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Introduction

• **Substantive question:** What is the relationship between gay rights policies in the states and public opinion?
  - Responsiveness (correlation)
  - Congruence (opinion majorities)
  - Policy-specific opinion vs. general ideology

• **Methodological question:** How can we estimate policy-specific opinion at the state level?
  - State surveys
  - Disaggregation
  - Multilevel Regression and Poststratification (MRP)
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• **Methodological question:** How can we estimate policy-specific opinion at the state level?
  - State surveys
  - Disaggregation
  - Multilevel Regression and Poststratification (MRP)
Alternative 1

- State Surveys
  - Usually not an option
  - Rare and not comprehensive
  - Often not comparable (wording, timing, method)
Alternative 2

- **Disaggregation**
  - Erikson, Wright, & McIver (1993)
  - Pools large numbers of national surveys
  - Disaggregates by state
  - No pooling of respondents/information across states
  - **Advantages**
    - Easily implemented
    - Used successfully by numerous scholars
    - Respects differences across states
  - **Disadvantages**
    - Must pool surveys over numerous years (10 to 25)
    - Does not correct for sampling artifacts
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- Multilevel Regression and Poststratification (MRP)
  - Park, Gelman, & Bafumi (2006)
  - National level surveys
  - Individual survey responses are modeled
    - Demographic & geographic factors used
    - Estimated with a hierarchical linear model
    - Respondents are partially pooled (endogenous)
    - State level effects are also modeled
  - Create estimates for each demographic-geographic respondent type
  - Poststratification: weight these estimates by frequencies within state
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- MRP Continued...
  - Advantages
    - Potentially more accurate
    - Corrects for sampling artifacts
    - Potentially requires fewer surveys
  - Disadvantages
    - Statistically more complex
    - More data of a different type (census)
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The Status Quo

- **What we know**
  - Disaggregation solid successes when $N$ is large
  - Older simulation techniques relatively inaccurate

- **What we don’t know**
  - Are estimates from MRP as good as those from disaggregation?
  - How good are they?
  - How many surveys do we need to generate “good” estimates using MRP?
  - How complicated a model of individual response is necessary?
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Research Design

- Compare each method
  - Use random samples of pooled national poll data
  - Use disaggregation as the baseline
  - Vary sample sizes
  - Compare the predictive success

- Then see how far one can push MRP
  - Compare sparse and complex models of opinion
  - Assess MRP from a single national poll
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Comparing methods

- Randomly split data
  - 1/2 used to define “truth"
    - Truth measured using disaggregation
  - Some portion of the remaining data is used to estimate opinion
    - Once using each technique
  - We do this 200 times

- Vary sample sizes
  - 5% ($n = 1,400$) (roughly a national poll)
  - 10% ($n = 2,800$)
  - 25% ($n = 7,000$)
  - 50% ($n = 14,000$)
Data

- 26 national polls from 1996 through 2005
  - Approximately 28,000 respondents
- Ask respondents about support for same-sex marriage
- Re-code for internal consistency
  - Male or female
  - Black, Hispanic, or White
  - Age (4 levels)
  - Education (4 levels: <HS, HS, some college, college)
- State level data
  - % Evangelical Protestants & Mormons
  - Region
- 1% Public Use Microdata Sample from the 2000 Census
  - Used in poststratification
Applying MRP

- Estimating Individual Opinion
  (LMER function in R)

\[ \Pr(y_i = 1) = \logit^{-1}(\beta^0 + \alpha_{\text{race,gender}}^{j[i]} + \alpha_{\text{age}}^{k[i]} + \alpha_{\text{edu}}^{l[i]} + \alpha_{\text{state}}^{s[i]} + \alpha_{\text{year}}^{p[i]}) \]

\[ \alpha_{\text{race,gender}}^{j} \sim N(0, \sigma_{\text{race,gender}}^2), \text{ for } j = 1, \ldots, 6 \]
\[ \alpha_{\text{age}}^{k} \sim N(0, \sigma_{\text{age}}^2), \text{ for } k = 1, \ldots, 4 \]
\[ \alpha_{\text{edu}}^{l} \sim N(0, \sigma_{\text{edu}}^2), \text{ for } l = 1, \ldots, 4 \]
\[ \alpha_{\text{year}}^{p} \sim N(0, \sigma_{\text{poll}}^2), \text{ for } p = 1, \ldots, 7 \]
\[ \alpha_{\text{state}}^{s} \sim N(\alpha_{m[s]}^{\text{region}} + \beta^{\text{relig}} \cdot \text{relig}_{s}, \sigma_{\text{state}}^2), \text{ for } s = 1, \ldots, 49 \]
\[ \alpha_{\text{region}}^{m} \sim N(0, \sigma_{\text{region}}^2), \text{ for } m = 1, \ldots, 5 \]
Applying MRP

- Estimating state opinion

\[
y_{\text{state } s}^{\text{MRP}} = \frac{\sum_{c \in s} N_c \theta_c}{\sum_{c \in s} N_c}
\]
Cross Validation: Mean errors by state and method

5% Sample (N~1,400)

10% Sample (N~2,800)

25% Sample (N~7,100)

50% Sample (N~14,200)
Cross Validation: Summary performance measures

Mean Absolute Error

<table>
<thead>
<tr>
<th>Sample</th>
<th>5%</th>
<th>10%</th>
<th>25%</th>
<th>50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>(4.9, 10.6)</td>
<td>(4.5, 7.8)</td>
<td>(4.1, 5.3)</td>
<td>(3.8, 4.3)</td>
</tr>
<tr>
<td>Std Dev</td>
<td>(2.9, 12.4)</td>
<td>(2.1, 8.5)</td>
<td>(1.4, 4.7)</td>
<td>(1.0, 2.7)</td>
</tr>
</tbody>
</table>

Standard Deviation

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<tbody>
<tr>
<td>Value</td>
<td>(0.46, 0.74)</td>
<td>(0.59, 0.78)</td>
<td>(0.74, 0.81)</td>
<td>(0.81, 0.83)</td>
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Correlation

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How Often MRP Beats Disaggregation

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<tr>
<td>Value</td>
<td>(58%, 83%)</td>
<td>(62%, 97%)</td>
<td>(68%, 99%)</td>
<td>(73%, 99%)</td>
</tr>
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Pushing MRP further (the response model)

- How complicated a response model do you need?
  - Compare sparse and complex demographic models
  - Assess contributions of demographic and geographic predictors

- Create five sets of estimates
  - Use 10% samples for estimates
  - Use 90% samples and disaggregation to define the baseline (repeat 200 times)
Correlation by Model Complexity

- Geography vs. Demography?
  - Methodological message
  - Substantive message
MRP Using A Single National Poll

- Results suggest that imputation only needs a single large national poll... is that true?

- Face validity
  - Use four national polls to generate four different estimates (by state) of support for same sex marriage
  - Do these results look reasonable?

- Compare to actual state-level polls
  - Gathered 75 polls—cover all but 13 states and Washington D.C.
  - Use a national poll taken during the same year to generate a prediction
  - How close do we get?
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External Validity: predicting state polls

Correlation between MRP estimates & actual state polls = .73
Methodological Conclusion

• Findings
  • MRP is superior to disaggregation when samples are small to medium sized
  • For large samples, the methods converge (but MRP still has the edge)
  • MRP performs nearly as well on small and large samples
  • Does “sufficiently” well even using a “single” national poll

• Implications
  • Many more issues, finer-grained geographic areas, narrow time periods
  • Should greatly enhance research into responsiveness
  • Speaking of which... what can you do with policy-specific state-level opinion?
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Gay Rights in the States

• Approach
  • Gay rights policies
  • Estimate state-level policy-specific opinion
  • Compare to actual state policies

• Implications
  • Democratic control of government
  • Federalism
  • Tyranny of the majority
  • Special interest (pro-gay bias?)
  • Methodological (specific opinion?)
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Gay Rights Data

- 39 national polls (approximately 70,000 respondents)
- 1994-2005
- race, gender, age, education, age × education
- state, region, religion
- policies:
  - same-sex marriage
  - civil unions
  - sodomy laws
  - second-parent adoption
  - health benefits for domestic partners
  - housing anti-discrimination laws
  - employment anti-discrimination laws
  - hate crime laws
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Theoretical Expectations

- High responsiveness
  - Non-complex policies
  - Salient (some highly)
  - Consistently on state legislative agendas

- But...
  - Gays rights policies determined by the interaction of legislatures, courts, direct democracy, state and federal constitutional law
  - Courts highly involved in some (adoption, sodomy); less in jobs, housing, hate; others split
  - Varying intensity of preferences, salience, information
## Mean Difference

<table>
<thead>
<tr>
<th>Pro-Gay Policy</th>
<th>States with Policy</th>
<th>States without Policy</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same-Sex Marriage</td>
<td>46</td>
<td>32</td>
<td>14 (NA)</td>
</tr>
<tr>
<td>Civil Unions</td>
<td>51</td>
<td>40</td>
<td>11**</td>
</tr>
<tr>
<td>Second-Parent Adoption</td>
<td>49</td>
<td>39</td>
<td>10**</td>
</tr>
<tr>
<td>Employment Protection</td>
<td>75</td>
<td>69</td>
<td>6**</td>
</tr>
<tr>
<td>Housing Protection</td>
<td>78</td>
<td>73</td>
<td>6**</td>
</tr>
<tr>
<td>Health Care Benefits for Domestic Partners</td>
<td>65</td>
<td>59</td>
<td>6**</td>
</tr>
<tr>
<td>Hate Crimes Law includes Sexual Orientation</td>
<td>72</td>
<td>67</td>
<td>5**</td>
</tr>
<tr>
<td>No Sodomy Prohibition</td>
<td>50</td>
<td>40</td>
<td>10**</td>
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Basic Responsiveness
Responsiveness

- policy-specific opinion, voter ideology, government ideology, % religious conservatives
- separate models, full model

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<th>Model 1: Policy Fixed Effects</th>
<th>Model 2: State Fixed Effects</th>
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<tr>
<td></td>
<td>Unstandardized Coefficients</td>
<td>Standardized Coefficients</td>
</tr>
<tr>
<td>Policy-Specific Opinion</td>
<td><strong>.11</strong> (.06)</td>
<td><strong>3.76</strong> (2.15)</td>
</tr>
<tr>
<td>Government Ideology</td>
<td><strong>.03</strong> (.01)</td>
<td><strong>1.16</strong> (.39)</td>
</tr>
<tr>
<td>Voter Ideology</td>
<td><strong>.13</strong> (.04)</td>
<td><strong>1.90</strong> (.54)</td>
</tr>
<tr>
<td>Share Relig. Conservatives</td>
<td>-.05 (.04)</td>
<td>-1.27 (.94)</td>
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Causality? Two Responses

- Demographics vs. State Effects
  - Demographics are fixed – can’t respond to policy except in aggregate correlations
  - State effects which “correct” for this do not vary systematically with policy adoption
- Limit analysis to polls prior to policy adoption – civil unions and hate crimes laws
  - Robust, statistically significant, substantively similar
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Responsiveness: What have we learned?

• Strong positive relationship between policy-specific opinion and state policy
  • Even after controlling for other possible influences
  • Bigger role shaping outcomes than other influences
  • Strength varies by policy
  • Evidence of causality
  • Next: congruence. Do opinion majorities prevail?
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## Congruence

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Congruence Maps

- SODOMY
- MARRIAGE
- CIVIL UNIONS
- ADOPTION
- JOBS
- HOUSING
- HEALTH BENEFITS
- HATE CRIMES
- CONGRUENCE INDEX
Congruence Graphs
Congruence: What have we learned?

- Opinion majorities often do not prevail
- Policies pertaining to economic fairness least congruent
- Policies regulating personal relationships most congruent
- Courts not counter-majoritarian (civil unions, adoption, marriage most congruent)
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