Analyzing Environmental Spending Trends: A Comparison Across Political Party Preference and Awareness

Intro to Data Analytics

DATA220L-112

EcoTrackers

Marist College
School of Computer Science and Mathematics
Submitted To:
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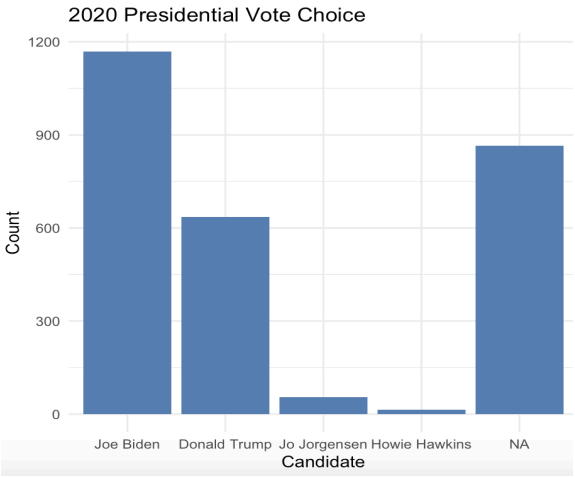
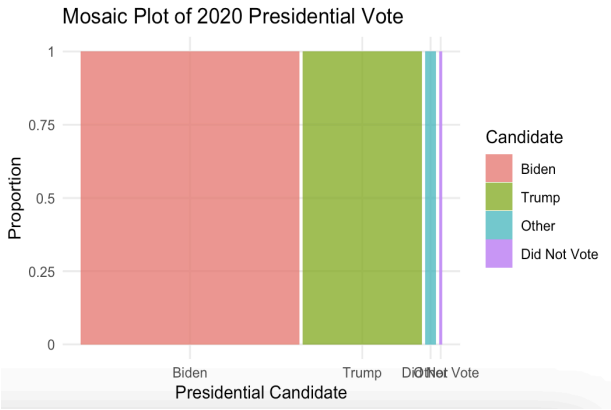
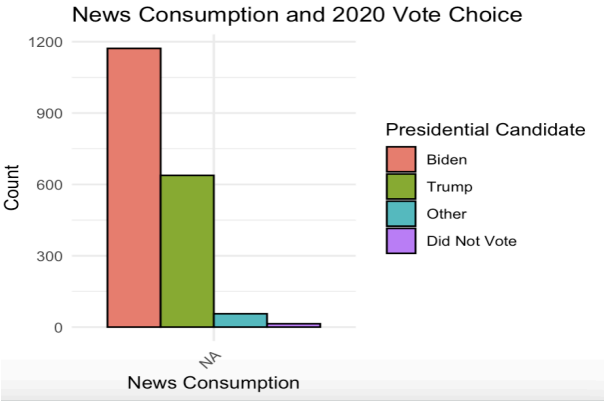
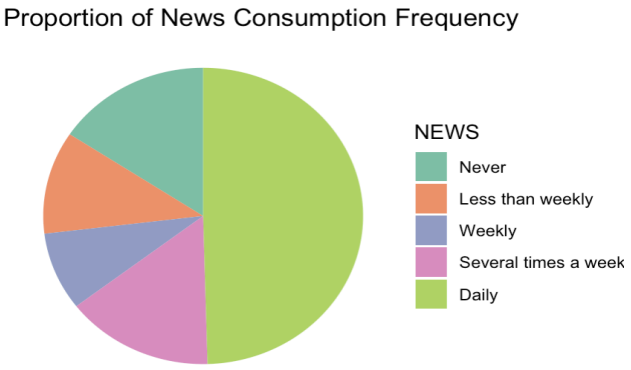
PRES20:

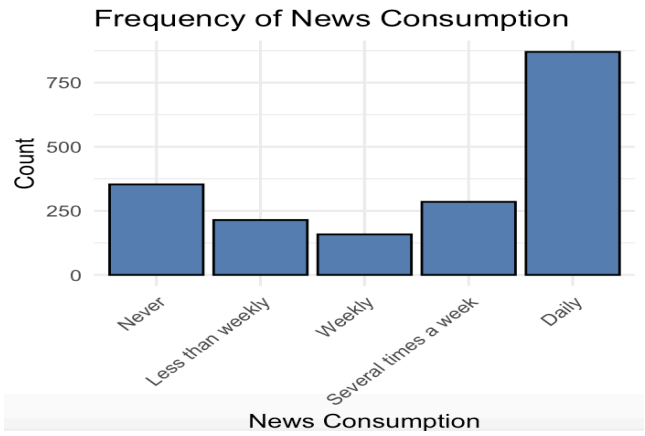




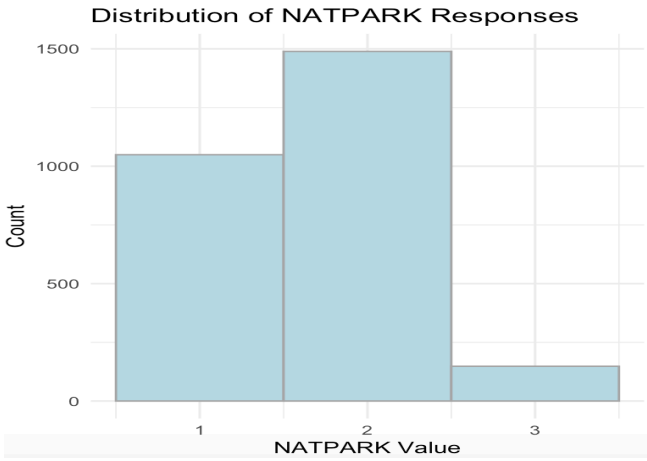


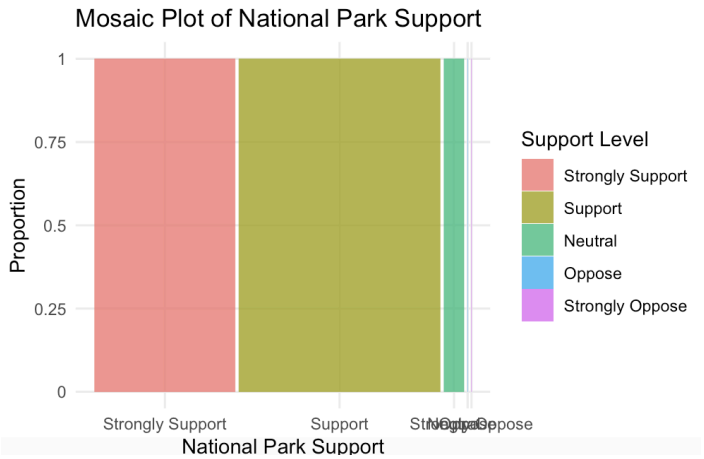
NEWS:

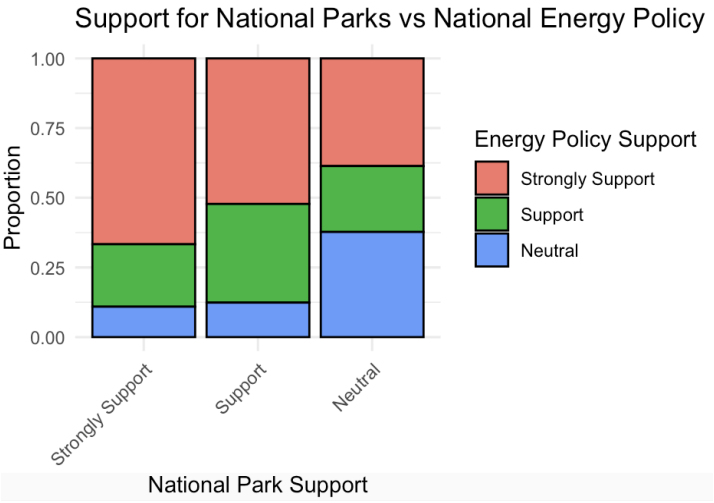




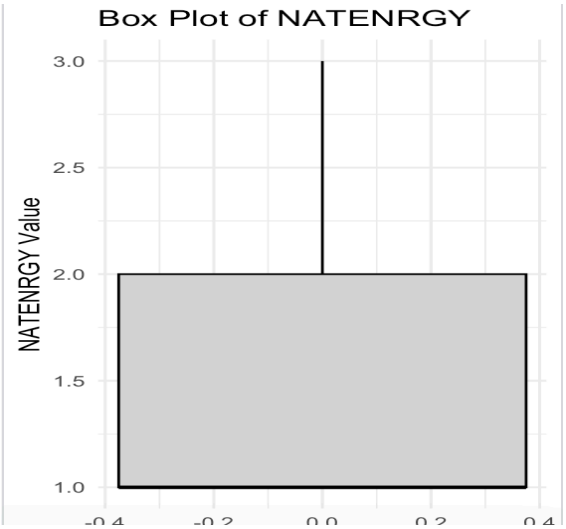
NATPARK:

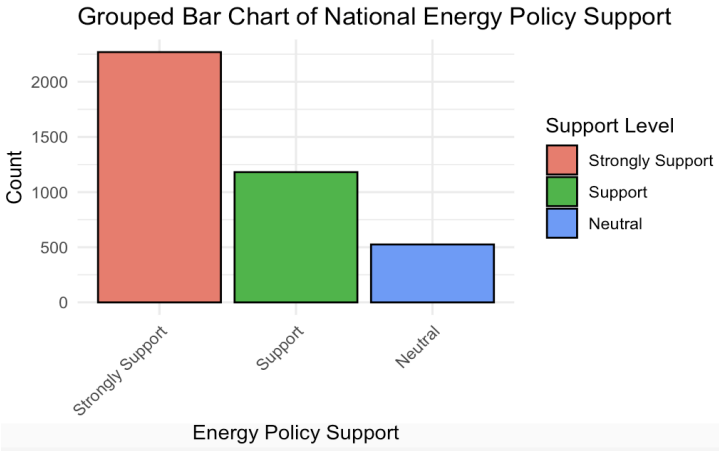



Mosaic Plot of National Park Support
Proportion
1
0.75
0.5
0.25
0
Strongly Support
Support
National Park Support
Support Level
Strongly Support
Support
Neutral
Oppose
Strongly Oppose


Support for National Parks vs National Energy Policy
Proportion
1.00
0.75
0.50
0.25
0.00
Strongly Support
Support
Neutral
National Park Support
Energy Policy Support
Strongly Support
Support
Neutral

NATENRGY:


Box Plot of NATENRGY
NATENRGY Value
3.0
2.5
2.0
1.5
1.0


Grouped Bar Chart of National Energy Policy Support
Count
2000
1500
1000
500
0
Strongly Support
Support
Neutral
Energy Policy Support
Support Level
Strongly Support
Support
Neutral

Project Objective and Research Question

Project Objective

The project objective is to analyze environmental spending data and examine how it correlates with political party affiliation. This includes identifying trends and patterns in data provided by the General Social Survey (GSS) as well as exploring differences in spending across political parties to gain a better understanding of this potential relationship. Specifically, we will incorporate variables such as voting behavior in the 2020 U.S. presidential election (PRES20), frequency of newspaper readings (NEWS), opinions on government spending for parks and recreation (NATPARK), and views on spending for alternative energy sources (NATENRGY).

Research Question

Does political party affiliation influence environmental spending priorities and preferences and what role do voting behavior, consumption of news, opinions on spending for parks and recreational services, and views on spending for alternative energy sources play in shaping these spending prerogatives?

Details:

1. Subset of GSS Data:

- Political party affiliation
- Environmental spending

2. Task to Investigate:

- Exploring whether there is a relationship between political party preference/political awareness and environmental spending

3. Four Related Variables:

- PRES20 1.000 Did you vote for Joe Biden or Donald Trump?
- NEWS 1.000 How often do you read the newspaper--every day, a few times a week, once a week, less than once a week, or never?
- NATPARK 1.000 (... are we spending too much, too little, or the right amount on …. Parks and recreation
- NATENRGY 1.000 (... are we spending too much, too little, or about the right amount on) Developing alternative energy sources

All categorical variables - chi-square test

Review the Related Work

Samples

1. Pacca, L., Curzi, D., Rausser, G., & Olper, A. (2021). The Role of Party Affiliation, Lobbying, and Electoral Incentives in Decentralized US State Support of the Environment. *Journal of the Association of Environmental and Resource Economists*, *8*(3), 617–653. https://doi.org/10.1086/711583

Positives: States with abundant oil or high-polluting sectors tend to contribute more economically. Governors receiving higher contributions are associated with lower expenditures on environmental conservation efforts. Lobbying, specifically polluting lobbies, may affect a governor's decision-making. Environmentalists may become more active by persuading politicians and the voting public when polluting lobbies are stronger. Results suggest that environmental expenditures increase by about 10% under Democratic governors compared to Republican ones (Pacca et al., 2021).

Negatives: This article focuses on governors, which may limit variability due to a lack of data from other political systems and government organizations (Pacca et al., 2021).

2. Cruz, S. M. (2017). The relationships of political ideology and party affiliation with environmental concern: A meta-analysis. *Journal of Environmental Psychology*, *53*, 81–91. https://doi.org/10.1016/j.jenvp.2017.06.010
3.

Positives: Political party affiliation is demonstrated to have had a statistically significant positive relationship with environmental concerns. Political ideology has an even stronger relationship (Cruz, 2017).

Negatives: Studies were conducted at different times, so different political movements, shifts, or environmental concerns could have changed, which may have caused differences, a lack of trends/patterns, or unreliability in data (Cruz, 2017).

4. McCright, A. M., Xiao, C., & Dunlap, R. E. (2014). Political polarization on support for government spending on environmental protection in the USA, 1974–2012. *Social Science Research*, *48,* 251–260. https://doi.org/10.1016/j.ssresearch.2014.06.008

Positives: Provides history into the issue of polarization between the two parties and how they view environmental spending. Laying a strong basis for what each party believes in and what they want to spend money on (McCright et al., 2014).

Negatives: It provides essential background information on the topic and why and how each political party goes through their thought process on economic spending; however, it only references our governmental system from pre-2012, so it would be before the Paris Agreement, which had a massive change on our governmental views with regards to economic spending (McCright et al., 2014).

The Merits of Your Project

Based on the previous step, this project provides different advantages since it builds upon previously existing research. These advantages include:

1. A comprehensive understanding of political party affiliation and political influence on environmental spending
2. Additional factors, such as lobbying, may influence environmental spending
3. Extends beyond a presidential or governor's role, including policymakers, legislators, and additional levels of government
4. Tracking of historical trends and patterns in environmental spending
5. Help to shape public policy and increase advocacy

An end user should report this project because it will provide data-driven results of political party affiliations on environmental spending. This project will address limitations to previous studies, such as the Pacca et al. (2021) study, which focuses solely on a governor's role in environmental spending. Additionally, this project can inform legislators, advocacy groups, etc., on different environmental efforts and initiatives, further help citizens to have a better understanding of environmental spending and concerns on a political scale and increase public awareness and decision-making.

GitHub Repository Address

Github link: Data-220-112-Analyzing-environmental-spending-trends-Ecotrackers

Descriptive Statistics

PRES20:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
1.000	1.000	1.000	1.428	2.000	4.000	1352

Interpretation:

These statistical values summarize the distribution variable PRES20. The distribution is skewed right based on the minimum, 1st quartile, median, and 3rd quartile, indicating that most values are concentrated around 1.0 and 2.0. The median (1.000) is slightly lower than the mean (1.428), suggesting a right-skewed tendency. The upper limit of the data is shown by the maximum value of 4.000, while a substantial amount of incomplete data is indicated by the 1,325 missing values (N/As).

NEWS:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
1.000	2.000	4.000	3.717	5.000	5.000	1397

Interpretation:

These statistical values summarize the distribution variable of NEWS. The distribution appears slightly left-skewed based on the minimum, first quartile, median, and third quartile, suggesting that most values are concentrated around 2.000 and 4.000. The mean (3.717) is slightly lower than the median (4.000), reinforcing this left-skewed tendency.

NATPARK:

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
1.000	1.000	2.000	1.667	2.000	3.000	73

Interpretation:

These statistical values summarize the variables of NATPARK. The minimum value is 1.000, and the maximum is 3.000, indicating a relatively small range. The 1st quartile (1.000) and median (2.000) suggest that at least half of the data is concentrated between 1.000 and 2.000. The mean (1.667) is slightly lower than the median, which suggests a slight left skew in the distribution. The 3rd quartile (2.000) indicates that most values do not exceed 2.000, with only a few reaching 3.000. There are 73 missing values (NAs) in the dataset.

NATENRGY:

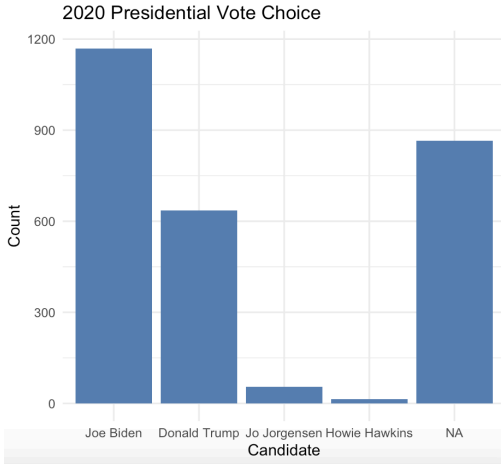
Min	1st Qu.	Median	Mean	3rd Qu.	Max	NA'S
1.000	1.000	1.000	1.561	2.000	3.000	123

Interpretation:

These statistical values summarize the variables of NATENRGY. The minimum (1.000), 1st quartile (1.000), and median (1.000) indicate that a large portion of the data is concentrated at the lowest value. The mean (1.561) is slightly higher than the median, suggesting a slight right skew in the distribution. The 3rd quartile (2.000) and maximum (3.000) show that while most values are low, a portion extends to higher numbers. Additionally, there are 123 missing values (NAs) in the dataset.

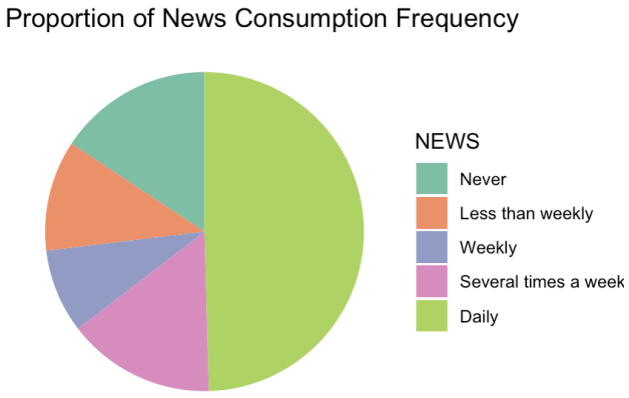
Data Visualization

PRES20: Bar Chart



The bar chart for the PRES20 variable shows survey respondents's voting choices in the 2020 U.S. presidential election. Each bar represents the number of survey respondents who voted for each candidate in 2020, with President Joe Biden having the tallest bar. This indicates that most respondents voted for President Joe Biden while the least amount of respondents voted for Howie Hawkins. The N/A bar column represents respondents who did not vote or chose not to express who they voted for.

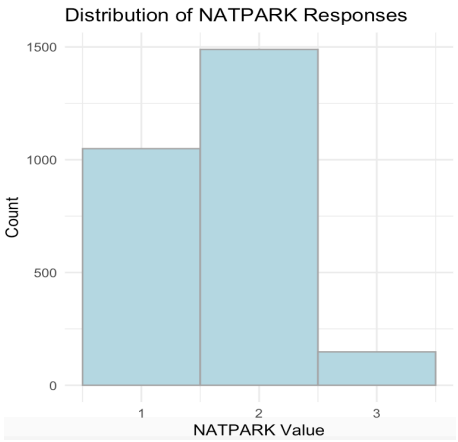
NEWS: Pie Chart



The pie chart for the NEWS variable represents the frequency of news consumption across survey respondents. The largest response is daily, indicating that almost half of survey

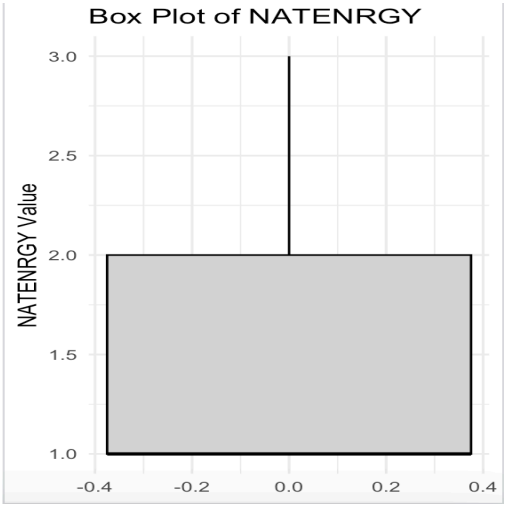
respondents consume the news daily, while the smallest response is weekly, indicating that less than a quarter of respondents consume news weekly. This distribution helps to understand the survey respondent's engagement with current news.

NATPARK: Histogram



The histogram for the NATPARK variable represents the distribution of responses related to national park engagement. The largest response category is 2, indicating that the majority of the survey respondents fall into this group, followed by category 1 with a slightly lower count. The smallest response is category 3, showing significantly fewer respondents in this group. This distribution helps to understand the level of engagement or visitation patterns among survey participants.

NATENRGY: Boxplot



The boxplot for NATENRGY variable represents the distribution of responses related to national energy attitudes. The median response is around 2, with most responses falling between 1 and 2,

indicating a relatively concentrated distribution. The upper whisker extends to 3, suggesting some higher values, but no extreme outliers are present. The distribution helps to understand survey respondents' general sentiment or preference regarding national energy topics.

Advanced Descriptive Statistics

Provide a short paragraph about your interpretation of statistical values.

PRES20:

B index: 0.05405649

Interpretation:

A B index of 0.05405649 for the PRES20 variable indicates a weak relationship since the value is close to zero. This suggests that changes in the PRES20 variable have little effect on its overall impact. This weak relationship and the B index's proximity to zero may also indicate that the data is not well spread out along the five categories of PRES20, as the Biden, NA, and Trump categories contain a larger number of observations in comparison to the other two categories

NEWS:

B index: 0.4122566

Interpretation:

This suggests a moderate concentration of news consumption where there are still news sources that dominate the industry however there is enough lew way and individuality to allow these news sources to spread diversity. A B index of 0.4122566 could indicate that the more diverse news outlets are gaining traction. This moderate relationship also suggests that changes in the NEWS variable have a more significant effect on its overall impact.

NATPARK:
B index: 0.2719003

Interpretation:

This b index of 0.271 indicates that there are interactions between multiple national parks around the country rather than just a select few. This could indicate an inclination to see more than one or a couple national parks increasing the interest of the participants. This also reflects effective management and outreach from the national parks.

NATENRGY:

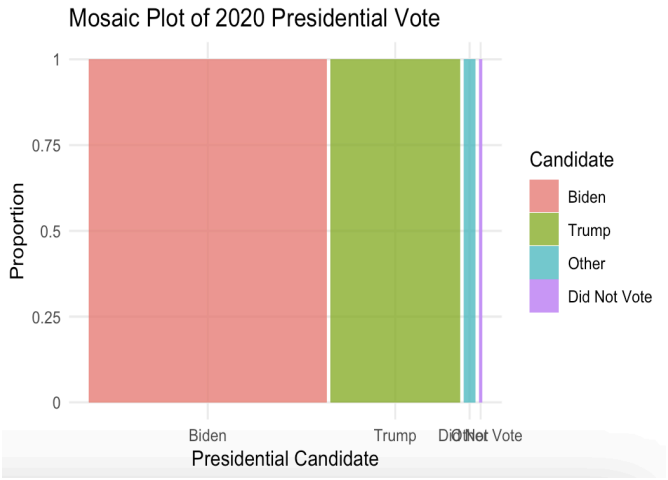
B index: 0.4672798

Interpretation:

This indicates a slight domination of view points with a B index of 0.467 however it still allows for a little diversity between these said view points allowing for a gray area. This indicates that national debates regarding energy consumption leads to mass agreement in some discussions and divisions in others. This indicates ideological influences on energy attitudes with some groups sharing opinions and others diverging significantly throughout the topic.

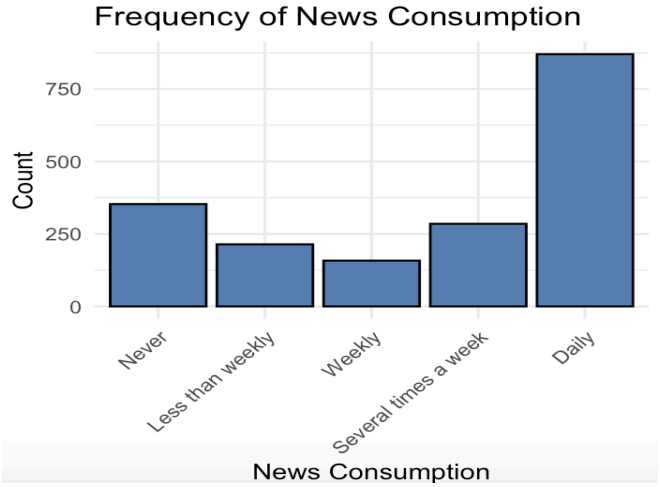
Bivariate analysis

PRES20: Mosaic Plot



Interpretation: This visual interpretation for the PRES20 variable suggests that the Biden category takes up the most space, indicating a greater number of voters for President Biden, while the did not vote category takes up the least amount of space, indicating that a small fraction of people did not vote in this specific survey. Overall, the PRES20 variable is largely dominated by votes for Biden and Trump, indicating favoritism for the two-party system, making politics largely dominated by the Democratic or Republican party.

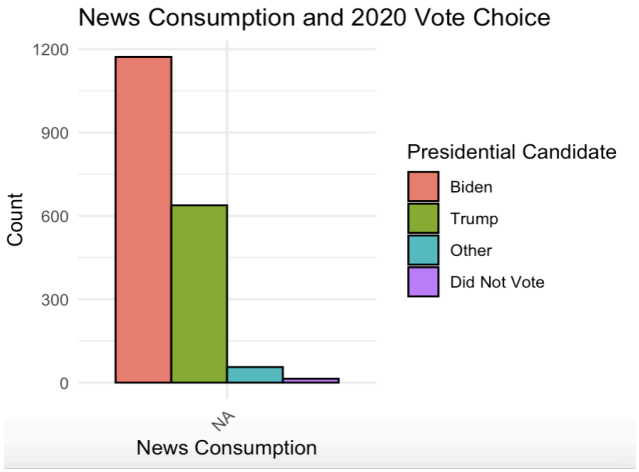
NEWS: Grouped Bar Chart



Interpretation: This bar chart displays the distribution of responses to news consumption as collected by the NEWS variable. The majority of respondents viewed/read the news daily, with

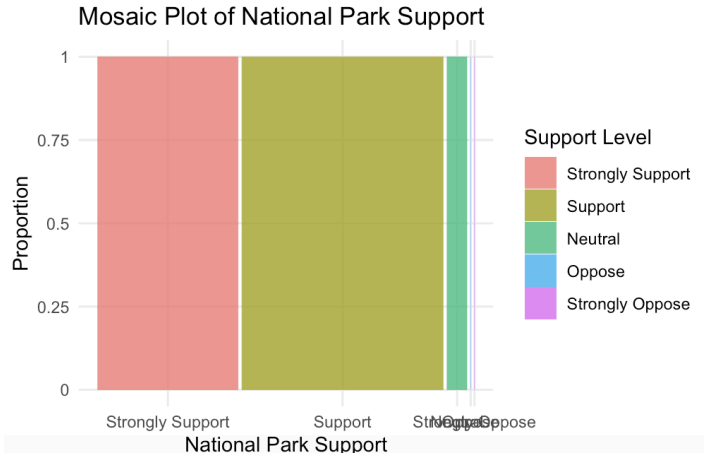
the next most frequent response being never. We plan to run bivariate analyses to help draw conclusions between current event awareness and presidential candidate preference.

Comparing Two Categorical Variables: PRES20 and NEWS - Bar Chart



Interpretation: This bar chart comparing the PRES20 and NEWS variables shows the relationship between news consumption and voting choice in the 2020 presidential election. The majority of respondents who consumed news more frequently voted for President Biden, followed by President Trump. A very small number of voters chose to vote for a third party or chose not to vote at all. Overall, survey respondents who consumed the most news likely voted for the major candidates, with more votes for President Biden.

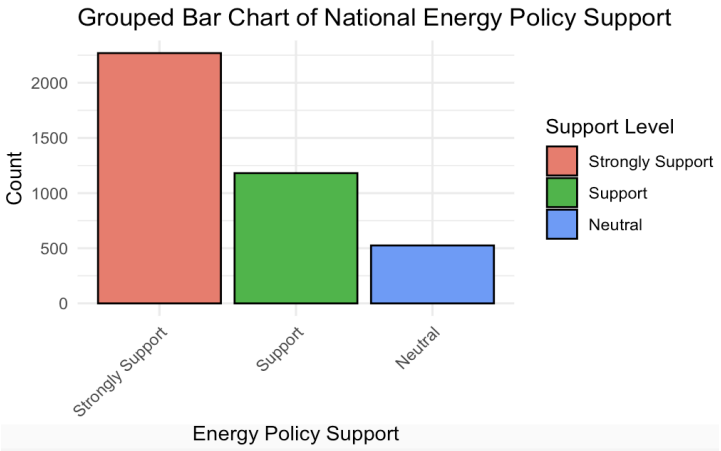
NATPARK: Mosaic Plot



Interpretation: This mosaic plot illustrates the distribution of support levels for national parks. Most respondents fall into the "Strongly Support" and "Support" categories, as indicated by the two largest sections of the plot. The "Neutral," "Oppose," and "Strongly Oppose" categories take

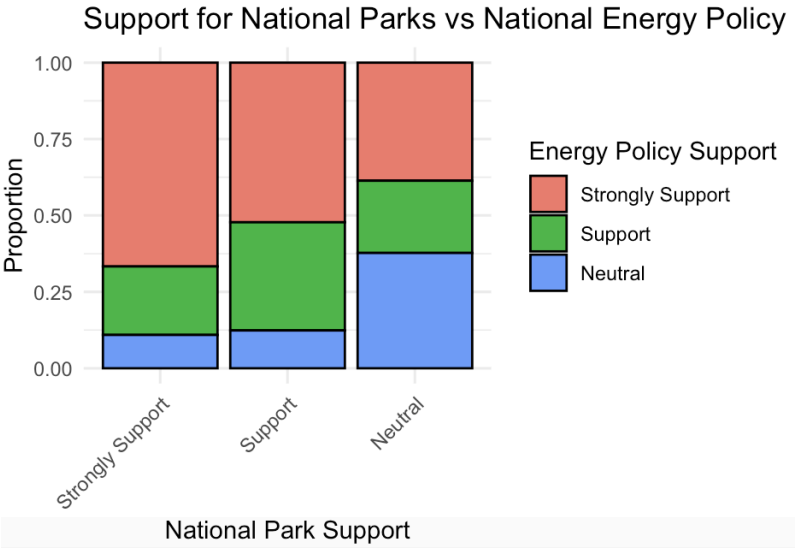
up much smaller portions, suggesting that opposition to national parks is relatively rare. Overall, the data indicates that most survey respondents express some level of support for national parks, with strong opposition being minimal.

NATENRGY: Grouped Bar Chart



Interpretation: This grouped bar chart displays the distribution of respondent opinions on national energy policy and spending in the US. The majority of respondents said they strongly supported developing alternative energy sources. The least amount stated that they were neutral on the subject, with zero respondents stating that they were against energy spending.

Comparing Two Categorical Variables: NATPARK and NATENRGY - Grouped Bar Chart



Interpretation: This grouped bar chart displays the distribution of respondent opinions on level of support for national park spending versus national energy policy. The majority of respondents stated that they “strongly support” or “support” national parks and national energy policy, while minimal respondents remain neutral pertaining to these issues.