VIOLENT CRIME TRENDS AND THE FORMATION OF PUBLIC ATTITUDES ABOUT GUN CONTROL

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Motivation:
Over the past two decades, trends in crime and gun violence have changed dramatically. After peaking in the early 1990s, the overall violent crime rate has fallen precipitously, and yet, since 2000, the frequency and scale of incidents of mass gun violence have been steadily on the rise. Studies have shown that support for gun control has decreased over time, but that a majority of the public still supports a number of gun-related policies. In turn, in this project, I seek to answer two questions:

1. How have changes in the nature and frequency of violent crime influenced public opinion on gun policy?
2. Has the process of attitude change occurred differently across states and/or demographic groups?

Methodological Approach

Drawing on earlier work by Shirley and Gelman (2014), I model attitudes about gun control using an overparametrized hierarchical Bayesian logistic regression model. Modeling opinion in this way has three main benefits:

1. Overparameterization → estimation of national-level trends, along with state deviations from those trends.
2. Hierarchical → shrinkage across groups, meaning categories with low sample sizes are weighted more towards group mean. This is necessary given that only 19,148 of the 51 x 25 x 2 x 4 x 4 = 81,600 possible groups are represented in the data.
3. Estimation of population-level trends is possible via poststratification.

Individual Level

The respondent level of the model is shown below. Note that each term is allowed to vary by state. Thus, each $\alpha$ terms represent a piece of the state-specific intercept, and each $\delta$ term represents a piece of the state-specific slope (change over time).

$$P(Y_i = 1) = \logit^{-1}(\alpha_{state-year} + \alpha_{state-black} + \alpha_{state-education} + \alpha_{state-age} + \delta_{state-black}X_{state-black} + \delta_{state-female}X_{state-female} + \delta_{state-education}X_{state-education} + \delta_{state-age}X_{state-age} + \beta_{education}X_{education} + \beta_{age}X_{age})$$

Group Level Examples

Each term also has a group level model. Here are two examples:

$$\alpha_{state-black} \sim N(\alpha_{state-black}^{state} + \delta_{state-black}^{state} + \sigma_{state-black}, \sigma_{state-black}^2)$$

$$\alpha_{state-female} \sim N(\alpha_{state-female}^{state} + \delta_{state-female}^{state} + \sigma_{state-female}, \sigma_{state-female}^2)$$

Conclusions/Extensions

- Model confirms steady decline in support (approx. 0.4% per year) for stricter gun control measures for the “average” survey respondent.
- No clear effect of mass violence on attitudes. Parameterization may be issue.
- Precisely estimated null effect of overall violent crime rate on attitudes.
- Republican voting correlated with baseline attitudes ($p < 0.01$) and changes in attitudes over time ($p < 0.05$). Effect is small: 2 std. deviation increase yields < 2% change.
- Significant variation within and across regions. Unobserved state-level factors are important. Urban/Rural and gun ownership proxy need to be added.
- Partisanship is clearly important. Considering including this in the model and not poststratifying.