Voting Results as Related to Education Level in the 2024 Presidential Election

Introduction

Since at least 2008, political scientists, geographers, and journalists have recognized a pattern of adults with four-year college degrees being more likely to vote for the Democratic presidential candidate than the Republic candidate. Evidence of this relationship were found at the national level during both the 2016 and 2020 presidential elections. As such, it is likely that this relationship held true during the 2024 presidential election. From this information, it can be hypothesized that Virginia counties with higher populations of adults with bachelor's degrees were more likely to have voted Democratic in the 2024 presidential election. Data has been taken from the Virginia Department of Elections (2024) and the IPUMS National Historic GIS System (2023) to show election and education percentages at the county-level for the Commonwealth of Virginia.

Figure 1 depicts the percentage of voters for the Democratic presidential candidate, Kamala Harris, by county in the Commonwealth of Virginia in 2024. The largest percentages of Democratic voters were generally found in independent cities across the state, such as Petersburg and Charlottesville, as well as in counties in the eastern part of Virginia, such as Arlington and Albemarle counties. The lowest percentages of Democratic voters were generally found in the western part of Virginia, including in Lee and Buchanan counties.

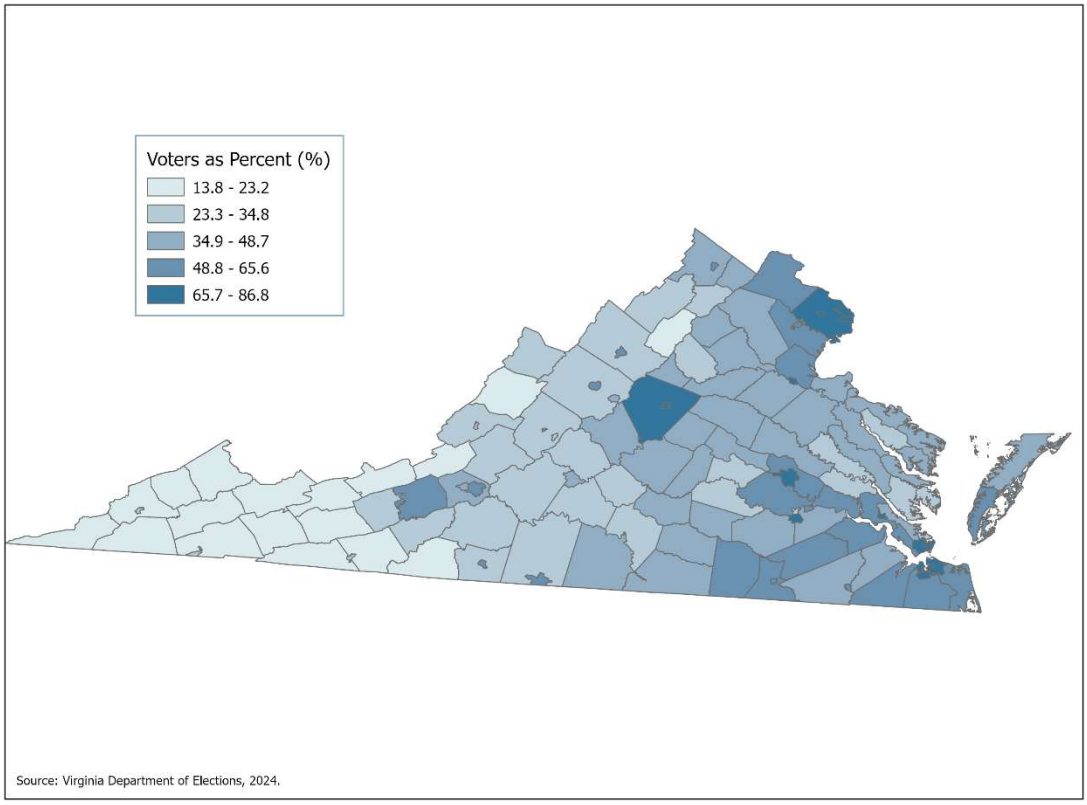

Figure 1: Percentage of Voters for Democratic Candidate (Harris) in 2024

Figure 2 depicts the percentage of adults, defined as people over the age of 25, with bachelor's degrees by county in the Commonwealth of Virginia in 2023. The largest percentages of adults with bachelor's degrees were generally found in the northern and central parts of Virginia, in cities such as Falls Church and Lexington and in counties such as Arlington and Albemarle. The lowest percentages of adults with bachelor's degrees were generally found along the southern and western edges of Virginia, in Buchanan and Lunenburg counties, as well as Hopewell City and Covington City.

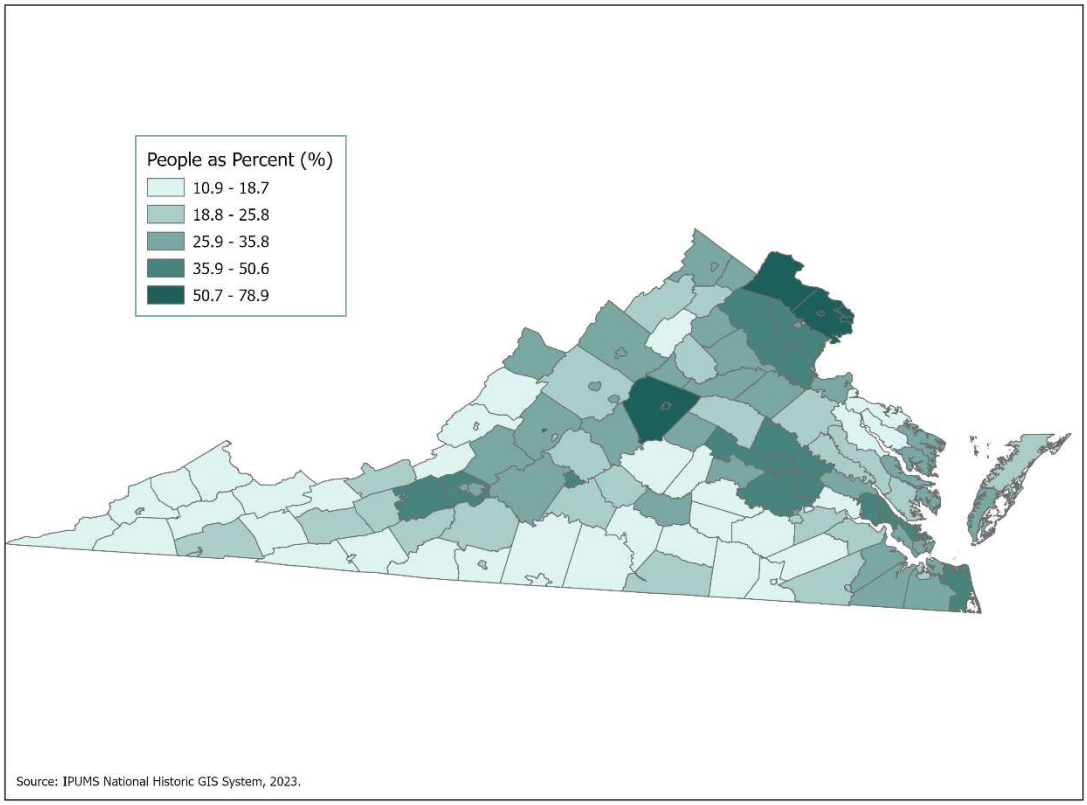

Figure 2: Percentage of People Over 25 with Bachelor's Degrees in 2023

Methodology

B. describe your methods (see steps 11 – 15). Should include:

The hypothesis, that counties with higher populations of adults with bachelor's degrees were more likely to have voted for Harris in the 2024 presidential election, was tested by comparing the percentage of voters who voted for Harris between counties with high and low percentages of adults with bachelor's degrees.

This began by adding two fields to the attribute table of election results that had been added to the geodatabase: the percentage of Democratic voters (P_Dem) and the percentage of people age 25 or older with bachelor's degrees (P_Bach). These fields were then calculated as follows: P_Dem is equal to the number of Democratic voters divided by the total number of

voters, multiplied by 100; P_Bach is equal to the number of people with bachelor's degrees divided by the total number of people age 25 or older, multiplied by 100. These calculations resulted in the percentages used for this test. The election results attribute table was then joined with the attribute table for the polygon feature class representing counties in the geodatabase, thus assigning the percentage data as part of a polygon on the map.

The difference between "high" and "low" percentages of adults with bachelor's degrees is defined as being higher or lower than a critical value of 36%, which was determined after looking at the recorded percentage values. A simple value of "high" could have been at or over 50%, however this would have resulted in a very small number of selected counties and would not have accurately represented the total data. Approximately one-fifth (27 out of 133) of the counties and independent cities have a population with bachelor's degree percentage above 36%, meaning it accounts for a large segment of the counties overall, without being overspread. There is also a natural break in the recorded data between 35.8% and 37.5%, making 36% a reasonable measure of difference.

After deciding a critical value, the select by attributes tool was used to select all counties with a percentage of people with bachelor's degrees was greater than 36%, thus visually highlighting these high percentage counties on the map, attribute table, and frequency histograms. With these features highlighted, it was easier to record data measures, such as the minimum, maximum, mean, and standard deviation. The selection of these features was then inverted and subsequently recorded to show the data measures for counties with low percentages. With data recorded for counties with both high and low percentages of adults with bachelor's degrees, this data could then be compared to that of percentages of voters for the Democratic candidate in those same counties.

Results

The mean percentage of Democratic voters in counties with a high percentage of people with bachelor's degrees was 58.639, while the mean percentage of the same in counties with a low to average percentage of people with bachelor's degrees was 38.025. Unsurprisingly, there are large differences in the statistics for minimum and range, with values of approximately 26.8 versus 13.8 (13 point difference) and 58.3 versus 73.0 (15 point difference), respectively. There are marginal differences in the statistics for maximum and standard deviation, with values of approximately 85.0 versus 86.8 (1.8 point difference) and 15.8 versus 15.1 (<0.7 point difference).

Table 1: Comparing Percentage voting for Democratic Party's candidate (Harris) between High and Low to Average Percent Earning Bachelor's degree Counties

Statistic	Support for Dem Candidate in High % Bach Counties (>36%)	Support for Dem Candidate in Low & Avg % Bach Counties (<36%)
Number (N)	27	106
Minimum	26.758	13.820
Maximum	85.006	86.828
Range	58.248	73.008
Mean	58.639	38.025
Std. Deviation	15.778	15.137

Descriptive Statistics

As stated previously, the mean for Democratic voters in counties with a high percentage of adults with bachelor's degrees is about 20 points greater than it is in counties with a low percentage of adults with bachelor's degrees. This difference is greater than the standard deviation for either selection, and indicates a greater likelihood that those with bachelor's degrees voted Democrat. While the maximums are nearly identical, counties with higher

percentages of adults with bachelor's degrees have a higher minimum value, meaning they were more likely to vote for the Democratic candidate overall. The frequency histograms also depict a greater portion of individuals with bachelor's degrees voting Democratic in the 2024 presidential election. These results combined support the hypothesis that there is a significant positive relationship between individuals having bachelor's degrees and individuals voting for the Democratic candidate in the 2024 presidential election in Virginia.