction to categorical data analysis,* London, Wiley-Interscience.

Beltrán, Ulises, ed. (1996), *Los mexicanos de los noventa*, Mexico City, UNAM.

Camp, Roderic Ai, ed. (2001), *Citizen views of democracy in Latin America*, Pittsburgh, University of Pittsburgh Press.

Clogg, Clifford C. and L. Goodman (1984), "Latent Structure Analysis of a Set of Multi-dimensional Contingency Tables", *Journal of the American Statistical Association*, vol. 79, pp. 762-771.

Dempster, A.P., N.M. Laird and D.B. Rubin (1977), "Maximum Likelihood from Incomplete Data Using the *EM* Algorithm", *Journal of the Royal Statistical Society. Series B (Methodological)*, vol. 39, no. 1, pp. 1-38.

Durand Ponte, Víctor Manuel (2003), *Ciudadanía y cultura política. México, 1993-2001*, Mexico City, Siglo Veintiuno Editores.

Flores, Julia and Y. Meyenberg (2000), *Ciudadanos y cultura de la democracia. Reglas, instituciones y* valores, Mexico City, UNAM and IFE.

Goodman, Leo A. (1973), "The Analysis of Multi-Dimensional Contingency Tables when Some Variables are Posterior to others", *Biometrika*, vol. 60, pp. 179-182.

Hagenaars, Jacques A. (1993), *Loglinear models with latent variables*, Newbury Park, Sage.

Latinobarómetro (2004), *Informe–Resumen. Latinobarómetro 2004. Una década de mediciones*, www.latinobarometro.org.

Lazarsfeld, Paul F. and N.W. Henry (1968), *Latent structure analysis,* Boston, Houghton Mifflin.

Peschard, Jacqueline (2002), "El perfil de la cultura política predominante en México: súbditos en transición", in *Deconstruyendo la ciudadanía. Avances y retos en el desarrollo de la cultura democrática en México*, Mexico City, Segob and M.A. Porrúa, pp. 145-152.

Pereyra, Carlos (1990), *Sobre la* democracia, Mexico City, Cal y Arena.

Powers, Daniel and Y. Xie (2000), *Statistical methods for categorical data analysis*, San Diego California, Academic Press.

Raftery, A.E. (1995), "Bayesian Model Selection in Social Research", in Marsden P. (ed.), *Sociological methodology*, Washington, D.C., The American Sociological Association.

Vermunt, Jeroen (1996), "Causal Loglinear Modeling with Latent Variables and Missing Data", in *Analysis of change. Advanced techniques in panel data analysis*, Berlin/New York, Walter Gruyter, pp. 36-60.

Vermunt, Jeroen (1997), *LEM 1.0: A general program for the analysis of categorical data*, Tilburg, Tilburg University.

Vermunt, Jeroen and W. Georg (1995), "Analyzing Categorical Panel Data by Means of Causal Log-linear Models with Latent Variables: An Application to Change in Youth-Centrism", on-line at http://spitswww.uvt.nl/~vermunt/za1995.pdf.

Zhai, Cheng Xiang (2004), "A Note on the Expectation-Maximization (EM) Algorithm", on-line paper at http://sifaka.cs.uiuc.edu/course/397cxz03f/em-note.pdf.

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