Pandemic Election: The Interactive Effects of COVID-19 and Age Across States and Counties in the 2020 Presidential Election

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Abstract: The 2020 Presidential General Election represented the first modern presidential election to occur during a pandemic. Polls leading into the election indicated a hotly-contested race between incumbent President Donald Trump and Democratic challenger, Joseph Biden, especially in several key battleground states. The highly contagious coronavirus presented added risk for in-person voting, especially among the 60+ population. What effect did the Covid-19 pandemic have on in-person voting across states and counties? This paper builds off of previous research conducted by the author that found an interactive effect between county Covid-19 rates and voter age during the Florida 2020 Presidential Preference Primary in March 2020. Older voters in counties with a high Covid-19 rate were less likely to turnout than younger voters in low Covid-19 counties. Does this pattern remain nearly 8 months later in Florida and other states? It is important to answer this question given that voters had more knowledge of the risks of Covid-19 by November, along with President Trump promoting in-person voting due to his claims of the potential for election fraud. Using individual voter data from files from Arizona and Florida, I study the interactive effects of a voter's age with the level of Covid-19 prevalence in their respective county on their likelihood of voting in person on Election Day.

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Introduction

The 2020 Presidential General Election held on Nov. 3, 2020 was the first federal general election of the Covid-19 pandemic in the U.S., and the first federal general election held during a global pandemic in over one-hundred years. In March 2020, when the pandemic began to spread exponentially throughout the U.S., states were in the middle of the presidential and congressional primaries. Citizens 60 years of age and older and individuals with compromised immune systems were the most susceptible to complications or death from Covid-19, necessitating states to devise plans to continue with elections. Some states postponed their primaries to later dates and others offered mail-in voting options.

After the party conventions in Summer 2020, the Biden and Trump campaigns focused on the November general election and voter turnout. By the time of the November general election, the Covid-19 pandemic continued to grip the country, with nearly every U.S. citizen unvaccinated and the nation facing troubling rates of transmission and death, despite a wealth of knowledge gained by medical professionals concerning the virus and treatment options. States automatically mailed ballots to voters, allowed mail-in voting, or eased restrictions on requests for absentee ballots. President Donald Trump heavily criticized mail-in balloting during rallies, interviews, and press conferences, citing unsubstantiated claims of the increased likelihood for voter and election fraud (Parks, 2020; Solender, 2020). He pushed his supporters to vote in-person on Election Day at the polls, and even suggested to North Carolina voters to vote twice – once by mail, and then on Election Day – just to make sure their vote was counted (Haberman & Saul, 2020). At one point, he also stated that voters should go to the polls to watch for malfeasance/fraud (Korte & McNamara, 2020). It is no surprise then, that a late October 2020

Gallup poll revealed that 77% of registered Republicans indicated their intention to vote at the polls on Election Day (Solender, 2020).

Against this contentious and competitive presidential election backdrop was the Covid-19 pandemic and voters needing to decide whether and how to vote. What were the effects of the Covid-19 pandemic on voter turnout, specifically, the interactive effects of Covid-19 prevalence and voter age on their likelihood of voting in-person versus other methods, or simply not voting? Using individual level voter files purchased from various states, I test the hypothesis that as county Covid-19 rates rise, older voters are less likely to turnout in-person on Election Day compared to younger voters and voters in low Covid-19 counties. I also hypothesize that this effect is more pronounced among Democrats since President Trump encouraged his supporters to turnout in-person on Election Day.

In what follows, I briefly review the theoretical and applied literature on voter turnout, especially as it pertains to the Covid-19 pandemic. I then explain the data and methods used to test my hypotheses in the states of Arizona and Florida, two key swing states in the November 2020 General Election. Next, I discuss the findings, and finally conclude with limitations and directions for future research.

Calculus of Voting

A Downsian approach to understanding voter turnout involves analyzing the costs and benefits of voting for individual citizens (Downs, 1957). The benefits one receives from having their preferred candidate win an election is compared to the costs of voting. For Downs (1957), the principal costs of voting are time – to become informed, and to engage in the actual act of voting. When the individual's benefits gained from voting are multiplied by the probability of the individual's vote deciding an outcome, the costs usually outweigh the benefits. Therefore,

even relatively minute costs to voting (like driving to the polls and waiting in line) may deter individuals from voting (Aldrich, 1993). Such a calculus of voting in voters' minds would suggest limited voter turnout in most elections. To account for periods of moderate and high voter turnout and in response to Downs' seminal work, Riker and Ordeshook (1968) describe the sense of civic duty individuals receive from voting, which offsets the associated costs of voting for many citizens. This rational choice model of voting is depicted by the well-known equation:

$$U = P(B) - C + D$$

The utility of an individual voting (U) is a function of the benefits of voting (B), multiplied by the probability of their vote deciding the election outcome (P), minus the costs (C) associated with voting. Riker and Ordeshook's "D-term", civic duty, is added to the model to account for civic duty's effects on the utility of voting – a net positive effect.

It is beyond the realm of this research to measure and analyze the benefits of voting for individuals, along with their sense of civic duty. No doubt, given the closeness of the presidential election as depicted in media and polling reports, along with the clear ideological divisions in the U.S., voters likely perceived benefits of having their preferred candidate win. Yet, neither Donald Trump nor Joe Biden (or their respective political parties) were viewed favorably by a majority of citizens according to an October 2020 Gallup poll (Saad & Brenan, 2020). Turnout for the November 2020 election measured at 66.8% of the voting-eligible population (Frey, 2021), suggesting that civic duty, or a combination of civic duty and perceived benefits, compelled voters to turnout at record numbers.

My approach in this research is to look at the costs of voting, specifically the Covid-19 costs that voters, especially older voters faced. The risk of contracting Covid-19 by voting in-person may have deterred some voters from voting in-person, instead opting to vote through

another method (mail-in, provisional, early, etc.) or to not turnout at all. This may be more prevalent among older citizens.

Some of these arguments were certainly part of the decision-making process for states to ease requirements for absentee voting methods like mail-in, provisional, and early voting. While states made it easier to vote absentee, thus lowering the costs of voting, claims of election fraud could have compelled some citizens to vote in-person on Election Day, even if they were part of the older population particularly susceptible to suffering from complications from Covid-19.

Covid-19 & Voter Turnout

Declines in voter turnout may have serious implications for the outcomes of elections, fundamental components of democratic governance and resulting policy. (Landman and Splendore, 2020). Surprisingly, relatively few published studies exist that examine the impacts of Covid-19 on voter turnout, with even fewer studies focusing on voter age. Most of these studies are also conducted for elections outside of the U.S. Therefore, scholars have somewhat limited knowledge of the effects of Covid-19 and the interactive effects of Covid-19 and age on voter turnout in the November 2020 U.S. election. Previous research indicates that seasonal influenza has a negative effect on electoral turnout - approximately a 4.9% decline in the U.S. (Urbatsch, 2017) – however, Covid-19 represents an unprecedented global pandemic not seen since the 1918 Spanish influenza outbreak.

Some international studies became the first research of the pandemic on electoral turnout. Fernandez-Navia, Polo-Muro, and Tercero-Lucas (2021) examine municipal elections in Spain relatively early in the pandemic in July 2020. At that time, 31 cities in Spain reported zero Covid-19 cases (Fernandez-Navia, Polo-Muro, & Tercero-Lucas, 2021). Comparing aggregate turnout in cities without any reported Covid-19 cases to cities with reported cases, they find

decreased turnout rates to the effect of 2.6% - 5.1%. Similarly, a study of Brazil's November 2020 municipal elections focuses on Covid-19 *deaths* leading to a decline in turnout of up to 5%, while also noting a general decline in turnout as Covid-19 cases rise closer to the date of the election (Constantino, Cooperman, & Moreira, 2021). In France, municipal election turnout declined (upwards of 20%), as a function of population density and Covid-19 prevalence measured as the proximity of municipalities to clusters of Covid-19 cases (Noury, Francois, Gergaud, & Garel, 2021).

Studies of municipal elections in Europe have also been the predominant source of information and data analysis on age and voter turnout in the age of Covid. The elderly population showed the greater reluctance to vote due to Covid-19, as evidenced through their declines in turnout in French and Italian municipal elections (Noury, Francois, Gergaud, & Garel, 2021; Haute, Kelbel, Briatte, & Sandri, 2021; Picchio & Santolini, in press). Comparing 2014 and 2020 French municipal election turnout, Haute, Kelbel, Briatte, & Sandri (2021) identify a general decrease in turnout in 2020, and despite seniors voting at higher rates than younger voters, this turnout gap decreased in 2020. Picchio and Santolini (in press) rely on Covid-19 mortality rates, compared to cases of Covid-19, on the effects of voter turnout for the elderly (defined as citizens 70 and older). For Italian municipal elections in September and October 2020, elderly turnout decreased by 0.5% for each 1% increase in the 70+ mortality rate.

Studies in the U.S. are more limited. Most relevant to this research is Scheller's (2021) study on the interactive effects of Covid-19 prevalence and age on voter turnout in the March 2020 Florida Presidential Preference Primary. Moving away from aggregate turnout data, he uses individual level voter data provided by the State of Florida, finding support for an interactive effect between county Covid rates and voter age – older voters in high Covid counties

were less likely to vote at all or less likely to vote in person compared to younger voters in lower Covid counties. The effect was more pronounced among Republican voters, an unexpected result that he partially attributes to the fact that Donald Trump was the presumptive Republican nominee and that the Democratic nomination was still in question.

This study represents an update to the Scheller (2021) research, testing whether or not the findings extend to the November 2020 general election. The March 2020 Florida Presidential Preference Primary occurred at the very inception of the Covid-19 pandemic in the U.S. Little was known about the virus at that time, but by the November 2020 election, scientists had learned more about the virus, mitigation and treatment, and states began to adopt alternative voting methods to promote voter participation. Do the Scheller (2021) findings extend to the November 2020 general election, or did President Trump's calls for his supporters to turnout in-person create an ideological difference in turnout? I hypothesize that as county Covid-19 rates rise, older voters are less likely to turnout in-person on Election Day compared to younger voters and voters in low Covid-19 counties. I also hypothesize that this effect is more pronounced among Democrats since President Trump encouraged his supporters to turnout in-person on Election Day. The swing states of Arizona and Florida provide an initial test of these hypotheses with their availability of individual level voter characteristics and voting histories.

Data and Methods

Arizona

Unlike other states, Arizona is more limited in the personal information it publicly releases for purchase. Identifiers like a voter's race and gender are not available, and the voter's age is limited to the year of birth. Nevertheless, each voter's party identification, previous voting history, and registration date is available. Additionally, voter addresses allow for the inclusion

of county and local ballot measures and offices for election to gauge the political climate during the November 2020 General election.

The Arizona voter data files are separated into several files containing voter information and voting histories due to the size of the files. Therefore, the first step in the creation of the Arizona master dataset is the appending of the files together. From there, data recoding and cleaning is necessary to result in a dataset that provides an accurate portrayal of all registered voters for the November 2020 election.

Since the voter's date of birth is not given, only the year of birth, I create a basic age variable. Given that the November election is near the end of the calendar year, and that most citizens likely have had a birthday, I calculate the age of the voter by subtracting their year of birth from 2021. This gives an approximate age of the voter. Age-squared is also included as a control variable to account for linearity effects.

Local issues and offices for election may compel voters to turnout to the polls (Tolbert, Grummel, & Smith, 2001). All fifteen counties in Arizona had county level offices for election, including county Boards of Supervisors, Sheriff, Assessor, etc. Additionally, citizens in all counties faced propositions (referenda) to consider. Therefore, none of these types of elections are included in the analysis – there would exist no variation, as all voters were presented with these options and offices for election. Some municipalities held mayoral elections during the November 2020 general election. A mayoral election variable controls for the presence of a mayoral election. It is coded 1 if the respective citizen lived in a municipality with a mayoral race, and 0 if there was no mayoral race.

Previous voting history is included as a control for the propensity of individuals to turnout. I include a dummy variable indicating if the citizen voted in the previous primary

election. Voters not registered by the primary registration deadline are dropped from the analysis to ensure voters in the dataset have some history to analyze. Finally, a control variable for population density of the county is included and based upon the 2020 Census.

The prevalence of Covid-19 prior to the election, which may affect a voter's decision on whether and how to vote is a difficult concept to concretely measure. Given that states allowed mail-in voting, early voting, absentee voting, etc., county Covid-19 rates the day before the election, or even a few days or a week before the election, may not accurately measure the cost of voting in terms of potential Covid exposure for voters. In an attempt to average out, or obtain a general measure of a county's level of Covid-19 before the election, I collect county-level counts of Covid cases for each of the 30 days before the November 3rd election. This data is made available from the *New York Times*' Covid-Tracker. The Covid-Tracker tracks cumulative cases of Covid-19, so I calculate the change in number of Covid-19 cases for each day for each county between October 4 and November 2 (the day before the general election). I then average the change over the thirty days, multiply by 1,000 and then divide that number by the county's 2020 Census population to create a variable that measures the average change in Covid-19 cases per 1,000 people for the month before the election. This is done for every county, and for each voter, their county's average change in Covid-19 per day for the 30 days prior to the election are merged with the dataset. For example, the average change in daily cases in the month before the election in Maricopa County, Arizona, was 0.1304; therefore, every Maricopa County voter receives a value of 0.1304 for their Covid-19 case rate. This rate is then multiplied by the voter's age to create the interaction term between county Covid rate and age.

Florida

The State of Florida makes available a CD of registered voters, their general demographic information, and their voting histories at no cost. The CD contains 67 separate voter information files for each of Florida's 67 counties, along with 67 separate voter history files for each Florida county. Therefore, the first step in creating a master file of Florida eligible voters and their voting histories is to append each of the voter information files and then merge the voter history files into the appended voter information file. This is easily accomplished through use of the voter ID variable in each of the files.

With the master Florida dataset containing voter information and their histories, I create the control variables for this study. Gender is recoded into three dummy variables: female, male, and unknown. Female is used as the reference category. Unlike other states, Florida includes each voter's race. Dummy variables are created using the most reported categories. These include: White, Native American, Asian, Black, Hispanic, Other, Multi Race, and Unknown Race. White is used as the reference category.

Each voter's date of birth is included in the dataset. Therefore, I calculate the voter's age on Election Day by subtracting their date of birth from the date of the election and then dividing by 365.25. STATA can convert these respective dates into numerical values and subtracting gives the number of days lived by the individual. Dividing by 365.25 gives the age of the voter in years. As in other studies, to account for linearity, I also include age-squared as a variable. Any voter younger than 18 on Election Day is dropped from the analysis.

In the same manner as the Arizona dataset, I use the Covid-Tracker to calculate the change in number of Covid-19 cases for each day for each county between October 4 and November 2 (the day before the general election). I then average the change over the thirty days, multiply by 1,000 and then divide that number by the county's 2020 Census population to create

a variable that measures the average change in Covid-19 cases per 1,000 people for the month before the election. This rate is then multiplied by the voter's age to create the interaction term between county Covid rate and age.

Voter history is also included to account for an individual's propensity to vote. To ensure all voters in the analysis have a voter history, I drop all individuals that registered after Feb. 18, 2020, the deadline to register to vote in the March 17, 2020 Presidential Preference Primary. Then, dummy variables are created for voting method in this primary: Did Not Vote, Voted In Person, Voted Early, or Voted Absentee. The reference category is Did Not Vote. These primary voting history variables are used to control for an individual's propensity to vote. A final control variable for population is also included for the analysis.

Finally, control variables for the presence of a mayoral election or local referendum are included. Since the Florida dataset contains the voter's address, I create a dummy variable coded 1 if the voter could vote for mayor in the general election and 0 otherwise. The use of the voter's address also allows for the inclusion of a similarly-coded dummy variable if the voter faced a municipal or county level referendum decision. These local races could compel some voters to vote instead of abstaining. All variables used in the analysis are included in Table 1 for comparison between Arizona and Florida.

Dependent Variable & Statistical Test

The dependent variable for both the Arizona and Florida datasets is how the individual voted in the November 2020 general election. Four categories are included in this variable for the state of Arizona: Did Not Vote, Voted In-Person, Voted Early/Mail, and Voted Provisional. Arizona does not delineate between early voting and voting by mail, so both categories are included in the same category. The state of Florida is the same in its manner of reporting, so the

coding scheme is the same as Arizona. The dependent variable is unordered and categorical, necessitating the use of a multinomial logistic regression model. The base category for the regression is set as voted early/mail. Robust standard errors are used to account for heteroscedasticity.

Table 1: Variables		
Variable	**Arizona**	**Florida**
Dependent Variable: Voted in 2020 General Election	Coded as: 1 = Did Not Vote 2 = Voted In-Person 3 = Voted Early/Mail 4 = Voted Provisional	Coded as: 1 = Did Not Vote 2 = Voted In-Person 3 = Voted Early/Mail 4 = Voted Provisional
COVID Rate	Average new cases per 1,000 people in the 30 days prior to election in county	Average new cases per 1,000 people in the 30 days prior to election in county
Age	Age of voter (2021 – year of birth) in approximate years	Age of voter in years
COVID Rate X Age	COVID Rate X Age	COVID Rate X Age
Age Squared	Age X Age	Age X Age
Mayor	Coded 1 if mayoral election on ballot for voter; 0 otherwise	Coded 1 if mayoral election on ballot for voter; 0 otherwise
County Population Density	Number of people per square mile in county	Number of people per square mile in county
Voting History	Coded 1 if voted in previous primary; 0 otherwise	Coded 1 if voted in March 2020 Presidential Preference Primary; 0 otherwise
Gender		Dummy variables for Female (reference category), Male, and Unknown
Race		Dummy variables for White (reference category), Native American, Asian, Black, Hispanic, Other, Multi-Race, Unknown
Local Referendum		Coded 1 if a city or county referendum was on the ballot; 0 otherwise

Findings

Arizona

Results for Arizona are located in Table 2 and separated by Democrats and Republicans. The results are surprising and counter to expectations.

Table 2: Determinants of Early/Mail Voting in 2020 General Election - Arizona
Multinomial Logistic Regression Coefficients (***Base Category: Voted Early/Mail***)
Did Not Vote and Voted Provisional Coefficients Omitted – Available in Online Appendix
Robust standard errors used. *p<0.10; **p<0.05; ***p<0.01

Variable	Voted In-Person (Dems.)	Voted In-Person (Repubs.)
COVID Rate	3.75***	0.996***
Age	0.009***	0.03***
COVID Rate X Age	0.054***	-0.01**
Age Squared	-0.003***	-0.0004***
Mayor	-1.05***	-0.173***
County Population Density	-0.002***	-0.003***
History: Voted in 2020 Primary	-1.70***	-0.875***
Constant	-1.88***	-1.00***
N	1,281,104	1,375,015
Pseudo R^2	0.1897	0.1497

For Democrats, the interaction term between Covid-19 Rate and Age is positive, oddly indicating that as county Covid-19 rates increase along with voter age, voters are *more* likely to turnout in-person compared to voting early/by mail. The presence of a mayoral election, the county's population density, and if the voter voted in the previous primary all had a negative effect on in-person turnout compared to voting early/by mail. The coefficients for these variables are the same for both Democrats and Republicans, except for the interaction term. The effect is exactly the opposite for Republicans. The negative interaction term between Covid-19 rate and age indicates that as county Covid-19 rates and age increase, Republican voters are less likely to turnout in-person compared to voting early/by mail.

Discussion/Conclusions

The finding that as county Covid-19 rates and age increase Republican voters are less likely to vote in-person and more likely to vote by mail or vote early is surprising given the context of the election. President Trump pushed his supporters to vote in-person due to his perceptions of possible voter fraud. Election Day in-person turnout was just over 5% for Democrats in Arizona and just over 10.5% for Republicans. So, Republican voters did turnout more in-person relative to Democrats – President Trump's words did not fall on deaf ears. However, the finding for the interaction term suggesting that older Republican voters in high Covid-rate counties were compelled to vote by mail/early may simply be a statistical artifact. With nearly 3,000,000 residents in the dataset, it is no surprise that all variables are statistically significant. Substantively, the effect is likely to be miniscule. Also, the fact that over 1,000,000 of both Democrats and Republicans voted early/by mail and that relatively so few individuals actually turned out on Election Day to the polls, may be the driving force behind the results. There is low variability in the dependent variable such that this fact, combined with the large sample size, could be leading to the results seen.

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