Riley McNair
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The Correlation of Protests and Polarization

In today's increasingly interconnected world, the amplification of extreme views seems to be on the rise. Such dynamics have led to a noticeable polarization of viewpoints, particularly in the political arena. Robinson (2022) highlights a trend that has been unfolding over the years, which is the diminishing trust Americans place in their governing institutions and federal agencies. This erosion of trust is further worsened by the fact that partisan identities are influencing perceptions of governmental performance (Robinson, 2022). The combination of these factors has led the United States into a state of hyperpolarization.

Prior research at cross-national levels have shown that protests are most likely to occur in countries where the average level of citizen grievance is rather low, but citizens in polarized communities tend to have more severe social disruptions (Griffin et al., 2021). This paper shifts the focus from a national to a state-level examination of political polarization in the United States. By doing so, it aims to explore the correlation between the degree of polarization within a state and its level of political activism, as exhibited through protesting. This approach offers a nuanced understanding of how divisions within states might influence their propensity for political engagement and activism. As it also seeks to answer the question, laid out by the assignment "Are polarized communities subject to more frequent or more severe social disruptions".

Operationalization of Variables

<u>Polarization in the United States: A Quantitative Analysis</u>

This paper defines polarization in the United States as the extent to which individuals or groups within a society hold starkly contrasting and often extreme political positions. Characterized by a widening ideological distance between political entities, such as parties in the United States (Republican and Democrat). To accurately measure the extent of polarization at the state level, this research integrates data from the Cooperative Congressional Election Study (CCES) and the American National Election Study (ANES), creating a substantial dataset for analysis. By utilizing a consistent question from each survey regarding party affiliation—rated on a seven-point scale—this method categorizes respondents' political identities as follows:

1. Strong Democrat   2. Not very strong Democrat
3. Independent-Democrat   4. Independent
5. Independent-Republican 6. Not very strong Republican
7. Strong Republican

By grouping respondents by state, the study examines the distribution of party affiliation, allowing for the calculation of the proportion of respondents within each of the seven categories on a state-by-state basis. The utilization of Shannon Entropy theory allows for the quantification of response distribution across these categories, providing a measure of political diversity within states. This approach generates a variance number for each state, offering insights into the relative level of polarization. A higher variance in party identification within a state would indicate a higher level of polarization.

<u>Measuring Civil Engagement: Protest Frequency</u>

To assess civil engagement through the lens of protest frequency, this analysis uses data from the Armed Conflict Location & Event Data (ACLED), which documents the number of protests occurring in the United States over the past two years. This data is then grouped by state, allowing for an examination of protest activity on a state basis. To ensure comparability across states, the study normalizes this data by using the most recent population figures per state from the US 2020 Census. The number of protests in each state is divided by its population, and then multiplied by 100,000 to standardize the number of protests per 100,000 residents. This standardized metric allows for an equal comparison of protest activity across diverse states, allowing us to then measure patterns of civil engagement in relation to political polarization.

Quality Control of X

<u>Data Cleaning:</u> The initial step in my analytical process involved cleaning of the 'party_identification' variable. Removing entries with missing values and excluded responses where participants indicated uncertainty or non-response, such as "Do Not Know" or "No Answer." Similarly, I refined the 'state_id' data by eliminating any instances with missing information, thereby ensuring a dataset that is both accurate and reliable for further analysis.

<u>Variance Score Calculation</u>: Employing the principles of entropy measure, I computed the variance scores for categorical values associated with state-level polarization.

$$H(X) = -\sum_{i=1}^{n} p_i \log_2 p_i$$

Note: This is the formula to measure the variance of the categorical variable, using the Entropy Theory.

Distribution of Polarization Scores Across States
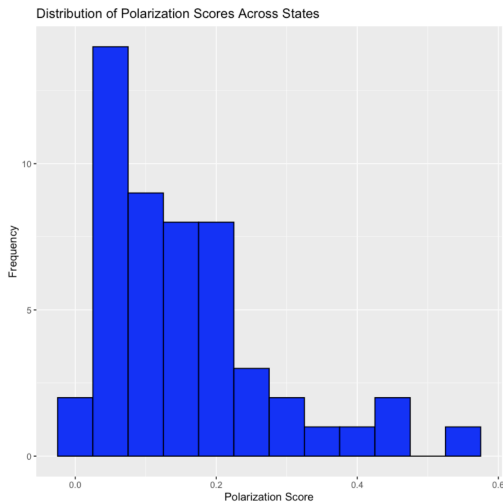
The histogram, depicting the distribution of these scores across states, leans toward a right-skewed distribution while maintaining a semblance of normality.

An accompanying table details descriptive statistics, including the mean, median, and range, confirming an appropriate count of scores without significant anomalies or outliers.

count	mean	median	variance	std_deviation	IQR	min	max	range
<int>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
50	0.1547565	0.1367375	0.01447088	0.120295	0.1374468	0.01458563	0.5340817	0.519496

Methods and Findings

<u>Hypothesis</u>

Null Hypothesis: There is no significant correlation between the degree of political polarization in a state and the frequency or severity of social protests or disruptions in that state.

$$H_0 : \rho = 0$$

Alternative Hypothesis: There is a significant correlation between the degree of political polarization in a state and the frequency or severity of social protests or disruptions in that state.

$$H_A : \rho \neq 0$$

<u>Results</u>

Linear Regression

The linear regression analysis depicted in the graph below illustrates an inverse relationship between state-level political polarization and the frequency of protests. This suggests that states exhibiting higher degrees of polarization tend to have a lower average number of protests. Although these findings are preliminary and warrant further exploration, one plausible interpretation is that states with a more uniform set of political beliefs may be more cohesive in

their approach to activism, potentially leading to more organized and frequent protest events, particularly on matters of national importance.

Correlation Between State's Political Diversity and Protests per 100k
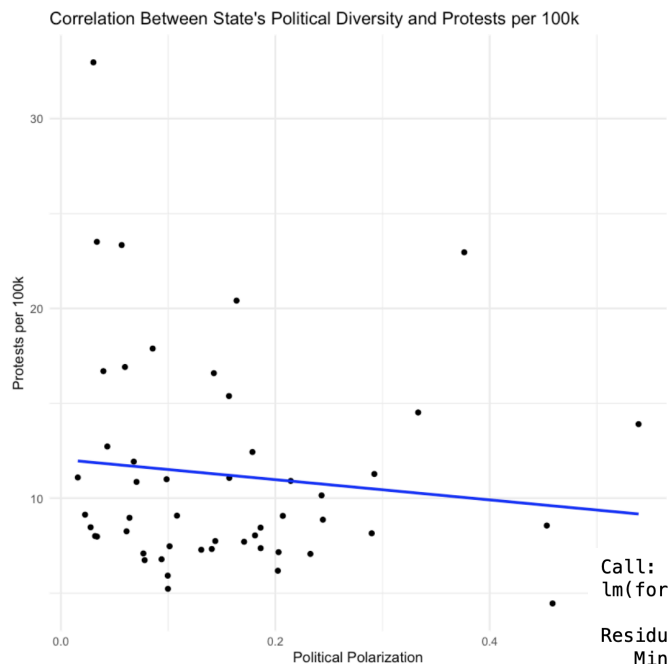
- The coefficients show that as the polarization variance score increases by one unit, the protests_per_100k decreases by approximately 5.256. However, the p-value associated with polarization_var is 0.441, indicating that this is not statistically significant at typical alpha levels (e.g., 0.05), and therefore we cannot confidently assert there is a correlation.

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Call:
lm(formula = protests_per_100k ~ polarization_var, data = combined_data)

Residuals:
   Min     1Q Median     3Q    Max
-6.288 -3.797 -2.129  1.227 21.082

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)        12.036      1.320   9.118 4.76e-12 ***
polarization_var   -5.256      6.760  -0.777    0.441
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 5.693 on 48 degrees of freedom
Multiple R-squared:  0.01243,   Adjusted R-squared:  -0.008141
F-statistic: 0.6043 on 1 and 48 DF,  p-value: 0.4407
```

Analysis

The regression output suggests that there is not a statistically significant relationship between state-level polarization variance and the number of protests per 100,000 people, thus we fail to reject the null at a significance level of .05%. While the model indicates a negative relationship (more polarization variance associates with fewer protests per capita), this relationship does not hold statistical significance based on your dataset and the regression analysis performed.

LOESS

Given the absence of a clear linear relationship between these variables, I employed a LOESS (Locally Estimated Scatterplot Smoothing) model to better capture and visualize the nuances of their association. This approach allows for the illustration of potential non-linear patterns that may exist between state-level political polarization and the frequency of protests.

Correlation Between State's Political Diversity and Protests per 100k
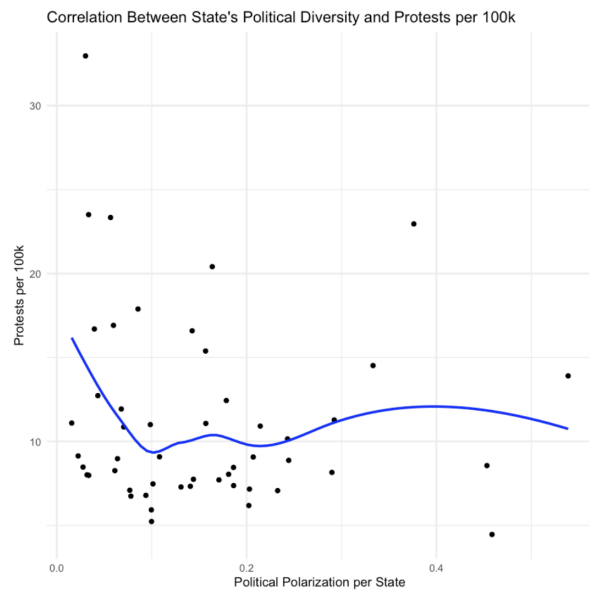
The LOESS curve appears to start higher on the left, decrease and then level off as polarization increases. This pattern suggests that states with lower polarization scores might have a higher rate of protests initially, but as polarization increases, the rate of protests per 100k tends to stabilize or not increase much further.

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