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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June 25, 2014
2014 EITM Summer Institute
@ University of Houston
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, Szynecer, 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
    - 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**
    - $Y_i$ stands for the estimated number of individuals supporting the Affordable Care Act $n_i$ policy in state $i$
    - $n_i$ is number of individuals supporting Affordable Care Act in a given state $i$
    - $p_i$ is probability success parameter $p$ is index by state $i$.
    - $\beta$ and $\gamma$ are vectors of coefficient estimates
    - $X$ matrix is individual and institutional-specific variables
    - $Z$ matrix contains state-specific variables
    - $\sigma$ common variance
    - $\gamma_a (= \gamma_{a1} ... \gamma_{ai})$ is random effect
    - $\varepsilon$ is the error term (residual variance)
EITM Framework: Step Two

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

\[
y_i \sim binomial(n_i, p_i)
\]

\[
logit(p_i) = \frac{X\beta}{\exp[Z\gamma_a]} + \varepsilon_i
\]

\[
\varepsilon_i \sim N(0, \lambda)
\]

\[
\lambda \sim gamma(\delta_1, \delta_2)
\]

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

**Prior distribution**

**Hyper-prior distribution**
EITM Framework: Step Two

- Statistical Analogue Notation
  - $\psi$ = Model assumes voters earn positive utility by supporting a social policy if the true value is different from zero.
  - Voters do not possess 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:
    - $f(\mathcal{U} | I)$
  - Cumulative distribution function:
    - $F(\mathcal{U} / I)
      - $F$ is cdf with $u$ and $\delta^2$
EITM Framework: Step Two

- Statistical Analogue Notation
  - Assume $\mathcal{U}$ 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 $\mathcal{U} \geq 0$, so
      - $\Pr (support \ social \ policy) = 1 - F(0 | I)$
    - Likewise the probability of rejecting ACA is:
      - $\Pr (reject \ social \ policy) = F(0 | I)$
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.
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
  - \( \lambda_{[z]} \sim \text{gamma} (0.1, 0.1) \)
  - \( \lambda_{[z]} \sim \text{gamma} (0.1, 0.1) \)
  - \( \mu \sim \text{dnorm} (0, 0.1) \)
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 $\beta$ 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 $\lambda^{[\tau]}$ 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.
## Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Individual-specific Variables</strong> ^1</td>
<td></td>
</tr>
<tr>
<td>Public Opinion on Affordable Care Act</td>
<td>.565</td>
</tr>
<tr>
<td>Retired</td>
<td>.213</td>
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<tr>
<td>Age (in years)</td>
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<tr>
<td>Married</td>
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<tr>
<td>Male</td>
<td>.522</td>
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<td>High School Education</td>
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<td>Union Member</td>
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<tr>
<td>Rural Areas</td>
<td>.178</td>
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<tr>
<td>White</td>
<td>.774</td>
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<tr>
<td>Liberal-Conservative Scale</td>
<td>4.29</td>
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<tr>
<td>Hierarchical and Egalitarianism Scale ^2</td>
<td>5.25</td>
</tr>
<tr>
<td>Income</td>
<td>$49,000</td>
</tr>
</tbody>
</table>

^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.
### Table 1: Descriptive Statistics (contd.)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
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<tr>
<td><strong>Institutional Variables</strong></td>
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<tr>
<td>Section 1115 Medicaid Waivers$^3$</td>
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<td>Divided State Government$^4$</td>
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<td>Individual Insurance Mandates$^5$</td>
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<td>Large Business Insurance Mandate$^5$</td>
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<td>.187</td>
<td>0</td>
<td>1</td>
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</table>

$^3$ 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.