How Social Identities Facilitate the Growth of Affective Political Polarization

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Abstract

This study explored the relationships between a selection of social identity factors and affective political polarization among adults in the United States. A broad selection of literature was reviewed and employed in informing a descriptive and inferential statistical analysis of 2008 and 2020 American National Election Studies (ANES) survey data. Multiple regression was used to describe and quantify the relationships between selected variables and affective polarization within the datasets. These methods were paired with tests for differences in means in a comparative analysis of the 2008 and 2020 demographic and political environments, which revealed a statistically significant difference in the levels of affective polarization between the two years. Ideological polarization and ageing stood out as the factors that contributed most heavily to this this growth in affective polarization. Broadly, these findings suggested that demographic and psychographic shifts may have played a role in facilitating growth of affective political polarization across the years. Finally, a post-hoc analysis identified the growth of affective polarization as originating from increased hostility for political out-groups, highlighting the need for further research into other political, social, and economic events that may have triggered the growth of affective polarization.

DOI: 10.5195/pur.2024.79

Introduction

Political polarization in the US has been on the rise in recent years, both within the electorate and among political elites. A particularly illustrative piece of anecdotal evidence for this rise in polarization is found in the contrast of the 2008 and 2020 presidential concession speeches. Following his loss to Barack Obama in the 2008 presidential election, John McCain gave a concession speech in which he did not speak poorly of the other party or candidate, but instead congratulated his opponent and expressed his hopeful outlook for the country under Obama's presidency. He maintains a respectful and positive tone throughout, emphasizing that Obama's "success alone commands [McCain's] respect for his ability and perseverance." By contrast, when Donald Trump lost the presidential race to Joe Biden in 2020, he refused to give a concession speech at all, breaking the long-standing tradition. Trump even expressed on Twitter that he did not agree with the results of the election, claiming it to be rigged, and is commonly blamed for inciting the January 6th insurrection of 2021.

More concrete evidence of the rise in polarization comes from survey data. Graphs that show the levels of affective polarization in the US electorate exhibit a notable increase in polarization from 2000 to 2016, with dramatic decreases in out-party feeling post-1990 (Druckman & Levy 2021).

Affective polarization and ideological polarization are the two major types of political polarization. Ideological polarization is the quantified difference in policy positions between individuals in each party, while affective polarization is characterized by a difference in sentiment towards members of one's own political party versus opposing political parties, with people feeling more warmth towards members of their own political party. High levels of affective polarization can weaken political dialogue and cause people to position themselves more closely to their existing policy positions at the expense of reason. Many studies do not clearly define these two types of polarization and instead lump them together, using the term "political polarization" to refer to either of them (Kubin & von Sikorski 2021).

Our guiding question for our research asks what factors, in particular what social identities, affect one's level of political polarization. In this paper, we are specifically interested in affective polarization. Previous research by Mason (2015), Mason & Wronski (2018), and Perry (2022) explain the concept of social sorting, a phenomenon where individuals' social identities become more and more aligned with a specific partisan identity. This process causes the electorate to sort across party lines and is thought to lead to increased levels of affective polarization among voters (Mason, 2015; Mason & Wronski, 2018; Perry, 2022). There is less research on affective polarization than ideological polarization, but we know that affective polarization is on the rise and can have many negative consequences for the strength and effectiveness of a democracy. In the following section, we survey existing literature on affective polarization in relation to critical aspects of social identity.

Literature Review

Ideological Polarization

From data collected by the American National Election Studies (ANES) surveys, Webster, S. & Abramowitz, A. (2017) explore social welfare ideology and its specific impact on affective polarization and how groups feel about another group based on their group values/ideologies. Their conclusions indicate that "ideological distance strongly influences feelings toward opposing party candidates and the party as a whole." Ideological polarization can be thought of as political polarization centered on the ideologies and beliefs that groups hold. This form of polarization complements affective polarization, polarization centered on the feelings and sentiments held for the "ingroup" and against the "outgroup." In this research, we approach ideological polarization as an additional independent variable which can be a factor in the degree of affective polarization. Concluding from previous studies, affective polarization does not tend to indicate growing ideological differences between groups. However, affective polarization has been increasing in recent years which correlates with increased salience in "ideological identities" (Iyengar, Lelkes, Levendusky, Malhotra, & Westwood, 2019). An observational time series conducted by Bougher (2017) concluded that, "ideological extremity and constraint are both associated with stronger partisan affect." Therefore, the radicalization of partisan ideology increases partisan affect.

Furthermore, as ideological opinions among one's group or party diverge, feelings of negative affect toward the other group or party increase. Rogowski & Sutherland (2016) use a nationally representative sample survey to find that citizens base their political views largely on the political elite which represent their political party. In recent years, there has been an increased rate of polarization among political elites and as these elites endorse certain policies, they become more central to a party's identity which further contributes to polarization. Over time, Republicans and Democrats in the U.S. have shown an increase in support for their own party's candidate(s) as well as increased feelings of "antipathy" toward the opposing party's candidate(s). As candidates express more extreme divisions in ideology, citizens gain a heightened emotional awareness of the ideologies which the political elite stand for and increase positive feeling toward their own party's candidate and their ideology as well as increased negative feelings towards the opposing party's candidates and their ideology. Survey data collected and published in this report indicates that "increased ideological differences between political candidates produced substantially more polarized evaluations of those candidates".

Income

A study by Dettrey and Campbell (2013) finds a correlation between ideological polarization and income inequality as both are increasing in recent years. However, there must be a distinction as the growing income inequality cannot necessarily be identified as a cause of the increasing ideological polarization. "The well-off have not become significantly more conservative and less liberal nor have those on the lower rungs of the economic ladder become significantly more or less conservative." Therefore, although income does not align directly with political ideology and, therefore, ideological polarization, income inequality may increase political interest which can be an indication of why ideological polarization simultaneously increases with polarization. Overall, the authors conclude that

"ideological polarization is the result of increased polarization of the political parties, not class polarization."

During periods of high-income inequality and larger wealth gaps, political parties become more ideologically polarized, and, therefore, also affectively polarized. Voters have a greater interest in politics during times of economic prosperity or economic decline. Therefore, as people are more affected by income levels - either high or low - there is an increased interest in politics. Voters have increasingly different political views in different economic circumstances.

From our review, we observe that an individual's income level cannot necessarily predict their political affiliation or their level of negative political affect toward the opposite party. However, in society, during periods of greater income disparities, there is generally a greater degree of polarization between the parties. In addition, during periods of economic crises, there is a reduced potential for redistribution and high circulation of wealth. This typically widens the wealth gap. When considering these periods of time, we notice that as the ability to redistribute wealth decreases, and disparities in income levels increase, there is increased social conflict which typically results in people choosing more extreme political ideologies which ultimately increases affective political polarization (Schmitt & Freire, 2012).

Partisanship

Stacy Ulbig (2020) finds that partisan identities create "identities and behaviors that reflect stereotypes related to primed social groups." This article references an experiment which concluded that political conversations are often seen as arguments or threats. In addition, there is a tendency through the process of socialization for people to associate other identities with partisan identities. This is termed "automatic association." Automatic association examples include associating the LGBTQ+ community with the Democratic Party and wealthy people with the Republican Party in an American context. Partisanship is, itself, an aspect of identity which influences our social interactions. The way in which one affiliates with their political party influences daily decisions, even if they do not consider themselves to align with "extreme" partisan beliefs. The process of socialization, beginning in early childhood, develops one's partisan identification and influences their future decisions. Eventually, partisan affiliation creates negative partisan animosity meaning negative feelings toward the opposite party.

Social Media

Bail et.al. (2018) and Garimella and Weber (2017) find empirical evidence that suggests the usage of social media platforms may elevate polarization. Nordbrandt tests the direction of the relationship between an individual's level of social media usage and affective polarization. Social media provides opportunities to impact what kind of information and media appear in an individual's feed and coupled with the algorithms that personalize platforms, individuals have a high level of control of what information they are exposed to. "Social media exposure to pro-attitudinal information may prime people to continuously recall their own political identity and contribute to making identification with the political in-group more salient" (Levendusky 2013). This 'echo chamber' dynamic leads to an expectation of increased polarization.

Another side to this argument is that cross cutting communication exposes individuals to the perspectives and experiences of the "other side". This could create inter-group understanding and reduce the risk of biased views being blindly reproduced. Cross cutting may depolarize attitudes and emotions insofar as these are not already perfectly reasoned and unbiased (Kim,2015; Mutz, 2006).

There is considerable debate and disagreement as to whether social media is a factor influencing polarization; a direct relationship between social media and affective polarization has not been established. However, most scholars agree that polarization affected the use of social media.

Gender

Ondercin and Lizotte (2020) have found substantial evidence that abortion attitudes and partisan strength are partially mediating the effect of sex on affective polarization, with abortion strength mediating 11.4% of the effect of sex and partisan strength accounting for 60.27% of the effect of sex on affective polarization. Sex differences in affective polarization are partially a result of men and women differing in the strength of their partisan identities and the strength of their abortion attitudes. Women tend to have stronger attitudes on abortion and tend to be stronger partisans, which results in higher levels of affective polarization for women. Sex can also act as a moderating variable. Ondercin and Lizotte found that partisan strength has different effects for men and women. This indicates that sex differences are partially driven by partisan strength having a greater influence on women's affective polarization than men's affective polarization.

There exist significant differences in the levels of affective polarization for men and women, with women being more affectively polarized than men. Sex indirectly affects one's levels of affective polarization, acting as both a mediator and a moderator.

Interestingly, there is also evidence to suggest that voters may be more affectively polarized towards women than men. A 2020 study that used tweet sentiment analysis to examine how users on Twitter talked about candidates running for the US senate in the 2018 congressional elections found that male senatorial candidates were talked about more positively than female candidates. They also found that female candidates of the out-group party were talked about the least favorably of all candidates (Mentzer et al., 2020).

Race

The Pew Research Center reports that White voters lean toward the Republican party and by contrast African American voters remain overwhelmingly Democratic. Majority Asian voters identified with Democratic party. The issue of race, whether it be in regard to background of voters or the various agendas and promises each side advocates, has played a vital role in the measuring affective polarization. Lilliana Mason writes in the ASPA report, "The process of social sorting allowed the Republican Party to represent the interests of 'traditional' White, Christian America while the Democratic Party was increasingly representing those who were still struggling to overturn centuries of social inequality". The 2016 election illustrates this racial divide, for instance the Republican candidate won 58% of white voters but only 8% of Black voters. Also noted were wide gulfs in support from White and Hispanic voters and between White and Asian American voters both of about 39% points. This is relevant as no other

demographic indicators whether age, religion or income come close to this level of division. In the same ASPA report, Zoltan Hajnal of the University of California calls this gap between parties the "racial chasm".

Other literature defines this racial divide as layered by rural-urban divide and a division over education. What was a stark racial chasm in the 2016 election has been receding relative to other factors. A study by the Institution for Social Policy Studies found that race explained about 60% of variation in voting for the past two presidential elections with geography accounting for another 30%. The American Political Science Review paper by Kuriwaki and Angelo Dagonel of Harvard university explored the relationship between race, geography and education. They found that while Black voters across the country showed relative consistency, White and Hispanic voters exhibited variation by location.

Education

According to the Pew Research Center, overall patterns in education and partisanship are pronounced among White voters. In 2016, 49% of White voters with college degrees aligned with the Democratic party compared to the 46% for the Republican party. Among voters with postgraduate experience, the Democratic advantage has grown over the years. College graduates tend to be more liberal across economic, social, racial and foreign policy issues. Political scientist Elizabeth Simon writes, "this correlation has held up with remarkable geographic and temporal consistency". Voters with college degrees have been more likely than those without to support legal abortions, LGBTQ+ causes, rights of minorities and expansive immigration. While this correlation exists, studies have not been able to claim causal relationship between education and polarization. Lodge and Taber point out that it is possible that more biased individuals choose to acquaint themselves with more political information that backs up their opinions. Studies done using NES Survey data revealed that individuals with more education have consistently higher correlations across issues of economy, morality, civil rights and foreign policy than those with less education (Baldassarri and Gelman, 2008). This indicates that education leads to more structured and consistent ideological opinions and not necessarily affective polarization. Level of education has been increasingly associated with party affiliation and level of polarization.

Methodology

Datasets

This study used the 2008 and 2020 American National Election Studies (ANES) Time Series studies to explore and compare the associations between various social, economic, and demographic variables and affective polarization across 2008 and 2020 respectively. Both datasets are composed of personal data collected through interviews of individuals selected as part of a cross-section of U.S. eligible voters. For consistency, only data from pre-election interviews was analyzed. The 2020 pre-election dataset contained 8,280 observations, while the 2008 pre-election dataset contained 2,322 observations. Observations were filtered such that data from respondents who were not asked or refused to answer any of the questions analyzed in this study was excluded. Thus, the 2020 dataset used in the following analysis contained 5644 observations, while the 2008 dataset contained only 212 observations. Because only 13 predictor variables were analyzed in each year, both datasets proved robust enough to support the intended statistical models.

Thus, assuming representativeness, results from the statistical models may be applied to the larger population of the U.S. electorate in 2008 and 2020 respectively. However, there are several factors which may reduce the generalizability of our results. There is potentially response bias impacting the generalizability of all data collected as part of the ANES surveys, which can be accounted for through weighting. However, because the data was filtered for respondents providing answers to a specific set of questions, weighting methodology was not accessible and as a result the statistical results and implications for the U.S. electorate may be impacted by some minor bias.

Variables

The primary response variable for both years in this study was affective polarization. Affective polarization ("Affpol") was calculated by taking the absolute value of the difference between a participant's feeling thermometer ratings of the Democratic and Republican parties respectively. Possible responses for feeling thermometers ranged from 0-100, with 0 representing the strongest cold feelings and 100 representing the strongest warm feelings. Thus, Affpol ranged from 0-100, 0 meaning there was no distinction in an interviewee's feelings towards the parties and 100 representing the most extreme difference in feelings towards the parties. Thus, the Affpol variable acted as a quantitative representation of the degree to which a participant was affectively polarized.

The social, economic, and demographic predictor variables explored in this study are as follows:

- Idepol is a quantitative variable representing the degree to which a participant viewed themself as ideologically polarized. Idepol was calculated by subtracting the participant's self-ideology score from the ideology score of the further of the two political parties then taking the absolute value. Ideology scores were assigned on a scale from 1-7, 1 representing "extremely liberal" and 7 representing "extremely conservative". Thus, Idepol ranged from 0-6, 0 suggesting that a participant was not ideologically polarized at all, and 6 suggesting that a participant was extremely ideologically polarized.

- Female is a categorical dummy variable where 1 indicated that the participant was female and 0 indicated that the participant was male.
- Sexuality is a categorical variable divided into "straight", "gay", and "other". The category "gay" was treated as the baseline category.
- Race is a categorical variable divided into "black", "white", and "other". The category "black" was treated as the baseline category.
- Education is a quantitative variable with lower numbers indicating less education and higher numbers indicating more education. Values range from 1-5 in 2020 and 0-7 in 2008 due to differences in the survey questions.
- Income is a quantitative variable with lower numbers indicating lower household income and higher numbers indicating higher household income. Values range from 1-22 in 2020 and 1-25 in 2008 due to differences in the survey questions.
- Age is a quantitative variable associated with the age of the respondents. Respondents over 80 were coded as 80 years old in the 2020 dataset, while in the 2008 dataset respondents over 90 were coded as 90 years old due to limitations in access to personal information through the ANES datasets.
- PersonalDistrust is a quantitative variable gauging participants' trustfulness. Values range from 1-5, with 1 suggesting that the respondent believes others can "always" be trusted and 5 suggesting that the respondent believes others can "never" be trusted.
- RelUnimp and RelNotimp are variables gauging the importance of religion to participants in 2020 and 2008 respectively. RelUnimp is a quantitative variable ranging from 1-5, with higher numbers indicating that religion was less important to the respondent. RelNotimp is a categorical dummy variable indicating whether the participant categorized religion as important (0) or unimportant (1).
- IntendVote and LikelyVote are variables gauging the likelihood of a participant voting in the 2020 and 2008 presidential elections respectively. IntendVote is a categorical dummy variable indicating whether the participant did (1) or did not (0) intend to vote in the upcoming presidential election. LikelyVote is a quantitative variable ranging from 1-10 with higher numbers indicating that the respondent was more likely to vote in the upcoming presidential election.
- Inattention and Disinterest are variables gauging a respondent's interest in and attention given to politics in 2020 and 2008 respectively. Inattention is a quantitative variable ranging from 1-5 with higher values indicating that the respondent pays less attention to politics. Disinterest is a quantitative variable ranging from 1-3 with higher values indicating that the respondent is less interested in political campaigns.

Statistical Modeling and Analysis Plan

This study employed both descriptive and inferential methods in exploring and comparing the relationship between social, economic, and demographic identity factors with affective political polarization over time. The statistical programming language R and additional packages "dplyr",

"MASS", and "regclass" were employed throughout the analysis for both calculation and visualization. Descriptive methods included simple summary statistics and graphical analysis. The multiple regression model highlighted in equation (1) was then constructed for both t=2008 and t=2020.

$$\boldsymbol{Y_t = B_{1t}X_{1t} + B_{2t}X_{2t} + B_{3t}X_{3t} + B_{4t}X_{4t} + B_{5t}X_{5t} + B_{6t}Z_{1t} + B_{7t}Z_{2t} + B_{8t}Z_{3t} + B_{9t}U_t + B_{10t}V_t + B_{11t}W_t} \quad (1)$$

The variables are defined at a time t (2008 or 2020) as follows:

- Y_t is the continuous response variable Affpol.
- X_{1t} is the continuous variable Idepol.
- X_{2t} is the continuous variable Education.
- X_{3t} is the continuous variable Income.
- X_{4t} is the continuous variable Age.
- X_{5t} is the continuous variable PersonalDistrust.
- Z_{1t} is the dummy variable Female.
- Z_{2t} represents the categorical variable Sexuality.
- Z_{3t} represents the categorical variable Race.
- U_t represents RelUnimp in 2020 and RelNotimp in 2008.
- V_t represents IntendVote in 2020 and LikelyVote in 2008.
- W_t represents Inattention in 2020 and Disinterest in 2008.

Inferential methods were prefaced through regression diagnostics. Specifically, Variance Inflation Factors were calculated to highlight the lack of collinearity issues, residual plots were used in assessing the linearity and homoscedasticity conditions, and a normal probability plot was used in assessing the normality condition. Potential concerns associated with violations in regression conditions and the implications of such violations for inference were underlined and discussed in later sections.

The significance and magnitude of regression outputs was then analyzed across time periods to highlight factors that are strongly related to affective polarization. A statistical method for the comparison of regression coefficients across models was then employed according to the methodology described in Clogg, Petkova and Haritou (1995) in order to gauge differences in the relationship between important predictor variables and affective polarization over time. Finally, a two-sample framework for testing differences in means was used in analyzing changes in the distributions of social identities from 2008 to 2020. Potential concerns in the comparison arising from the slightly different structure of the model over time was discussed in later sections.

Results

Descriptive Statistics

The response variable in this study, Affpol, displayed visibly distinct distributions in 2008 and 2020. Among the 212 data points from 2008, Affpol followed a right-skewed distribution with most respondents demonstrating low affective polarization between 0 and 10, as seen in Figure 1. Notably, the mean value of Affpol in 2008 was above the median (Mean: 34.2; Median: 30.0). Among the 5901 data points from 2020, Affpol followed an asymmetric, trimodal distribution, also seen in Figure 1. While some respondents still demonstrated low affective polarization, the density of observations between 0 and 10 was halved from 2008 to 2020. Instead, the highest proportion of respondents demonstrated moderate to high affective polarization ranging from 60 to 70. Notably, in 2020, the mean value of Affpol was no longer above the median (Mean: 51.7; Median: 55.0), though both measures increased by approximately 20 units from 2008 to 2020. Contextualized with the standard deviations of Affpol (SD_{2008}: 28.0; SD_{2020}: 29.5), the extreme magnitude of the shift in the centrality of the distribution from 2008 to 2020 is highlighted. These numerical findings are summarized in Table 1.

Table 1 also provides numerical summaries for the quantitative predictor variables from the 2008 and 2020 datasets. Like Affpol, Idepol displayed sharp changes in its distribution from 2008 to 2020. In 2008, the responses followed a symmetric, bell-shaped distribution centered on a value of 3. However, by 2020, the distribution became left-skewed and was centered on a value of 4. These distributional shifts, as seen in Figure 2, were also underlined by the 0.75 unit increase in average ideological polarization among respondents ($Mean_{2008}$: 3.02; $Mean_{2020}$: 3.77). Another notable distributional shift from 2008 to 2020 occurred in the variable Age. Despite sampling methods resulting in voters over the age of 80 being coded as only 80 years old in 2020, the mean age of respondents increased by 5.5 years between 2008 and 2020 ($Mean_{2008}$: 45.4; $Mean_{2020}$: 50.9), highlighting a critical change in the demographics of respondents.

Table 2 provides summary data for the categorical predictor variables in both the 2008 and the 2020 datasets. In both years, the distribution of the dummy variable for gender, Female, was split nearly evenly between male and female respondents, with males being the slightly larger proportion in 2008, and females in 2020. For Sexuality, in both years the vast majority of respondents identified as straight ($\hat{p}_{2008}$:0.98; $\hat{p}_{2020}$: 0.93). In 2008, this left only five respondents falling into the "other" or "gay" categories, which is problematic for statistical analysis. In 2008, 395 respondents fell into one of the alternative categories, allowing for a more robust statistical analysis. In both years, approximately three quarters of respondents were classified as white in the Race category. In 2008, this left only twenty-seven and twenty-six respondents classified as black and other respectively, a sample size which may also be problematic for statistical analysis. Both the RelNotimp and IntendVote categories in 2008 and 2020 respectively had enough respondents in each subcategory to allow for a robust statistical analysis.

Within both the 2008 and 2020 datasets, there were only two bivariate relationships with moderate correlations, while the rest were weak. The most notable bivariate relationship was between Affpol and Idepol: in 2020, they held the strongest correlation between any quantitative or dummy variables, highlighting a moderate, positive, linear relationship within the sample. The correlation was only slightly weaker in 2008 (r_{2008}: 0.39; r_{2020}: 0.44). The associated scatterplot for 2020, seen below in Figure 3,

highlights this relationship through the dense regions of observations which follow a loosely positive, linear trend, but also captures the variability in the relationship due to the large sample size and numerous outliers (n=5901). The only other linear relationship of moderate strength appeared in 2008 between the predictor variables Income and Education (r_{2008}: 0.41; r_{2020}: 0.36).

Inferential Statistics

The full model specified in equation (1) was then fit to the data from 2008 and 2020. In both years, the model was statistically significant based on the test for overall regression (2008: $F_{13,198}=5.005$, p = 0.00, $r^2=0.2473$; 2020: $F_{13,5887}=163.3$, p = 0.00, $r^2=0.2651$). Before analyzing the regression coefficients, regression diagnostics were employed.

Firstly, to ensure that no collinearity issues impacted the regression, the Variance Inflation Factors (VIFs) were calculated for each predictor variable. In 2008, Education had the highest VIF, while Income had the second highest. This is expected due to the moderately correlated nature of the variables as previously discussed. However, the VIFs were both less than four, and thus indicate that there was no collinearity issue ($VIF_{Education}=1.41$, $VIF_{Income}=1.34$). In 2020, the VIFs were all similarly low, indicating that there was also no collinearity issue.

Next, the normal probability plots, as seen in Figure 4, were analyzed in addressing the normality condition. In 2008, the sample quantiles tended to be of lesser magnitude than the theoretical quantiles for negative residuals, and of larger magnitude for positive residuals, indicating some right-skewness in the data. The Shapiro-Wilks Normality Test was then employed ($W=0.966$, $p=0.000$), confirming that the data did not follow a normal distribution. In 2020, the data followed the line of normality far more closely, with some slight deviation among negative residuals. Due to the large number of observations, the Shapiro-Wilks Test would be too sensitive to outliers to be of use in gauging normality. In both cases, divergence from normality can be largely explained by the bounded nature of the response variable, Affpol, in the survey format. Still, these potential violations in the normality condition are of note for future analysis and interpretation.

Next, the residual plots for the models, as seen in Figure 5, were analyzed to assess the linearity and homoscedasticity regression assumptions. At first glance, both plots appear to display a negative linear trend. However, this trend likely does not originate from problems inherent to the model, but instead from the bounded nature of Affpol in survey responses. With lower predicted values, there is more potential for variation in positive residuals than negative, as the lower bound for responses (0) is closer to the predicted value than the upper bound (100). Similarly, for higher predicted values, there is more potential for variation in negative residuals than positive, explaining the negative linear trend in the plots. Ignoring the borders of the plots, which mark the survey bounds, the jackknife residuals appeared to generally be evenly and randomly scattered around 0. No clear nonlinear pattern emerged, and the residuals tended to have a similar spread regardless of the predicted value, suggesting that the linearity and homoscedasticity conditions were both generally satisfied.

These findings suggest that the negative, linear pattern observed in the borders of the residual plot is unavoidable due to the sampling method and does not originate from nonlinear relationships between the predictors and the response variable. Thus, a transformation of the predictor or response variable would

not ameliorate the trend in the plots, and the linear regression model may simply be less accurate around predictions in the extremes.

A final concern for the regression model visible in the residual plots is the fact that the model predicts several negative values for Affpol, which has no meaning in the context of the survey. While a logit transformation would remedy the issue of bounded predictions, it would also detract from the interpretability of the model. The objective of this study is to gauge broad relationships between various social identity factors and affective polarization, not to maximize predictive accuracy, rendering a multiple linear regression sufficient.

The coefficients and p-values for the 2008 and 2020 regression models are contained in Table 3. In 2008, the intercept, along with Idepol, Education, and Disinterest were the only predictors significant at the 5 percent level. Idepol had a positive coefficient, suggesting that, all else equal, Affpol and Idepol tend to increase together. Alternatively, Education and Disinterest both had negative coefficients, suggesting that, all else equal, as Education or Disinterest increases, Affpol tends to decrease. Among these three predictors, the coefficient with the most impact was that of Idepol. Considering an individual with no ideological polarization (Idepol = 0) against the same individual with extreme ideological polarization (Idepol = 6), the model predicts the latter to display affective polarization in the magnitude of 40.95 units greater than the former, a difference which can be contextualized against the mean affective polarization in the sample of 34.2.

In 2020, the intercept, along with every predictor variable except Income, was significant at the 5 percent level. Idepol, Female, PersonalDistrust, Age, and IntendVote all had positive coefficients, suggesting a positive relationship between the continuous variables and Affpol, and a greater average Affpol among females and respondents who intended to vote in the 2020 presidential election. Alternatively, Education, RelUnimp, Inattention and the displayed categories in Sexuality and Race all had negative coefficients, suggesting negative relationships between the continuous variables and Affpol. Additionally, the negative coefficients imply lower average Affpol among respondents classified as straight or other as opposed to gay with respect to Sexuality, and respondents classified as white or other as opposed to black with respect to Race. Again considering Idepol, the magnitude of the coefficient increased, meaning the model predicts the difference in affective polarization among an individual with no ideological polarization (Idepol = 0) and the same individual with extreme ideological polarization (Idepol = 6) to be even more extreme than in 2008, around 51.08 units.

An important note in the analysis of the 2008 and 2020 regressions involves the distinct sample sizes and the impact on significance. The sample in 2008 was composed of 212 observations, while the sample from 2020 was composed of 5901. These different sample sizes imply that standard errors in 2020 will likely be smaller across the board, as there would be less variation given more information. Thus, the 2020 regression labels even predictors with small, insignificant effect sizes as significant, explaining why the majority of predictors were highly significant. This renders the level of significance as unmeaningful for comparison across the two years. Still, the in-sample effects of predictor variables on Affpol can be compared through the coefficients following the methodology of Clogg, Petkova and Haritou (1995). While the regressions are not completely identical, the predictor variables that are distinct across the two

years were both intended to capture the same aspects of a respondents identity given different survey questions across 2008 and 2020, making comparisons across the regressions useful.

The first variable of interest for comparison is Idepol. Testing for a difference in coefficients yields an insignificant result (z=-1.23, p=0.11). This means that there is insufficient evidence to conclude that the population coefficient on Idepol is different from 2008 to 2020, and thus insufficient evidence to claim that the effect of ideological polarization on affective polarization has changed over time. A second variable of interest for comparison is Female. Testing for a difference in coefficients similarly yields an insignificant result (z=-0.18, p=0.43). This means that there is insufficient evidence to conclude the the true coefficient of Female is different from 2008 to 2020, and thus insufficient evidence to claim that the difference in affective polarization across the male and female groups has changed over time. Excluding Sexuality due to low sample sizes in 2008, Race and PersonalDistrust are the other variables that can similarly be compared over time because the responses are structured the same across 2008 and 2020. As with Idepol and Female, the tests for a difference in coefficients yields insignificant results (z_{Race}=-0.68, p_{Race}= 0.25; $z_{PersonalDistrust}$=-0.43, $p_{PersonalDistrust}$=0.33). Together, these results suggest that changes in the impacts of social identity factors from 2008 to 2020 does not account for the increased affective polarization, implying that it might instead originate from changes in the distributions of social identities among respondents.

The two-sample framework for testing a difference in means among variables in 2008 and 2020 highlights significant changes in the distributions of social identities among respondents. These changes could have contributed to significantly increased affective polarization (z_{Affpol} =8.90, p_{Affpol}=0.00). Referring to the most notable predictor variables contained in Table 1, the means for Idepol and Age among respondents increased significantly from 2008 to 2020 (z_{Idepol} =7.49, p_{Idepol}=0.00; z_{Age} =4.76, p_{Age}=0.00). The positive coefficient on both factors in the 2020 regressions suggests that there is a positive correlation between each factor and Affpol, suggesting that increases in the means for each factor may have contributed to the significant rise in Affpol from 2008 to 2020.

Post Hoc Analysis

Throughout this study, the focus has been on exploring identity factors associated with affective polarization and comparing and analyzing those relationships and how they changed from 2008 to 2020. While increases in affective polarization motivate this exploration, how those increases manifested has thus far been ignored. This section initiates a descriptive statistical exploration of how changes in affective polarization manifested, yielding evidence that increases in disdain towards the out-party, rather than heightened warmth towards the in-party, is responsible for increased affective political polarization.

Figure 6 summarizes data on feeling thermometer ratings of both parties by year for respondents with either Democrat or Republican preferences. In both charts, the trend is the same. Intuitively, the mean feeling thermometer score of the in-party is higher than the out-party, regardless of year. Across years in both plots, the mean feeling thermometer score of the in party stays the same, suggesting that heightened warmth towards the in-party is not a critical factor in explaining increased affective polarization. Instead, the notable decrease in the out-party feeling thermometer scores in 2020 across both plots suggests that negative feelings towards the out-party increased from 2008 to 2020. These results suggest that the origin

of increasing affective polarization, calculated as the difference between the in-party and out-party feeling thermometer ratings, lies in increased disdain for the opposing party rather than heightened warmth towards the in-party. This implication highlights the problematic nature of the rise in affective political polarization.

Discussion

The descriptive and inferential statistics employed in this study help to address numerous questions surrounding affective political polarization. Significant differences in means across 2008 and 2020 suggest that affective polarization is increasing among voters. The multiple regression analysis employed in both years builds on much of the literature, highlighting factors that are significantly correlated with affective polarization. Analysis of means allowed us to point at growth in ideological polarization and the aging United States voter population as contributing to the growth in affective polarization. Further retrospective analysis allowed us to claim that the growth in affective polarization was derived specifically from increasing negative sentiments rather than growing party loyalty. Together, these conclusions help build on the understanding of affective political polarization and its ties to social identity.

Interpretation of Results

The descriptive section of this analysis focused on the distributional changes of Affpol and Idepol from 2008 to 2020. In both cases, the distributions became more left skewed and higher values became more common. This implies that the difference in feeling thermometer ratings of the parties generally increased from 2008 to 2020; people became relatively more hostile towards the out-party and viewed the in-party more favorably. In other words, affective polarization became more pronounced. Similarly, the general increases in Idepol mean that the political self-placement of individuals became further away on average from the placement of the out-party. In other words, ideological polarization increased.

These descriptive findings were expanded on in the inferential section of the analysis. Based on the multiple regression model used for 2008, each of Idepol, Education, and Disinterest were significant in predicting Affpol. Specifically, looking at the coefficients, the results of the regression suggest firstly that ideological polarization tends to increase with affective polarization. While not establishing a causal relationship, this finding suggests that extreme political views may promote increased affective polarization. Secondly, the negative coefficient on Education suggests that more educated individuals tend to be less affectively polarized. Finally, the negative coefficient on Disinterest suggests, rather intuitively, that individuals less interested in politics tend to be less affectively polarized.

Focusing on the 2020 model, a significant positive coefficient on Female confirms findings from previous literature that women tend to be slightly more affectively polarized than men. Also of note was the significant positive coefficient on age, suggesting that older individuals tend to be more affectively polarized than younger individuals.

Implications

It is essential to understand affective political polarization because it can lead to negative human interactions and a lack of understanding from diverse perspectives. While our social identities can influence political decisions and the degree of affective political polarization in our society, this extends beyond the political and into the social realm. The way in which humans view and interact with each other is constantly influenced by biases including political affiliation. As previously discussed in this paper, partisanship is a social identity. According to Iyengar, Lelkes, Levendusky, Malhotra, and Westwood (2018), "Democrats and Republicans both say that the other party's members are hypocritical, selfish and close-minded, and they are unwilling to socialize across party lines." Without interacting with people from different political affiliations due to affective polarization, an "echo chamber" is created in which people's political beliefs are constantly affirmed by those they surround themselves with which can lead to deeper connections with partisan identities and lead more quickly to radicalization. This further increases the hatred toward the out-party and creates further division. In this same study, the researchers use a "feeling thermometer" from the American National Election Study to show the degree of affective polarization and its change over time. This study found that the feeling thermometer shows a significant increase in affective polarization since 1980 (22.64 degrees in 1978 to 40.87 degrees in 2016). Our study used a comparison between 2008 and 2020 to demonstrate a similar result. The animus felt toward the opposite party is a pressing issue in today's society, especially in the U.S. In addition to creating an "echo chamber", partisan bias increases exclusion of individuals such as in the job market. Iyengar, Lelkes, Levendusky, Malhotra, and Westwood label this "affective spillover" which is when partisan "cues" significantly impact nonpolitical attitudes and actions. With the increase in affective polarization over time, the amount that this impacts the nonpolitical sphere has also increased significantly. This means that citizens tend to exclude or even penalize opposing partisans and reward co partisans. Our findings progress this field of study by helping reveal relationships between our social identities and affective polarization, all of which goes into understanding and combating growing polarization.

Limitations

This study provides a broad survey of background information on identity factors associated with affective political polarization and allows for valuable insights regarding the strength and direction of many of those associations over time. However, the statistical findings alone are not entirely generalizable and should be viewed as strictly correlational, not as concrete evidence of a causal relationship. These limitations in our results come from several factors. The primary factor involves the data collection itself and our sampling methods. Because we were selecting responses in the ANES dataset which were complete for each of our selected questions, we were unable to appropriately weight the observations and unable to ensure representative data. While there is no explicit bias in our data due to this process, it is impossible to claim that our results should be fully generalizable to the population of U.S. voters, and that must be considered in the interpretation of our results. A second limitation in our study comes from omitted variable bias. While we attempted to include relevant variables associated with affective polarization in our model, the dataset did not include questions relating to many relevant aspect of identity: this was reflected in the low coefficient of determination for the model in both years (R^2_{2008}= 0.247; R^2_{2020}=0.265). A final limitation involved in the study involves the irregular distribution of survey

response data, and its reflection in our statistical model. Notably, there was a divergence from normality, and both the homoscedasticity and linearity conditions appeared to be violated in the residual plot. However, as previously discussed, because the majority of the data followed a more consistent trend, the conditions can be treated as generally met, and the model can still be employed in correlational analysis.

Future Directions

The findings from this study, paired with the discussed limitations in our data and generalizability, invite numerous questions that could direct future research studies. First and foremost, the same questions that this study explored could be addressed through analysis of a more representative pool of voters. Because we were selecting from a database not intended for this specific analysis, our data was not weighted to reflect the demographics of the intended population. A similar study with a narrower scope focused on political polarization would allow for more concise questioning and more generalizable conclusions. Further, this future study could include additional questions gauging new identity factors that were not represented in the ANES dataset, but were represented in the literature, such as social media usage. Future research could also be designed so that questions and responses across different years are aligned in terms of phrasing and range, allowing for standard time-series analysis rather than comparative analysis. A well-developed study including the listed aspects could potentially allow for causal claims. Additional future research might explore the cause of increased political polarization through socio-political events, rather than through identity factors. We noted that growing affective polarization was derived from growth of negative out-group sentiments rather than increased party loyalty: what events have contributed to fueling political partisanship and hatred over the last few decades?

Conclusion

In this study, a broad survey of literature surrounding affective political polarization was reviewed and employed in informing a statistical analysis of ANES data from 2008 and 2020. These results help to develop the understanding of affective polarization as related to various aspects of human identity and suggests that shifts in both demographic and psychographic identity factors throughout the population could contribute to the observed growth in affective polarization. These conclusions should help motivate future research that further fleshes out causal relationships between identity factors and affective polarization and explores other socio-political events motivating its growth. Only once the malignancy of affective political polarization is better understood can effective measures be taken to reduce its decadent impact on society.

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