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Explaining youth voter turnout: How the usual explanations fall short

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Abstract

Despite widespread concern about the low voter turnout of young Americans, very little political science research focuses on those factors predicting their turnout. This brief shows that some well-known predictors of voter turnout in U.S. national elections do not do well at predicting the voting behavior of 18-to-29-year olds. Union membership, homeownership, and being employed matter for middle-aged voters, but not for young people. And marital status and stock ownership have only small impacts for young people. Instead, a highly context- specific factor — disapproval of President Trump in 2018 — predicted much higher turnout. The lack of predictive power of traditional characteristics and the strength of the relationship between disapproval of the president and voting suggests the need for additional research into factors and interventions that could boost young adult voter turnout. Going forward, researchers should continue to look into new, less explored paths to address the puzzle of low voter turnout among young Americans.

Introduction

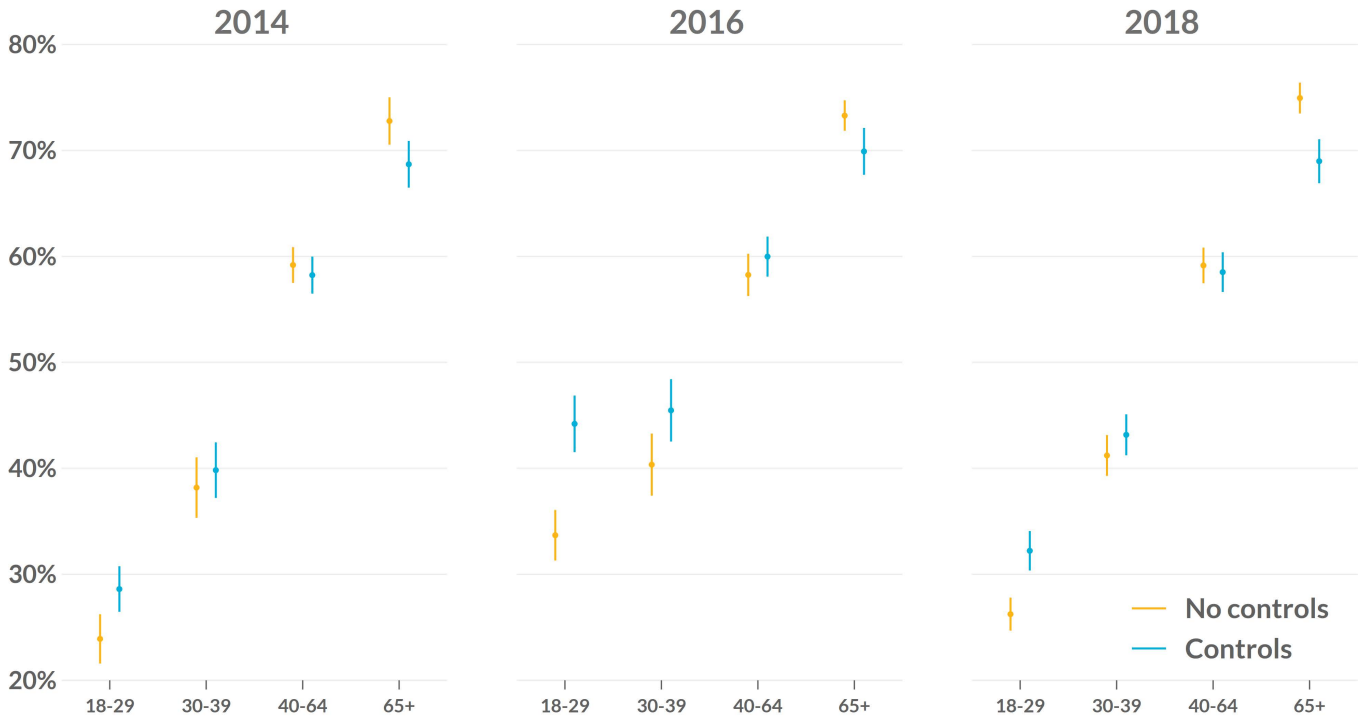
Young Americans vote at much lower rates than older Americans. Figure 1 shows the proportion of adults in different age categories who voted in the 2014, 2016, and 2018 national elections, calculated using data from the Cooperative Congressional Election Study. The estimates in orange show that in 2014 and 2018, the turnout rates of 18-to-29-year olds were nearly 50 percentage points lower than those of adults 65 years and older.[1] That age-turnout gap was only slightly narrower during the presidential election of 2016.

Political science research shows that individual characteristics like education, income, race, ethnicity, homeownership, and union membership are associated with voter turnout, and some of the age gap in turnout can be explained by these other factors. For example, young adults tend to have lower income than older adults and also are less likely to be homeowners, and that helps to explain why young people vote less. However, even when some of those other differences are accounted for, the relationship between age and turnout persists. The blue estimates in Figure 1 show turnout by age group after controlling for a host of individual demographic and economic characteristics (which are detailed below). The turnout gap between the oldest and youngest age groups narrows somewhat but remains quite large: it is 40.1 percentage points in 2014, 25.7 percentage points in 2016, and 36.8 points in 2018.

[1] The magnitude of the age-turnout gap varies depending on the source of voter data and the assumptions used in estimating the voter turnout rate. The 2018 Current Population Survey data in particular show a higher turnout rate for the youngest group and a lower turnout rate for the oldest group, but still a large gap between the two. We present visualizations of these differences in the Appendix.

Figure 1: Voter Turnout in the United States in Recent Elections

Share of population that voted, by age group and year



Source: Authors' analysis of the Cooperative Congressional Election Study, 2014, 2016, and 2018: Common Content.
Sample: All citizens 18 years or older.

This strong link between age and turnout is important for a number of reasons. Active citizen participation in democracy is important in its own right, and it is troubling that young adults participate in politics at such low rates. Moreover, large and persistent differences in turnout by age almost certainly have consequences for political and policy outcomes. Young voters have different policy preferences from older Americans. In the past decade, for example, young voters have been significantly more favorable to gay marriage, funding for K-12 education, funding for higher education, and legalizing marijuana and less supportive of increases in funding for Social Security (Brady and Petek, 2016). If America's young voters tend to prefer different candidates and hold different policy preferences than older voters, then low turnout rates among young adults suggest that their interests are represented less well—and may result in policies less favorable to them.

Why, then, do young adults vote at lower rates than older adults? Existing research does not provide clear answers, in part because most research hasn't put the focus on explaining turnout among young adults in particular. It could be that the predictors of voter turnout are somewhat different for younger adults than for their older counterparts—and that researchers have missed some factors that are especially important to young people by not examining young people as a subgroup. Recent political science research that *does* put the focus on young adults demonstrates how productive such an emphasis can be: For example, a recent book by John B. Holbein and D. Sunshine Hillygus, *Making Young Voters* (Cambridge Univ. Press, 2020) demonstrates the importance of noncognitive skills such as perseverance, self-regulation, and ability to integrate into social settings for voting. In addition, research by Holbein and Hillygus as well as Jacob M. Grumbach and Charlotte Hill (*Journal of Politics*,

forthcoming) demonstrates that states' electoral rules can have disproportionately large turnout-dampening effects for young people.

In this brief, we take a modest step in that direction by analyzing whether some well-known predictors of voter turnout in U.S. national elections also predict voter turnout among young adults in particular. With few exceptions, we find that these "usual" predictors are better at explaining the turnout of older adults than the turnout patterns of younger Americans. Ultimately, our results generate more questions than answers, but they bolster the claims of recent research that standard individual-based accounts of voter turnout may need to be adjusted to explain the turnout of young adults in particular. They suggest that going forward, researchers should continue to look down new, less explored paths to address the puzzle of low voter participation among young Americans. Such research would have great potential to generate clearer answers about what explains youth turnout specifically—and to point the way toward reforms and policies that could increase youth turnout.

Methodology

For this report, we rely on the Common Content data from the Cooperative Congressional Election Study (CCES), a large and nationally representative election survey administered by YouGov, housed at Harvard University (Ansolabehere, Schaffner, and Luks 2019a).

Our primary outcome is whether the CCES respondent voted in the 2018 election.[2] The CCES validates respondents' reported turnout by matching to administrative voter records from the elections data firm Catalist. We code respondents as having voted if they had a validated voting record; we code them as non-voters if either there was no match to the administrative records *or* there was a match that confirmed the participant did not vote.[3]

In our analysis, we examine the relationship between voter turnout and certain individual characteristics, such as education, that are known to be correlated with turnout. Importantly, however, we look at those relationships *within different age groups*. Specifically, we break the respondents into four age categories: those who are 18 to 29 years old, 30 to 39 years old, 40 to 64 years old, and 65 years or older. We then examine the relationship between turnout and individual characteristics like education within each of those four age groups. This allows us to assess whether some well-established predictors of voter turnout are strong predictors of turnout among young people in particular—or whether they are better at explaining the turnout patterns of middle-aged and older Americans.

Throughout, we use a regression framework to examine the interaction of certain key explanatory variables with age. They are:

- **Education** (college or postgraduate degree)
- **Race and ethnicity** (separate indicators for Asian, Black, Hispanic, white, and other)

[2] In the Appendix, we carry out the same analysis using a pooled dataset of 2014, 2016, and 2018.
[3] In the Appendix, we describe the other turnout measures in greater detail and report our main results for these measures as well.

- **Income** (separate indicators for family income groups $20k-$39,999; $40k-$59,999; $60k-$79,999; $80k-$99,999; $100k-$119,999; $120k-$149,999; and $150k+, with incomes less than $20k as the baseline group)
- **Employment status** (separate indicators for employed, retirees, and students, with unemployed as the baseline group)
- **Marital status** (married or in a domestic/civil partnership)
- **Union membership** (currently or formerly a union member)
- **Homeownership** (owns a home)
- **Stock ownership** (invested in the stock market)

Using the coefficient estimates from interactions of age and each of these sets of explanatory variables, we examine the marginal difference in voter turnout (in percentage point terms) among those with and without each characteristic *and* how that marginal difference might vary across age groups. For example, we examine the percentage point difference in voter turnout between homeowners and non-homeowners for 18-to-29-year-olds, 30-to-39-year-olds, 40-to-64-year olds, and those 65 and older. None of these results should be interpreted as the causal effect of any explanatory variable on voter turnout, but they are helpful in showing how the correlates of voting can be different for different age groups.

In each of our models, we also include the other demographic/economic variables as controls, not interacted with age. There are two exceptions. First, in the main results presented here, we do not include income as a control because it is missing a large number of respondents—especially for the youngest group of adults.[4] Second, we include an indicator for whether the respondent is male or female as a control in all models but do not report results for this variable.[5]

Results

We begin by focusing on the relationships between voter turnout and five of the binary explanatory variables: marital status, union membership, homeownership, stock ownership, and college attainment. All of these variables except marital status have a positive relationship with voter turnout when we analyze all age groups together (not shown). Moreover, as shown in the Appendix, citizens in the youngest age group are less likely than older citizens to be married, union members, homeowners, and stock owners. But do these individual characteristics have the same relationship to turnout *within* each of the age groups? We explore this in Figure 2 by plotting the age-specific relationships between turnout and each of the five variables.

All of these individual characteristics are strong, positive predictors of voter turnout for older Americans: citizens aged 40 to 64 and citizens 65 and older. For these two age groups, people who are married or in domestic or civil partnerships are significantly more likely to vote than those who are not. Union members are much more likely to vote than non-union members: 9.7 percentage points more for the 40-to-64 group and 7.1 percentage points more for the 65 and older group. Those who own their homes

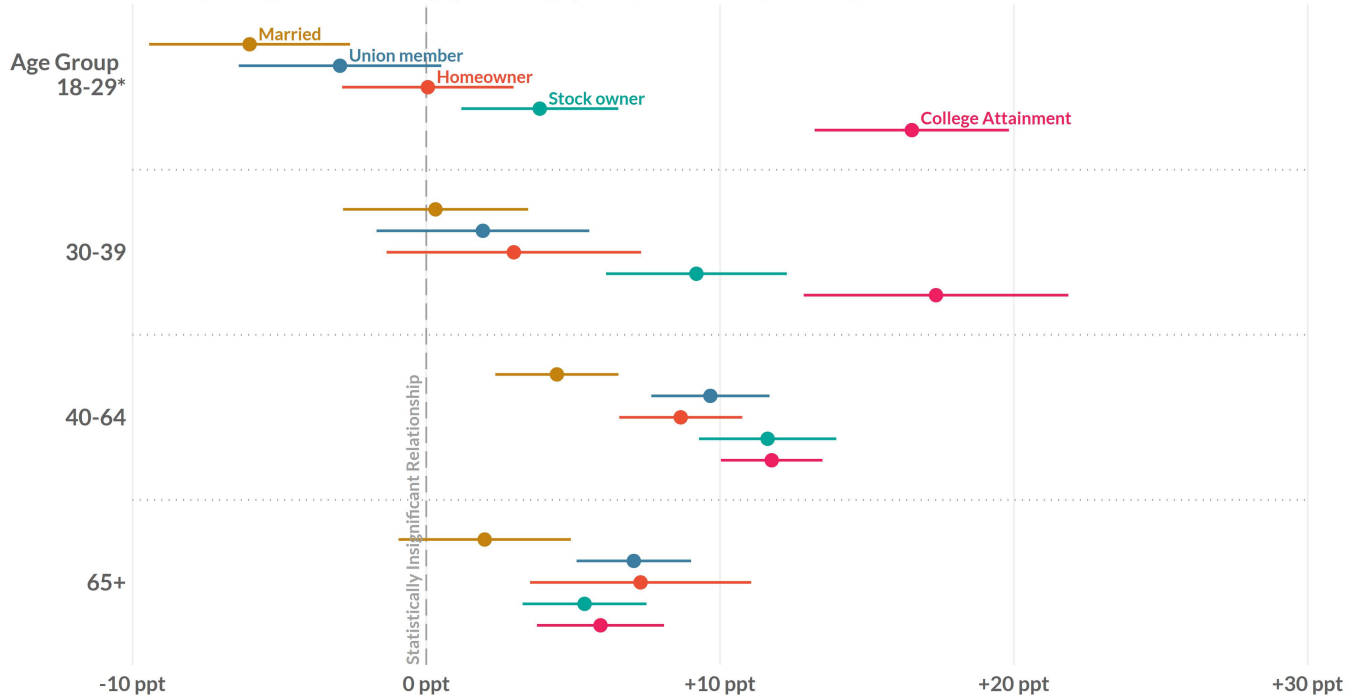
[4] The addition of the income groups as controls makes only a slight difference to the analysis. We report those results in the Appendix.
[5] The CCES asks the following question of respondents: “Are you…? Male or Female"

are more likely to vote than those who do not. And both stock ownership and college attainment are positive predictors of turnout among middle-aged and older Americans as well.

This much is as expected. More surprising are the smaller, statistically insignificant relationships between some of these well-established predictors of turnout and the turnout of younger Americans. Being married or in a civil or domestic partnership is not a positive predictor of voting for either those in the 18-to-29 group or the 30-to-39 group. In fact, for the youngest group of voters, those who were married and in civil/domestic partnerships were *less* likely to vote in 2018 than those who were not. The same pattern holds for union membership and homeownership. For younger people, being a union member does not make one significantly more likely to vote. Nor does homeownership: the coefficient on homeownership for the 18-to-29 group is very close to zero, and for the 30-to-39 group it is positive but smaller than for the older age groups.

Figure 2: Correlates of Turnout by Age Group

Average marginal relationship (percentage points) between explanatory variable and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older. **College attainment estimates calculated on a sample of ages 24+.*

The only two of these five characteristics that *do* have the expected relationship with voter turnout among young Americans are stock ownership and college attainment. In fact, the difference in the turnout rates of college graduates and non-college graduates is even larger for the two younger groups than for the two older groups. Here, our estimates for the youngest age group are based on those aged 24 to 29, and we find that those with a college degree are 16.5 percentage points more likely to vote than those without a college degree. For the 30-to-39-year-old group, the point estimate is 17.4 percentage points. In the two younger age groups, moreover, individuals who are invested in the stock market are more likely to vote than those who are not. For the youngest group, however, the turnout difference between stock owners and non-stock owners is quite small—smaller than for the 30-to-39

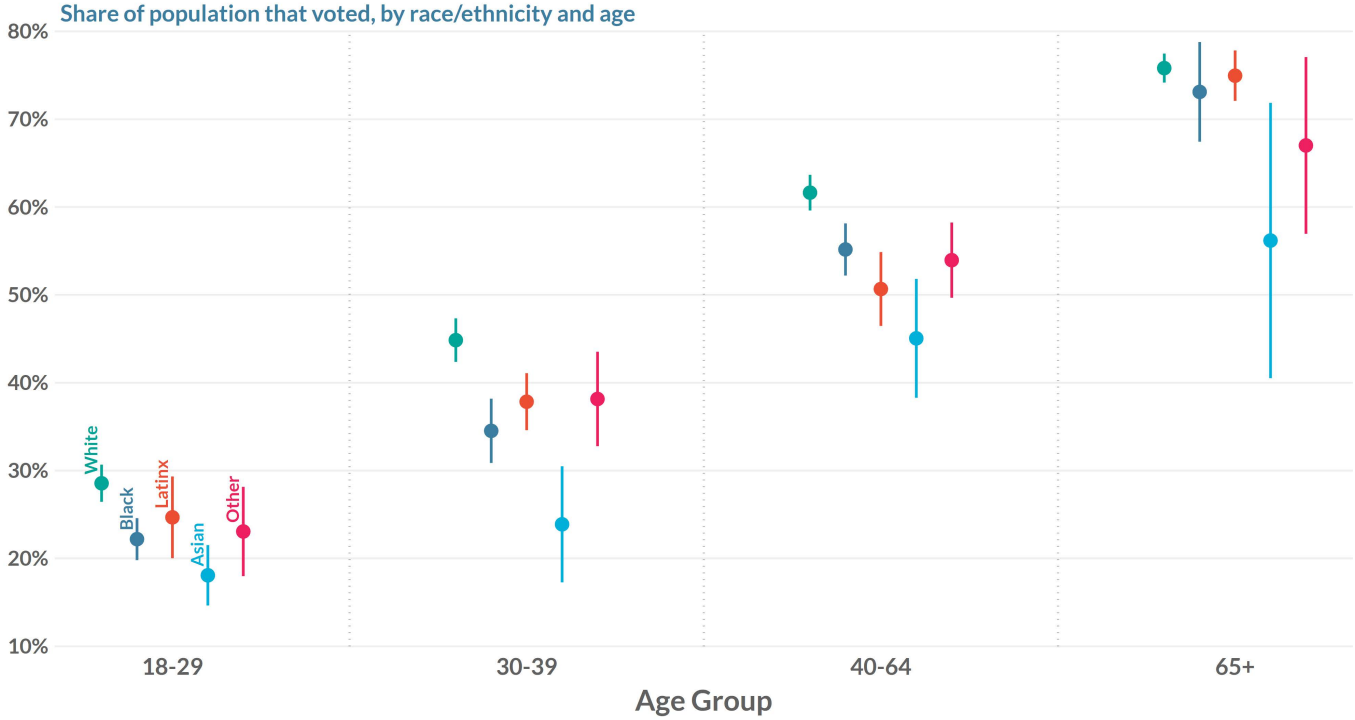
group and the 40-to-64 group.[6] Thus, with the exception of college attainment, these factors are not as good at distinguishing the voting behavior of younger Americans as they are for older Americans.

Next we turn to race and ethnicity. When we analyze all age groups together, the estimates show that Black and Latinx turnout is lower than white turnout, and that the turnout of Asian Americans is lower than all of these other groups. But do those relationships vary by age group? We explore in Figure 3.

Consistent with the pattern shown in Figure 1, we see in Figure 3 that turnout rises markedly with age. However, the strength of race and ethnicity as predictors varies across age groups.

Figure 3: Race and Ethnicity

Share of population that voted, by race/ethnicity and age



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older.

When we focus on individuals in the two middle age groups—30-to-39-year-olds and 40-to-64-year-olds—we find relatively pronounced turnout gaps between different racial and ethnic groups. For both of these age groups, Black and Latinx turnout is lower than white turnout, and the turnout of Asian Americans is lower still. Within the 40-to-64 age group, for example, the turnout of Black Americans averages 6.5 percentage points lower than whites. Latinx turnout averages 11 percentage points lower than whites. And turnout among Asian Americans averages a full 16.6 percentage points lower than whites.

For the youngest voters, however, turnout is low across the board and varies somewhat less by racial and ethnic groups. On the one hand, the turnout gap between white and Black Americans is roughly

[6] The relationship between stock ownership and turnout is positive even when we add income as a control. Moreover, the relationship between stock ownership and turnout is larger for the 40-to-64 group even when we add the interaction of income level and age group.

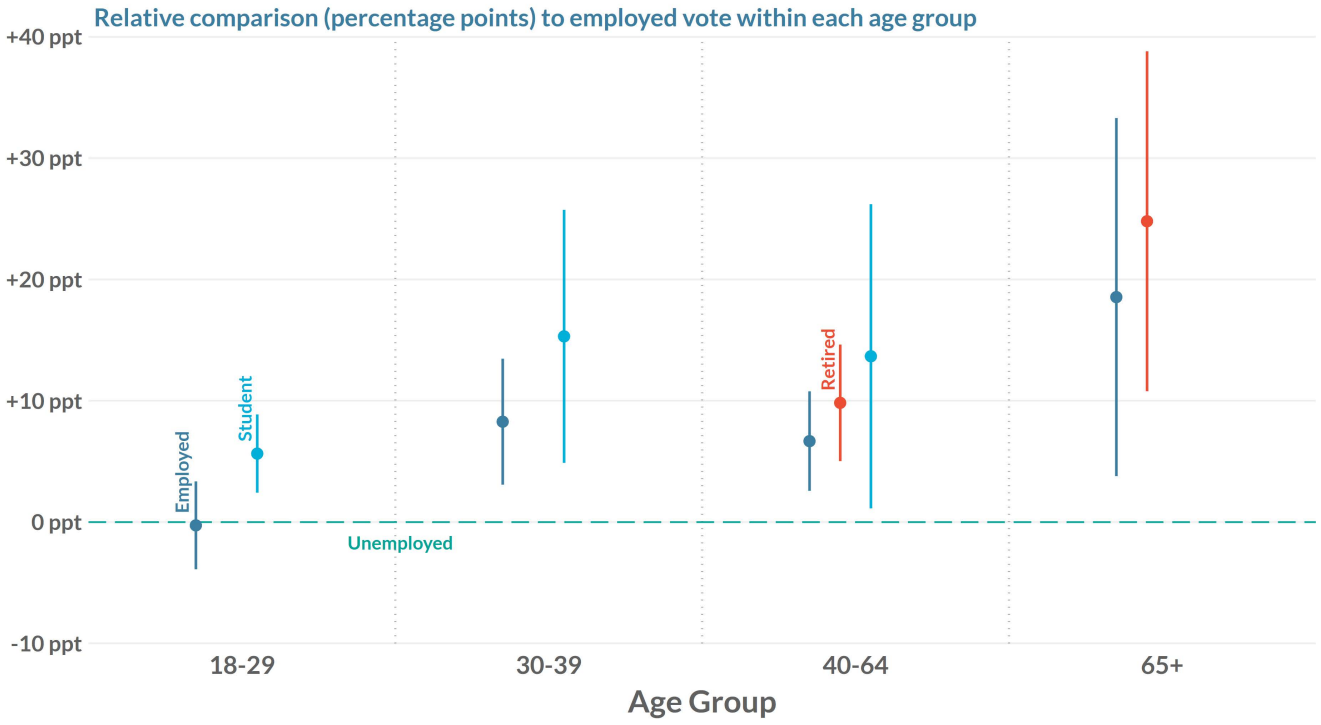
the same for 18-to-29-year-olds and 40-to-64-year-olds. On the other hand, the gap between white turnout and Latinx and Asian turnout is smaller for the younger group: 4 points and 10.5 points, respectively.

Notably, racial and ethnic turnout gaps are also less pronounced for the 65-and-older group, because for them, turnout tends to be relatively high across the board. (The point estimates for Asian Americans and those in the "other" group -- respondents not identifying as white, Black, Latinx, or Asian -- are exceptions here, but the confidence intervals for those groups are also quite large.) Overall, though, we see the same general pattern as in Figure 2: individual race and ethnicity tends to be a stronger predictor of voter turnout for middle-aged people than the youngest (and oldest) adults.

What about employment? When we look at the turnout patterns of all age groups together, employed individuals are more likely to vote than those who are unemployed. But does that relationship vary across age groups?

Figure 4 shows that it does. Compared to those who are temporarily out of work or unemployed (the baseline), employed individuals in the 30-to-39 group, 40-to-64 group, and 65-and-older group are more likely to vote. But that is not true for the 18-to-29 group: for the youngest Americans, voter turnout rates are no higher among the employed than the unemployed.

Figure 4: Employment Status



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older.
Notes: While our model estimates use the full sample of citizens, we drop the following coefficients from the visualization: 18-29 retired (n=14), 30-39 retired (n=31), 65+ student (n=1), and all other employment categories not included within unemployed, employed, student, and retiree (n=9,675).

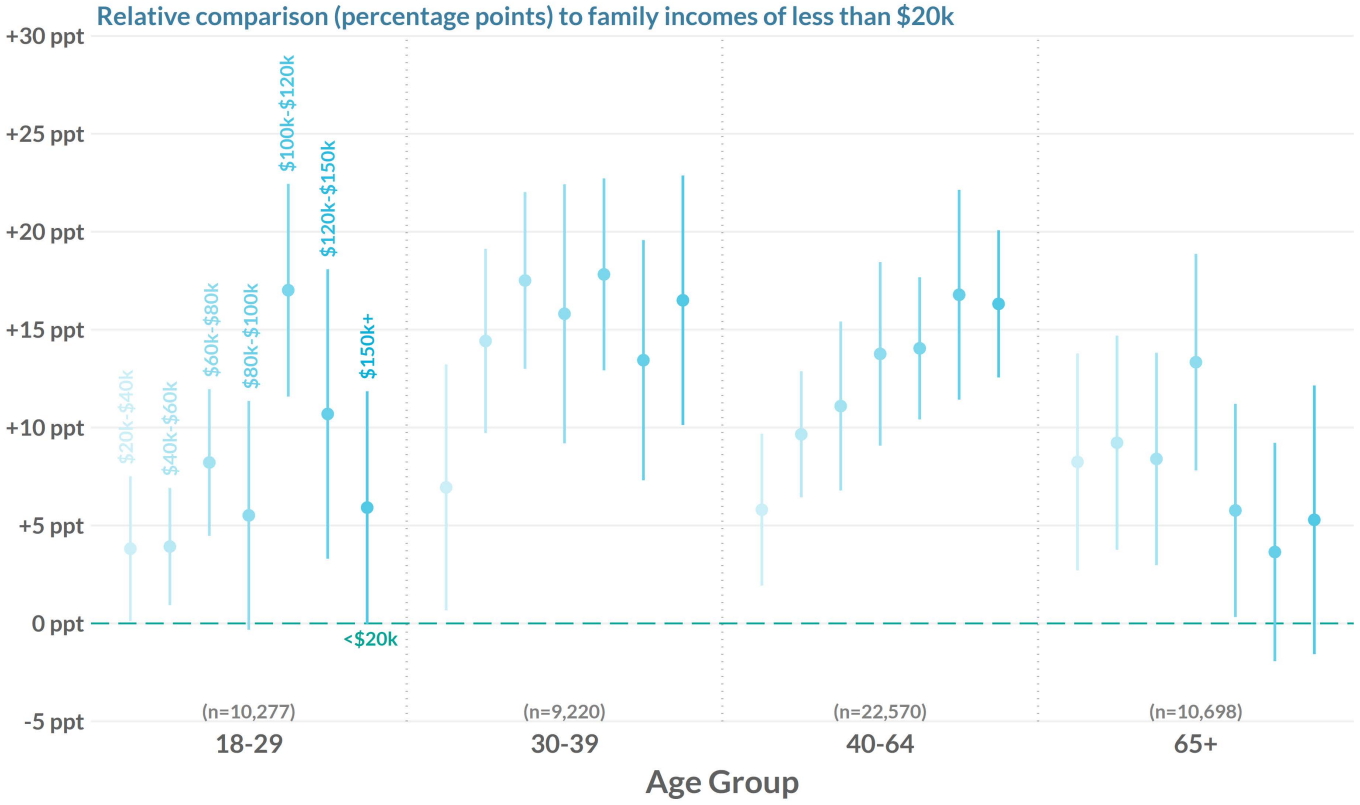
In the model used to generate these estimates, we also interacted other employment status indicators with the age groups, including indicators for whether the individual is a student, whether she is retired,

and whether she is a homemaker or disabled. Across the board, students are more likely to vote than unemployed individuals. For the 40-and-older groups, Figure 4 also shows that retired individuals are more likely to vote than the unemployed. Viewed as a whole, however, we see that once again, employment status better distinguishes between voters and non-voters for the middle-aged and older age groups than for young adults.

Finally, we turn to family income. As we've discussed, this variable is missing for many of the respondents in the CCES data (see Appendix). However, it is well known that there is a strong, positive relationship between income and turnout, so in Figure 5, we interact seven of the eight family income bins with the age groups. The excluded category is the lowest income level (less than $20k).

Figure 5: Family Income

Relative comparison (percentage points) to family incomes of less than $20k



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older.

For 40-to-64-year-olds, there is a roughly linear upward trend in voting rates with family income, as expected. The same general pattern is evident for 30-to-39-year-olds, although these estimates are less precise (there are fewer respondents than in the 40-to-64 group). Among the youngest and oldest adults, however, the relationship between income and turnout is less pronounced.[7] For both, individuals with income above $20k turn out at higher rates than those with income less than $20k (the baseline), but turnout rates do not clearly rise with increases in income, and not all of these estimates are significantly different from the <$20k group. Compared to those in the two middle age groups—30-to-39

[7] As we show in the Appendix, the family income variable had the largest fraction of missing observations, and this rate of missingness increased for older groups.

and 40-to-64—income is not as strong a predictor of voter turnout for those in the 18-to-29 age group and those in the 65-and-older age group.

With few exceptions, then, most of the standard correlates of voter turnout are better predictors of voter turnout for middle-aged Americans than for the youngest (and oldest) adults. This suggests that some of the ways in which researchers have understood and explained patterns of voter turnout in the past are better suited for explaining the political behavior of middle-aged and older adults than younger adults.

With the data we have, we cannot explain *why* this is—that is, why some of the standard correlates of voting work differently for young adults than for older adults. It could be that some of the variables mean different things for younger citizens than for older citizens. For example, it is possible that young people living with their parents—and thus still part of that family—report the family income of their parents. Even so, because income and the other variables are widely recognized as predictors of turnout, it is important to highlight that (as measured) they do less well at predicting the turnout of young adults. This suggests that to understand the voting behavior of young Americans, we may need to revise existing theories and develop new ones—and open the inquiry to new, less explored factors that might provide a clearer explanation of why some young people vote and why so many do not.

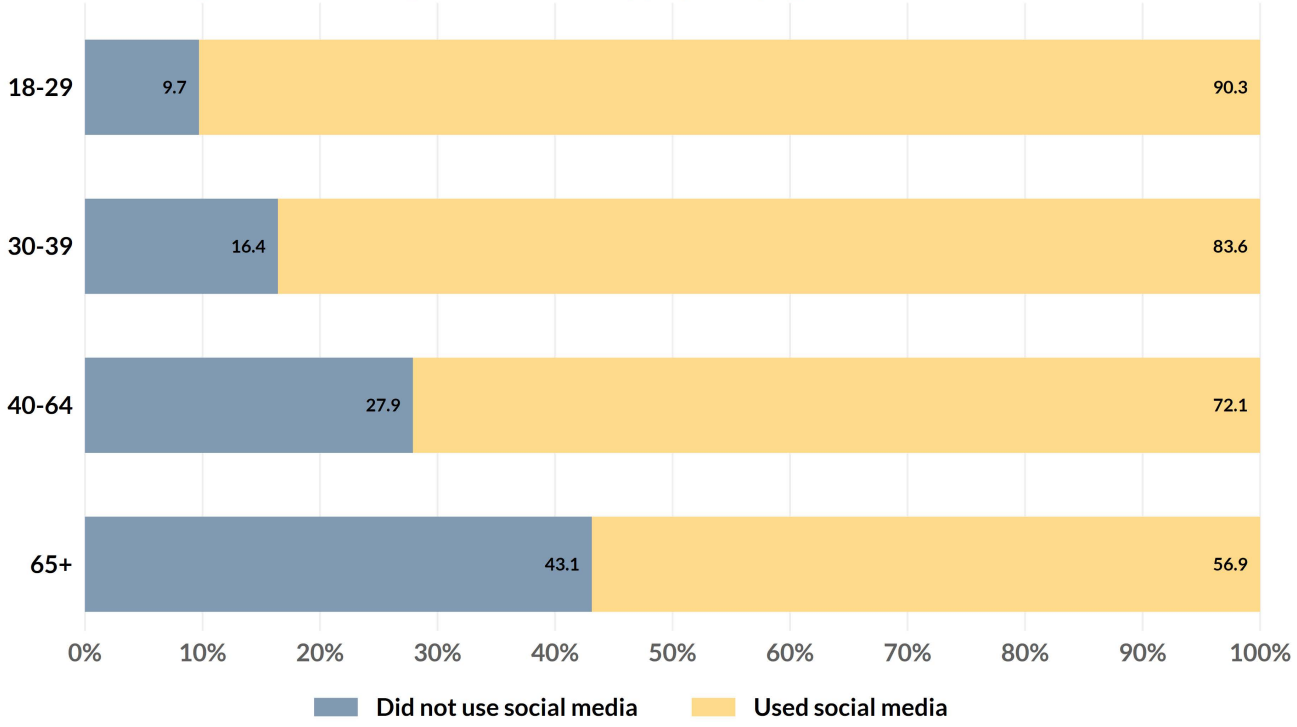
Many have pointed to social media as an especially important factor to consider when it comes to discussing political participation generally and the participation of young adults in particular (e.g., Schlozman, Brady, and Verba, 2018, 122-126). As Holbein and Hillygus (2020) explain in their book, young adults report that they are highly interested in politics. And some argue that young adults are politically active in different ways than older adults, such as by engaging in politics through social media.

Our analysis of the CCES data confirms that the youngest group of adults is much more active on social media than older Americans. See Figure 6. Within the 18-to-29 group, 90% of respondents report using social media, compared to roughly 84% of 30-to-39-year-olds, 72% of 40-to-64-year-olds, and only 57% of the 65-and-older group. Moreover, within the social media users of each age group, roughly the same share—about 78% to 80%—report using social media for political purposes, as we show in Figure 7.[8] Thus, these data do show that young people are more likely to engage in politics through social media than older adults. However, conditional on social media use, using social media for political purposes is roughly constant across age.

[8] The CCES asks a series of questions about social media use, including several about using social media for political purposes. These questions generally take the form of “Did you post/comment/watch a video about politics on social media?”

Figure 6: Proportion of Social Media Users

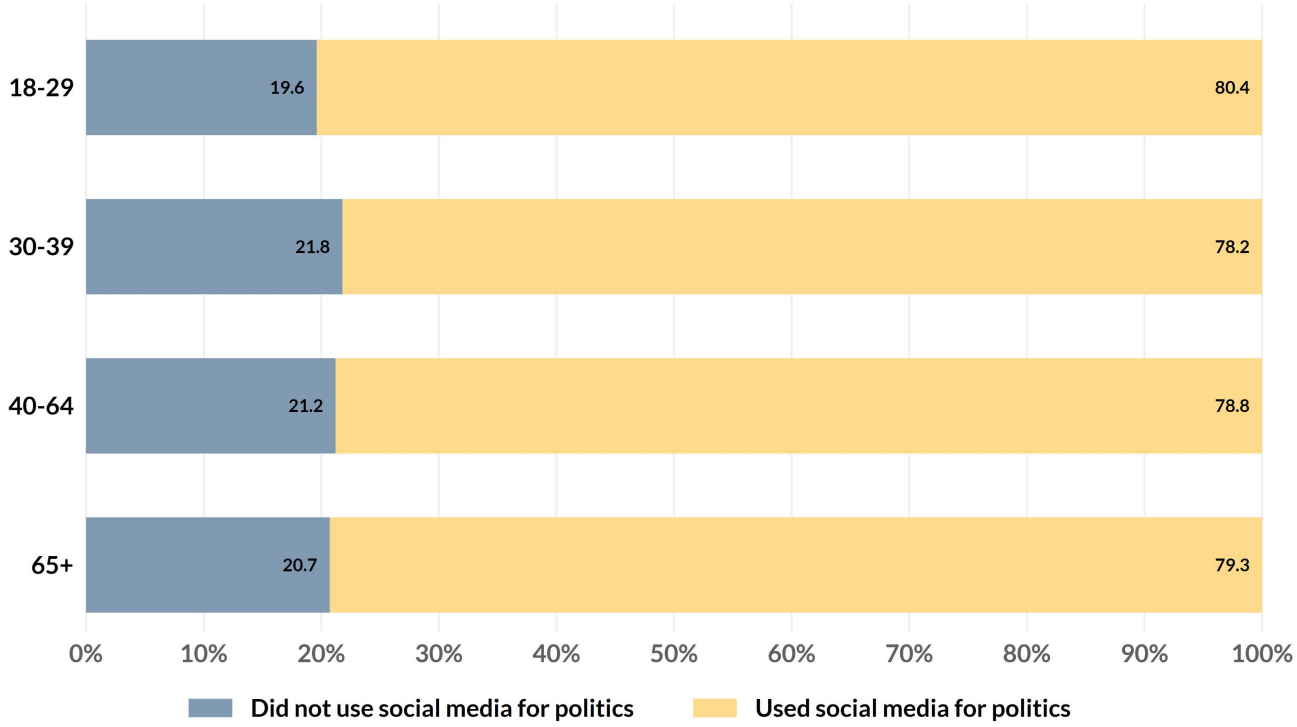
Share of age distribution using social media for any purpose, by age



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older.

Figure 7: Proportion of Social Media Political Users

Share of age distribution using social media for political purposes, by age



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older that use social media.

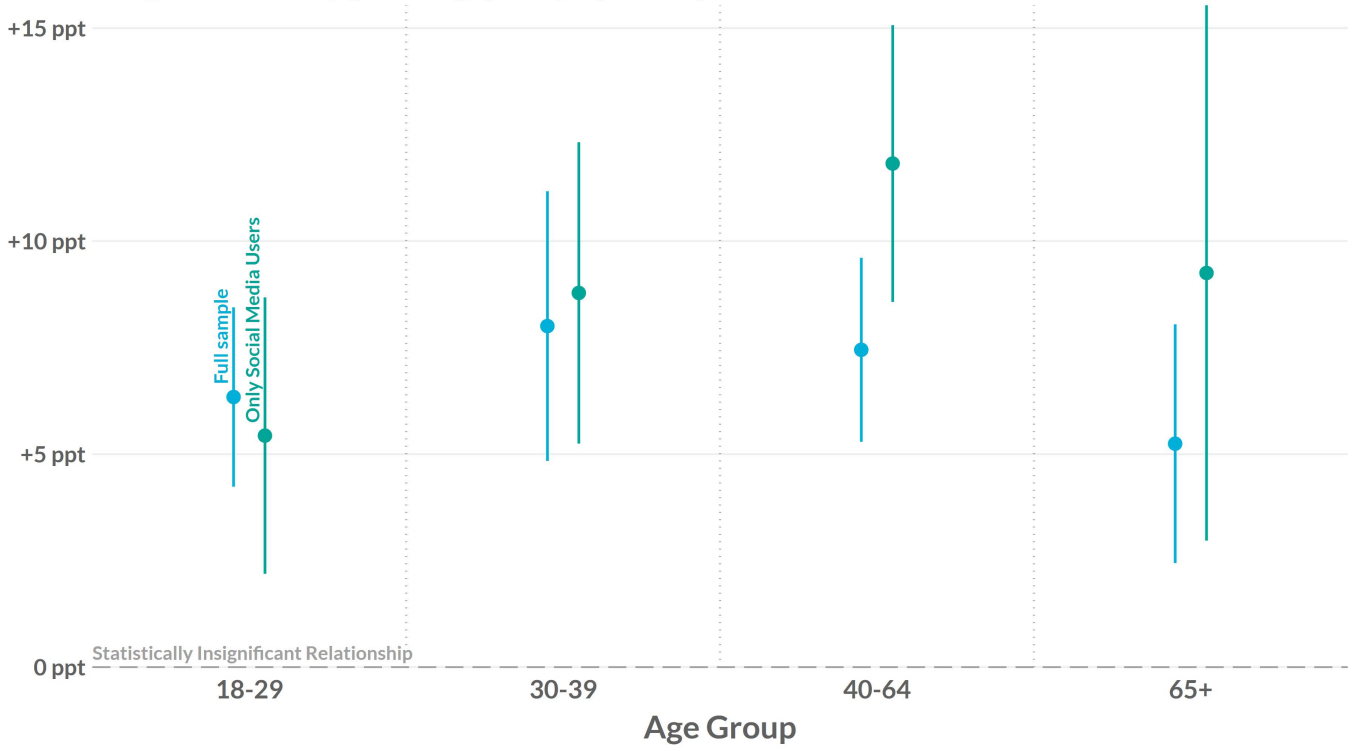
But is engaging in politics on social media associated with turning out to vote in national elections? And is political social media use a stronger predictor of turnout among young adults than older adults?

We explore this in Figure 8 by adding the indicator for political social media use to the model of turnout and interacting it with three of the four age groups. We report two sets of results for each age group. The estimates shown in green are from a model that includes all citizens, regardless of whether they used social media. The difference in voter turnout rates is calculated by comparing voter turnout among those who did use social media for political purposes versus those who either did not use social media or those who used social media only for non-political purposes. The estimates shown in blue are from a model that only includes social media users; we calculate the difference in voter turnout between those who used social media for political purposes and those who used social media for only non-political purposes.

For all age groups, regardless of whether we include all citizens (green) or only social media users (blue), we find that people who report using social media for politics are more likely to vote. We do not find, however, that this positive relationship is larger for young people. If anything, it is larger for the 30-to-39 and 40-to-64 groups. So while political social media use *is* a positive predictor of voter turnout, that relationship is not specific to young people—it is something that holds for all age groups.

Figure 8: Is Politics on Social Media Associated with Voting?

Marginal relationship (percentage points) of politically-related social media use and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: All citizens 18 years or older. The baseline group for the full sample estimates includes any individuals who did not use social media OR did not use social media for political purposes.

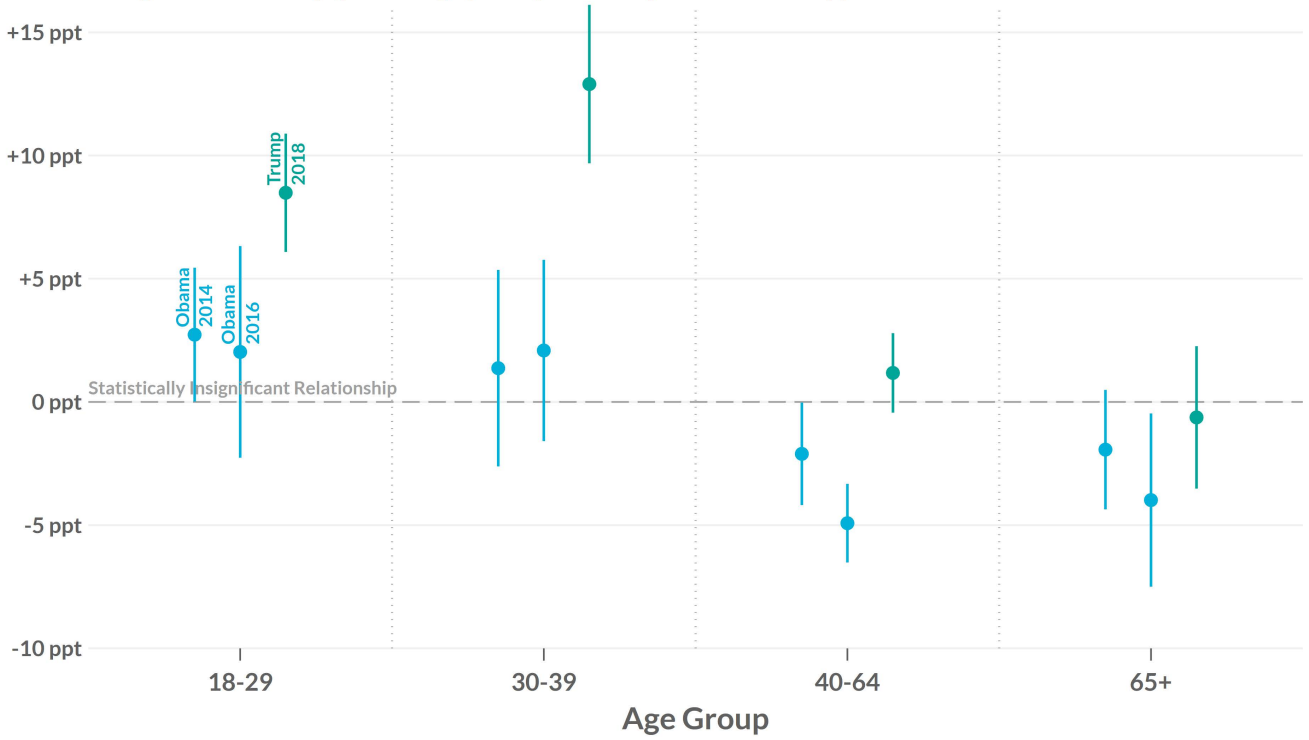
Another possibility we explore is inspired by the relatively high participation rates of young adults in the 2018 midterm election as compared to other recent midterm elections. According to the CCES data, turnout among 18-to-29-year-olds was 26.2% in 2018, 33.7% in 2016, and 24% in 2014. 2018, of

course, was the midterm election two years into the presidency of Donald Trump, and when we add respondents' presidential approval ratings to the model of turnout (not interacted with age), we find a strong, negative relationship for 2018: individuals who disapproved of President Trump were more likely to vote.

In Figure 9, we explore whether respondents' approval ratings of President Trump have a different relationship to turnout in 2018 across the different age groups. For comparison purposes, we also do the same for 2016 and 2012 using respondents' approval ratings of President Obama. We group the presidential approval ratings into two categories: those who "strongly approve" or "somewhat approve" and separately those who "strongly disapprove" or "somewhat disapprove."

Figure 9: Is Presidential Disapproval Associated with Voting?

Marginal relationship (percentage points) between presidential disapproval and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study, 2014, 2016, and 2018: Common Content.
Sample: All citizens 18 years or older.

The figure shows that disapproval of President Trump was a much stronger predictor of the turnout of young people in 2018 than the turnout of older Americans. Specifically, 18-to-29-year-olds who disapproved of President Trump were 8.5 percentage points more likely to turn out in the 2018 midterm elections than respondents of the same age who approved of President Trump. Among 30-39-year-olds, the gap is wider: those disapproving of President Trump were 13 percentage points more likely to vote than those who approved of his performance. The 2018 turnout gap between those who approve and disapprove is markedly smaller for the 40-to-64 age group and the 65-and-older age group. Among seniors in particular, there is no discernible relationship between presidential approval and voter turnout. And for young people, in 2016 and 2014, disapproval of President Obama was a comparatively weaker predictor of turnout than disapproval of President Trump in 2018.

These last findings are striking for two reasons. First, they may help to explain why youth turnout was higher in 2018 than in other midterm elections of the past: Trump disapproval ratings were high among younger citizens than within the 65-and-older group, and younger citizens who disapproved of President Trump were especially likely to turn out in the 2018 midterm election. Second, this is one of the only factors we have explored that does a better job of explaining the turnout of younger Americans than it does the turnout of older Americans. And it is a variable that is specific to the individual who sits in the White House, not a more enduring feature of respondents themselves that could point to a path toward increasing the turnout of young Americans on a more permanent basis.

Conclusion

There is an extensive research literature on voter turnout, and it is widely recognized among scholars and practitioners that the turnout of young adults is much lower than that of older adults. However, despite considerable concern about low rates of youth turnout, most research on turnout has not focused on young adults in particular—and whether the factors that explain patterns of youth turnout are different than the factors that explain the turnout of older Americans.

In this brief, we show that many individual characteristics that are widely recognized as positive predictors of turnout are not as good at predicting the voter behavior of 18-to-29-year olds as they are middle-aged and older Americans. This suggests that researchers and practitioners concerned with low youth turnout should develop theories and empirical research designed to explain youth voter turnout in particular. The findings of such research could have great promise in pointing the way toward effective reforms.

Some very recent research demonstrates that focusing on the turnout of young adults as a subgroup can be highly productive and informative. Holbein and Hillygus (2020), for example, highlight that noncognitive skills—skills that help people follow through on their intention to vote—are strong yet understudied predictors of voter turnout and are especially important for understanding the turnout patterns of young people. Grumbach and Hill (forthcoming), moreover, show how electoral rules like same-day registration have larger turnout-increasing effects on young citizens than older citizens. In addition, new research by Charlotte Hill (2020) demonstrates that young people are disproportionately affected by the many costs of and barriers to voting: for example, they have greater difficulty finding time and planning ahead to vote, are less likely to own the documentation they need, and struggle more with the aspects of registering and voting that cannot be done online. These newer studies show the promise of focusing on and trying to explain differential patterns of participation by age—with an emphasis on the youngest adults.

Appendix

Our primary source of data in this brief is the CCES Common Content, which surveys over 50,000 U.S. residents each national election year. We restrict our analysis to various formulations (described below) of the "Voting Eligible Population" by analyzing all respondents 18 years or older who are citizens.[9] For 2018, 2016, and 2014, the CCES provides validated voter records that can be used to construct turnout variables based on matches to administrative voter records maintained by the elections data firm Catalist. Specifically, the CCES specifies four different turnout measures that can be constructed from these validation variables. For our main results, we focus on CCES Option 1 (CCES1), which identifies all participants as voters if they had a validated voting record and as non-voters if either there is no match to a validated record *or* there is a successful match that confirms the participant did not vote.

In our analysis, we use a regression framework to examine the interaction of our key explanatory variables with age, conditional on a set of demographic/economic controls. The dependent variable throughout is a binary indicator of whether the respondent voted or not. In all models, we include several demographic and economic covariates: dummy variables for college attainment status, race/ethnicity, male/female, employment status, union membership, stock ownership, homeownership, and marital status. In addition, we include indicators for three of the four age groups (with 18-to-29 as the excluded category). In each separate regression, we also interact one of the covariates (or, in the case of race/ethnicity, employment status, and family income, the relevant set of covariates) with the age group indicators. Using the coefficient estimates from the interaction terms, we use the "Margins" command in Stata to identify the marginal difference in voter turnout (in percentage point terms) and the margin of error of this difference for those with and without each explanatory variable characteristic *within* each age group.

We also test for social media use and presidential approval, neither of which is included as a covariate in any of our models. Unless otherwise noted, all of our results report point estimates and standard errors, conditional on a list of demographic/economic controls. We cluster by state of voter registration using the Stata svyset command, and we weight all of our results using the "commonweight" variable provided by the CCES.[10]

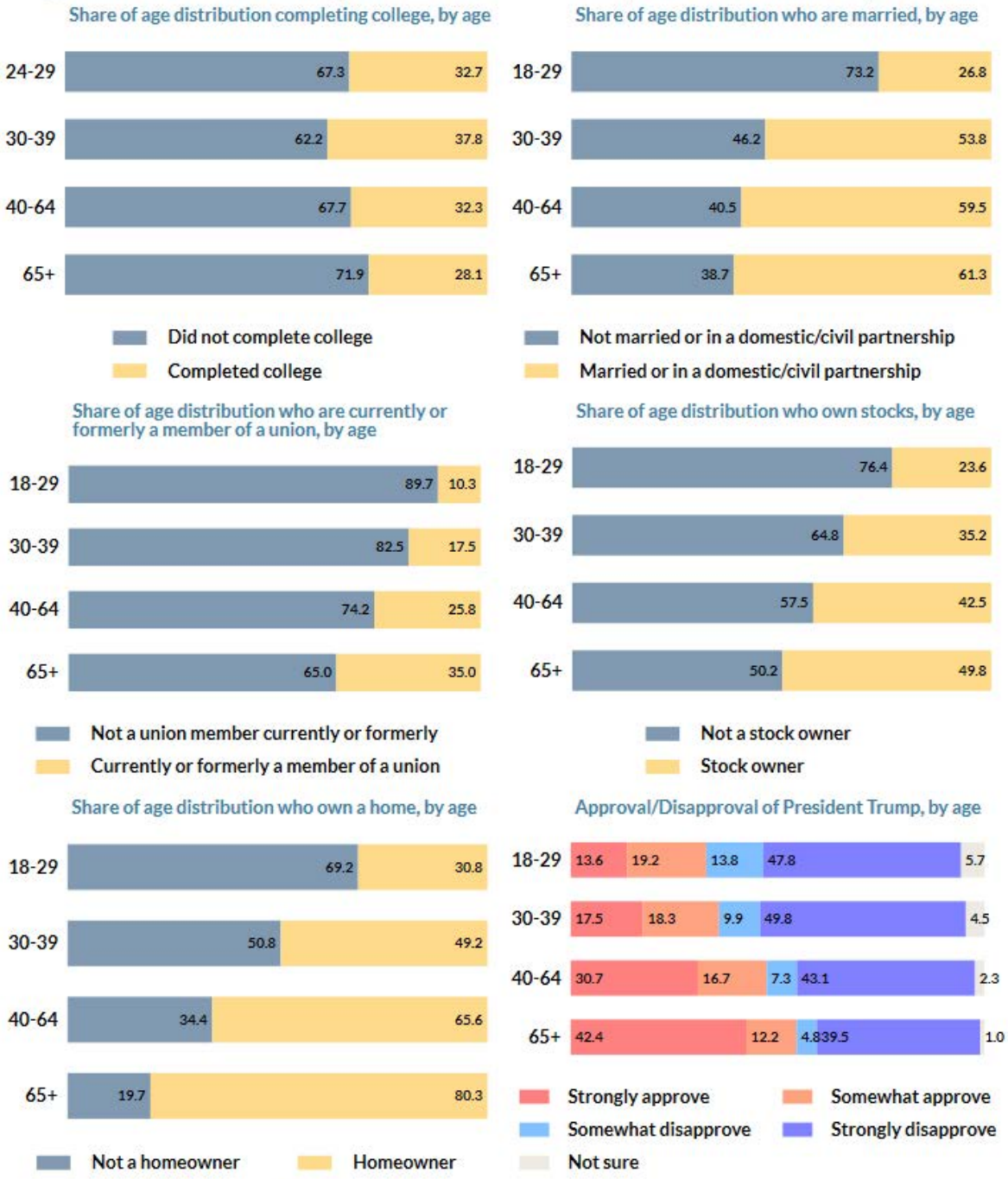
While our main results are based on the 2018 CCES data, we also use a pooled data set of 2014, 2016, and 2018 to test the replicability of our results across time (see below), with period controls for each separate year included in a three-way interaction with the explanatory variable of interest and age.

Distribution of Select Characteristics by Age Group

The demographic and economic characteristics of citizens in the younger age groups are different from those in the older groups. In Figure A1, we present the share of individuals in each age group who 1) have a college degree, 2) are married or in a civil/domestic partnership, 3) are union members, 4) own stock, and 5) own homes. In addition, we present Trump approval/disapproval by age in 2018.

[9] We cannot account for other sources of disenfranchisement for voter eligibility, such as felony records.
[10] We use the Catalist state of voter registration for most respondents. For respondents that do not have a Catalist state of voter registration, we use the CCES variable for state of voter residence.

Figure A1: Descriptive Statistics (No Controls)



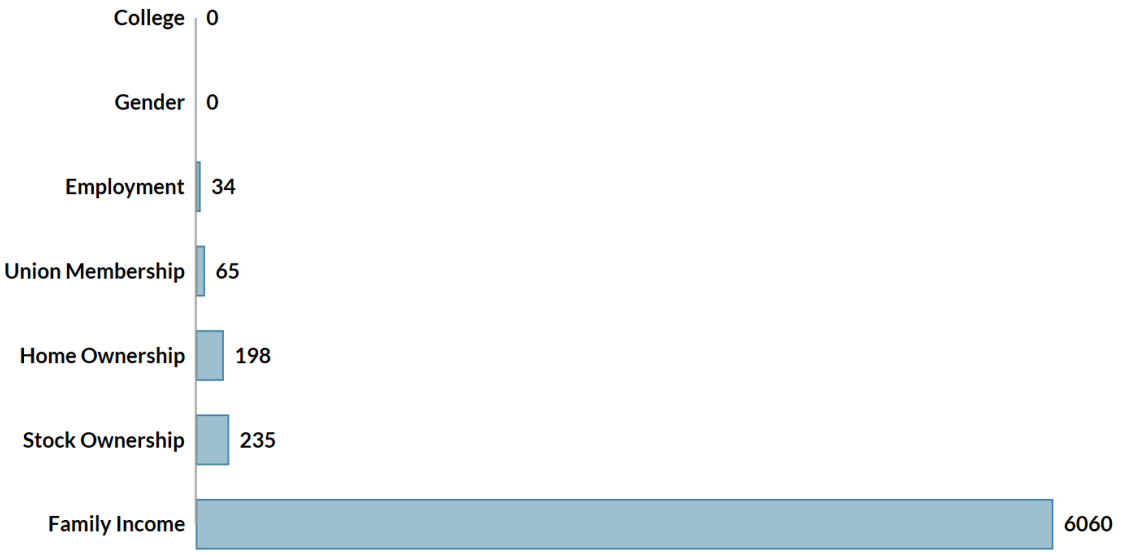
Source: Authors' analysis of the Cooperative Congressional Election Study, 2018: Common Content.
Sample: Descriptive statistics for college attainment calculated on a sample of all citizens 24 years or older. All other statistics are calculated on a sample of all citizens 18 years or older.

Missing Observations

Overall, we find that there is little missingness for our models' key covariates. Figure A2 and Figure A3 show that the only substantial source of missing observations is the family income variable, which is why we omit it from the specification for our primary models. This missingness for family income is particularly problematic across ages, as is apparent in Figure A3. Missingness across all of our other covariates is negligible.

Figure A2: Missing/Non-Missing Observations for Model Covariates

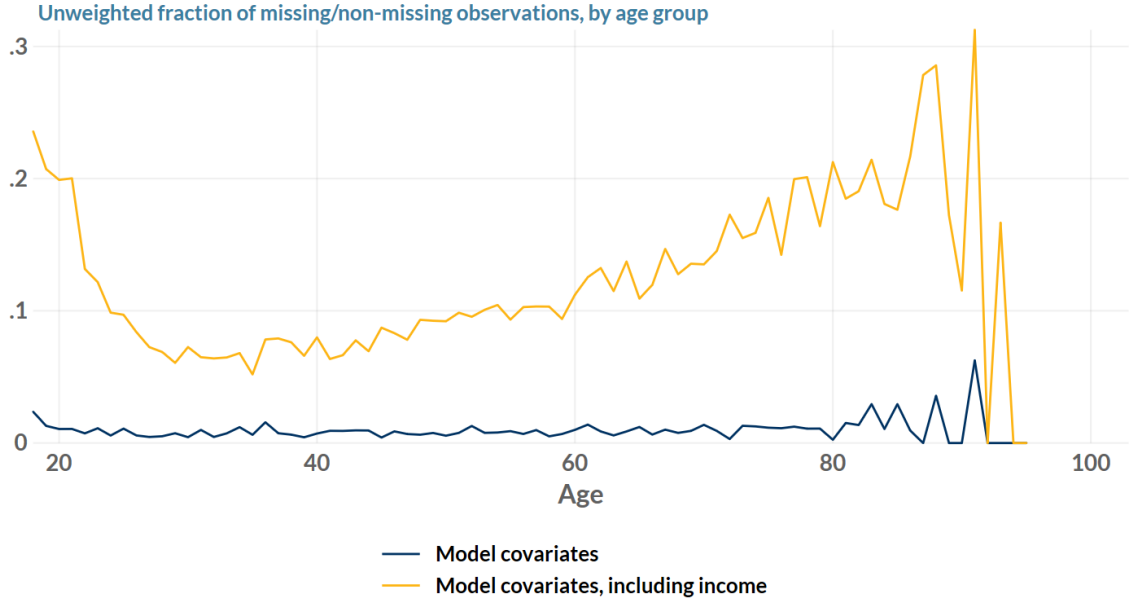
Unweighted frequency of missing/non-missing observations



Source: Authors' analysis of Cooperative Congressional Election Study data.
Sample: All citizens 18 years or older.
Notes: Based on CCES voter turnout option 1.

Figure A3: Fraction of Missing/Non-Missing Observations for Model Covariates

Unweighted fraction of missing/non-missing observations, by age group

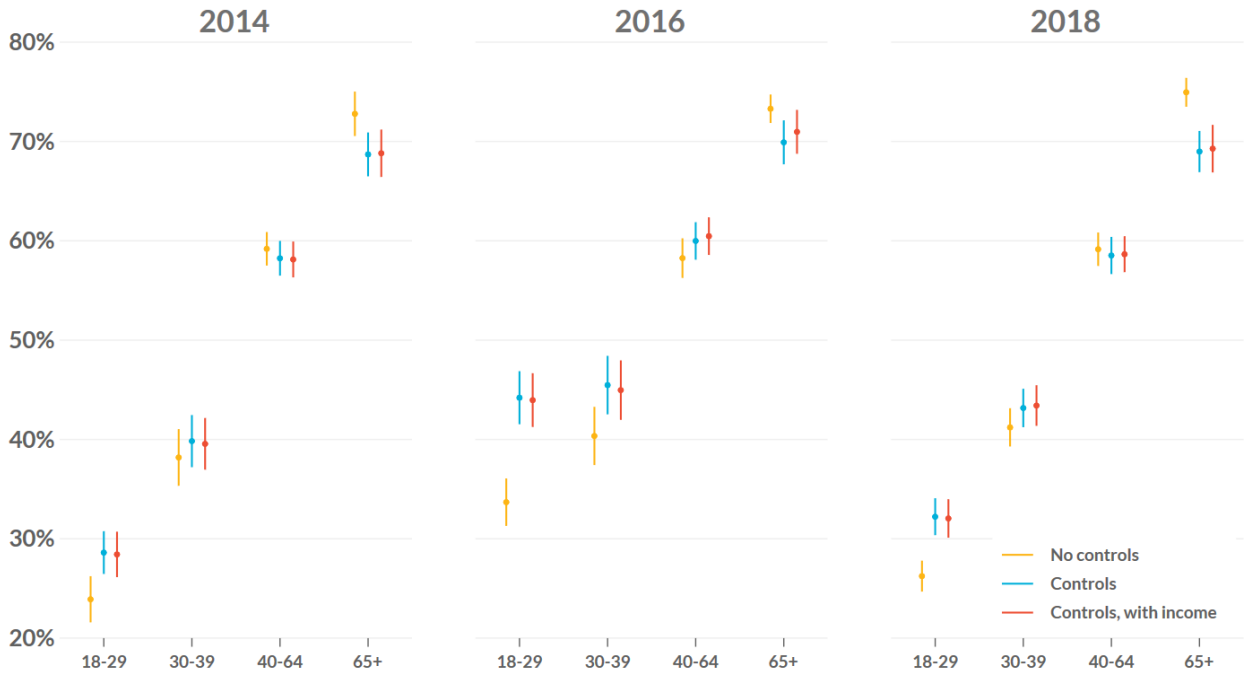


Source: Authors' analysis of Cooperative Congressional Election Study data.
Sample: All citizens 18 years or older.
Notes: Based on CCES voter turnout option 1.

Our estimates of voter turnout (in Figure 1) change little when we include family income as a control. See the figure below.

Figure A4: Voter Turnout in the United States in Recent Elections

Proportion of population that voted, by age group and year



Source: Authors' analysis of the Cooperative Congressional Election Study, 2014, 2016, and 2018: Common Content.
Sample: All citizens 18 years or older.

Turnout in the CCES vs. the CPS

There are many different ways to measure voter turnout. Here we examine how different CCES voter turnout formulations affect the estimates of turnout by age, without controls, and we also compare those results to the estimates from the CPS. The first three CCES voter formulations (CCES1, CCES2, and CCES3) are based directly on the instructions provided in the CCES guide to produce "validated" voter turnout based on matches to the administrative records by the voter data firm Catalist (Ansolabehere, Schaffner, and Luks, 2019b). In each of these three formulations, the voting population includes all matched records that have some record of voter participation. Each formulation differs based on treatment of the non-voting population. CCES1 includes both matched non-voters and non-matched respondents as non-voters. CCES2 exclusively includes matched non-voters as non-voters. And CCES3 includes all matched non-voters, non-matched respondents reporting no voter registration, and non-matched respondents self-reporting no vote as non-voters. CCES4 is based exclusively on the respondents' non-validated self-reported response for voter participation/non-participation (i.e., there is no administrative records component to this measure). The first CPS measure—"CPS: Census Weights"—is based on the raw means for voter turnout in the CPS (McDonald, 2020a). The "CPS: Bias corrected weights" makes adjustments to weights based on code provided by the United States Elections Project to correct for increasing non-response in recent years and over-reporting of voter turnout found in the raw CPS data (McDonald, 2020a).

Summary of Voter Turnout Formulations:

Voter Turnout Formulation	Description
CCES1	Matched non-voters and non-matched respondents as non-voters
CCES2	Matched non-voters as non-voters
CCES3	Matched non-voters, non-matched respondents reporting no voter registration, and non-matched respondents self-reporting no vote as non-voters
CCES4	Self-reported vote
CPS: Census weights	Basic turnout measure
CPS: Bias corrected weights	Weights bias corrected for non-response and over-reporting, see: McDonald (2020b)

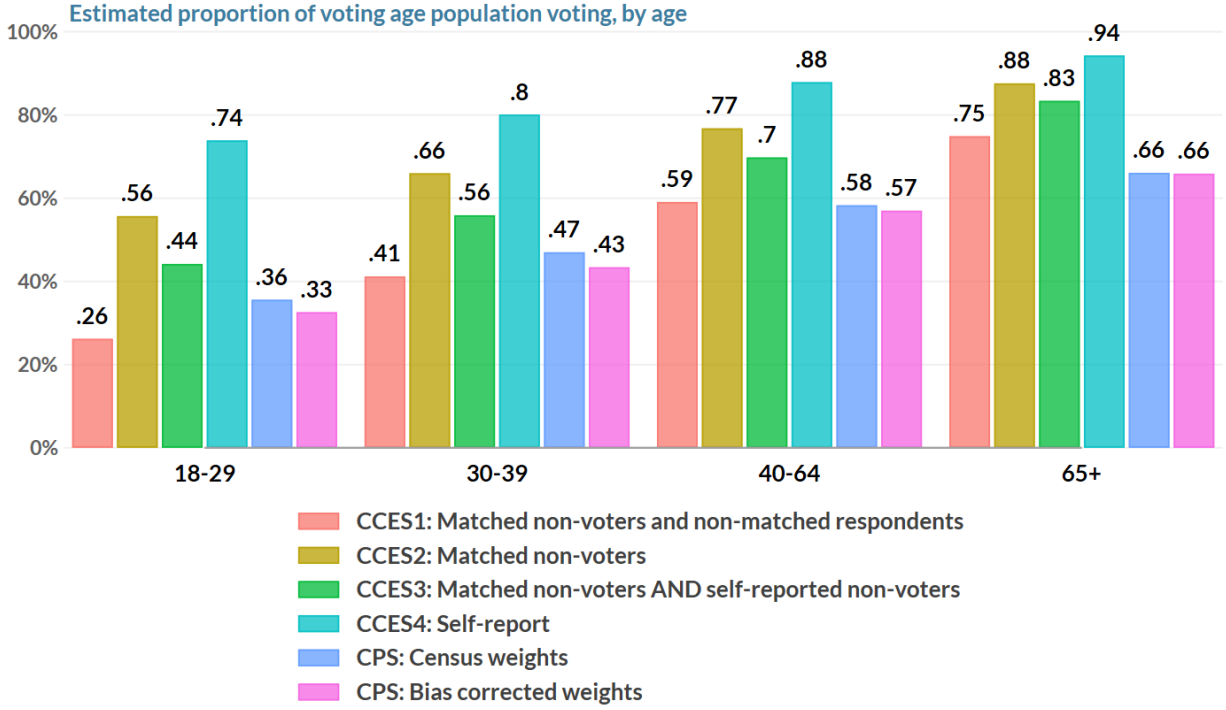
Figures A5 and A6 compare all six of these voter turnout formulations by age in 2018. We can see that the self-reported turnout measure (CCES4) has the highest turnout results across all age groups. This is consistent with the literature showing that individuals are likely to over-report their participation in elections because voting is seen as a socially virtuous activity. Even this basic plot lends credence to matches using administrative voter records. Each of the other CCES measures varies by age, and depending on assumptions about the non-voting population, yields higher or lower voter turnout rates.

There are benefits and drawbacks to each of the three main CCES measures, which are worth considering. One benefit of CCES1, as Figure A5 shows, is that it is closest to the CPS reported turnout rates for all age groups, even for the bias-corrected version of the CPS. While the CPS is not the single standard for voter turnout, it is one of the most widely-used measures. One potential drawback of the CCES1 is the non-constant differential between the CCES1 rate of turnout relative to the CPS across age groups (e.g., CCES1 shows a greater difference in turnout rates relative to the CPS among seniors than among 40-to-64-year-olds). This may be related to under-matching of survey respondents with greater residential mobility (e.g., young adults).[11] The optimal measure for addressing this differential rate of voting across age in 2018 is likely CCES2, which has voter turnout rates that are essentially constant relative to the CPS (in other words, the turnout by age slope for CCES2 and the CPS are essentially parallel). While the slope is similar, CCES2 shows much higher turnout than the CPS.

[11] For a further discussion of this issue, see: Agadjanian (2018).

Figure A5: Comparison of CCES and CPS Turnout in 2018

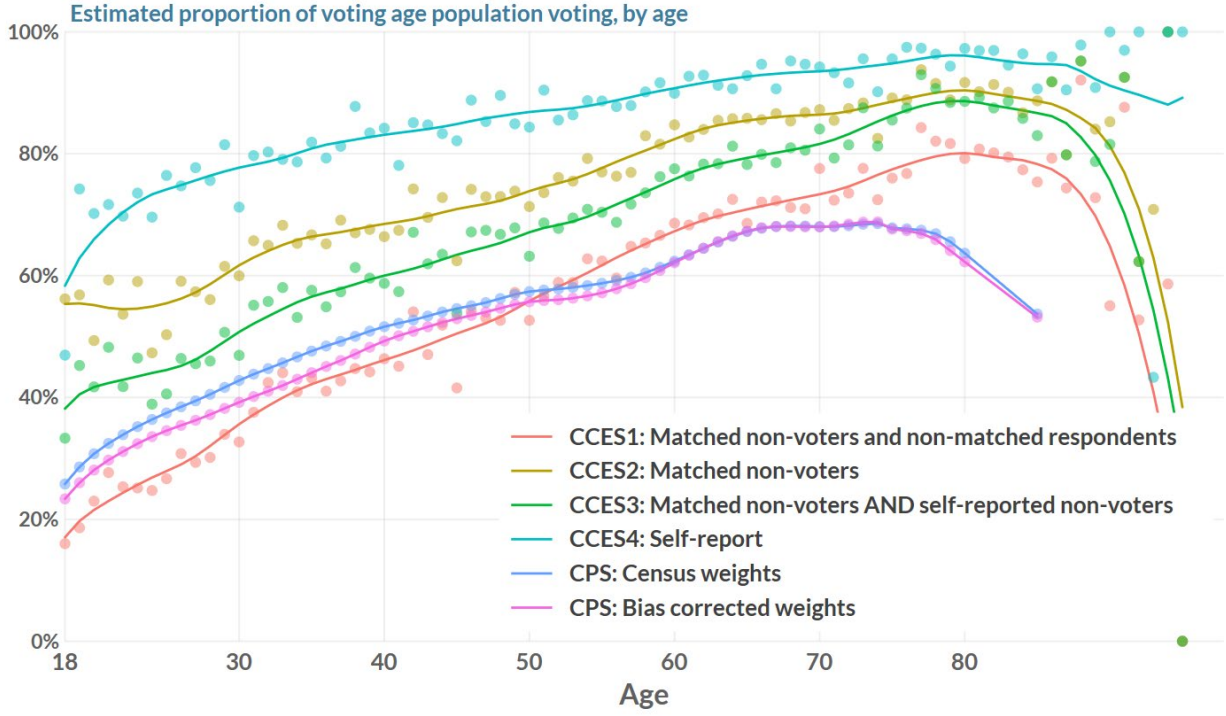
Estimated proportion of voting age population voting, by age



Source: Authors' analysis of data from the Cooperative Congressional Election Study and the United States Elections Project.
Sample: The CCES sample includes all citizens 18 years or older. The CPS sample includes the citizen voting-age population.

Figure A6: Comparison of CCES and CPS Turnout in 2018

Estimated proportion of voting age population voting, by age



Source: Authors' analysis of data from the Cooperative Congressional Election Study and the United States Elections Project.
Sample: The CCES sample includes all citizens 18 years or older. The CPS sample includes the citizen voting-age population.

Figure A6 shows these results in more granular detail. We plot average turnout rates by age (not age *group*). Again, we can see that CCES1 corresponds most closely, on average, to the CPS; although, CCES3 is seemingly closer for certain younger ages and the CCES series departs with the CPS for ages 75+.

Ultimately, we chose CCES1 for our main analysis for the following reasons. First, we followed the recommendation of CCES staff: CCES1 is the turnout variable they use most frequently (personal communication, June 11, 2020). Second, as we have noted, CCES1 is closest on average to the results of the CPS.

Robustness to Different Voter Turnout Formulations

In the results below, we rereport our main findings from above alongside the results of additional specifications. Specifically, we respecify our main models along two dimensions: we test four different voter turnout formulations using the CCES (described in the preceding section of the Appendix), and we change our model specification to use different controls. The first specification uses the standard controls used in our study's main results, the second adds a set of dummy variables for family income (binned), and the third uses our standard controls on a pooled data set for the 2014, 2016, and 2018 elections with a three-way interaction for year dummies, age dummies, and the primary explanatory variable. In all, this yields twelve different specifications for each age group, which we report for nearly all of our main results below.[12]

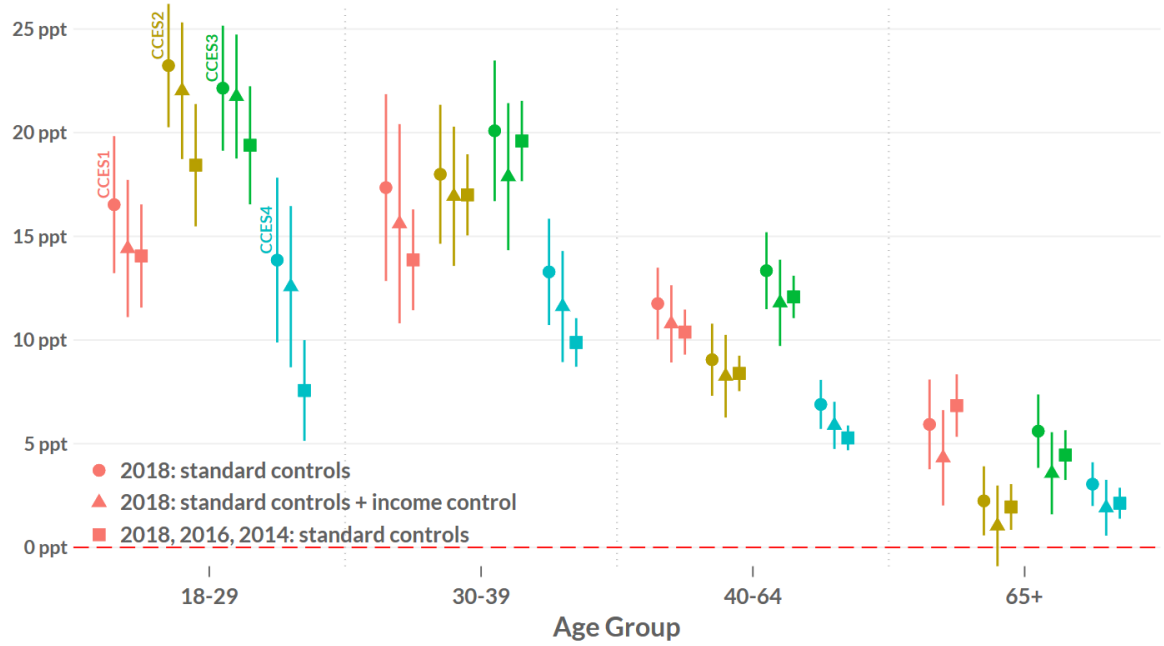
A few general, but not universal, patterns stand out from these expanded results. First, it's clear that our preferred specification (CCES1 with standard controls) generally estimates a larger relationship to turnout for our variables of interest than either the models with income controls or with pooled data for the 2014, 2016, and 2018 elections; although, the magnitude of this pattern varies. The generally lower estimates on the specifications with family income as a control could be because income is an important omitted variable from our model. As we note elsewhere, however, the family income variable in the CCES is subject to non-trivial missingness. The generally lower estimates for the specification using the pooled data for three elections may simply reflect a larger effect in 2018 relative to previous years.

Regarding the CCES voter turnout formulations, we see some differences across the models. Most notably, CCES4 is an outlier in many of our extended results. However, this is likely the least reliable turnout measure because it is solely based on self-reported voting.

[12] For simplicity of visualization, we focus on the results that included binary (dummy) variables. For the employment results, we exclude students and retirees and focus our results on the relationship between turnout and employment relative to unemployed individuals as the baseline.

Figure A7: Differences Across College Attainment Specifications

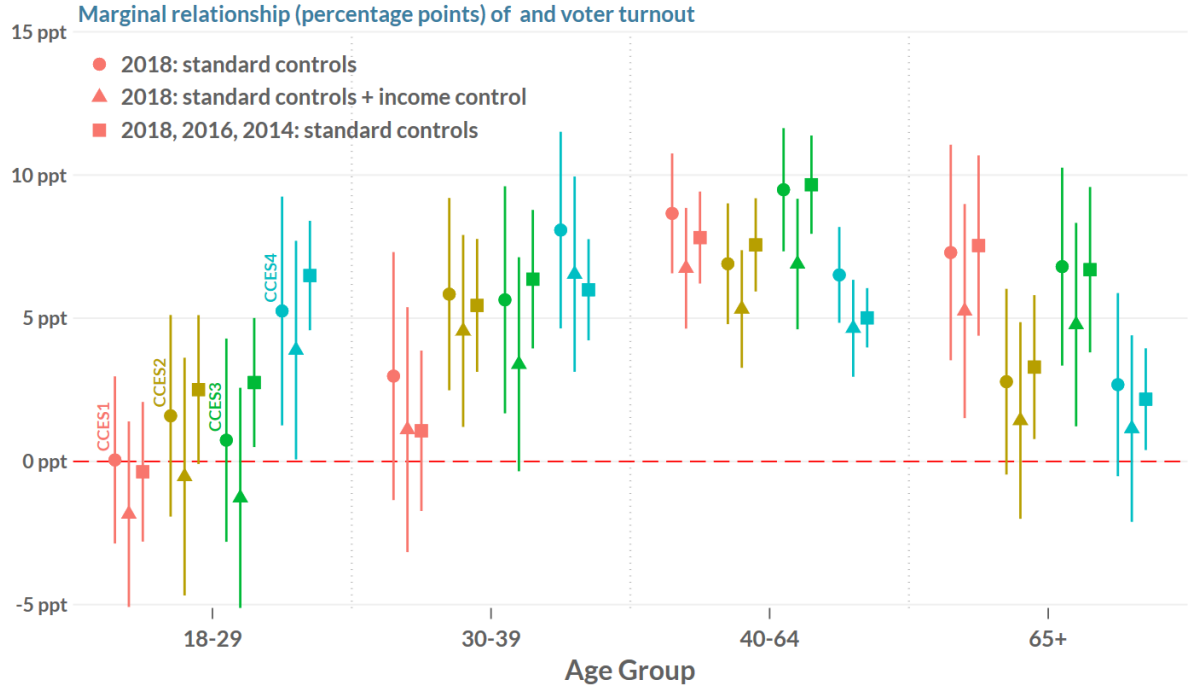
Marginal relationship (percentage points) of college attainment and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older. **College attainment estimates calculated on a sample of ages 24+.*

Figure A8: Differences Across Home Ownership Specifications

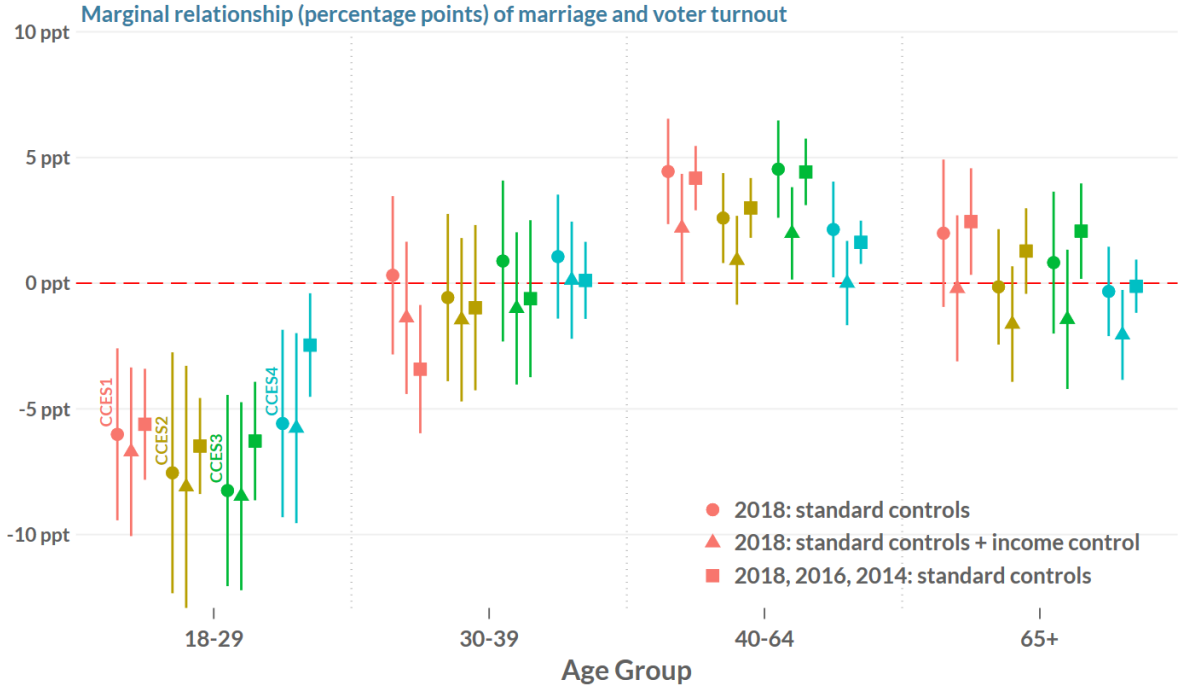
Marginal relationship (percentage points) of and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

Figure A9: Differences Across Marriage Specifications

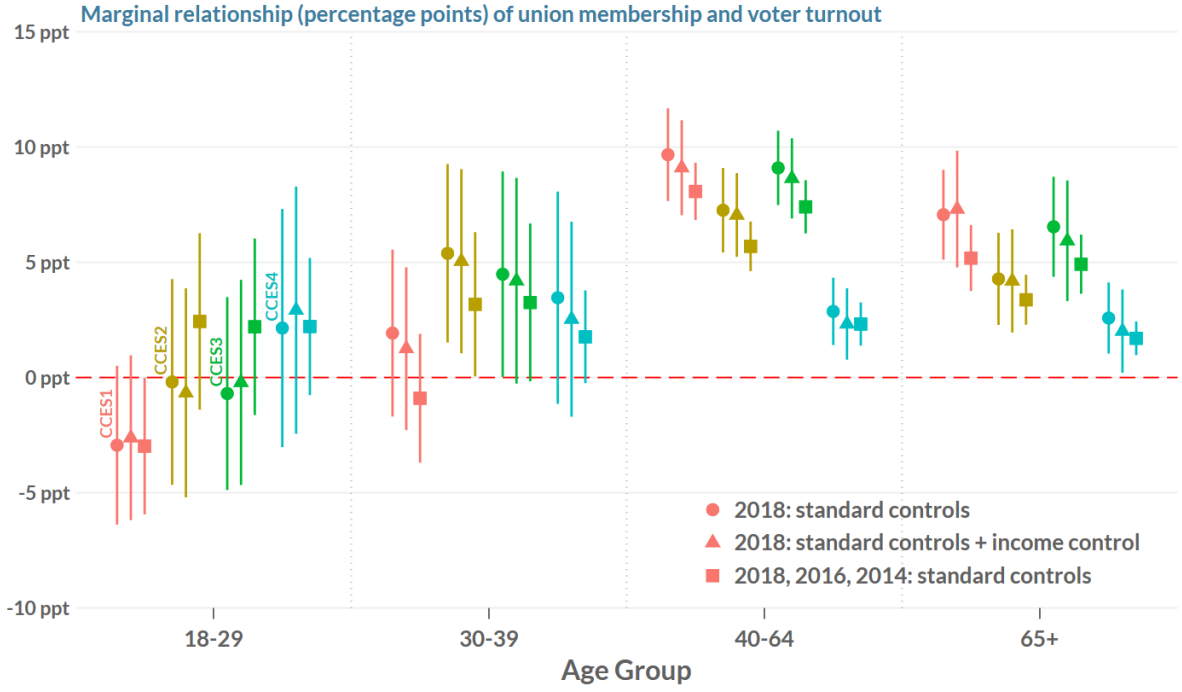
Marginal relationship (percentage points) of marriage and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

Figure A10: Differences Across Union Member Specifications

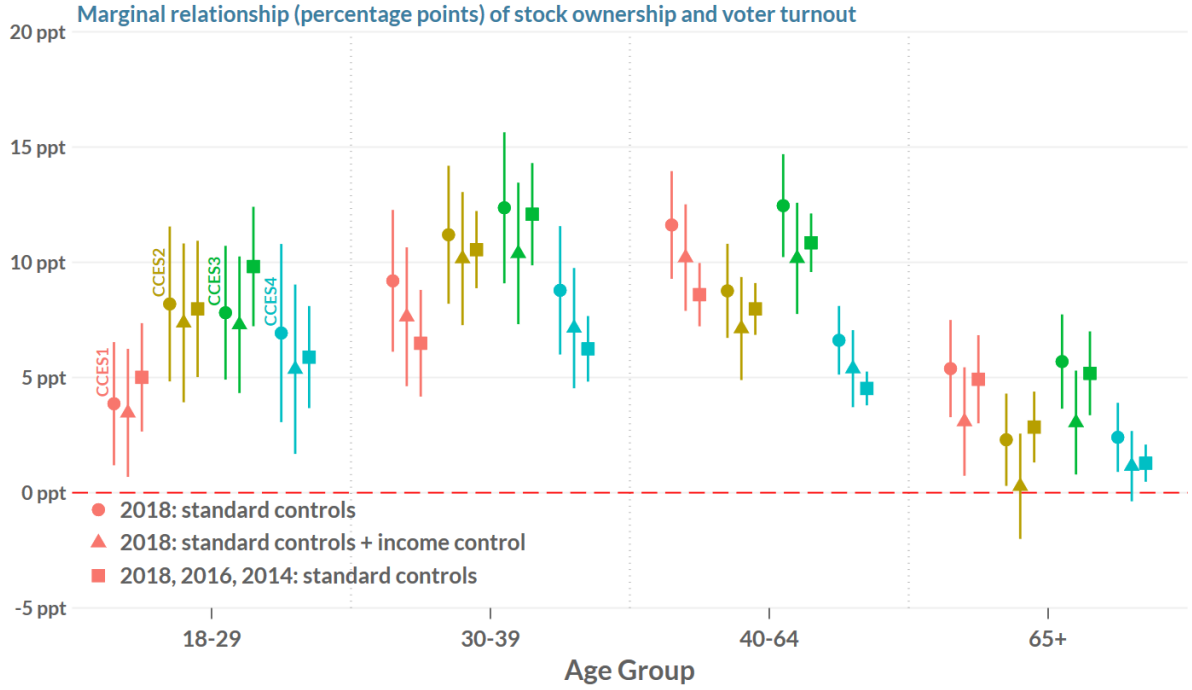
Marginal relationship (percentage points) of union membership and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

Figure A11: Differences Across Stock Ownership Specifications

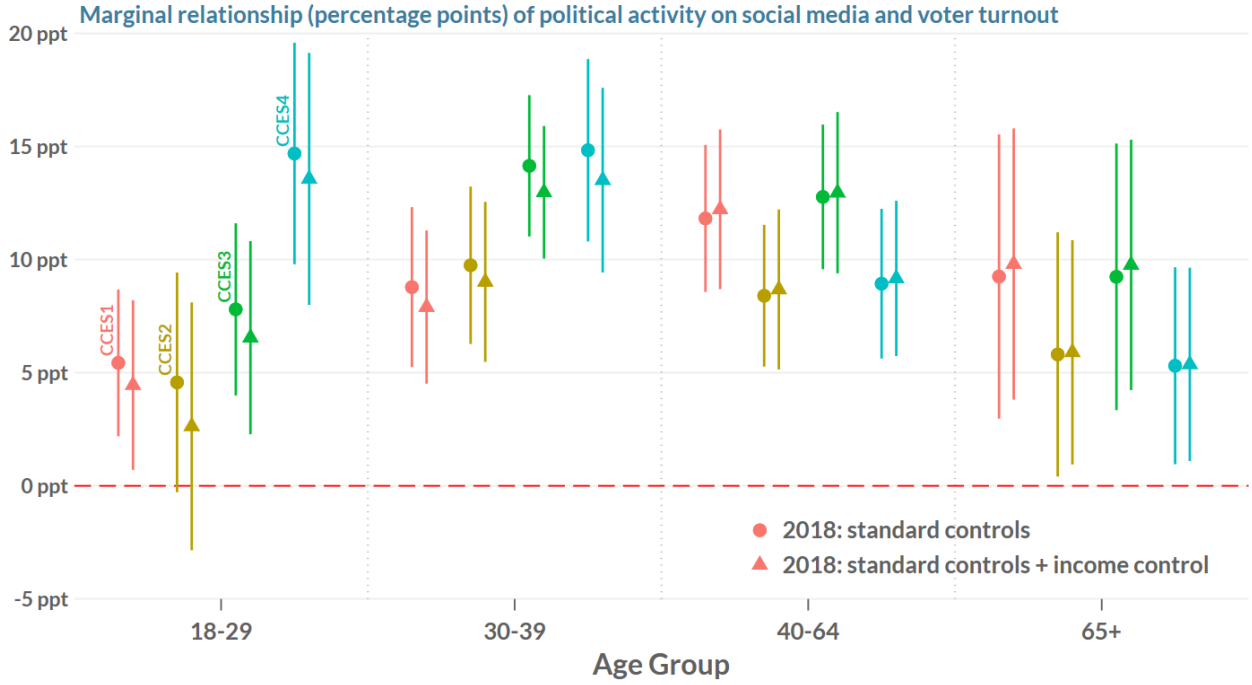
Marginal relationship (percentage points) of stock ownership and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

Figure A12: Differences Across Political Activity on Social Media Specifications

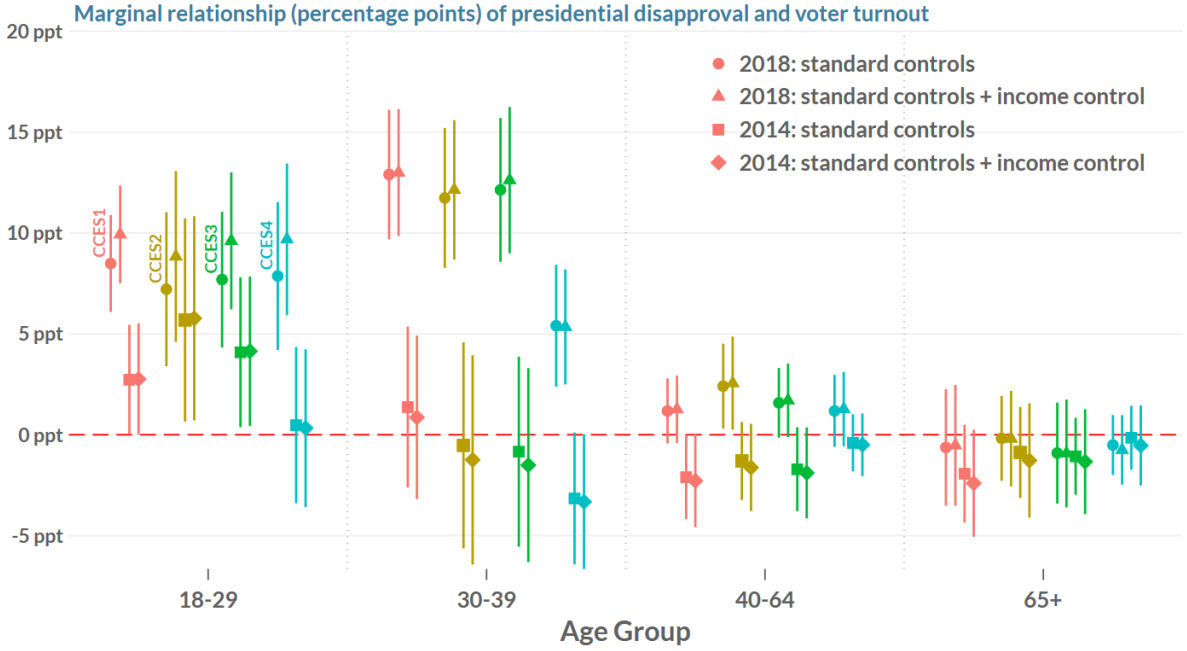
Marginal relationship (percentage points) of political activity on social media and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

Figure A13: Differences Across Presidential disapproval Specifications

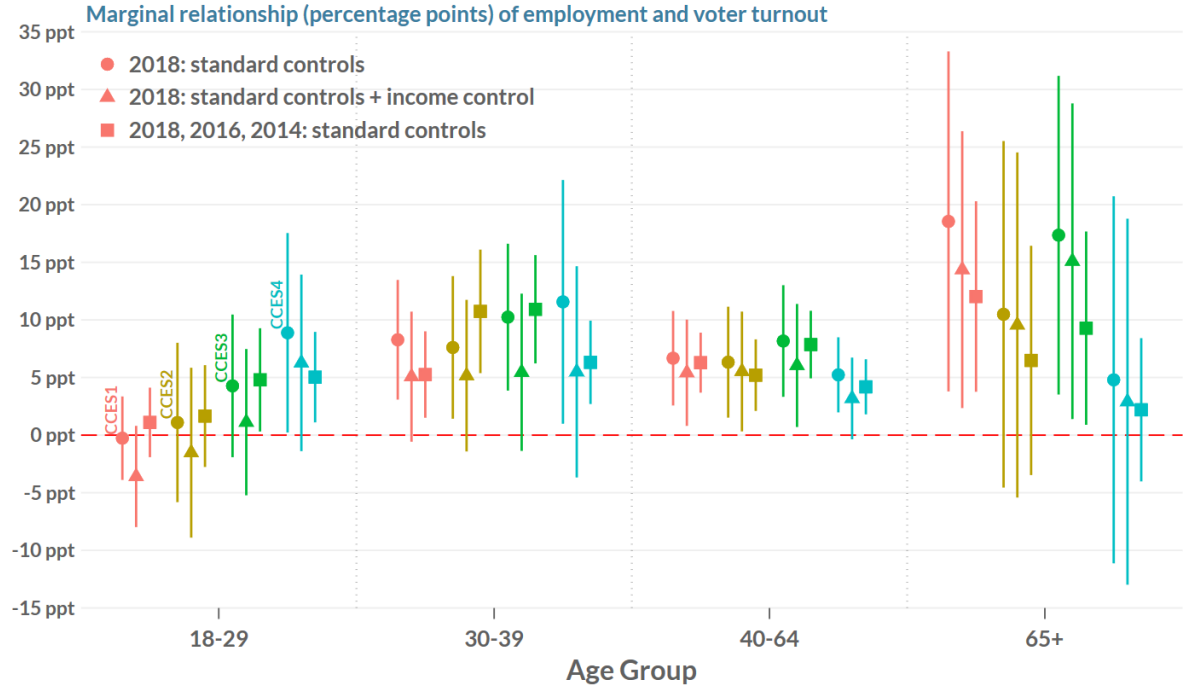
Marginal relationship (percentage points) of presidential disapproval and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

Figure A14: Differences Across Employment Specifications

Marginal relationship (percentage points) of employment and voter turnout



Source: Authors' analysis of the Cooperative Congressional Election Study: Common Content.
Sample: All citizens 18 years or older.

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