Assessing Voter's Attitudes on the Affordable Care Act: A Bayesian Hierarchical Model Approach Using Cultural Cognition, Public Policy and Geographic Variation Theory

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Presentation Outline

- EITM Framework
- Hypotheses
- Empirical Findings
- Conclusions
- Questions

EITM Framework: Step One

- **EITM linkage** is between:
  - behavior concepts of learning and decision-making
  - the applied statistical concept of binary choice model.
- **Formal Tools** involve the use of Bayesian updating.

Research Questions

- What factors influence individual attitudes on social policy support?
  - Cultural arrangements
  - Social institutions
  - Geographic location
  - Political Ideology
  - Demographics

Research Questions

- Why does context matter in regards to voters' support for social policies?
- What role does cultural worldviews and state location play in voters' decisions on social policies?
- How is changing social demographics at the state and regional level influencing political behavior?

EITM Framework: Step One

- **Previous research findings**:
  - Indicates political ideology informs individual judgments on social policy support.
    - Busemeyer, Goerres, and Weschle 2009; Ellis and Faricy 2011; Eichenberg and Stoll 2012; Petersen, Bang, Sznycer, Cosmides, Tooby 2012; Simon and Lovrich 2010; Ramji and Quinonez 2012; Wilson and Nielson 2011
  - Treats culture as a latent variable.

EITM Framework: Step One

- **Cultural Cognition, Public Policy and Geographic Variation Theory**
  - State and regional cultures into which individuals are socialized allow room for choice and variation.
  - Cultural worldviews drive decisions on social policy support.

EITM Framework: Step One

- **Cultural Cognition, Public Policy and Geographic Variation Theory**
  - American behavior is culturally strategic.
    - Individualistic culture of the Northeast is different from Midwest, West and the Deep South brand of individualism. (Bandara 2002; Kahan and Braman 2006; Jacobs 1992)

EITM Framework: Step One

- **Cultural Cognition, Public Policy and Geographic Variation Theory**
  - My contribution to the literature
    - Modification of Kahan et al (2010) and Kahan and Braman's (2006) conception of cultural worldviews
    - Include subjective Bayesian methods

EITM Framework: Step Two

- **Formal Concept**
  - Cultural Cognition, Public Policy and Geographic Variation Theory explained using **three methodological approaches**.
    - Capture the enduring cultural aspects by supplementing survey data with social historical evidence (Jacobs 1992)
    - Disentangle the effect of individual and state predictors on individual outcomes
      - Two-stage hierarchical model accounting for individual and state level data
    - Illustrate how updating information changes voters' belief systems

EITM Framework: Step Two

- **Formal Concept**
  - Cultural Cognition, Public Policy and Geographic Variation Theory expands on Frey's (2012) findings on Demographic transition theory:
    - My contention is the region of the country and the state where individuals reside influences social policy support.

EITM Framework: Step Two

- Statistical Analogues
  - **Parametric Specification**
    - $\mathbf{Y}_i$ stands for the estimated number of individuals supporting the Affordable Care Act $\mathbf{n}_i$ policy in state $\boldsymbol{i}$
    - $\mathbf{n}_i$ is number of individuals supporting Affordable Care Care Act in a given state $\boldsymbol{i}$
    - $\boldsymbol{p}_i$ is probability success parameter $\boldsymbol{p}$ is index by state $\boldsymbol{i}$.
    - β and γ are vectors of coefficient estimates
    - $\boldsymbol{X}$ matrix is individual and institutional-specific variables
    - $\mathbf{Z}$ matrix contains state-specific variables
    - σ common variance
    - $\gamma_a (= \gamma_{a1} \ldots \gamma_{ai})$ is random effect
    - ε is the error term (residual variance)

EITM Framework: Step Two

- Statistical Analogue Notation
  - **Hierarchy and Prior**
    - The multi-level model

$$y_i \sim binomial\ (n_i\ ,\ p_i)$$

$$logit(\ p_i\ ) = \frac{X\beta}{\exp[Z\Upsilon_a]} + \varepsilon_i \quad (1)$$

Random Effects Model: Success probability and associated logit term error allowed to vary across states

$$\varepsilon_i \sim N(0, \lambda)$$

Prior distribution

$$\lambda \sim gamma(\delta_1, \delta_2)$$

Hyper-prior distribution

EITM Framework: Step Two

- Statistical Analogue Notation
  - U = Model assumes voters earn positive utility
    - by supporting a social policy if the true value is different from zero.
  - Voters do not posses perfect foresight on the true value of social policy support.
  - Voters learn the expected value based on an information set.
    - Via updating by Bayesian mechanism

EITM Framework: Step Two

- Statistical Analogue Notation
  - Expected (subjective) distribution function:
    - $f(Y \mid I)$
  - Cumulative distribution function:
    - $F(Y \mid I)$
      - *F is* cdf with *u and* δ^2

EITM Framework: Step Two

- Statistical Analogue Notation
  - Assume $Ų$ is non-negative
    - Voters support the ACA and value the social policy higher because voters oppose absorbing the expenses of the uninsured.
    - The probability of voter supporting ACA is when $Ų \geq 0$, so
      - $\Pr(\textit{support social policy}) = 1 - \mathrm{F}(0 \mid \mathrm{I})$
    - Likewise the probability of rejecting ACA is:
      - $\Pr(\textit{reject social policy}) = \mathrm{F}(0 \mid \mathrm{I})$

EITM Framework: Step Two

- Statistical Analogue Notation
  - Expected Benefit of social policy support
    - Voters escape the status of an exploited group
      - Retain their preferred healthcare program.
      - Avoid being coerced into government-sponsored healthcare plans.
      - Avoid absorbing the costs of the uninsured.

EITM Framework: Step Two

- Statistical Analogue Notation
  - Bayesian Methods is a good fit for Cultural Cognition, Public Policy and Geographic Variation Theory because:
    - humans live in a society where knowledge is the a highly coveted form of social capital
    - cultural arrangements influence attitudes on social policy (Tansey and O'Riordan 1999).

Data and Measurement

- Dataset
  - Micro-level data
    - ANES 2010-2012 Evaluations of Government and Society Study, October 2010 Survey
  - Macro-level (Institutional) data
    - National Conference of State Legislatures
      - State Attorneys General challenging constitutionality of Affordable Care Act
    - National Academy for State Health Policy
      - Section 1115 Medicaid waivers

Data and Measurement

- Dependent Variable
  - Variable from ANES in which survey respondents were asked:
    - *Congress considered many important bills over the past two years. Tell us whether you support or oppose the Patient Protection and Affordable Care Act legislation in principle.*

Data and Measurement

- Dependent Variable
  - **Social policy support variable coded**
    - 0 = survey respondents stating they oppose the Affordable Care Act
    - 1 = survey respondents stating they support Affordable Care Act.

Data and Measurement

- Independent Variables
  - Individual-specific variables (**Fixed effects**)
    - Political ideology scale
      - Liberal to conservative
    - Cultural world views scale constructed
      - Method adopted from Karl Dake (Kahan 2006) using items from public opinion surveys

Data and Measurement

- Level One: Independent Variables
  - Social Demographics
  - Individual-specific variables (**Fixed effects**)
    - White voters
    - Income
    - Union Members
    - Marital Status
    - Retirees
    - Age
    - High School Educational Attainment
    - Females

Data and Measurement

- Level One: Independent Variables
  - Geographic context (**Fixed effect**)
    - Region
      - Northeast
      - West
      - South
      - Midwest
  - Institutional context (**Fixed effect**)
    - Section 1115 Medicaid waivers
    - State Attorneys General

Data and Measurement

- Level Two: Independent Variables
  - State location and cultural worldviews (**Random Effect**)
  - Respondents report their state residence
    - 43 states in the union used from ANES dataset
  - Cultural worldviews vary by state

Hypotheses

- Primary hypotheses for **Random Effects**:
  - *H1* : The random effects associated with the state-specific intercepts can be omitted from the model
  - *H2*: The variance of the residuals is homogenous for all 43 states.

Hypotheses

- Primary hypotheses related to cultural cognition, social policies and regional differences.
  - *H3* : Support for the Affordable Care Act will increase in regions of the country with rising rather than declining populations.
    - South and West
  - *H4* : Support for the Affordable Care Act will be lower in states where citizens hold hierarchical views rather than egalitarian views.
    - Cross level effect

Hypotheses

- Primary hypotheses related to cultural cognition, social policies and regional differences.
  - *H5* : Support for the Affordable Care Act will be lower in states where political leaders have officially opposed its implementation.
  - *H6* : Support for the Affordable Care Act will be higher in states where political leaders have officially applied for Medicaid waivers from the federal government.

Method

- MCMC Simulation
  - R and Openbugs
- Priors
  - $\lambda_{[z]}$ ~ gamma (0.1, 0.1)
  - $\lambda_{[z]}$ ~ gamma (0.1, 0.1)
  - $\mu \sim$ dnorm (0, 0.1)

Selected Results

- Given the data on hand, the findings indicate social policy support depends on rising cultural worldviews in the state.
  - The HPD for cultural views is bounded away from zero on the positive side.
  - The probability that β is contained in the credible interval [0.232, 0.422] is 95 percent for the model.

Selected Results

- **Variance Component Factor**
  - Voters' holding cultural worldviews varying by state produce different sources of variances in their social policy decisions.
  - The large $\lambda_{[\tilde{z}]}$ variance term suggests voters differ in their social policy support.
  - The reliable posterior mean indicates including variables predicting why some voters support social policies whereas others do not is appropriate method.

Selected Results

- Variance Component Factor
  - The $\lambda_{[E]}$ term suggests:
    - Social location is salient.
    - There are differences in voters' support for social policy based on state location.

Selected Results

- Confirms demographic transition theory
  - Political ideology alone does not explain political behavior
  - Changing demographics influencing politics
- Geographic context matters
  - Random effect for region leaned away from social policy support.
  - Individual attitudes across all regions of the country were frequently inclined to oppose the Affordable Care Act.

Data and Measurement

Table 1: Descriptive Statistics

	Estimates			
Variables	Mean	Standard Deviation	Minimum	Maximum
Individual-specific Variables [1]				
Public Opinion on Affordable Care Act	.565	.496	0	1
Retired	.213	.410	0	1
Age (in years)	49	17	18	100
Married	.556	.497	0	1
Male	.522	.500	0	1
High School Education	.607	.489	0	1
Union Member	.104	.306	0	1
Rural Areas	.178	.383	0	1
White	.774	.418	0	1
Liberal-Conservative Scale	4.29	1.41	1	7
Hierarchical and Egalitarianism Scale[2]	5.25	1.78	-0.162	10.23
Income	$49,000	$10,000	0	$75,00 plus

[1] Data obtained from ANES: Evaluations of Government and Society Study 1 (EGSS 1), 2010-2012.

[2] Hierarchical and Egalitarianism Scale was constructed using 10-item questions from ANES: Evaluations of Government and Society Study 1 (EGSS 1), 2010-2012.

Data and Measurement

Table 1 : Descriptive Statistics (contd.)

Variables	Estimates			
	Mean	Standard Deviation	Minimum	Maximum
Institutional Variables				
Section 1115 Medicaid Waivers[3]	.753	.431	0	1
Divided State Government[4]	.357	.479	0	1
Attorney General Lawsuit[4]	.545	.498	0	1
Individual Insurance Mandates[5]	.217	.173	0	1
Small Business Insurance Mandate[5]	.218	.231	0	1
Large Business Insurance Mandate[5]	.190	.187	0	1

[3] Data obtained from The National Academy for State Health Policy.

[4] National Conference of State Legislatures.

[5] Data obtained for the medical loss ratio (MLR) mandates or the 80/20 rule from Kaiser Family Foundation: The Kaiser Initiative on Health Reform and Private Insurance. Estimates are standardized.