Shaping the Nation: The Effect of Fourth of July on Political Preferences and Behavior in the United States*

Andreas Madestam† and David Yanagizawa-Drott‡

November 2011

Abstract

This paper examines whether social interactions and cultural practices affect political views and behavior in society. We investigate the issue by documenting a major social and cultural event at different stages in life: the Fourth of July celebrations in the United States during the 20th century. Using absence of rainfall as a proxy for participation in the event, we find that days without rain on Fourth of July in childhood shift adult views and voting in favor of the Republicans and increase turnout in presidential elections. The effects we estimate are highly persistent throughout life and originate in early age. Rain-free Fourth of Julys experienced as an adult also make it more likely that people identify as Republicans, but the effect depreciates substantially after a few years. Taken together, the evidence suggests that political views and behavior derive from social and cultural experience in early childhood, and that Fourth of July shapes the political landscape in the Unites States.

*We are grateful to Alberto Alesina, Edward Glaeser, Eliana La Ferrara, Torsten Persson, David Strömberg, Richard Zeckhauser, and seminar participants at Bocconi, Harvard Kennedy School, National Conference of Swedish Economists, Norwegian School of Economics and Business Administration, 7th CSEF-IGIER Symposium on Economics and Institutions, and University of Bergen for valuable comments. All errors are our own. This paper was previously circulated under the title "Shaping the Nation: Estimating the Impact of Fourth of July Using a Natural Experiment."

†IGIER and Department of Economics, Bocconi University, email: andreas.madestam@unibocconi.it.

‡Harvard Kennedy School, Harvard University, email: david_yanagizawa-drott@harvard.edu.

1 Introduction

Political preferences and subsequent behavior are important determinants of policy, and hence the allocation of society's resources. While standard economic theory takes preferences as given, recent work shows that tastes for policy can be endogenous to political regimes (Alesina and Fuchs-Schündeln, 2007). The notion of context-specific preferences also aligns with theories of political socialization, emphasizing how social interactions in childhood predict adult political opinion and behavior (Jennings and Niemi, 1974). Although early life conditions exert a strong influence on later social and cognitive outcomes (see Heckman, 2007 for a review), there is little empirical evidence that cultural practices shape political views and behavior, and whether tastes and behavior patterns originating in childhood are more persistent than those formed as an adult.

This paper investigates these questions by documenting the effects of a major social and cultural event at different stages in life: the Fourth of July celebrations in the United States. In 2011, an estimated 151 million Americans age 18 or older celebrated Fourth of July, or Independence Day, by attending a barbecue. Another 104 million watched the fireworks or went to a community festivity, while more than 31 million saw a parade (National Retail Federation, 2011). Children are a particular focus, and adults with children at home are more likely to participate in Fourth of July celebrations than those without (Gallup, 2002; Rasmussen Reports, 2010).

As a large social and cultural event, Fourth of July may affect people's political preferences and behavior in at least two ways. First, the celebration is traditionally considered patriotic in nature. A majority of people report displaying American flags and over 30 percent say they sing patriotic songs (AARP, 2006; Rasmussen Reports, 2009, 2010). One implication is that social interactions during the festivities builds a national identity and a belief in the underlying principles supporting American society. That is, it instills a civic duty that fosters political participation in the sense of Downs (1957) and Riker and Ordeshook (1968). Second, Fourth of July potentially affects party preferences if patriotism divides along political lines. Survey evidence shows that Republicans see themselves as more patriotic, attend Fourth of July to a greater extent, and also view the holiday as more important compared to Democrats (Gallup, 2002; Rasmussen Reports, 2006, 2009). While patriotic values need not be partisan, experimental findings in psychology indicate that exposure to arguably patriotic symbols, such as the American flag, shifts political support toward the Republicans (Carter et al., 2011).[1]

Using data on individuals born between 1920 and 1990, we investigate whether the childhood experience of Fourth of July affects partisan preferences and voting behavior as an adult. Since individuals participate in the celebrations throughout life, we also examine if the experience of

[1] Although the impact of a national flag is likely to vary depending on the country and the time period (see, for example, Hassin et al., 2007), the important point is that exposure to patriotic symbols during Fourth of July can have a direct influence on political preferences, in addition to peer effects coming from social interactions.

Fourth of July in adulthood impacts preferences and behavior. Finally, to test whether the childhood years are particularly formative, we estimate the degree of persistence in political preferences originating from exposure in childhood, and compare it to the persistence of the adult experience.

Estimating the effects of Fourth of July celebrations presents two main challenges. First, it is difficult to observe participation in the festivities. For example, it is hard to measure how many parades an individual attended during childhood or how many fireworks she watched. Second, even if such measures would be correlated with political preferences, they may not reflect a causal effect of participation in the Fourth of July celebrations. For instance, if conservative individuals and families are more likely to attend, a positive correlation between participation on Fourth of July and partisanship, thus, simply reflects that some people are more conservative to begin with.

We address these issues by exploiting a natural experiment induced by random daily variation in rainfall. The basic idea is the following: fireworks, parades, political speeches, and barbecues are typically held outdoors. Parents and children are less likely to participate if it rains, and events are often cancelled due to bad weather. Some children grow up with nice weather and are more likely to celebrate, while others are hit by bad weather making it less likely that they join the festivities. We thus use absence of rain as a proxy for participation on Fourth of July.[2] By using within-county variation across cohorts, we exploit shocks in rain that are arguably uncorrelated with other determinants of political preferences and behavior. Any estimated difference in outcomes should therefore capture a causal effect of weather-induced participation in the Fourth of July celebrations.

A limitation of our study is that data on historical attendance is unavailable. To assess the assumption that rainfall affects participation, we examine if rain on Fourth of July leads to the cancelation of key events. If people dislike attending the celebrations when it rains, organizers may cancel events in expectation of low turnout. We explore the issue by counting the number of newspaper articles writing about called-off fireworks, parades, and barbecues. The results show a strong and positive relationship between rain and the number of articles mentioning cancelation of these events, indicating that rainfall reduces the likelihood that citizens celebrate Fourth of July.

To investigate if Fourth of July affects preferences and behavior, we compile individual-level outcome data from 25 American National Election Studies (ANES) conducted between 1954-2008 and match it with county-level information on rainfall taken from the National Oceanic and Atmospheric Administration (NOAA) during the period 1920-2008. To explore if rainfall reduces attendance, we collect newspaper data from Newslibrary.com on articles writing about cancelation of key events on Fourth of July and merge this with the information on rain.

We first estimate the effect of the number of rain-free Fourth of Julys experienced in childhood on preferences and behavior as an adult. We then compare the contemporaneous change in

[2]Because we cannot observe participation in specific Fourth of July activities, we are agnostic about which type of celebratory activity that matters.

preferences and behavior for adults, who experience a rain-free Fourth of July, with those that do not. Finally, to quantify persistence, we make simplifying functional form assumptions about the underlying process that determines how previous experience affects current beliefs and behavior at different stages in life. This framework allows us to estimate two distinct persistence parameters: one for experiences as a child and one for experiences as an adult. We then exploit variation across individuals that differ in age and cohort to estimate persistence over the life cycle.

Using this empirical strategy, we show that Fourth of July celebrations as a child have a significant impact on people's political preferences later in life. The likelihood that an adult at the sample mean age of 39 identifies as a Republican increases by 0.61 percentage points for each rain-free Fourth of July in childhood. Alternatively, one within-county standard deviation in the number of rain-free childhood Fourth of Julys increases the likelihood by 0.99 percentage points. The celebrations also affect voting behavior in presidential elections. One rain-free Fourth of July in childhood boosts turnout at age 39 by 0.88 percentage points. Equivalently, a one standard deviation change raises turnout by 1.43 percentage points. Part of this is due to a shift in political views as the event changes who people vote for. The likelihood of voting for the Republican candidate increases by 0.85 percentage points per rain-free day or by 1.40 percentage points in terms of a one standard deviation change. There is no impact on the likelihood of identifying with or voting for the Democrats, indicating that Fourth of July moves preferences to the right rather than increase political polarization.

The effects we identify are highly persistent and occur early in childhood. In fact, the impact of Fourth of July on partisanship not only persists over time, it is reinforced by 2.5 percent per year over the life cycle. Even for turnout, where the effect depreciates slightly, it will take over 45 years before it declines to half. We also find that political preferences are formed by exposure to rain-free Fourth of Julys as early as ages 4-8. Meanwhile, there are no statistically significant effects for children below age 4 or late in childhood. Examining voting behavior, we show that the critical period occurs a little later, around ages 9-13.

Experiencing rain-free Fourth of July as an adult also affects political preferences. A rain-free Fourth of July in the survey year makes it 1.78 percentage points more likely that an individual contemporaneously identifies as a Republican, or 0.73 percentage points in response to a one standard deviation change in the likelihood of a rain-free celebration. We find no evidence that Fourth of July affects voting behavior. Unlike in childhood, the impact of Fourth of July on adults displays substantial depreciation, with the initial effect declining by half in 2.4 years time.

Finally, we investigate the impact on policy issues and show that childhood Fourth of Julys increase preferences for defense spending and decrease support for government-provided health insurance. The effect on defense spending is consistent with the idea that the event instills patriotic sentiments, while the effect on health insurance indicates that individuals also become more

conservative on policy issues not directly related to patriotism or national security. There are no effects on policy preferences coming from celebrations as an adult.

We check the identification strategy by demonstrating that childhood and contemporaneous rainfall is uncorrelated with other determinants of political preferences and behavior. In addition, we estimate whether rain on 2nd, 3rd, 5th, and 6th of July affects the outcomes. We find no effects, indicating that our findings are driven by weather conditions affecting participation on Fourth of July, rather than weather conditions in early July influencing the outcomes for reasons unrelated to the celebrations.

It is useful to compare our estimates with other important determinants of political preferences and behavior. Having Republican parents in our sample makes a person 44 percentage points more likely to identify as a Republican.[3] Field experiments that randomize door-to-door canvassing find that turnout increases by 7 percentage points (de Rooij et al., 2009). By comparison, the impact of a rain-free childhood Fourth of July on partisanship is 1/70 in magnitude of the effect of having Republican parents. Looking at the experimental evidence, the long-term impact on turnout of Fourth of July produces an effect equivalent of 1/9 in magnitude compared to canvassing.

Overall, our results indicate that social interactions and experiences of cultural events are important drivers of political views and behavior and that exposure in early childhood is particularly formative. They also suggest that Fourth of July shapes the political landscape in the U.S.

Our findings are consistent with three broad interpretations. First, evidence from development psychology and neurobiology shows that children are particularly responsive toward change, implying that later experience requires relatively more intensity and tends to be less efficient in shaping emotions and behavior (Knudsen et al., 2006). The persistence we document also concurs with work on persuasion and cognitive biases. In Rabin and Schrag's (1999) model of confirmatory bias, people misinterpret ambiguous information in favor of confirming their prior. Closely related are Mullainathan and Washington (2009) and Gerber et al. (2010) who empirically show that people are motivated to maintain congruence between emotions, beliefs, and actions. Finally, Murphy and Shleifer (2004) propose a theory where social networks influence insiders' beliefs. People converge closer to those within the network and further away from people with different beliefs. The implication is that celebrating Fourth of July early in life infuses persistent political beliefs and behavior by providing a prior that is reconfirmed because of confirmatory bias and/or a need to maintain congruence. Also, the prior may induce people to listen more to peer groups with a particular political leaning, leading to stronger beliefs over time.

A second interpretation is based on political congruence between the patriotism promoted on Fourth of July and Republican beliefs, in the sense that the celebrations instill values and behavior

[3] Although conditional on a set of fixed effects and controls, this estimate should most likely not be interpreted causally.

associated with the Republicans. There is evidence that the political right has been more successful in linking with American patriotism and its symbols during the 20th century (Thomas and Flippen, 1972; Mathisen, 1989; Leege et al., 2002; Parker, 2009). The experimental findings of Carter et al. (2011), showing that exposure to patriotic symbols favor the Republicans, also support this idea.

A third interpretation is that Fourth of July builds a national identity and a shared belief in the underlying principles supporting society, one such principle being the civic duty to vote (Downs, 1957; Riker and Ordeshook, 1968). This interpretation also aligns with work by economists and sociologists that view national holidays as occasions that reconfirm societal commitments, national identity, and political norms (Durkheim, 1912; Turner, 1985; Etzioni, 2000; Chwe, 2001).[4]

Our paper is related to a growing literature that analyzes the persistence of preferences and behavior generated by personal experience. Exploiting the German unification, Alesina and Fuchs-Schündeln (2007) show that East Germans are more in favor of state intervention, an effect they estimate will vanish in 20 to 40 years. Using the 9/11 attacks in the U.S., Kaplan and Mukand (2011) find that voters registering after 9/11 are more likely to register as Republicans, an effect that persists over the two-year study period. More broadly, exposure to economic fluctuations in the U.S. has lasting effects on beliefs about redistribution, the importance of luck, and trust in institutions (Giuliano and Spilimbergo, 2009) and on stock market participation (Malmendier and Nagel, 2011).[5] We add to this literature by documenting how a recurrent cultural practice affects people's political preferences and behavior at different stages in life.[6]

The focus on party identification as a measure of people's political preferences is motivated by recent work showing how partisan identity causally affects political attitudes and behavior (Gerber et al., 2010). Moreover, by examining determinants of political behavior we contribute to empirical research explaining voter turnout. This literature investigates the impact of personal characteristics such as age, education, gender, and race (see, for example, Ashenfelter and Kelley, 1975 and Wolfinger and Rosenstone, 1980). However, most existing studies are based on simple correlations (for exceptions related to education, see Dee, 2004 and Milligan et al., 2004). We link to this work by exploiting a natural experiment to study the causal determinants of political participation.

In addition, political theorists rationalize why people vote by appealing to the voting act's consumption benefits or civic duty (Downs, 1957; Riker and Ordeshook, 1968). More recent

[4]Chwe (2001) argues that events, such as Fourth of July, can be rationalized as a common knowledge-generating coordination mechanism that allows people to submit to a social or political authority.

[5]Giuliano and Spilimbergo show that people experiencing the shocks at ages 18-25 are most likely to be affected, while Malmendier and Nagel conclude that more recent events have stronger effects, particularly on younger people.

[6]The idea that personal experience determines preferences also relates to work that investigates how adults' preferences may be affected, notably DellaVigna and Kaplan (2007) who study media persuasion, Green and Gerber (2008) who focus on get-out-the-vote experiments, Washington (2008) who documents congressional decision making, Mullainathan and Washington (2009) who examine voting behavior and cognitive dissonance, and Clingingsmith et al. (2009) who quantify the impact of the Hajj pilgrimage on pilgrims' attitudes, beliefs, and practices. Unlike in these contributions, we consider how childhood experience can affect preferences and subsequent adult behavior.

theory views voters as group members who want to "do their part" to help the group win (Coate and Conlin, 2004; Feddersen and Sandroni, 2006). The challenge to this approach is understanding why people join groups. We connect to these papers by examining a possible determinant of civic duty. Also, by studying Fourth of July as a source of group identity formation, we provide an explanation for how people align or identify with their groups in the first place.

Finally, the paper relates to theoretical work on how political culture is sustained or changed as people acquire their attitudes, emphasizing parents' role in value transmission (Bisin and Verdier, 2000, 2001; Tabellini, 2008). There is also a literature in political science considering the impact of parents' political views on their children and whether childhood or changes throughout life determine political beliefs and behavior (Jennings and Niemi, 1974; Sears, 1983; Alwin, 1994).[7]

The next section gives some background on Fourth of July to contextualize our findings. Section 3 discusses the methodology. In Section 4 we present our results. Section 5 concludes.

2 A Brief History of Fourth of July

On July 3, 1776, John Adams, the second president of the United States wrote "[Fourth of July] ought to be commemorated as the day of deliverance...It ought to be solemnized with pomp and parade, with shows, games, sports, guns, bells, bonfires, and illuminations, from one end of this continent to the other, from this time forward, forevermore" (Adams, 1776, p. 3).[8] In the years that followed, Fourth of July was the only national holiday, marking the date of the nation's existence and serving as a display of national unity. The latter function of Independence Day was particularly important in helping the scattered citizens of 13 states view themselves as part of a single nation (Waldstreicher, 1995; Travers, 1997; Heintze, 2007). Celebrations in the early republic included militia drills, processions, readings of the Declaration, dinners, and fireworks.[9]

Present-day festivities took form in the late 19th and early 20th century, being part of the Progressive Movement's effort to revive civic ceremonies on Fourth of July. Appelbaum (1989) describes how the tastes of the progressive reformers ran towards "patriotic pageants, patriotic music, parades with patriotic floats, marching units patriotically costumed in period dress, and tableaux vivants depicting patriotic scenes in American history" (Appelbaum, 1989, p. 141). Through campaigns such as "Safe and Sane July Fourth", the reformers sought to convince local civic officials to make the public holiday resemble a playground festival, in which children performed dramatic

[7] While work in political science has examined determinants of adult political behavior and opinions, there are no quantitative studies that use causal inference methods.

[8] John Adams' letter to his wife, Abigail, actually spoke of July 2, the date the resolution of independence was approved, but from the outset, Americans celebrated independence on Fourth of July, the date shown on the Declaration of Independence (Appelbaum, 1989).

[9] Historic accounts further document how newspapers played a vital role in spreading common Fourth of July practices across the country (Waldstreicher, 1995; Newman, 1999).

skits and dances (Smilor, 1980; Glassberg, 1987). In documenting Fourth of July celebrations in Minnesota in the early and mid 20th century, Nemanic (2007) writes "Independence Day programs featured events for the entire family, with particular emphasis placed on children...festivities would begin with a noisy wakeup ritual followed by a patriotic parade. Afterwards, a formal ceremony might be held that included orations and readings from the Declaration of Independence. The afternoon offered an array of contests, concerts, and sporting events. In the evening,...a torch light parade might be held...Fireworks ended most celebrations" (Nemanic, 2007, p. 121).

Celebrations in the first half of the 20th century were also political events. Local politicians planned for the occasion, as well as provided financial support to the festivities. They participated actively in the parades and presented orations during the formal ceremonies. Many used the holiday to campaign or to gain visibility between campaigns by giving political speeches. In the cities, civic groups and political parties organized separate events to further their particular cause (Appelbaum, 1989; Nemanic, 2007).

Fourth of July in the 1950s and the 1960s included beauty contests, auto races, regattas, dog shows, and parachute-jumping contests, as well as traditional parades and orations (Appelbaum, 1989). The holiday became increasingly commercialized as businesses took over the Fourth of July program sponsorship from town volunteer committees and the political parties (Nemanic, 2007). Also, the backyard barbecue was institutionalized during this period, making Fourth of July a more private tradition among friends as opposed to a community festival. While Fourth of July celebrations in the last 40 years have kept much of the private features introduced in the 1950s and the 1960s, some of the patriotic practices from the beginning of the 20th century were reintroduced. Contemporary festivities can be full-day affairs, with parades and speeches in the morning followed by afternoon barbecues, tailgating, and evening fireworks (Heintze, 2007).

3 Methodology

The ideal experiment to estimate the effects of Fourth of July would be to allocate participation randomly to some individuals and not to others, and then compare preferences and behavior across the two groups. In the absence of such evidence, and because we cannot audit actual attendance nor control for unobserved factors likely to motivate those who join the festivities, it is difficult to measure the short- and the long-term impact of the celebration.

The key innovation of this study is to exploit random day-to-day variation in precipitation to estimate the effect of Fourth of July. Using daily rainfall data has two advantages. First, rain deters people from participating in the celebrations, most of which are held outdoors. While there is no data on attendance rates throughout the 20th century, we show below that rain increases the likelihood that events during Fourth of July are canceled, implying that fewer people attend the

celebrations. In addition, even if celebrations are not called off, several newspaper accounts from festivities across the U.S. report that rainfall reduces the number of people who participate. In recounting the event in 2004, the *Washington Times* wrote "Rain keeps crowds thin, ends some festivities...Metro reported a drop of more than 100,000 riders from last July Fourth, likely the result of the weather" (Washington Times, July 5, 2004). Similarly, in describing the celebrations in 2003, the *Houston Chronicle* reports "...weather dampens turnout for Red, Hot & Blue bash...crowd estimates put attendance at a little more than half of the 100,000 people who normally pack the event" (Houston Chronicle, July 10, 2003). In what follows, absence of rain thus serves as a proxy for participation in holiday celebrations on Fourth of July. Second, since weather is stochastic, conditional on the likelihood of rain, the number of days in childhood in which a child experiences rain on Fourth of July is random. Similarly, rainfall on a specific Fourth of July is also a random event. Random rainfall therefore provides plausibly exogenous variation in participation in the celebrations. In the next sections, we discuss the data, present an organizing framework for the empirical analysis, and lay out the details of our identification strategy.

3.1 Data

We rely on information from three sets of data. The data on rainfall comes from NOAA National Data Centers, the data on political preferences and political behavior is taken from the ANES, and the newspaper data comes from the NewsLibrary.com website. NewsLibrary.com employs a common search engine to search online news archives for newspapers. We have information on the number of articles writing about key events being cancelled on Fourth of July for the period 1990-2009.[10] In all, there are 940 observations measured at the state-by-year level. ANES contain survey data on partisanship, voting behavior, and preferences for different policies. It also includes demographics, such as education, income, age, race, and marriage status. The NOAA dataset comprises daily rainfall from approximately 18,000 weather stations for each July between 1920 and 2008.[11]

We proceed in several steps to match the rainfall and the ANES. For each day, we first aggregate the weather station data to the county level by extracting the average rainfall (in inches) in the county. Figure 1 graphically shows the probability of rain on Fourth of July for all U.S. counties during the sample period (with sample counties in red). To minimize measurement error problems due to missing information, we only include counties for which there is at least fifty years of data. The ANES contains every national election between 1954 and 2008. To measure rainfall during

[10]The number of newspapers available varies over the period. Before 1990, NewsLibrary.com includes very few newspapers. Hence, we do not analyze data prior to 1990.

[11]NOOA has information for some weather stations going further back in time. However, according to a NOOA contact person the data quality before the 1920s is very low. Consequently, we do not use earlier data.

childhood and later in life, we match the 1920-2008 county-level rainfall data with individuals born 1920 and later surveyed in the ANES. This allows us to construct variables measuring rainfall at different stages in life for each ANES respondent. A majority of the surveys have information on the county of residence. A limitation, however, is the lack information on the county of birth or county of residence in childhood. When investigating the long-term effect of Fourth of July, we would like to measure rainfall for an individual during her childhood years. Since we only observe the county of residence at the time of the survey, we match at the county of residence, leading to a measurement error problem. However, in most surveys, data is available at the region of birth. To mitigate some of the measurement error problem, we only include individuals living in the region of birth when analyzing the effect of the childhood Fourth of Julys.[12] Since weather systems are typically clustered at any given day, the spatial correlation of rainfall across nearby counties within regions will be high, thereby lessening some of the measurement error. Also, as the county-level rainfall data in childhood is incomplete in some cases, we only include individuals for which there is no more than one childhood Fourth of July rainfall observation missing.[13] Given that the measurement error is likely to be classical, if anything, attenuation bias will lead us to underestimate the long-term effects. Since we do not face the same issues linking contemporaneous weather of the ANES respondents, we create two different samples. Panel A restricts the observations as above and we use this dataset to investigate the long-term effects of experience in childhood. Panel B is used when examining the experience as an adult. In this case, we do not restrict the sample.

In addition, for each day we measure the fraction of counties in a state that experience rain. We match this information with newspaper data at the state-by-year level. We only include states for which there was at least one newspaper article reporting any type of canceled Fourth of July event during the 1990-2009 period. In this sample, on average 40.0 percent of the counties in a state experience rain in a given year, and 26.2 percent of the state-year observations have at least one report of canceled events of any type.

Table 1 presents the summary statistics. The rainfall data allows us to measure the weather at any given age. To keep the estimations tractable, we construct a few key weather variables. In the empirical framework below, we discuss how we approach the data and the variables used in the estimation. In addition, we create variables that capture weather during different ages in childhood.

3.2 Empirical Framework

Our objective is to investigate how past experience of Fourth of July festivities shape contemporaneous political preferences and behavior and how we can use the information on rainfall to make

[12]The correlation between partisanship and migration is weak, reducing concerns about external validity.

[13]In addition to the above issues, in the years when Fourth of July is on a Sunday, the official federal holiday is on July 5 and many events also move to July 5. Therefore, we use July 5 rainfall in these particular years.

inference about this process. We want to allow for the possibility that the effect of Fourth of July depends on the age at the time of the celebration. The age at a given festivity could also influence how the experience is perceived in the future. For a given age, this implies that there exist a cumulative effect of past Fourth of July experiences that affects present beliefs and behavior.

To introduce some structure, it is useful to define two parameters that capture both the *treatment effect*, β_a, and the degree of treatment *persistence*, δ_a, where a denotes the age when Fourth of July is celebrated. The following model illustrates the cumulative relationship between past experience and current political preferences and behavior:

$$y_i = \alpha + \sum_{t=0}^{age_i} \delta_a^t \beta_a T_{a,i} + \varepsilon_i, \tag{1}$$

where y_i is the outcome of interest (party identification, turnout, presidential candidate voted for) for individual i of current age age_i. The variable $T_{a,i}$ is a dummy variable indicating whether the individual experienced Fourth of July at some past age $a = age_i - t$, where t is the number of years since the person was of age a, and ε captures all the other determinants of the outcome. For simplicity, we assume a geometric persistence rate.[14] Past experience at some age a has lasting effects only if $\beta_a > 0$ *and* $\delta_a > 0$.

There are at least two channels through which Fourth of July can have an initial effect on political preferences and behavior ($\beta_a > 0$). First, the celebration may offer an opportunity to reconfirm societal commitments that foster a national identity and, subsequently, a civic duty to vote through peer effects across participants (Durkheim, 1912; Downs, 1957; Riker and Ordeshook, 1968; Turner, 1985; Etzioni, 2000; Chwe, 2001).[15] Second, to the extent that patriotism or association with patriotic symbols divide along political lines, evidence from randomized experiments in social and cognitive psychology suggests that Fourth of July may affect beliefs and behavior because of exposure to patriotic symbols and cues linked to the event, at least in the short term (Ferguson and Hassin, 2004; Hassin et al., 2007; Carter et al., 2011).[16]

While these arguments rationalize why Fourth of July may have an impact, they do not answer to the question of whether young children have well-defined political preferences. Although an extensive literature in psychology and political science claims that political ideas, identity, and

[14] In our estimations, we check whether the parameterization is a good approximation of the underlying data generating process. We find that the geometric persistence rate provides a reasonable fit. The parameterization is similar to the ones used in the political science literature, where they measure persistence of partisanship by running regressions of current partisanship on previous partisanship, using panel data (see, for example, Sears and Funk, 1999).

[15] In addition, if socialization is important, then the initial effects β_a may depend on the total number of participants in the celebrations. We expect $\beta_a(n)$ to be increasing in n, where n is the participating population or the share of the local community that participates. Since we lack data on n we cannot investigate this directly.

[16] Carter et al. (2011) find that exposure to the American flag induces a shift toward the Republicans up to 8 months after treatment and label this as long-term effects. In the current context, however, we view these results as short term.

preferences are formed in childhood (Hyman, 1959; Easton and Dennis, 1969; Jennings and Niemi, 1974), we will not be able to shed light on the details of the underlying mental process.

The formulation allows for the possibility that Fourth of July experiences have different initial treatment effects at each age, as well as different degrees of persistence. While equation (1) conceptualizes the impact of Fourth of July for every past year back to the year of birth, the large number of coefficients make it difficult to quantify with any meaningful precision. Since we are interested in investigating the broad difference between the childhood and the adult experience, we take an alternative and more tractable route. In particular, we restrict the number of parameters and break down the analysis of Fourth of July into two distinct periods in life: effects of the childhood experience and effects of the adult experience.

3.2.1 Childhood and Adult Experience of Fourth of July

This section describes how we conceptualize the childhood and the adult experience. Since the ANES data does not survey children, there are no measures of political preferences during childhood. This presents a challenge as it is technically infeasible to estimate β_a at different ages in childhood without estimating δ_a simultanously. To keep things relatively simple, denote the childhood experience $\bar{T}_i$ as the number of Fourth of Julys celebrated as a child. The following equation captures how the childhood experience of Fourth of July affects preferences and voting behavior of an adult at some current age age_i:

$$y_i = \alpha + \delta^t_{child}\beta_{child}\bar{T}_i + \varepsilon_i. \tag{2}$$

We define the last year of childhood as age 18. Thus, $t = age_i - 18$ is the number of years into adulthood for an individual.[17] The parameter β_{child} shows the initial effect of the childhood experience at age 18 of attending one additional Fourth of July in childhood and δ_{child} describes the degree of persistence of the childhood effects beyond age 18.[18]

For the adult experience, outcome variables are measured contemporeaneously. As this permits us to estimate initial effects directly (without having to estimate persistence at the same time) we use a slightly different framework. Let $T_{a,i}$ be a dummy variable indicating whether the individual participated in Fourth of July celebrations at some past adult age a. The following equation shows how past adult experience of Fourth of July celebrations affect current adult preferences and voting

[17] Ending childhood at age 18 is motivated by the study of voting in federal elections and the use of the ANES data. An individual can vote if she is 18 years old by November of the election year. Since Fourth of July occurs before that, this definition is equivalent to defining childhood as the pre-voting period in life.

[18] To keep things simple, we assume that the initial effect of childhood experience is linear in the number of Fourth of July celebrations experienced. We partially assess this by testing for non-linearities in the number of rain-free Fourth of Julys. We find no evidence of non linearities.

behavior:

$$y_i = \alpha + \sum_{t=0}^{age_i - \bar{a}} \delta_{adult}^{t} \beta_{adult} T_{a,i} + \varepsilon_i, \tag{3}$$

where $t = age_i - a$ is the number of years since Fourth of July at age a, with $\bar{a} = 19$ as the first year after the end of childhood. β_{adult} is a parameter capturing the initial effect of celebrating Fourth of July as an adult and δ_{adult} is the degree of persistence of the adult experience.

What do we expect about the degree of persistence? Equations (2) and (3) allow the effects to depreciate ($0 \leq \delta < 1$), be permanent ($\delta = 1$), or appreciate over time ($\delta > 1$). A priori it is unclear what to expect, as it depends on the underlying model generating political beliefs. Suppose there is some initial effect (β_{child} and/or β_{adult} are non zero). In a standard Bayesian set up, individuals update their preferences as they become older and receive new information. As a result, if Fourth of July shifts beliefs in a particular direction, the effects should depreciate over time.[19] In terms of our framework, this implies that δ is less than one. Also, since Fourth of July arguably provides little information in relation to other sources that affect political beliefs, such as the education system and media, this suggests that the degree of persistence should be limited.

A competing view that predicts a significant degree of persistence relies on theories of cognitive bias. Celebrating Fourth of July early in life may instill persistent political beliefs and behavior by providing a prior that is reconfirmed over time because of confirmatory bias (Rabin and Schrag, 1999) and/or a need to maintain congruence (Mullainathan and Washington, 2009; Gerber et al., 2010). Also, the prior may induce people to listen more to peer groups with a particular political leaning, leading to stronger beliefs over time (Murphy and Shleifer, 2004). Together, the non-Bayesian mechanisms imply that an initial shift of beliefs in childhood can lead to non-depreciating effects as individuals become older (that is, $\delta_{child} \geq 1$), whereas experience of the same event later in life displays less persistence ($\delta_{adult} < 1$).

To understand how child and adult experience of Fourth of July affects preferences and behavior over time we thus want to estimate the following parameters $(\beta_{child}, \delta_{child})$ and $(\beta_{adult}, \delta_{adult})$.

[19] It is difficult to reconcile effects of Fourth of July with a simple Bayesian information story. Assume Bayesian learning about some fundamental state variable, S, on the left-right real line, where an individual on July 3rd has a prior political belief, $E[S]$. If attending Fourth of July provides information that shifts the individual's posterior to the right, this implies that the signal must be to the right of the prior. Fourth of July therefore acts as a "right-wing" information shock. As Bayesian beliefs are martingale, they only shift if the information shock is a surprise. Otherwise, the individual would have incorporated Fourth of July on July 3rd. However, as Fourth of July has been celebrated since 1776, it is not obvious why unexpected information should be generated on this particular day.

3.3 Identification Strategy and Specifications

This section describes how we use rainfall to estimate the effects of the childhood and the adult experience of Fourth of July. The empirical analysis builds on two main assumptions. First, conditional on the probability of rain, rain on a given Fourth of July is as good as randomly assigned. Second, individuals are less likely to participate in the festivities when it rains. Importantly, this allows us to estimate δ_{child} and δ_{adult}, even though we cannot measure Fourth of July participation directly. To see this, assume that participation in childhood is generated by the following simple relationship:

$$\bar{T}_i = \alpha' + \gamma_{child}\bar{R}_i + \mu_i, \tag{4}$$

where $\bar{R}_i$ is the number of rain-free Fourth of Julys experienced as a child and $0 < \gamma_{child} \leq 1$ is a scale factor capturing that absence of rain increases the likelihood of attendance.[20] Equations (2) and (4) together yield

$$y_i = \alpha + \delta^t_{child}\theta_{child}\bar{R}_i + e_i, \tag{5}$$

where $\theta_{child} \equiv \beta_{child}\gamma_{child}$ and $e_i \equiv \delta^t_{child}\beta_{child}(\alpha' + \mu_i) + \varepsilon_i$. Under the assumption that rainfall is uncorrelated with any other determinant of y_i or $Cov(\bar{R}_i, e_i) = 0$, equation (5) highlights two important properties of our framework. First, we are able to identify the degree of persistence, δ_{child}, despite exploiting the reduced-form effect of rain on participation as opposed to randomly allocating attendance to the event. That is, $E[\hat{\delta}_{child}] = \delta_{child}$. Second, the estimated initial treatment effect of rain-free days, θ_{child}, is a lower bound of the initial treatment β_{child} or $E[\hat{\theta}_{child}] = \theta_{child} \leq \beta_{child}$. These conclusions also apply when estimating the effects for adults.

$\bar{R}_i$ is a random variable with a Bernoulli distribution with 15 draws and probability of rain p. Since rainy areas may be fundamentally different from non-rainy ones, $Cov(\bar{R}_i, e_i) = 0$ is only likely to hold conditional on the probability of rain. If areas with relatively low p are mostly Republican, then $\bar{R}_i$ will be correlated with political preferences for other reasons than the Fourth of July celebrations. However, conditional on p, $\bar{R}_i$ should be uncorrelated with e_i.[21] The challenge when implementing this idea in a regression framework thus concerns estimating the likelihood of rain on a specific Fourth of July for each cohort born between 1920 and 1990. If this probability

[20] In a 2SLS/IV framework, this is equivalent of the first-stage equation where we assume that rainfall affects outcomes through participation. Although lack of rainfall, conditional on participation, can potentially affect the experience of the festivities directly, we believe that this is unlikely to drive our findings. Perhaps more important, the data does not allow us to investigate whether peer effects could lead to a social multiplier (Glaeser et al., 2003), where the effects depend on the total number of participants n, so that θ is increasing in n.

[21] For example, if areas with a lower probability of rain during the summer are mostly Republican, then rainfall is correlated with political preferences for other reasons than Fourth of July.

would be constant across years at a given location, the problem could be solved using fixed effects for the proper geographic identifier, such as the county. This may be insufficient, however, if climate change affects the probability of rain, and this change for some reason is correlated with changes in political preferences. To address the possibility that heterogeneous rainfall trends across different U.S. regions could be correlated with other determinants of political preferences and behavior, we include a set of fixed effects, state time trends, and individual covariates.[22] We now turn to our specifications.

3.3.1 Specifications: Childhood Fourth of July

To investigate if Fourth of July affects people's partisan preferences, whether they turn out to vote, who they vote for, and the degree of persistence, we estimate the following two separate regression models:

$$y_{ibcy} = \lambda_{child}\bar{R}_{bc} + \varphi_c + \tau_b + \pi_y + \phi_s \times y + \omega X_i + \varepsilon_{ibcy}, \tag{6}$$

and

$$y_{ibcy} = \delta^t_{child}\theta_{child}\bar{R}_{bc} + \varphi_s + \phi_s \times y + \omega X_i + \varepsilon_{ibcy}, \tag{7}$$

where $\bar{R}_{bc}$ is the number of rain-free Fourth of Julys of individual i born in county c in year b surveyed in year y, and t is the number of years since childhood. As infants and toddlers are unlikely to be affected due to limited cognitive ability, we define childhood to include ages 4-18 in our main specification.[23] The specification in (6) also allows for county (φ_c), birth-cohort (τ_b), and survey-year fixed effects (θ_y), as well as state-specific time trends ($\phi_s \times y$) and a vector of individual covariates X_i. The county fixed effects control for any time-invariant county-level determinant of preferences and behavior. The birth-cohort fixed effects control for any time-variant determinant of preferences and behavior across birth cohorts. The survey-year fixed effects control for any time-variant determinant across different survey years (that is, elections). The state-specific trends control for any linear time trend in preferences and behavior that is specific to each state. We also include the following individual (dummy) covariates: race (African American, other non white), education (high school degree with some college education, college degree), gender, marriage status, and family income (middle tertile, top tertile).[24] The standard errors are clustered at the state

[22] Even if rainfall is uncorrelated with other determinants of political preferences and behavior, including individual controls has the benefit of improving precision as long as the covariates (such as education and income) are not endogenous to the celebrations. We investigate how sensitive the results are to the inclusion of different fixed effects and individual controls. In general, the main results do not change.

[23] The robustness results also confirm that there is no effect of Fourth of July below age 4.

[24] Note that we indirectly control for age since age is collinear with the cohort- and the survey-year fixed effects.

level, which allows for an arbitrary correlation between individuals residing in the same state.[25] Figure 2 shows the residual variation in childhood rain-free Fourth of July ($\bar{R}_{bc}$) of equation (6). We see that, even conditional on the large set of fixed effects, there is still substantial variation across the cohorts. Because the non-linear least squares estimations do not handle as many fixed effects, we use a slightly different set of controls when estimating (7).[26] In this case, we use state fixed effects (φ_s), state-specific time trends ($\phi_s \times y$), and a vector of covariates X_i. The baseline covariates are: second-order polynomials in survey year, age, and birth year, as well as the probability of rain on Fourth of July in a given county. We also present results including the individual covariates specified above.

We proceed in two steps. First, we estimate λ_{child} in (6) using OLS. Second, we estimate δ_{child} and θ_{child} in (7) using non-linear least squares. We show both results partly because the OLS is simple and straightforward to interpret. More substantially, we first measure λ_{child} since it makes little sense to estimate δ_{child} if λ_{child} is zero, which would be the case if θ_{child} is equal to zero.[27] Hence, if there is a reduced-form effect of rain-free Fourth of Julys in equation (6), θ_{child} must be non zero, making it worthwhile to estimate the persistence δ_{child}.[28]

3.3.2 Specifications: Adult Fourth of July

To estimate the effects of Fourth of July celebrations as an adult, we proceed using two specifications. Since it is possible to measure outcomes contemporaneously for adults,[29] we first estimate the initial effect, θ_{adult}, in the following regression:

$$y_{ibcy} = \theta_{adult} R_{cy} + \varphi_c + \tau_b + \pi_y + \phi_s \times y + \omega X_i + \varepsilon_{ibcy}. \tag{8}$$

To measure the persistence of the adult experience, we go on to estimate:

$$y_{ibct} = \sum_{t=1}^{\bar{s}} \delta_{adult}^t \theta_{adult} R_{cy} + \varphi_s + \phi_s \times y + \tau X_{ibcy} + \varepsilon_{ibcy}. \tag{9}$$

[25] The results remain essentially the same if we cluster at the county level.

[26] To assess the sensitivity of the different specifications, we check if the OLS estimates differ depending on the fixed effects. In general, they are quantitatively very similar, making it unlikely that the non-linear estimates suffer from omitted variable bias.

[27] As the unbiased OLS estimate, λ_{child}, is equal to $\delta_{child}^t \theta_{child}$ (for the average sample t), a non-zero λ_{child} implies that θ_{child} is non zero. This is not a problem when it comes to the adult experience, as we can measure contemporaneous outcomes for adults and thus estimate θ_{adult} directly, without having to measure δ_{adult} at the same time.

[28] When estimating δ and θ, we use initial values that are consistent with the OLS estimate of λ. Specifically, we set the initial value of δ to one, then we set θ equal to the estimated λ. We try different initial values and the results are qualitatively similar.

[29] By contemporaneously we mean that the outcome data and rainfall on Fourth of July is measured in the same year. Strictly speaking, Fourth of July and the ANES survey is usually a few months apart.

As we estimate θ_{adult} directly in (6), without measuring δ_{adult} at the same time, we substitute $\hat{\theta}_{adult}$ into (9) and estimate δ_{adult} using non-linear least squares. For each individual, we use past Fourth of July rainfall for each year going five, ten, and fifteen years back in time ($\bar{s} = 5$, 10, or 15) in order to estimate δ_{adult}. The main reason for imposing this limitation is that the sample size decreases with the number of past Fourth of Julys we include, leading to imprecise estimates.

The identifying assumption in equations (6)-(9) is that, conditional on the fixed effects and the state trends, rainfall on Fourth of July is uncorrelated with other determinants of the outcome. That is, since weather is a stochastic event, some cohorts growing up in a given county will have few Fourth of Julys without rain (and are thus less likely to celebrate), whereas other cohorts growing up in the same county will have many rain-free Fourth of Julys (making them more likely to celebrate). Similarly, whether adults experience rainy or rain-free Fourth of Julys is as good as randomly assigned.

Table 2 examines the assumption that rainfall affects attendance by exploring whether rain increases the likelihood that events during Fourth of July are canceled. The idea is that fewer people attend the festivities when fireworks, parades, and barbecues are called off. We study this by counting the number of newspaper articles that write about key events being canceled on Fourth of July. Each search includes the words "canceled" and "Independence Day" combined with "fireworks", "parade", or "barbecue", respectively.[30] We regress a dummy variable indicating whether at least one newspaper in a state reported a canceled event on the fraction of counties in a state that experienced rain on Fourth of July. Conditional on state fixed effects, columns 1-3 show a consistent, strong, and positive relationship between rainfall on Fourth of July and the likelihood that at least one newspaper writes about a canceled key event. Column 4 pools the searches while column 5 examines if the finding is driven by Fourth of July rainfall rather than weather conditions in early July. There is no evidence that rainfall in the days adjacent to the celebrations affect the number of newspaper articles. The estimate remains stable and the p-value on the F-test is 0.762, implying that we cannot reject the null hypothesis that the coefficients on the placebo days are all zero. Although an indirect measure of the effect of rainfall on attendance, this suggests that rain on Fourth of July leads to less fireworks, parades, and barbecues, with the consequence that fewer people participate in the celebrations.[31]

The identifying assumption implies that any other determinant of political preferences and behavior is uncorrelated with $\bar{R}_{bc}$ and R_{cy}. To assess the validity of this assumption, we check whether pre-determined individual covariates are correlated with $\bar{R}_{bc}$ and R_{cy}. In columns 1 and 2 of Table 3, we examine the estimated coefficient of equation (6), excluding $\bar{R}_{bc}$ and R_{cy}. We

[30] The findings are quantitatively the same if we use the terms "Fourth of July" instead of "Independence Day".

[31] In addition, as pointed out above, anecdotal evidence shows that rainfall decreases participation even if events are not canceled.

find that the set of individual covariates (race, gender, marriage status, education, and income) are strong predictors of identifying with the Republicans and voting in presidential elections. In columns 3 and 4, we estimate the same equations using $\bar{R}_{bc}$ and R_{cy} as the dependent variables, respectively. If the identifying assumption is correct, there should be no correlation between the individual covariates and the number of rain-free Fourth of Julys in childhood ($\bar{R}_{bc}$) or the likelihood of having a rain-free Fourth of July as an adult (R_{cy}). Column 3 shows that rain-free days in childhood are not correlated with the set of individual covariates.[32] The same holds for rain-free Fourth of Julys as an adult (column 4), except for one income dummy that is small and significant at the ten percent level. In addition, the F-tests indicate that the covariates are jointly insignificant. In fact, they explain almost none of the variation in rainfall, with a p-value of 0.841. Together, this lends credibility to the identification strategy.

4 Results

This section presents our main results on the impact of Fourth of July. We examine political preferences in terms of partisanship, voting behavior in presidential elections, and persistence over the life cycle. In the Appendix we include additional robustness tests. We first present measures of the average long-term results using OLS, followed by the results on persistence using the non-linear estimates.

4.1 Childhood Fourth of July: Political Preferences

Table 4 reports the main results on political preferences as measured by partisanship. It examines the average long-term impact of rain-free Fourth of Julys in childhood (equation 6). We first run the specification without the controls and the state trend (column 1), then we add the trend (column 2), followed by the individual covariates (column 3). The coefficients are similar across the three columns, statistically significant, and show that Fourth of July celebrations during childhood affect the likelihood of identifying with the Republicans at age 39 (the sample mean age). The main estimate, column 2, implies that one more rain-free Fourth of July increases the likelihood of identifying with the Republican party by 0.61 percentage points. Alternatively, one within-county standard deviation in the number of rain-free Fourth of July days (the standard deviation is 1.63 days) increases the likelihood by 0.99 percentage points.[33] As 36.2 percent identify as Republican

[32] Since we measure rainfall during childhood, only race and gender are truly pre determined. Nevertheless, none of the covariates are correlated with the rainfall variable. Although we include the covariates in the main regressions, we show that the results are insensitive to their exclusion. Because of obvious endogeneity concerns, we do not control for other ANES variables that are more closely related to political preferences, such as policy opinions or approval of the incumbent president.

[33] We explore within-county standard deviations since they correspond to the specifications used in our analysis.

in the sample, this means that one (one standard deviation) rain-free Fourth of July increases the fraction of Republicans by 1.7 (2.7) percent. In section 4.7, we show that the magnitude of these estimates compare well to other determinants of political preferences and behavior, such as the impact of having Republican parents.

To investigate if the effects are truly driven by weather conditions affecting the Fourth of July celebrations, rather than weather conditions in early July influencing political preferences for reasons unrelated to the celebrations, column 4 presents placebo results. In particular, the placebo variables measure the number of rain-free July 2nd, 3rd, 5th, and 6th in childhood. If the effects are determined by Fourth of July weather affecting the celebrations, having good weather during the other days should have no impact. Figure 4A plots the point estimates of column 4 and the corresponding 95 percent confidence intervals. There is no evidence that weather on other days around Fourth of July affects partisanship, and reassuringly, the point estimate for Fourth of July is similar in magnitude to the ones in columns 1-3.[34] We also run an F-test to verify the hypothesis that all five placebo coefficients are jointly zero. The p-value of the F-test that all the placebo coefficients are zero is 0.801, indicating that the placebo days explain very little of the variation in partisanship. The estimated effects therefore appear to be driven by weather on Fourth of July affecting the celebrations.

To understand if Fourth of July shifts political preferences to the right, rather than increase political polarization, columns 5 and 6 estimate the likelihood of identifying as an Independent and a Democrat, respectively. The point estimates are similar in magnitude and negative (although insignificant). While partisanship is discrete, it arguably reflects an underlying continuous distribution of political preferences. Figure 3 depicts graphically how we can rationalize the coefficients in columns 1-6. If the underlying distribution shifts to the right, then we should expect an increase in Republican partisanship and a decrease in Democratic partisanship. The effect on the fraction of Independents is ambiguous as this depends on the shape of the particular distribution. In line with this argument, the estimated coefficients indicate little evidence of Fourth of July increasing (or decreasing) political polarization.[35]

Overall, the results in columns 1-3 and 5-6 show that nice weather on Fourth of July during childhood causes individuals to identify more with the Republican party, consistent with the idea that participation in Fourth of July celebrations shifts preferences toward the political right.

[34]Note that even if Fourth of July celebrations truly have an impact, weather in the days preceding the festivity could still affect expectations about the weather during the celebrations and therefore cause cancellations of the events. However, as the results in column 4 show, we find no evidence of such effects. There are also no effects on identifying as an Independent or a Democrat for the placebos (results not shown).

[35]In the data, respondents identify as Republicans (including "leaners"), Independents, or Democrats (including "leaners"). Therefore, the point estimate in column 2 is equal to the sum of the point estimates in columns 5 and 6.

4.2 Childhood Fourth of July: Voting Behavior

In this section, we examine if the Fourth of July experience in childhood translates into altered political behavior as an adult. We do this by exploiting the ANES data to investigate the impact on whether adults turn out to vote and who they vote for in the presidential elections.

Columns 1-3 of Table 5 show the point estimates without individual covariates, with covariates, and with placebo days for voter turnout. The coefficient is significant and stable across the specifications. The estimate in column 1 indicates that one (one standard deviation) rain-free Fourth of July during childhood increases the likelihood of voting in presidential elections at age 39 by 0.88 (1.43) percentage points. Figure 4B plots the coefficients of column 3. There is no evidence that weather during other days around Fourth of July has an effect on turnout. In fact, the p-value on the placebo coefficients is 0.867, implying that we cannot reject that they are all zero. This further supports that the effects on turnout are driven by weather affecting participation in the celebrations.[36]

Columns 4-6 estimate the average long-term effect on the likelihood of voting for the Republican presidential candidate.[37] The outcome variable is a dummy indicating whether the respondent voted for the Republican candidate, and zero otherwise. That is, we do not condition on having voted. Since columns 1-3 show that there is an effect on turnout, and conditioning on an endogenous variable creates biased estimates, we include respondents that voted for a non-Republican candidate, as well as respondents that did not vote. To investigate whether Fourth of July skews voting in favor of the Republicans, we separately investigate if there is an effect on the likelihood of voting for the Democratic candidate.[38] Column 4 demonstrates that Fourth of July has a significant effect on voting behavior. For one (one standard deviation) additional rain-free Fourth of July in childhood, the likelihood of voting for the Republican candidate increases by 0.85 (1.4) percentage points. Columns 5 and 6 show that the estimated effect is similar in magnitude when individual covariates and placebo days are included. Figure 4C plots the coefficients of column 6. The pattern resembles the previous one, with no evidence of weather during other days having an impact. This is also confirmed by the high p-value (0.625) on the placebo coefficients.

To investigate whether the effect of Fourth of July explains voting behavior favoring the Republican over the Democratic party, we run the same regression on the likelihood of voting for

[36] A previous version of the paper included results on other variables of political participation, such as campaign contributions, attending political rallies, and working for a political party during the campaign. As these findings appear relatively late in childhood, we do not show the (insignificant) results when using the 4 to 18 age span. The results are available on request.

[37] Since the variables in the ANES are self-reported, the results should be interpreted with some caution. Note, however, that we would only get an upward bias in the estimates if the measurement error is positively correlated with rainfall on Fourth of July during childhood. The likelihood of such a correlation is arguably low.

[38] Note that even though Fourth of July shifts political preferences to the right we could still see an impact on the likelihood of voting for the democratic candidate if there is an effect on general turnout.

the Democratic candidate. Columns 7-9 show that there is no effect on voting for a Democratic presidential candidate. The point estimates are essentially zero. This indicates that the long-term effect of the Fourth of July celebrations on voting behavior is a higher Republican vote share in the presidential elections.[39]

4.3 Childhood Fourth of July: Persistence

So far we have analyzed the impact of Fourth of July on the average individual in the sample. While this tells us something about the effect of the childhood Fourth of July on the average adult respondent at age 39, it is less informative about the effects over the life cycle. In this section, we shed light on the issue of persistence by estimating equation (7) using non-linear least squares.

Columns 1 and 2 of Table 6 demonstrate that there is a remarkably strong persistence in the effects on political preferences. The point estimates of δ_{child} (1.045 and 1.023) imply that the childhood experience of Fourth of July not only persists over time, it is *reinforced*.[40] Specifically, for each year as an adult beyond age 18, the resulting effect of having experience Fourth of July as a child increases by 2.3 to 4.5 percentage points per year.[41]

In columns 3 and 4 we investigate the degree of persistence on voter turnout. Again, the results suggest high persistence. The point estimates indicate a low rate of depreciation of between 0.4 to 1.5 percentage points per year. In fact, we cannot statistically separate the estimates from one, meaning that the effects are essentially permanent. Moreover, even when the parameter equals 0.985, it will take at least 45 years before the effect declines to half. Finally, columns 5 and 6 show that there is strong persistence in the choice of the presidential candidate. The coefficients imply that the effects either appreciate (1.01) or depreciate slightly (0.992) over time. Again, we cannot reject that the δ_{child} parameter is statistically significantly different from one.

Figure 5 plots the implied long-term effects of the childhood experience across the life cycle, using the estimates from columns 2, 4, and 6. To assess whether the parameterization and functional form assumption of equation (7) are good approximations of the underlying data generating process, we also run OLS regressions with interactions between $\bar{R}_{bc}$ and different age intervals. This allows the persistence of the effects to evolve fully flexibly between the age intervals. If the functional form is a valid approximation, we should see that the OLS interaction coefficients are

[39] We find no effect on voting behavior in midterm elections (results not shown).

[40] Since the p-value for testing $\delta_{child} = 1$ is 0.004 and 0.105, respectively, we can only statistically separate the coefficient from 1 at the 5 percent level in the former case. As mentioned above, since the covariates are measured after childhood they are potentially endogenous to childhood experience, and so it is not obvious that the inclusion of covariates decreases the likelihood of a biased estimate.

[41] Since Tables 3, 4, and 5 all report significant point estimates for λ_{child}, we can reject that $\theta_{child} = 0$. Hence, as the main purpose of the non-linear least square estimations is to measure persistence, we do not discuss the magnitude and significance of θ_{child} in Table 6.

similar to the parameterized effects. Figure 5 shows that this is typically the case, as the OLS point estimates are close to the predicted effect using the non-linear estimates ($\theta_{child}, \delta_{child}$). In fact, all of the predicted values lie within the 95 percent confidence interval of the OLS estimates.

4.4 Childhood Fourth of July: How Early do Effects Occur?

To investigate how early in childhood the effects occur, we examine if there are critical periods when rain-free Fourth of Julys matter more in shaping adult outcomes. We estimate an equation similar to equation (6), but instead of using $\bar{R}_{bc}$ that counts the number of rain-free Fourth of Julys from ages 4-18, we add the number of days within four intervals: from ages 0-3, 4-8, 9-13, and 14-18.[42] This first interval should be viewed as a placebo, since if the effects are truly driven by children with sufficient cognitive development taking part in the celebrations, there should be no effect at infant and toddler age.[43] The set up also allows us to address concerns that the effects are driven by the respondent's parents participating on Fourth of July, rather than the respondent herself attending. If the effects were solely caused by parents attending the celebration, and that preferences are subsequently transmitted to the child later in life, we should also see effects when the child is below age 4.[44]

We begin by investigating whether there are any differential effects on political preferences. Table 7 shows that the impact of Fourth of July on political preferences occurs at a very young age. Experiences from as early as ages 4-8 have a long-lasting effect on the likelihood of identifying as a Republican later in life. The effect appears to be of a similar magnitude at ages 9-13. There is no evidence of effects before age 4 or in the late teens (ages 14-18). Columns 3 and 4 repeat the exercise for voter turnout. Compared to columns 1 and 2, the key ages for turnout come later and are mainly concentrated in adolescence. Columns 5 and 6 show a similar pattern for voting behavior, with effects appearing around ages 9-13. The consistent picture emerging, however, is that political preferences and behavior as an adult are shaped by experiences in early childhood, even as early as ages 4-8.

4.5 Adult Fourth of July: Short-Term Effects and Persistence

This section explores if Fourth of July has an immediate impact on adults' political preferences and behavior and whether these effects persist over time. The latter test also permits us to compare the degree of persistence between the childhood and the adult experience of Fourth of July.

[42] In principle, one could estimate the effect at every age. However, doing so leads to noisy estimates and we do not show the results. They are available on request.

[43] Children of ages 0-3 are usually considered infants and toddlers see, for example, the Bayley Scales of Infant Development (Black and Matula, 2000).

[44] Of course, this does not imply that the parent-to-child transmission of preferences does not matter per se.

Table 8 reports the regression results from equation (8) and shows the estimated initial effect, θ_{adult}, of having a rain-free Fourth of July in the same year as the survey. Columns 1-3 indicate that the likelihood of identifying with the Republicans increases substantially. Column 3 implies that one rain-free Fourth of July makes it 1.78 percentage points more likely that an adult identifies with the Republicans. Alternatively, a one within-county standard deviation change in the mean of a rain-free Fourth of July (the standard deviation is 0.41) increases the likelihood by 0.73 percentage points. The placebo estimates are also close to zero, with a p-value of 0.867. To investigate whether this is evidence of a shift to the right or of political polarization, we estimate the effect on the likelihood of identifying with the Democratic party. We find no such evidence, suggesting that the effects of the adult experience are qualitatively similar to the childhood experience of Fourth of July: political preferences shift to the right.

Columns 6-8 of Table 8 estimate the impact on voting behavior. We find no significant effects (although the coefficients are of the same sign), suggesting that the partisan shift that occurs when experiencing Fourth of July as an adult is insufficient to move voting behavior in favor of the Republican party.

Table 9 documents the degree of persistence of experiencing Fourth of July as an adult. Since there are no initial effects on voting behavior, we restrict our attention to the persistence of partisanship. As the lower age bound for adults is 18, the sample size decreases (and estimates become imprecise) when we increase the number of past shocks used to estimate the non-linear specification. To mitigate this problem, we present estimates using an increasing number of past shocks. We include 5, 10, and 15 years of past Fourth of Julys and show that the estimates are similar in magnitude. In columns 1 and 2, we exploit 5 years of past rainfall shocks as an adult. The point estimates for δ_{adult} are 0.867 and 0.765, respectively. We can statistically separate the persistence parameter from zero. However, due to the imprecise coefficients we are unable to separate the estimates from 1.[45] Columns 3-6 use increasing number of past rainfall shocks, and although the standard errors become even larger, the point estimates are similar to columns 1 and 2. Overall, this suggests substantial depreciation. For example, the parameter estimate in column 6, 0.746, implies that the initial effect will have declined by half in 2.4 years time. To verify if the parameterization and functional form assumption in equation (9) is valid, Figure 6 plots the implied effect (using estimates from column 2) against the OLS estimates of the dummy variable interaction of years since the Fourth of July shock. The predicted effect is within the 95 percent confidence interval of the OLS estimates, although there appears to be a slight underestimation of the persistence for the range 3-8 years past the shock.

[45]The coefficients on the persistence of the childhood effects reported in Table 6 are more precisely estimated. An alternative test is to do post-estimation analysis in Table 6, checking whether the estimate of δ_{child} is equal to the estimate of δ_{adult}. These tests strongly reject that they are the same. In this sense, we can reject that the childhood persistence parameter is the same as the adult persistence parameter.

Together, Tables 6 and 9 suggest that Fourth of July has an immediate impact on adults' political preferences but that shocks to political beliefs later in life are much less persistent than those occurring in childhood.[46]

4.6 Childhood and Adult Fourth of July: Policy Preferences

Having showed that Fourth of July affects political preferences and behavior, we now investigate if the event also has an impact on specific policy preferences. We focus on three key policy variables that have a clear left-right political dimension.[47] First, we estimate the effect on preferences for defense spending. This is motivated by the association between patriotism, or nationalistic sentiments, and preferences for a national defense. If Fourth of July increases patriotic sentiments, it may also boost the support for increased military spending. Second, a shift in beliefs toward the Republicans may induce people to favor policies traditionally associated with the Republican party. In view of the work on cognitive biases, Fourth of July does not necessarily affect preferences on policy issues directly. However, by voting for the Republicans (whatever the reason), individuals adopt Republican policy positions as to maintain internal consistency.[48] We investigate this channel by estimating the effect of Fourth of July on two salient issues: preferences for government-provided health insurance and the size of government.

Column 1 of Table 10 examines defense spending using a question from ANES where respondents are asked whether they prefer increased or decreased spending.[49] The results refer to the effect of an additional childhood Fourth of July as measured by regression specification (6). The point estimate is positive and significant at the five percent level. It implies that one (one standard deviation) rain-free Fourth of July during childhood increases the likelihood of favoring increased defense spending as an adult by 0.55 (0.89) percentage points.

In column 2 we study preferences for government-provided health insurance.[50] The coefficient is negative and significant at the five percent level. It implies that one (one standard deviation) rain-free Fourth of July during childhood decreases the likelihood of preferring health insurance provided by the government by 0.65 (1.06) percentage points. From a baseline of 0.617, this yields a long-term effect of 1.05 (1.73) percent. Column 3 shows that there is no significant effect on the

[46] Table A1 in the Appendix presents short-term effects of adult Fourth of Julys at different ages. We see that the effects on partisanship (column 1) appear to be concentrated before age 40, although large standard error do not allow us to separate the coefficients from the ones later in life. We also show effects on voting behavior for completeness.

[47] The policy variables considered are strongly associated with partisanship and voting behavior.

[48] This mechanism may, of course, also provide an additional explanation for the effects on defense spending.

[49] The ANES question uses a seven point scale. We construct a dummy variable indicating preferences for increased defense spending if the respondent reports a four or above on the scale.

[50] ANES asks for the policy position on a seven point scale. We use a dummy variables indicating whether the respondent is in favor of government-provided health insurance and whether the respondent is in favor of increased general spending/service by the government.

size of government. Even if Republicans typically favor smaller government, the absence of an effect is not surprising as the positive impact on defense spending may offset preferences for less spending on non-defense government expenses.[51]

Finally, columns 4-6 present estimates on the short-term effects of the adult Fourth of July experience [specification (8)] on the same policy outcomes. We find no significant effects. This is also consistent with the cognitive bias explanation, as there are no effects on voting behavior for adults.

4.7 Magnitude of Related Determinants: How do our Estimates Compare?

To understand how our findings compare with other estimates in the literature on partisanship and voting behavior, we quantify related channels in a number of ways. First, we follow work on political socialization and contrast our estimates to the implied effect of having Republican parents. In this literature, political beliefs are transmitted from parents to children (see, for example, Jennings and Niemi, 1974). To this end, we measure the effect of having a Republican mother and father (taken from ANES), under the assumption that parental partisanship is uncorrelated with other determinants of political preferences and behavior (conditional on a set of fixed effects and controls). Although a strong assumption, the exercise still has some merit. It asks the question: suppose the correlation between parent and child is causal, how large is the effect of one rain-free Fourth of July compared to growing up with Republican as opposed to non-Republican parents?

Column 3 of Table 11 shows the estimated coefficient from the regression of Republican partisanship on a dummy indicating whether both parents identify with the Republicans. The likelihood of identifying as a Republican is 44 percentage points higher when both parents are Republican. Comparing this to our estimate of the average long-term impact of a childhood Fourth of July (reproduced in column 1), implies that one rain-free Fourth of July corresponds to approximately 1/72 of the estimated effect of having Republican parents. Alternatively, one standard deviation in the number of rain-free Fourth of Julys in childhood corresponds to 1/44 of the effect of having Republican parents.[52]

Second, standard models of electoral competition predict that an individual's position in the income distribution is a key determinant of voting (see, for example, Persson and Tabellini, 2000). Accordingly, redistribution makes wealthier individuals more right wing as they contribute to a larger share of the tax burden. To investigate this channel, we use the measure of a respondent's position in the income distribution (available in quintiles) in the ANES. Taking the electoral model

[51] Defense spending constitutes a large share of the federal budget. The average defense spending between 1971-2010 was 21 percent of total federal spending (Congressional Budget Office, 2011).

[52] As there is no obvious reason to expect that Republican parents cause turnout, which is also what column 5 indicates, we refrain from this comparison.

at face value and assuming that income is the only determinant of political preferences and voting,[53] how much mobility in the income distribution does the Fourth of July effect amount to?

We report the estimates of the different income percentiles on Republican partisanship in column 4 of Table 11. The coefficients demonstrate that higher income is positively associated with Republican partisanship, especially in the upper tail of the distribution. Going from middle income (the 34-67 percentile reference group) to upper-middle income (68-95 percentile) shows an 8 percentage points higher likelihood of identifying as a Republican. Since ANES lacks the exact percentile of the respondents, we assume a linear relationship between income and partisanship and a uniform distribution of the households within the bins.[54] With this assumption, the middle-income bin shows the relationship for the median household and the upper-middle income bin estimates the relationship for the 71 percentile household. The effect of one (one standard deviation) rain-free Fourth of July in childhood on partisanship corresponds to being approximately 1.6 (2.6) percentiles higher up in the income distribution (for the middle-income household). Analogously, the immediate effect on Republican partisanship for adults is a move corresponding to 5.2 (2.1) percentiles. Using the 2006 household income data from the U.S. Census Bureau, we do a simple back-of-the-envelope calculation in terms of the dollar-equivalent effects for a middle-income household. The calculation indicates that one (one standard deviation) rain-free childhood Fourth of July increase in the likelihood of being Republican is equivalent to an increase of about $2,140 ($3,490) in household income. The effect of a rain-free (one standard deviation) Fourth of July as an adult is approximately $6,960 ($2,854).

Carrying out a similar exercise with respect to voting behavior, using the estimates in columns 5 and 8 of Table 11, shows that the effect of one (one standard deviation) rain-free Fourth of July in childhood increases turnout by the same amount as a 1.5 (2.4) percentile move higher up in the distribution, equivalent of approximately $1,990 ($3,250). Exploring columns 9 and 12, suggests that a rain-free (one standard deviation) Fourth of July in childhood increases the likelihood of voting for the Republicans by the same magnitude as a $1,810 ($2,960) increase in household income for a middle-income individual.

Finally, we compare our estimates to effects measured in a series of randomized field experiments. The benefit of this comparison is that, unlike above, we do not need to make strong assumptions about exogeneity. The downside is that previous work typically study short-term effects, barring a direct comparison of our persistence parameter δ with existing experimental estimates.[55]

[53] Equivalently, that income is uncorrelated with other determinants of the voting choice.

[54] Since the income distribution is skewed to the right, the true average percentile for the upper-middle bin is probably lower than what the exercise suggests. This leads to an underestimate of the effect of income on partisanship and an overestimate of the effect of Fourth of July in terms of income equivalence.

[55] Work in political science measures persistence of partisanship by regressing current partisanship on previous partisanship (see, for example, Sears and Funk, 1999). However, as the coefficients are difficult to interpret because of endogeneity problems, we do not compare our findings with this research. There is also a literature using randomized

In addition, the experiments have been conducted on adults, not on children. However, we believe that they provide the most relevant and credible comparisons from experimental data.

In a number of experiments, Gerber and Green (with co-authors) investigate how households receiving random "get-out-the-vote" treatments (canvassing, leaflets, or phone calls) change their voting behavior. These studies show that, on average, door-to-door canvassing produces an increase in turnout of 7.1 percentage points (de Rooij et al., 2009). Contrasting this with our long-term childhood effects on turnout (we do not find an effect on turnout for adults) of 0.78 percentage points, implies that one (one standard deviation) rain-free childhood Fourth of July is equivalent to approximately 1/9 (1/6) of the effect of door-to-door canvassing.

Finally, we compare our findings to experimental research in psychology. Carter et al. (2011) study the short-term priming effects of being exposed to patriotic symbols. Specifically, they expose subjects to the American flag when participants deliberate their voting intentions prior to the 2008 general elections and in a follow-up session a year into the Obama presidency. This work has implications for our understanding of Fourth of July to the extent that the celebration not only offers a socialization experience across the participants, but also exposes children and adults to a number of patriotic symbols, including the American flag. Carter et al. find that treated subjects were more likely to favor the Republicans up to 8 months after the exposure and 8 percentage points more likely to vote for the Republican presidential candidate (McCain). Contrasting this with our estimates of voting for the Republican presidential candidate, the effect of one (one standard deviation) rain-free Fourth of July in childhood corresponds to about 1/11 (1/7) of the short-term effect of being exposed to the American flag.

In all, the experience of Fourth of July induces effects that compare well with related field, laboratory, and survey evidence on the determinants of political preferences and voting behavior. To sum up: one rain-free childhood Fourth of July corresponds to estimates that are 1/70 in magnitude of having Republican parents or a 1.5-1.6 percentile move up in the income distribution for a middle-income household in our sample. Looking at experimental evidence, the long-term impact of Fourth of July produces effects equivalent of 1/9-1/11 in magnitude compared to random door-to-door canvassing or exposure to the American flag.

5 Concluding Remarks

To our knowledge, this is the first study to use a natural experiment approach to quantify how a recurrent social and cultural practice affects people's political preferences and behavior at different stages in life. We show that social and cultural practices influence people's political tastes and

experiments (Gerber et al., 2003) and regression discontinuity (Meredith, 2009) to investigate persistence in voter turnout. However, these papers estimate persistence over shorter time periods, making comparisons less meaningful.

their voting behavior. In particular, political views and behavior patterns derive from experience in early childhood and are highly persistent throughout life. The political shift we document as a result of Fourth of July celebrations primarily favors the Republican party: experiencing Fourth of July in childhood increases the likelihood that people identify with and vote for the Republican party as adults. Fourth of July also makes it more likely that adults temporarily see themselves as Republicans.

Three plausible mechanisms help interpret our findings. First, the highly persistent impact of celebrating Fourth of July as a child fits the notion that early-life experiences instill persistent beliefs and behavior by setting a prior that is reconfirmed over time either because of confirmatory bias or a need to maintain congruence. That political views, in fact, are reinforced over the life cycle agrees with the idea that the prior provided by Fourth of July perhaps induces people to listen more to peer groups with a particular political leaning, leading to stronger beliefs over time. The substantial depreciation experienced by adults supports these interpretations as the political prior is well-established by the time an individual reaches adulthood. Second, the shift in favor of the Republicans is consistent with the idea that there is a political congruence between the patriotism or the patriotic symbols promoted on Fourth of July and Republican beliefs. Third, the increase in voter turnout further suggests that Fourth of July transmits or fosters a civic duty to vote.

Our results open up a new set of questions. First, additional empirical work should examine whether and how other social and cultural practices shape political preferences and behavior. Second, replication studies using a similar method in other countries will be able to determine if there is something inherent in national day celebrations, and in nationalism more broadly, that shifts preferences to the right. Third, our results are difficult to reconcile with the standard rational model of voter behavior. More research is needed to understand how social interactions affect political preferences, and the implications for the theory of electoral competition in political economics. We believe that investigations of the psychological drivers of political preferences provide a fruitful avenue toward these goals.

References

AARP. 2006. "Patriotism Survey Among U.S. Adults Age 18 and Older." Surveys and Statistics. http://www.aarp.org/politics-society/government-elections/info-2006/patriotism_2006.html.

Adams, John. 1776. Letter from John Adams to Abigail Adams, 3 July 1776, "Had a Declaration...". In *Adams Family Papers: An Electronic Archive*. Boston: Massachusetts Historical Society.

Alesina, Alberto and Nicola Fuchs-Schündeln. 2007. "Goodbye Lenin (or Not?): The Effect of Communism on People." *American Economic Review* 97(4):1507–1528.

Alwin, Duane F. 1994. Aging, Personality, and Social Change: The Stability of Individual Differences Over the Adult Life Span. In *Life-span development and behavior*, ed. David L. Featherman, Richard M. Lerner and Marion Perlmutter. Lawrence Erlbaum Associates: Hillsdale pp. 135–185.

Appelbaum, Diana. 1989. *The Glorious Fourth: An American Holiday, An American History*. New York: Facts On File, Inc.

Ashenfelter, Orley and Kelley Stanley Jr. 1975. "Determinants of Participation in Presidential Elections." *Journal of Law and Economics* 18(3):695–733.

Bisin, Alberto and Thierry Verdier. 2000. "Beyond the Melting Pot: Cultural Transmission, Marriage, and the Evolution of Ethnic and Religious Traits." *Quarterly Journal of Economics* 115(3):955–988.

Bisin, Alberto and Thierry Verdier. 2001. "The Economics of Cultural Transmission and the Dynamics of Preferences." *Journal of Economic Theory* 97(2):298–319.

Black, Maureen M. and Kathleen Matula. 2000. *Essentials of Bayley Scales of Infant Development II Assessment*. New York: Wiley.

Carter, Travis J., Melissa J. Ferguson and Ran R. Hassin. 2011. "A Single Exposure to the American Flag Shifts Support Toward Republicanism up to 8 Months Later." *Psychological Science* 22(8):1011–1018.

Chwe, Michael Suk-Young. 2001. *Rational Ritual: Culture, Coordination, and Common Knowledge*. Princeton: Princeton University Press.

Clingingsmith, David, Asim Ijaz Khwaja and Michael Kremer. 2009. "Estimating the Impact of The Hajj: Religion and Tolerance in Islam's Global Gathering." *Quarterly Journal of Economics* 124(3):1133–1170.

Coate, Stephen and Michael Conlin. 2004. "A Group Rule-Utilitarian Approach to Voter Turnout: Theory and Evidence." *American Economic Review* 94(5):1476–1504.

de Rooij, Eline A., Donald P. Green and Alan S. Gerber. 2009. "Field Experiments on Political Behavior and Collective Action." *Annual Review of Political Science* 12(1):389–395.

Dee, Thomas S. 2004. "Are there Civic Returns to Education?" *Journal of Public Economics* 88(9-10):1697–1720.

DellaVigna, Stefano and Ethan Kaplan. 2007. "The Fox News Effect: Media Bias and Voting." *Quarterly Journal of Economics* 122(3):1187–1234.

Downs, Anthony. 1957. *An Economic Theory of Democracy*. New York: Harper and Row.

Durkheim, Émile. 1912. *The Elementary Forms of Religious Life*. New York: Free Press.

Easton, David and Jack Dennis. 1969. *Children in the Political System: Origins of Political Legitimacy*. New York: McGraw-Hill.

Etzioni, Amitai. 2000. "Toward a Theory of Public Ritual." *Sociological Theory* 18(1):44–59.

Feddersen, Timothy and Alvaro Sandroni. 2006. "A Theory of Participation in Elections." *American Economic Review* 96(4):1271–1282.

Ferguson, Melissa J. and Ran R. Hassin. 2007. "On the Automatic Association Between America and Aggression for News Watchers." *Personality and Social Psychology Bulletin* 33(12):1632–1647.

Gallup. 2002. "War on Terrorism/Mideast/Amtrack/Catholic Church." Roper Center for Public Opinion Research. `http://www.ropercenter.uconn.edu`.

Gerber, Alan S., Donald P. Green and Ron Shachar. 2003. "Voting May Be Habit-Forming: Evidence from a Randomized Field Experiment." *American Journal of Political Science* 47(3):540–550.

Gerber, Alan S., Gregory A. Huber and Ebonya Washington. 2010. "Party Affiliation, Partisanship, and Political Beliefs: A Field Experiment." *American Political Science Review* 104(4):720–744.

Giuliano, Paola and Antonio Spilimbergo. 2009. Growing Up in a Recession: Beliefs and the Macroeconomy. Working Paper 15321 NBER.

Glaeser, Edward L., Bruce I. Sacerdote and Jose A. Scheinkman. 2003. "The Social Multiplier." *Journal of the European Economic Association* 1(2-3):345–353.

Glassberg, David. 1987. "History and the Public: Legacies of the Progressive Era." *Journal of American History* 73(4):957–980.

Green, Donald P. and Alan S. Gerber. 2008. *Get Out The Vote: How to Increase Voter Turnout*. Second ed. Washington, D.C.: Brookings Institution Press.

Hassin, Ran R., Melissa J. Ferguson, Daniella Shidlovski and Tamar Gross. 2007. "Subliminal Exposure to National Flags Affects Political Thought and Behavior." *Proceedings of the National Academy of Sciences* 104(50):19757–19761.

Heckman, James J. 2007. "The Economics, Technology, and Neuroscience of Human Capability Formation." *Proceedings of the National Academy of Sciences* 104(33):13250–13255.

Heintze, James R. 2007. *The Fourth of July Encyclopedia*. Jefferson, North Carolina: McFarland.

Houston Chronicle. 2003. "Fourth of July Festitivities Were a Blast, But Inclement Weather Dampens Turnout for Red, Hot and Blue Bash." July, 10.

Hyman, Herbert H. 1959. *Political Socialization: A Study in the Psychology of Political Behavior*. Glencoe, Ill.: Free Press.

Jennings, Kent M. and Richard G. Niemi. 1974. *The Political Character of Adolescence: The Influence of Families and Schools*. Princeton: Princeton University Press.

Kaplan, Ethan and Sharun Mukand. 2011. The Persistence of Political Partisanship: Evidence from 9/11. mimeo.

Knudsen, Eric I., James J. Heckman, Judy L. Cameron and Jack P. Shonkoff. 2006. "Economic, Neurobiological, and Behavioral Perspectives on Building America's Future Workforce." *Proceedings of the National Academy of Sciences* 103(27):10155–10162.

Leege, David C., Kenneth D. Wald, Brian S. Krueger and Paul D. Mueller. 2002. *The Politics of Cultural Differences: Social Change and Voter Mobilization Strategies in the Post-New Deal Period*. Princeton: Princeton University Press.

Malmendier, Ulrike and Stefan Nagel. 2011. "Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?" *Quarterly Journal of Economics* 126(1):373–416.

Mathisen, James A. 1989. "Twenty Years After Bellah: Whatever Happened to American Civil Religion?" *Sociological Analysis* 50(2):129–146.

Meredith, Marc. 2009. "Persistence in Political Participation." *Quarterly Journal of Political Science* 4(3):186–208.

Milligan, Kevin, Enrico Moretti and Philip Oreopoulos. 2004. "Does Education Improve Citizenship? Evidence from the United States and the United Kingdom." *Journal of Public Economics* 88(9-10):1667–1695.

Mullainathan, Sendhil and Ebonya Washington. 2009. "Sticking with Your Vote: Cognitive Dissonance and Political Attitudes." *American Economic Journal: Applied Economics* 1(1):86–111.

Murphy, Kevin M. and Andrei Shleifer. 2004. "Persuasion in Politics." *American Economic Review* 94(2):435–439.

National Retail Federation. 2011. "NRF 2011 Independence Day Consumer Intentions and Actions Survey." National Retail Federation News Release. `www.bigresearch.com/samples/BIGinsight-july4th-2011-cookouts.pdf`.

Nemanic, Mary Lou. 2007. *One Day for Democracy: Independence Day and the Americanization of Iron Range Immigrants*. Athens: Ohio University Press.

Newman, Simon P. 1999. *Parades and the Politics of the Street: Festive Culture in the Early American Republic*. Philadelphia: University of Pennsylvania Press.

Parker, Christopher S. 2009. "Symbolic versus Blind Patriotism: Distinction without Difference?" *Political Research Quarterly* 63(1):97–114.

Persson, Torsten and Guido Tabellini. 2000. *Political Economics: Explaining Economic Policy*. Cambridge: MIT Press.

Rabin, Matthew and Joel L. Schrag. 1999. "First Impressions Matter: A Model of Confirmatory Bias." *Quarterly Journal of Economics* 114(1):37–82.

Rasmussen Reports. 2006. "Happy Fourth of July." Rasmussen Reports Telephone Survey. http://www.rasmussenreports.com/public_content/lifestyle/holidays.

Rasmussen Reports. 2009. "62 Percent Agree Fourth of July Is One of America's Most Important Holidays." Rasmussen Reports Telephone Survey. http://www.rasmussenreports.com/public_content/lifestyle/holidays.

Rasmussen Reports. 2010. "63 Percent Consider Fourth of July One of Nation's Most Important Holidays." Rasmussen Reports Telephone Survey. http://www.rasmussenreports.com/public_content/lifestyle/holidays.

Riker, William H. and Peter C. Ordeshook. 1968. "A Theory of the Calculus of Voting." *The American Political Science Review* 62(1):25–42.

Sears, David O. 1983. The Persistence of Early Political Predispositions: The Roles of Attitude Object and Life Stage. In *Review of Personality and Social Psychology Vol. 4*, ed. Ladd Wheeler and Phillip R. Shaver. Sage Publications pp. 79–116.

Sears, David O. and Carolyn L. Funk. 1999. "Evidence of the Long-Term Persistence of Adults' Political Predispositions." *The Journal of Politics* 61(1):1–28.

Smilor, Raymond W. 1980. "Creating a National Festival: The Campaign for a Safe and Sane Fourth, 1903-1916." *Journal of American Culture* 2(4):611–622.

Tabellini, Guido. 2008. "The Scope of Cooperation: Values and Incentives." *Quarterly Journal of Economics* 123(3):905–950.

Thomas, Michael C. and Charles C. Flippen. 1972. "American Civil Religion: An Empirical Study." *Social Forces* 51(2):218–225.

Travers, Len. 1997. *Celebrating the Fourth: Independence Day and the Rites of Nationalism in the Early Republic*. Amherst: University of Massachusetts Press.

Turner, Victor. 1985. *The Ritual Process: Structure and Anti-Structure*. Ithaca: Cornell University Press.

United States Congressional Budget Office. 2011. "Congressional Budget Office Historical Tables 1971-2010." Congressional Budget Office. http://www.cbo.gov/.

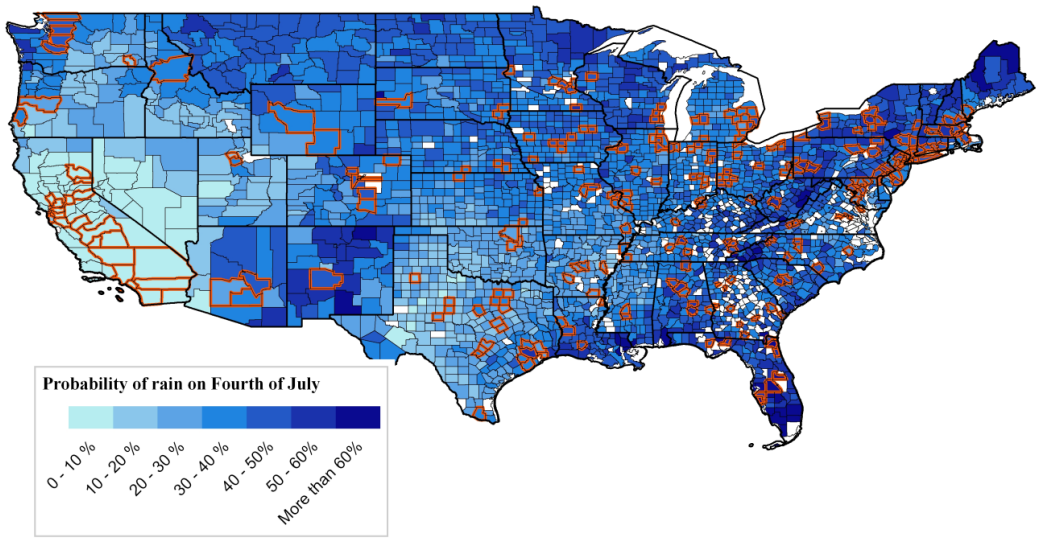
Waldstreicher, David. 1995. "Rites of Rebellion, Rites of Assent: Celebrations, Print Culture, and the Origins of American Nationalism." *Journal of American History* 82(1):37–61.

Washington, Ebonya L. 2008. "Female Socialization: How Daughters Affect Their Legislator Fathers' Voting on Women's Issues." *American Economic Review* 98(1):311–332.

Washington Times. 2004. "Downpour Breaks July Fourth Record: Rain Keeps Crowds Thin, Ends Some Festivities." July, 5.

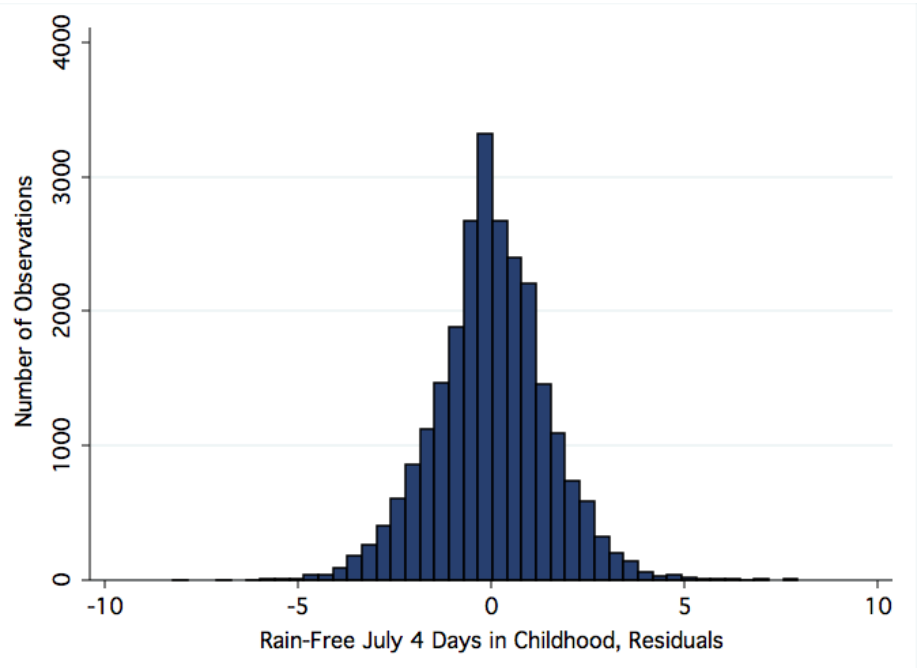
Wolfinger, Raymond E. and Steven J. Rosenstone. 1980. *Who Votes?* New Haven: Yale University Press.

Figure 1. Probability of rain on Fourth of July



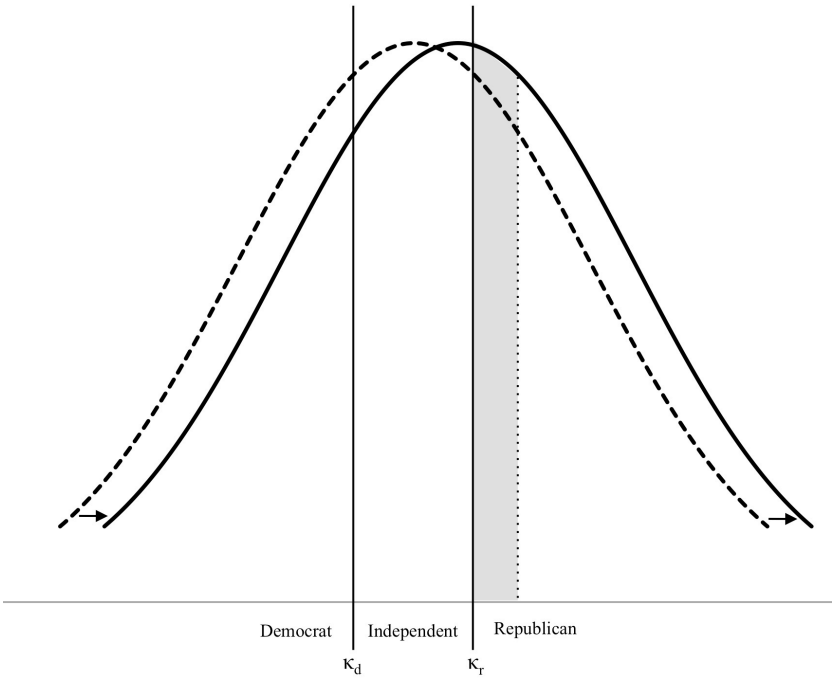
Note: The probability is the fraction of rainy Fourth of Julys in 1920-2008. ANES counties in red.

Figure 2. Within-county distribution of childhood days without rain on Fourth of July



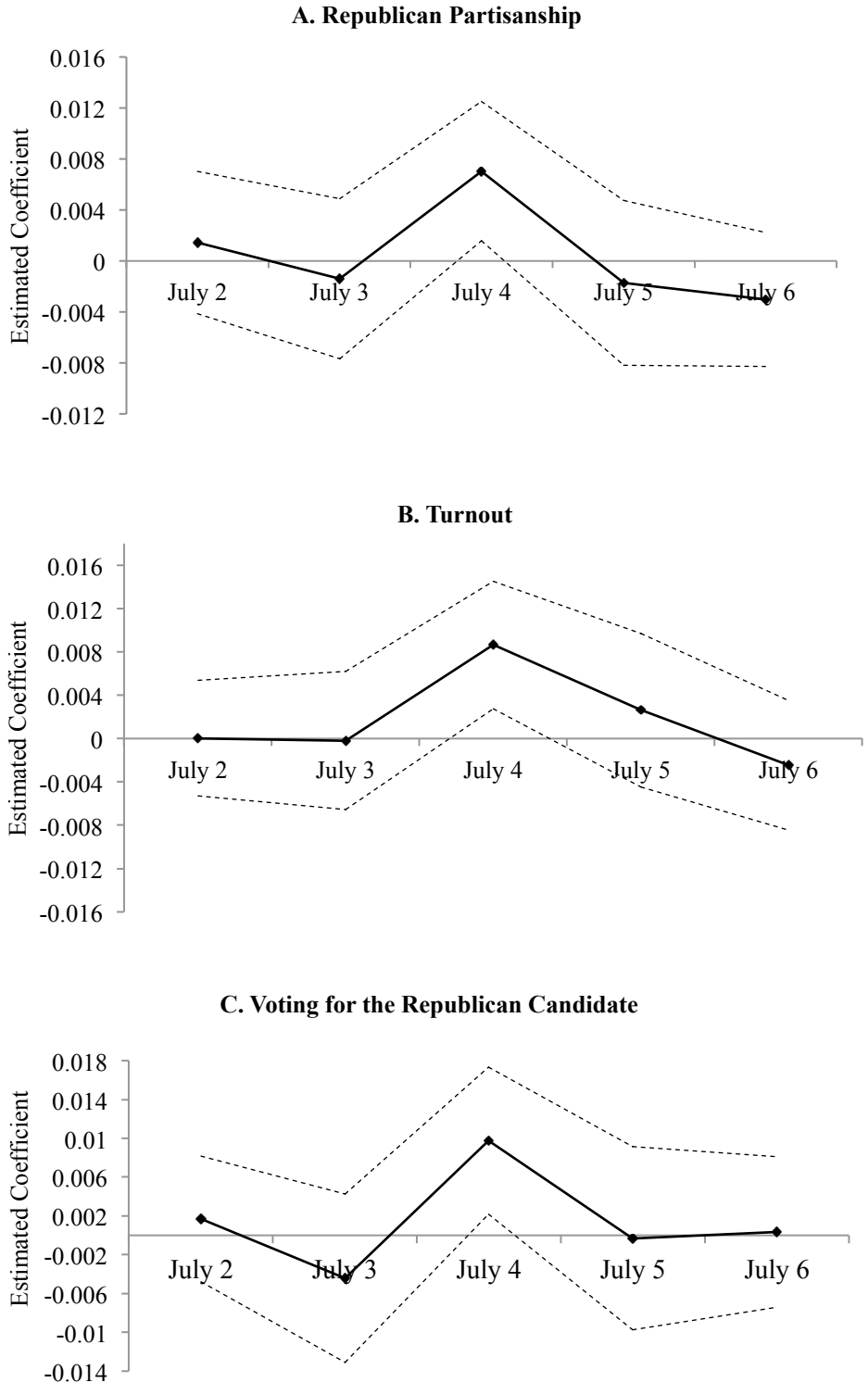
Note: The graph shows the histogram of residuals from a regression of Rain-Free July 4 days in childhood on county fixed effects, survey year fixed effects, cohort fixed effects, and state-specific time trends. This is the variation used in the main specification estimating the childhood effects of Fourth of July.

Figure 3. Partisanship and Underlying Political Preferences



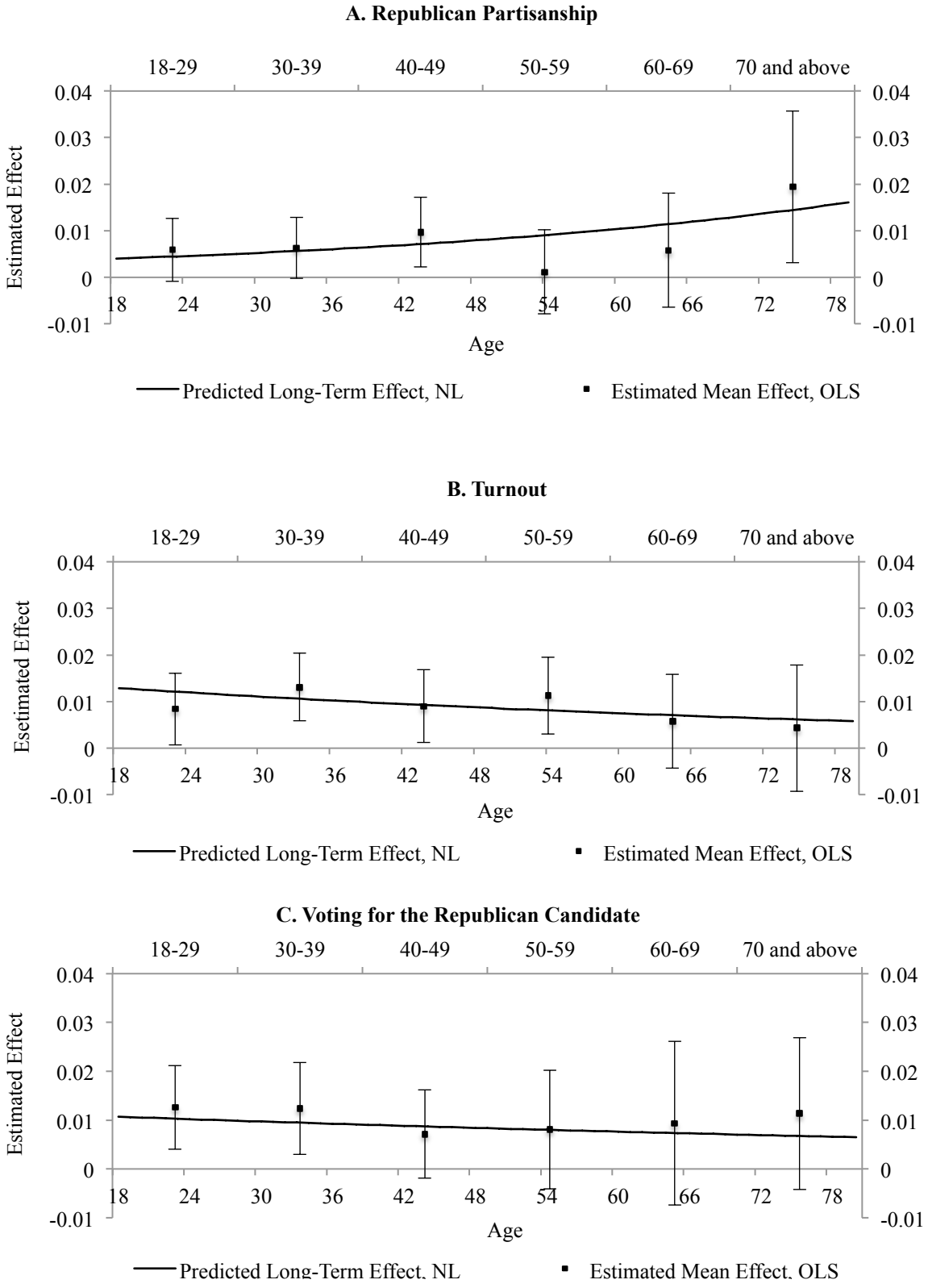
Note: The graph is a simple example with two hypothetical underlying distributions of political preferences on the left-right political spectrum, with two partisanship cutoffs corresponding to each political party. The right-shifted probability distribution function represents preferences in the presence of Fourth of July celebrations. The dashed distribution function corresponds to counterfactual political preferences in the absence of celebrations. The gray area is the positive effect of Fourth of July celebrations on the fraction of the population that identifies with the Republican Party.

Figure 4. Childhood Weather and Fourth of July: Long-term effects, λ_{child}



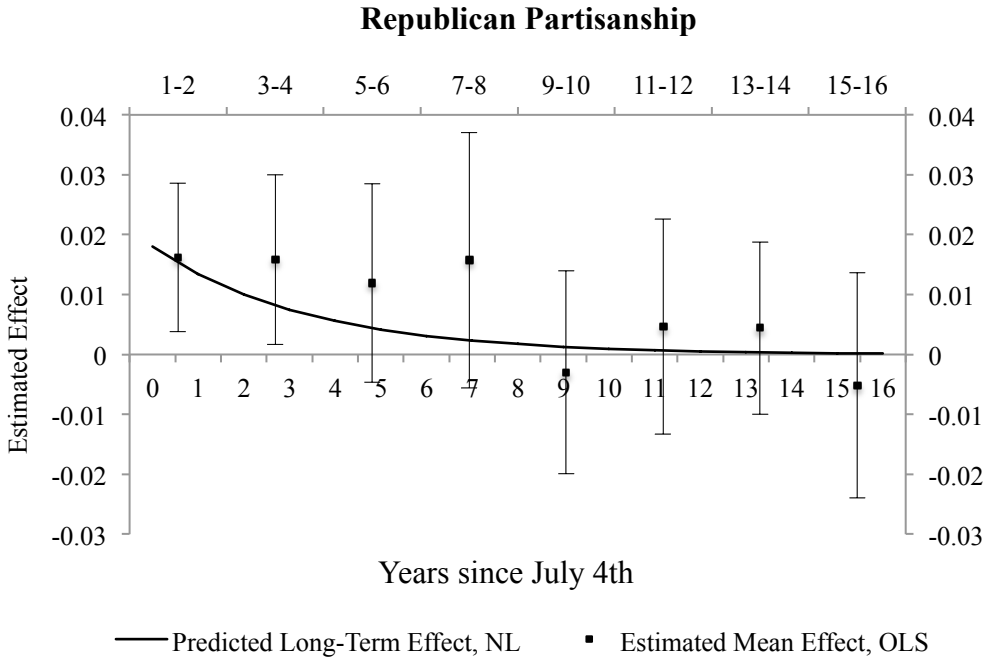
Note: Each graph plots the estimated coefficients and 95% confidence intervals of an additional rain-free day during childhood, for each day around Fourth of July.

Figure 5. Persistence of childhood Fourth of July. Predicted by the (θ_{child}, δ_{child}) estimates.



Note: The lower x-axis refers to the predicted long-term effect. The upper x-axis refers to the OLS estimates.

Figure 6. Persistence of adult Fourth of July. Predicted by (θ_{adult}, δ_{adult}) estimates.



Note: The lower x-axis refers to the predicted long-term effect. The upper x-axis refers to the OLS estimates.

Table 1. Summary Statistics

	Panel A: Childhood Weather Sample					Panel B: Adult Weather Sample				
	Obs	Mean	S.D.	Min	Max	Obs	Mean	S.D.	Min	Max
Weather										
Rain-free July 4, childhood	24926	9.10	2.90	0	15					
Rain-free July 4, age 0-3	24380	2.51	1.12	0	4					
Rain-free July 4, age 4-8	24926	3.08	1.30	0	5					
Rain-free July 4, age 9-13	24926	3.02	1.30	0	5					
Rain-free July 4, age 14-18	24926	2.99	1.32	0	5					
Rain-free July 4, adult						31464	0.624	0.485	0	1
Political Preferences, partisanship										
Republican	24622	0.362	0.481	0	1	31695	0.359	0.480	0	1
Independent	24622	0.130	0.336	0	1	31695	0.127	0.333	0	1
Democrat	24622	0.508	0.500	0	1	31695	0.513	0.500	0	1
Voting Behavior										
Turnout	23112	0.651	0.477	0	1	29848	0.652	0.476	0	1
Voted for the Republican Candidate	16815	0.251	0.434	0	1	21537	0.253	0.435	0	1
Voted for the Democratic Candidate	16815	0.269	0.443	0	1	21537	0.264	0.441	0	1
Political Preferences, policy										
Defense Spending	12242	0.668	0.471	0	1	15712	0.661	0.473	0	1
Government Health Insurance	10901	0.614	0.487	0	1	13941	0.610	0.488	0	1
Size of Government	12344	0.689	0.463	0	1	15395	0.681	0.466	0	1
Individual Covariates										
Race, African American	24628	0.121	0.327	0	1	31613	0.125	0.330	0	1
Race, Other Non-White	24628	0.100	0.301	0	1	31613	0.090	0.286	0	1
Gender, Female	24926	0.547	0.498	0	1	32076	0.549	0.498	0	1
Married	24874	0.616	0.486	0	1	32014	0.626	0.484	0	1
Income, Middle Tertile	23749	0.335	0.472	0	1	30866	0.331	0.470	0	1
Income, Top Tertile	23749	0.327	0.469	0	1	30866	0.341	0.474	0	1
Education, HS Degree With Some College	24747	0.252	0.434	0	1	31842	0.247	0.431	0	1
Education, College Degree	24747	0.207	0.405	0	1	31842	0.215	0.411	0	1
Age	24926	39.4	14.1	18	88	32076	39.7	14.0	18	88
Birth year	24926	1947.7	15.5	1920	1990	32076	1945.8	15.5	1920	1990

Rain-free July 4, childhood is the number of Fourth of Julys without rain during the respondent's childhood, defined as ages 4-18. Additional weather variables directly below measures the number for different intervals during childhood. *Rain-free July 4, adult* is a dummy variable indicating whether there was no rain recorded in the respondent's county on Fourth of July preceding the survey (i.e. same year). *Republican* is a dummy variable equal to one if the respondent thinks of himself/herself as a Republican, and zero otherwise. The variables *Independent* and *Democrat* similarly indicate whether the respondent thinks of himself/herself as an Independent or a Democrat, respectively. Turnout is a dummy variable indicating whether the respondent voted in the latest presidential election. *Voted for the Republican Candidate* is a dummy variable equal to one if the respondent voted for the Republican party in the latest presidential election, and zero otherwise. *Voted for the Democratic Candidate* is a dummy variable equal to one if the respondent voted for the Democratic party in the presidential election, and zero otherwise. *Defense Spending* is a dummy variable indicating whether the respondent is in favor of increasing defense spending, and zero otherwise. *Health Insurance* is a dummy variable indicating whether the respondent is in favor of government provided health insurance, and zero otherwise. *Size of Government* is a dummy variable indicating whether the respondent is in favor of increasing federal spending on government services in general, and zero otherwise. The survey data is from 25 cross-sectional American National Election Studies (ANES) conducted around presidential and mid-term elections between 1954-2008. Panel A has fewer observations than panel B because the sample is conditioned on the respondent living in the region of birth, as well as of missing rainfall data for early cohorts. The precipitation data covers 1920-2008 and comes from NOAA.

Table 2. Weather and Fourth of July Festivities

	Canceled Fourth of July Festivity				
Dependent Variable	Parades	Fireworks	Barbeques	Any Event	Any Event
	(1)	(2)	(3)	(4)	(5)
Rainy July 4	0.124***	0.0878**	0.0709***	0.107**	0.0998*
	(0.0396)	(0.0415)	(0.0240)	(0.0426)	(0.0585)
Rainy July 2					0.0495
					(0.0524)
Rainy July 3					-0.0355
					(0.0645)
Rainy July 5					0.0406
					(0.0598)
Rainy July 6					0.0132
					(0.0546)
Observations	940	940	940	940	940
R-squared	0.247	0.285	0.139	0.295	0.297
P-value on joint null hypothesis					0.762

All regressions include state fixed effects. *Rainy July 4* is the fraction of the counties in the state that experienced rain on July 4. An analogous definition is applied for the other days. The dependent variable is a dummy variable indicating whether at least one newspaper in the state report canceled Fourth of July festivities. All Types include parades, fireworks, and barbeques. The p-value corresponds to the F-test of the null hypothesis that Rainy July 2, 3, 5 and 6 are jointly zero. The data is at the state-year level and the sample period is 1990-2009. Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance level.

Table 3. Exogeneity Check

Dependent Variable	Republican	Turnout	Rain-free July 4, childhood	Rain-free July 4, adult
	(1)	(2)	(3)	(4)
Race, African American	-0.226***	0.039**	-0.021	0.010
	(0.018)	(0.016)	(0.061)	(0.012)
Race, other non-white	-0.101***	-0.093***	0.040	-0.005
	(0.018)	(0.012)	(0.051)	(0.012)
Gender, female	-0.033***	0.015**	0.011	0.003
	(0.007)	(0.007)	(0.023)	(0.004)
Married	0.038***	0.063***	-0.018	-0.005
	(0.007)	(0.008)	(0.028)	(0.007)
Income, middle tertile	0.009	0.086***	0.020	0.006
	(0.008)	(0.010)	(0.034)	(0.007)
Income, top tertile	0.066***	0.138***	0.055	0.012*
	(0.008)	(0.009)	(0.034)	(0.007)
Education, HS degree with some college	0.078***	0.167***	0.010	-0.001
	(0.010)	(0.009)	(0.029)	(0.006)
Education, college degree	0.118***	0.244***	0.035	0.000
	(0.011)	(0.013)	(0.034)	(0.007)
State time trends	Yes	Yes	Yes	Yes
Observations	23,021	21,634	23,283	29,633
R-squared	0.129	0.239	0.750	0.350
P-value on joint null hypothesis	<0.001	<0.001	0.248	0.841

All regressions include county, cohort, and survey year fixed effects. Rain-free July 4 is the number of Fourth of Julys without rain during the respondent's childhood (ages 4-18). *Turnout* is a dummy variable indicating whether the respondent voted in the latest national election. The outcome variable *Republican* is a dummy variable equal to one if the respondent thinks of himself/herself as a Republican, and zero otherwise. The p-value corresponds to the F-test of the null hypothesis that the race, gender, marriage status, income, and education variables are jointly zero. Regressions 1-3 uses panel A (childhood weather) and regression 4 uses panel B (adult weather). Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance level.

Table 4. Childhood Fourth of July: Long-Term Effects on Political Preferences, λ_{child}

Dependent Variable	Republican				Independent	Democrat
	(1)	(2)	(3)	(4)	(5)	(6)
Rain-free July 4, childhood	0.0061**	0.0061**	0.0057**	0.0066***	-0.0031	-0.0030
	(0.0030)	(0.0030)	(0.0028)	(0.0025)	(0.0021)	(0.0030)
Rain-free July 2, childhood				0.0011		
				(0.0031)		
Rain-free July 3, childhood				0.0009		
				(0.0037)		
Rain-free July 5, childhood				-0.0013		
				(0.0039)		
Rain-free July 6, childhood				-0.0030		
				(0.0026)		
Dependent variable mean	0.362	0.362	0.356	0.362	0.130	0.508
State time trends	No	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	No	Yes	No	No	No
Observations	24,622	24,622	23,021	24,622	24,622	24,622
R-squared	0.09	0.09	0.13	0.09	0.06	0.09
ANES Elections Sample	All	All	All	All	All	All
P-value on joint placebos				0.801		

All regressions include county, cohort, and survey-year fixed effects. Rain-free July 4 is the number of Fourth of Julys without rain during the respondent's childhood. The dependent variable Republican is a dummy variable equal to one if the respondent thinks of herself as a Republican, and zero otherwise. The dependent variables Independent and Democrat similarly indicate whether the respondent thinks of herself as an Independent or a Democrat, respectively. Individual covariates are the race, education, income, gender, and marriage status. The p-value corresponds to the F-test of the null hypothesis that Rain-free July 2, 3, 5 and 6 are jointly zero. The OLS estimates the average long-term effect. The average respondent age in the sample is 39. All regressions use panel A (childhood weather). Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance

Table 5. Childhood Fourth of July: Long-Term Effects on Voting Behavior, λ_{child}

Dependent Variable	Turnout			Voted for the Republican Candidate			Voted for the Democratic Candidate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Rain-free July 4, childhood	0.0088***	0.0078***	0.0084***	0.0085**	0.0071*	0.0098**	0.0004	0.0009	-0.0014
	(0.0025)	(0.0025)	(0.0031)	(0.0039)	(0.0037)	(0.0040)	(0.0033)	(0.0034)	(0.0039)
Rain-free July 2, childhood			-0.0001			0.0013			-0.0013
			(0.0026)			(0.0035)			(0.0040)
Rain-free July 3, childhood			-0.0000			-0.0040			0.0045
			(0.0027)			(0.0045)			(0.0035)
Rain-free July 5, childhood			0.0024			-0.0003			0.0028
			(0.0030)			(0.0047)			(0.0039)
Rain-free July 6, childhood			-0.0027			-0.0003			-0.0029
			(0.0029)			(0.0043)			(0.0045)
Dependent variable mean	0.735	0.735	0.735	0.347	0.347	0.347	0.371	0.372	0.371
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	Yes	No	No	Yes	No	No	Yes	No
Observations	12,919	12,765	12,919	12,175	12,038	12,175	12,175	12,038	12,175
R-squared	0.10	0.19	0.10	0.10	0.15	0.10	0.09	0.19	0.10
P-value on joint placebos			0.867			0.625			0.932

All regressions include county, cohort, age and survey-year fixed effects. *Rain-free July 4* is the number of Fourth of Julys without rain during the respondent's childhood (ages 4-18). *Turnout* is a dummy variable indicating whether the respondent voted in the latest presidential election. *Voted for the Republican Candidate* is a dummy variable equal to one if the respondent voted for the Republican party in the latest presidential election, and zero otherwise. *Voted for the Democratic Candidate* is a dummy variable equal to one if the respondent voted for the Democratic party in the presidential election, and zero otherwise. Individual covariates are race, education, income, gender, and marriage status. The OLS estimates the average long-term effect. The average respondent age in the sample is 39. All regressions use Presidential elections years in panel A (childhood weather). Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance level.

Table 6. Childhood Fourth of July: Persistence of Effects

Dependent Variable	Identification		Turnout		Voted for the Republican Candidate	
	(1)	(2)	(3)	(4)	(5)	(6)
Persistence, δ_{child}	1.046	1.025	0.996	0.985	1.007	0.989
	(0.0151)	(0.0152)	(0.00990)	(0.00961)	(0.0145)	(0.0166)
Initial Effect at age 18, θ_{child}	0.00147	0.00314	0.00941	0.0118	0.00847	0.0106
	(0.00136)	(0.00254)	(0.00327)	(0.00296)	(0.00504)	(0.00494)
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	Yes	No	Yes	No	Yes
Observations	24131	22595	12644	12492	11917	11782
ANES Elections Sample	All	All	Presidential	Presidential	Presidential	Presidential
p-value, H0: δ=0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
p-value, H0: δ=0 & θ=0	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
p-value, H0: δ=1	0.004	0.105	0.699	0.129	0.608	0.514

The coefficients are estimated using non-linear least squares [specification (7)]. All regressions include state fixed effects, state time trends, county rain probability control, and second order polynomials in birthyear, survey year, and age. The θ-coefficient is the initial effect at age 18 of an additional rain-free Fourth of July during childhood (ages 4-18). The δ-coefficient is the persistence parameter. When δ is equal to one, the effects are permanent through out life. When δ is zero, the effects have fully depreciated after one year. The rain probability control is the fraction of Fourth of Julys with rainfall in the county between 1920-2008. Individual covariates are race, education, income, gender, and marriage status. All regressions use panel A (childhood weather). Standard errors in parentheses, clustered at the state level.

Table 7. Childhood Fourth of July: Long-Term Effects from Treatment at Different Ages in Childhood, λ_{age}

	Political Preferences		Voting Behavior					
Dependent Variable	Republican		Turnout		Voted for Republican Candidate		Voted for Democratic Candidate	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rain-free July 4, age 0-3	-0.0003	-0.0014	-0.0009	-0.0033	-0.0037	-0.0046	0.0020	0.0007
	(0.0037)	(0.0036)	(0.0045)	(0.0042)	(0.0042)	(0.0039)	(0.0053)	(0.0055)
Rain-free July 4, age 4-8	0.0090**	0.0085**	0.0041	0.0029	0.0054	0.0049	-0.0012	-0.0014
	(0.0040)	(0.0039)	(0.0047)	(0.0048)	(0.0057)	(0.0055)	(0.0057)	(0.0058)
Rain-free July 4, age 9-13	0.0063*	0.0058	0.0130***	0.0136***	0.0098*	0.0084	0.0031	0.0051
	(0.0037)	(0.0039)	(0.0036)	(0.0036)	(0.0052)	(0.0050)	(0.0052)	(0.0053)
Rain-free July 4, age 14-18	0.0004	0.0005	0.0093**	0.0074*	0.0070	0.0056	0.0021	0.0016
	(0.0034)	(0.0033)	(0.0042)	(0.0042)	(0.0053)	(0.0051)	(0.0037)	(0.0037)
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	Yes	No	Yes	No	Yes	No	Yes
ANES Elections Sample	All	All	Presidential	Presidential	Presidential	Presidential	Presidential	Presidential
Observations	24,082	22,504	12,636	12,487	11,906	11,773	11,906	11,773
R-squared	0.09	0.13	0.11	0.19	0.10	0.19	0.10	0.15

All regressions include county, cohort, and survey-year fixed effects. Rain-free July 4 is the number of Fourth of Julys without rain during the respondent's childhood (for the specified years). Robust standard errors in parentheses, clustered at the state level. All regressions use panel A (childhood weather). *** 1% , ** 5% , * 10% significance level.

Table 8. Adult Fourth of July: Short-Term Effects on Political Preferences and Voting Behavior, θ_{adult}

	Partisanship					Voting Behavior		
Dependent Variable	Republican	Republican	Republican	Independent	Democrat	Turnout	Voted for Republican Candidate	Voted for Democratic Candidate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rain-free July 4, adult	0.0154**	0.0198***	0.0178**	-0.0088*	-0.0111	0.0057	0.0151	-0.0108
	(0.0068)	(0.0063)	(0.0070)	(0.0048)	(0.0076)	(0.0098)	(0.0110)	(0.0098)
Rain-free July 2, adult			0.0039					
			(0.0073)					
Rain-free July 3, adult			0.0028					
			(0.0076)					
Rain-free July 5, adult			0.0057					
			(0.0079)					
Rain-free July 6, adult			-0.0038					
			(0.0066)					
Dependent variable mean	0.359	0.354	0.354	0.354	0.354	0.741	0.354	0.371
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANES Elections Sample	All	All	All	All	All	Presidential	Presidential	Presidential
Observations	31,090	29,304	29,304	29,304	29,304	15,761	14,874	14,874
R-squared	0.09	0.13	0.13	0.07	0.12	0.18	0.19	0.14
P-value on joint placebos			0.867					

All regressions include county, cohort, and survey year fixed effects. Rain-free July 4 is a dummy variable indicating whether there was no rain recorded in the respondent's county on Fourth of July preceding the survey (same year). The dependent variable Republican is a dummy variable equal to one if the respondent thinks of herself as a Republican, and zero otherwise. The dependent variables Independent and Democrat similarly indicate whether the respondent thinks of herself as an Independent or a Democrat, respectively. The p-value corresponds to the F-test of the null hypothesis that Rain-free July 2, 3, 5 and 6 are jointly zero. Individual covariates are race, education, income, gender, marriage status. All regressions use panel B (adult weather). Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance

Table 9. Adult Fourth of July: Persistence of Effects

Dependent Variable	Republican Party Identification					
	(1)	(2)	(3)	(4)	(5)	(6)
Persistence, δ_{adult}	0.867	0.765	0.761	0.714	0.775	0.746
	(0.128)	(0.146)	(0.185)	(0.204)	(0.184)	(0.199)
Initial Effect, θ_{adult}	0.0178	0.0178	0.0178	0.0178	0.0178	0.0178
	(fixed)	(fixed)	(fixed)	(fixed)	(fixed)	(fixed)
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	Yes	No	Yes	No	Yes
Observations	24040	24040	20394	20394	17226	16466
Number of past years used for estimation	5	5	10	10	15	15
p-value, H0: δ=0	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
p-value, H0: δ=1	0.305	0.115	0.203	0.167	0.227	0.207

The coefficients are estimated using non-linear least squares. All regressions include state fixed effects, county rain probability control, and second order polynomials in birthyear, survey year, and age. The θ-coefficient is the initial (contemporaneous) effect of an additional rain-free Fourth of July, taken from Table 8. The δ-coefficient is the persistence parameter. When δ is equal to one, the effects are permanent through out life. When δ is zero, the effects fully depreciate after one year. The rain probability control is the fraction of Fourth of Julys with rainfall in the county between 1920-2008. Individual covariates are race, education, income, gender, and marriage status. All regressions use panel B (adult weather). Standard errors in parentheses, clustered at the state level.

Table 10. Childhood and Adult Fourth of July: Effects on Policy Preferences

	Long-Term Effects of Childhood Experience, λ_{child}			Short-Term Effects of Adult Experience, θ_{adult}		
Dependent Variable	**Defense Spending:** Should Increase	**Health Insurance:** Should Be Provided by the Government	**Size of Government:** Spending Should Increase	**Defense Spending:** Should Increase	**Health Insurance:** Should Be Provided by the Government	**Size of Government:** Spending Should Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Rain-free July 4, childhood	0.0055**	-0.0065**	0.0015			
	(0.0027)	(0.0030)	(0.0026)			
Rain-free July 4, adult				-0.0100	0.0087	0.0008
				(0.0106)	(0.0126)	(0.0087)
Dependent variable mean	0.670	0.617	0.693	0.662	0.611	0.684
State time trends	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,884	10,564	11,987	14,734	13,097	14,452
R-squared	0.15	0.12	0.13	0.15	0.12	0.14

All regressions include county, cohort, age and survey-year fixed effects. *Rain-free July 4, childhood* is the number of Fourth of Julys without rain during the respondent's childhood. *Rain-free July 4, adult* is a dummy variable indicating whether there was no rain recorded in the respondent's county on Fourth of July preceding the survey (same year). Individual covariates are race, education, income, gender, and marriage status. The average respondent age in the sample is 39. Regressions 1-3 use panel A (childhood weather) and regression 4-6 use panel B (adult weather). Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance

Table 11. Comparing the Estimates to Benchmarks

Dependent Variable	Republican				Turnout				Voted for Republican Candidate			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Rain-free July 4, childhood	0.0061				0.0078				0.0071			
	(0.0030)				(0.0025)				(0.0037)			
Rain-free July 4, adult		0.0198				0.0057				0.0151		
		(0.0063)				(0.0098)				(0.0110)		
Republican Parents			0.44				0.03				0.21	
			(0.02)				(0.02)				(0.02)	
0 to 16 Income Percentile				-0.10				-0.21				-0.19
				(0.02)				(0.01)				(0.01)
17 to 33 Income Percentile				-0.05				-0.10				-0.10
				(0.01)				(0.02)				(0.01)
68 to 95 Income Percentile				0.08				0.11				0.11
				(0.01)				(0.01)				(0.01)
96 to 100 Income Percentile				0.21				0.17				0.29
				(0.02)				(0.01)				(0.03)
State time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
ANES Elections Sample	All	All	All	All	Pres.	Pres.	Pres.	Pres.	Pres.	Pres.	Pres.	Pres.
Observations	24,622	29,304	6,337	21,779	12,765	15,761	4,525	11,986	11,741	14874	4,202	11,323
R-squared	0.09	0.13	0.30	0.02	0.19	0.18	0.17	0.06	0.19	0.19	0.20	0.06

All regressions include county, cohort, and survey-year fixed effects. Columns 1-2, 4-5, and 7-8 are reproduced from previous tables. *Republican Parents* is a dummy variable equal to one if the respondents reports that both the mother and the father is a republican, and zero otherwise. The income percentile variables are dummy variables indicating which percentile group the respondent belongs to. The excluded group in columns 4, 8, and 12 is the middle income group. The sample is panel A, except for the reproduced estimates in columns 2, 6 and 10 (panel B). Robust standard errors in parentheses, clustered at the state level.

Appendix Table A1. Adult Fourth of July: Short-Term Effects at Different Ages

Dependent Variable	Republican	Turnout	Voted for Republican Candidate
	(1)	(2)	(3)
Rain-free July 4, age 18-29 ($\theta_{18\text{-}29}$)	0.0345***	-0.0209	0.0044
	(0.0100)	(0.0141)	(0.0131)
Rain-free July 4, age 30-39 ($\theta_{30\text{-}39}$)	0.0263***	0.0338**	0.0478***
	(0.0093)	(0.0135)	(0.0143)
Rain-free July 4, age 40-49 ($\theta_{40\text{-}49}$)	0.0009	0.0368***	0.0230
	(0.0103)	(0.0107)	(0.0177)
Rain-free July 4, age 50-59 ($\theta_{50\text{-}59}$)	0.0145	0.0135	-0.0039
	(0.0153)	(0.0160)	(0.0198)
Rain-free July 4, age 60-69 ($\theta_{60\text{-}69}$)	-0.0079	-0.0373*	0.0071
	(0.0185)	(0.0205)	(0.0185)
Rain-free July 4, age 70 and above ($\theta_{70\text{-}T}$)	0.0511	-0.0091	-0.0266
	(0.0353)	(0.0248)	(0.0297)
State time trends	Yes	Yes	Yes
Individual Covariates	Yes	Yes	Yes
ANES Elections Sample	All	Presidential	Presidential
Observations	22,595	12,492	11,782
R-squared	0.13	0.19	0.20

All regressions include county, cohort, and survey-year fixed effects. *Rain-free July 4* is a dummy variable indicating whether there was no rain recorded in the respondent's county on Fourth of July preceding the survey (same year). All regressions use panel B (adult weather). Robust standard errors in parentheses, clustered at the state level. *** 1% , ** 5% , * 10% significance