

Voting lines, equal treatment, and early voting check-in times in Florida¹

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Abstract

Lines at the polls can foster unequal treatment of voters if some voters are compelled to wait longer than others, thus causing the attendant cost of voting to vary systematically across an electorate. In addition, long lines may influence future electoral participation. We leverage voter check-in times from Florida—involving 942,166 early in-person voters from the 2012 General Election and 1,687,217 from 2016—and highlight disproportionately long wait times incurred by minority voters. We find, however, fewer problems in 2016 compared to 2012. Florida early in-person voters who waited excessively in 2012 had a slightly lower probability—approximately one percent—of turning out to vote in 2016, *ceteris paribus*. Our results draw attention to the ongoing importance of the administrative features of elections that influence the cost of voting, and ultimately, whether voters in an election are treated equally.

Introduction

Modern democracies are characterized by regular and free elections, the legitimacy of which can suffer in the face of perceptions of unfairness and disparate treatment of groups of voters (Norris 2014). An election can fail to treat all voters equally if, for example, there are meaningful differences in vote tabulating technologies across the electorate (e.g., Kimball and Kropf 2008); if some groups of voters must contend with registration hurdles that others do not (e.g., Ansolabehere and Hersh 2014); if some voters face strict photo identification requirements and others no such requirements (e.g., Bentele and O'Brien 2013); and, if some voters have to travel much longer distances than others to cast their ballots (e.g., Dyck and Gimpel 2005). More generally, when the *cost of voting* in a given election varies significantly by voter group—where group membership could be based on race/ethnicity or party affiliation, for example—the principle of equal treatment of voters is at risk.

Here we consider how voting lines, an aspect of election administration, are related to equal treatment. The lines that develop outside a polling station reflect administrative decisions about resource allocation as well as the extent of voter turnout (Herron and Smith 2016). If lines adversely affect some voters more than others, then the cost of voting will vary across voters. Thus, if we seek to know whether a given election featured equal treatment of voters, we must assess the extent to which the voter groups who participated in it were subjected to long lines.

Voting lines are potential issues wherever voters cast their ballots *in-person*, as opposed to voting remotely via mail. The vast majority—over 75 percent in 2016 and approximately 66 percent in 2012—of voters in the United States who cast ballots in presidential elections do so in-person, either on an Election Day itself or during a corresponding early voting period whose duration depends on relevant local laws.¹

¹For the composition of the 2012 and 2016 electorates, see U.S. ELECTION ASSISTANCE COMMISSION (2013) and U.S. ELECTION ASSISTANCE COMMISSION (2017), respectively.

Our analysis considers two features of voting lines, by which we mean lines that form *in front of* polling stations as opposed to lines in which voters, already in the act of casting ballots, are forced to stand. First, waiting in line to vote constitutes a time tax (Mukherjee 2009). This tax can be negligible—for example, a voter waits a scant number of seconds prior to initiating her voting process—or imposing—some of the Florida voters we describe shortly waited several hours to vote in 2012. Associated with a voting line time tax are the distributional questions associated with all forms of taxation: is the time tax fair and, in particular, is the burden of this tax spread uniformly across voters or concentrated on selected groups?

Second, waiting in line is an experience that may have “downstream” electoral effects, as characterized by Pettigrew (2017). When an individual is compelled to pay a relatively high tax in order to participate in a social or political activity, a natural response might be to avoid the activity, or substitute for it, in the future. To make matters concrete, if a line in front of a particular restaurant is long, some individuals may substitute an alternative eatery for the restaurant in question, one without an imposing line, or even forego eating.² While it is not *a priori* clear that voting is substitutable in the way that selecting a restaurant might be, we should not dismiss outright the possibility that the effect of waiting in line to vote, which as we have already argued raises the cost of voting, might decrease the likelihood of voting in the future. Given the relatively low rate of voter participation in American presidential elections—approximately 58 percent in 2012 and 60 percent in 2016—any aspect of the voting experience that might have a depressive effect on turnout should be considered a matter worthy of study.³

²Alternatively, a line in front of a restaurant might be a quality signal, in which case the presence of a line might be an incentive to wait in it. The same could be said for voting, and here we ignore the possibility that lines form due to potential voters using the presence of lines as a means to gather information on whether voting is valuable.

³The national turnout rate for a general election depends on the way that the number of eligible voters in the country is calculated. The figures cited here are from the United States Election

These two features of voting lines—time tax and potential downstream participatory consequences—are conceptually distinct. The time tax for voting could be uniformly spread across voters, which might be normatively pleasing in the sense of not violating equal treatment of voters, and yet there could be a significant effect of waiting in line on future electoral participation. Or, the time tax could be concentrated on certain voters group, which most would argue violate equal treatment regardless of whether there are downstream consequences of waiting to vote. With this in mind, our empirical analysis of voting lines during early in-person voting in Florida is divided into two sections. First, we assess which voters are more likely to wait in line. Second, we consider whether individuals who wait excessively to vote are less likely to vote in a subsequent election.

In contrast to much of the literature on voting lines, which relies on surveys, we turn here to a relatively untapped source of electoral information, namely, voter check-in times collected by Florida counties that recorded check-ins from early voting sites in the 2012 and 2016 General Elections. The hundreds of thousands of check-in times which form the basis of our results are not subject to potential biases arising in self-reports of time spent in line. Moreover, we can associate a voter's check-in time with her race/ethnicity, party registration, and electoral participation, pieces of information available in Florida's statewide voter file. Our use of early voting check-in times complements the literature's reliance on survey results.

Regarding the time tax associated with waiting to vote, we find disproportionate concentration of this tax on minority voters. The situation was worse in Florida in 2012 than in 2016, and in general our collection of check-in times highlights fewer troubling issues in the latter. This is consistent with national, survey-based evidence on voting lines in the 2012 and 2016 General Elections.⁴ Whether the recent decrease in waiting times reflects progress in Florida election ad-

Project, available at <http://www.electproject.org/home> (last accessed December 11, 2017).

⁴For a national 2012 versus 2016 comparison, see <http://electionupdates.caltech.edu/2016/12/14/this-just-in-lines-at-the-polls-shorter->

ministration, substitution effects and voter sorting, or idiosyncrasies from either the 2012 or 2016 General Election is not clear. Two election-years of data are unlikely to be sufficient to gauge broad progress in a state as large and heterogeneous as Florida.

Regarding the effect of waiting to vote on future electoral participation, conditional on our strategy for identifying those Florida early voters who suffered long waits in 2012, we find small yet negative consequences regarding turnout in 2016. The consequences are not negligible insofar as long lines do appear to be associated with lower participation levels; they are, however, small, around one percent. This is consistent with Pettigrew (2017). We show as well that early voters in 2012 were less likely to vote early in 2016, *ceteris paribus*; in particular, early voters who voted early or late in a day of early voting in 2012 were particularly less likely to vote early in 2016.

The next section situates our study in the literature on voting lines and election administration. We then turn to early voting check-in times in Florida and explain what these times mean and how they can be interpreted. Our results, which leverage check-in times, are divided into two sections: first we describe the distribution of the voting time tax across our set of Florida voters, and second we analyze the downstream effects of the tax. We conclude with observations about congestion at the polls and equal treatment of voters.

Voting lines and equal treatment in American elections

Voting is a fundamental right. As the United States Supreme Court ruled in *Reynolds v. Sims* (1964), “[T]he right of suffrage can be denied by a debasement or dilution of the weight of a [in-2016-than-in-2012](#) (last accessed March 30, 2017), as well as http://www.richmond.com/opinion/their-opinion/guest-columnists/fortier-and-palmer-column-who-waits-the-longest-to-vote/article_81efabad-aa23-577b-83d1-0e524cf844ef.html (last accessed June 30, 2017).

citizen's vote just as effectively as by wholly prohibiting the free exercise of the franchise.”⁵ In assessing the costs that may debase or dilute voting, the high court has considered the fairness of an assortment of rules adopted by states, including rules that relate to redistricting, literacy tests, proof of citizenship, voter identification laws, and the purging of registered voters. In various cases, the Court has been asked to balance the interests of the state with the equal treatment of voters. Although there is ample evidence that long voting lines in Florida in the 2012 General Election disproportionately affected racial and ethnic minorities (Herron and Smith 2014), as of yet the Supreme Court has not been asked to rule on whether Section 2 of the Voting Rights Act applies to excessively long wait times at the polls, constituting “a denial or abridgement of the right of any citizen of the United States to vote on account of race or color” (52 U.S.C. §10301(a)).

Long voting lines have received considerable attention in the last several election cycles in the United States. “To me,” Cynthia Perez complained in March 2016 after seeing a long line wending its way around an early voting center in Maricopa County, Arizona, with those in line reporting standing in line for more than three hours before checking in to vote, “this is not what democracy is about.”⁶ Ahead of her state's 2016 presidential primary, election administrators in Maricopa County (over four million residents and one of the largest counties in the United States) had cut the number of Election Day polling places by roughly 70 percent, increasing the strain on early voting centers.⁷ Voters in a handful of states also experienced long lines in the 2016

⁵See <https://supreme.justia.com/cases/federal/us/377/533/case.html> (last accessed December 12, 2017) for the text of the decision.

⁶This quote is drawn from “Angry Arizona Voters Demand: Why Such Long Lines at Polling Sites?” *The New York Times*, March 24, 2016, available at <https://www.nytimes.com/2016/03/25/us/angry-arizona-voters-demand-why-such-long-lines-at-polling-sites.html> (last accessed December 15, 2017)

⁷According to the 2012-2016 American Community Survey, 5-Year Estimates, the population of Maricopa County is 4,088,549.

General Election, but their experiences were largely mild compared to what transpired four years prior in Florida.⁸ In 2011, the Florida state legislature curtailed the state's early voting period, which, as some observers had expected, resulted in long lines for many electors who tried to vote in person during the truncated early voting period in the 2012 General Election (Herron and Smith 2014). Following the election and the seemingly inevitable anger over long waits at the polls, then-United States President Barack Obama formed a Presidential Commission in early 2013 to address general election administrative issues in the United States. In doing so, he highlighted the plight of 102-year old Desiline Victor, a Haitian-American woman who on October 27, 2012, waited in line for nearly four hours at Florida's North Miami Public Library early voting center. Not surprisingly, Obama's Presidential Commission devoted some of its January, 2014, report to long lines, concluding that, "[A]s a general rule, no voter should have to wait more than half an hour in order to have an opportunity to vote" (p. 13, Bauer et al. 2014).⁹

⁸On various states with line issues in 2016, see "Why Long Voting Lines Could Have Long-Term Consequences," *The New York Times*, November 8, 2016, available at <https://www.nytimes.com/2016/11/09/upshot/why-long-voting-lines-today-could-have-long-term-consequences.html> (last accessed December 9, 2017). On Georgia in particular, see "Early voting lines are so long, people are fainting. That harms democracy," *The Guardian*, October 19, 2016, <https://www.theguardian.com/commentisfree/2016/oct/19/early-voting-lines-georgia> (last accessed December 9, 2017).

⁹The executive order creating this commission is available at <https://obamawhitehouse.archives.gov/the-press-office/2013/03/28/executive-order-establishment-presidential-commission-election-administr> (last accessed July 12, 2017).

Studying voting lines with surveys

These anecdotes above are striking and raise questions about voting lines in general—in particular, how long and which voters have to wait, how much variance there is across jurisdictions in waiting times, and what consequences lines have, if any, beyond the cost of standing in line. With few exceptions (e.g., Spencer and Markovits 2010; Herron and Smith 2016; Pettigrew 2017), much of what we know about wait times for voters is derived from survey data. Most notably, Stewart III (2013) and his coauthors have conducted post-election, Internet-based surveys in the United States following the last three general elections. These surveys query voters about their experiences at the polls, and the surveys include items on estimated wait times. Stewart III's *Survey of the Performance of American Elections* (SPAЕ), which surveys 200 individuals in each state and Washington, D.C., along with the Cooperative Congressional Election Study (CCES), have been used to gauge relative wait times across states as well as overall wait times for different sub-populations of voters. According to Stewart III, wait times across the United States vary considerably, but a state's average wait time tends to be consistent over time.

Surveys relying on self-reported wait times can serve as valuable barometers for gauging both individual-level and regional distributions of voting delays. For example, Floridians have for a decade consistently reported having to endure some of the longest wait times in the country. In the 2012 General Election, in-person voters in Florida reported on average waiting 39 minutes to cast a ballot, three times the national average (Stewart III 2013). Surveys like the SPAЕ can help identify when during the voting process wait times are most likely to occur. In the 2012 General Election, Stewart III documented that over three-fifths of early in-person voters nationwide who reported waiting in line to vote said their wait was primarily during the check-in stage.

Surveys are also helpful when trying to tease out the possibility of differential voting line time taxes across sub-populations of voters. Drawing on 2008 CCES data, Mukherjee (2009) finds minority voters were more likely, relative to White voters, to pay such a tax when queuing to vote. Kimball (2013), using the 2012 SPAЕ, reports that voters in urban areas faced longer lines

than rural voters, and Pettigrew (2016) estimates that typically non-white voting locations in the United States were associated with voter wait times approximately twice as long as those in white locations. Herron et al. (2017) use exit polls in Miami-Dade in 2014 to gauge the polling place experiences of voters leaving polling stations. In his study of the 2012 General Election, which builds on the 2008 General Election research design of Alvarez et al. (2009), Stewart III (2013) finds that a voter's race/ethnicity is an important "individual-level demographic" that explains disparate wait times. "African Americans waited an average of 23 minutes to vote," Stewart III found, "compared to only 12 minutes for Whites; Hispanics reported waiting 19 minutes, on average." Stewart III concludes that these differences in wait times could be "due to factors associated with where minority voters live, rather than with minority voters as individuals" (pp. 457-458).

There are several limitations with the use of survey results to estimate voter wait times at the polls. First, surveys by construction draw on voter self-reports. There are a variety of reasons that respondents might not recall accurately how long they waited in line before voting (e.g., Sackett et al. 2010), and social desirability may confound accurate reporting on turnout, leading to over-reporting (Ansolabehere and Hersh 2012). Second, surveys often do not distinguish among the various wait times that in-person voters can experience when parking, queuing up to check-in, filling out ballots, or processing completed ballots. Third, not all surveys have access to tens of thousands of respondents. Given variability across states and even local jurisdictions in election administration practices, national surveys may not be particularly well-suited for assessing variation in wait times across types of voters and polling places within a state.

An alternative to voter line surveys

In light of limitations with survey data, our approach to voting lines draws on an alternative source of information: observed check-in times of voters in Florida who cast their ballots at early in-person polling sites prior to the 2012 and 2016 General Elections. In 2016, more Florida voters—3.88 million—cast early in-person ballots than voters who mailed in their absentee ballots (2.76

million) or who voted in person at their local Election Day precincts (2.96 million) (Florida Department of State 2017). The prevalence of early in-person voting is not unique to Florida. Across the United States, early voting is increasingly popular; for analyses of early voting reforms and their consequences, see Neeley and Richardson (2001), Gronke and Galanes-Rosenbaum (2008), Gronke and Toffey (2008), Gronke (2012), and Burden et al. (2014).

Florida notwithstanding, there is good reason to focus on wait times during early in-person voting. Michael P. McDonald, on his Election Project website, estimates that over 23 million voters cast early in-person ballots in “advance” of the November 8, 2016, General Election, some 17 percent of the 137 million votes cast.¹⁰ If one were to be concerned that our focus on early voters in Florida limits our scope, these statistics imply that our results apply to millions of Americans.

Florida’s open records laws make the state an excellent laboratory for the study of election administration. For example, in their study of congestion at the polls in Florida in the 2012 General Election, Herron and Smith (2015) use precinct-level data detailing when the last voter in a precinct checked-in to vote in a study showing significant differences in the closing times of precincts within counties, contingent on a precinct’s racial and ethnic composition. Florida’s laws also provide a wealth of information not only about who votes, but when and how voters cast ballots. Drawing on publicly available voter demographic and vote history data in Florida, Shino and Smith (2016) demonstrate that voters who register to vote immediately prior to a registration deadline are more likely to turn out in that proximate General Election, but not in subsequent elections, and Amos, Smith and Ste. Claire (2017) find differences in individual-level turnout across political party and racial and ethnic categories among registered voters whose precincts were eliminated or relocated by local election administrators. Similarly, by linking multiple statewide voter files and individual-level early voting files, Herron and Smith (2014) demonstrate how reductions in the number of early voting days following the 2008 General Election were associated with a drop in early voting in 2012, especially among minority voters who had cast ballots on the final Sunday of early voting

¹⁰These numbers are drawn from the United States Election Project; see fn. 3.

in 2008, a day of early voting that was eliminated by the state legislature ahead of the 2012 election.

When it comes to direct election monitoring, however, Florida grants considerable privacy to voters. With the exception of those serving as candidate, political party, or ballot issue representatives, state law prohibits precinct observers from tracking voting processes inside a polling place when votes are actively being cast. This effectively precludes scholars who want to understand why lines form in front or inside Florida precincts from replicating observational studies of voter activities in the vein of Spencer and Markovits's (2010) study of California and Herron and Smith's (2016) research on New Hampshire.

Florida early voting check-in times

Election administration in the Florida—from registering voters, to determining precinct sizes, to staffing and locating polling places, and to setting early voting days and hours—is largely controlled at the county level within a framework established by the Florida state legislature. Our early voting check-in times are thus gleaned from Florida counties.¹¹

A Florida voter who wishes to cast his or her ballot early may vote at any early voting polling location in the county in which he or she is registered. This is distinct from in-person, Election Day voting, during which a registered Florida voter may vote only at his or her assigned precinct. This flexibility necessitates that a county track its early voters. Rather than relying on traditional, paper-based pollbooks to check-in these individuals, as is the case for Election Day in many Florida counties, the 67 county Supervisors of Elections in Florida use electronic pollbooks to check-in voters during the state's early voting period. These pollbooks are for the most part known as Electronic Voter iDentification machines, or EViDs for short. Although there is variance across

¹¹We made public records requests to individual Florida county Supervisors of Elections, and the data use in this paper is based on these requests. Most counties that we contacted were not able to provide us with early voter check-in times.

Florida counties in electronic pollbook implementation, for simplicity we refer to all electronic pollbooks as EViD machines.¹²

EViD machines allow county pollworkers to check-in and verify the registration statuses and identities of Floridians casting early, in-person ballots. The EViD system is designed to reduce the time it takes to process early voters, and it fosters synchronization across a county's early voting centers (important because, as just noted, early voters in Florida can choose where to cast their ballots) as well as with the Florida statewide voter database. For our purposes, EViD machines record the check-in times for all early voters, and this provides us with timestamps that specify when a voter began his or her voting process. EViD timestamps are recorded to the minute, and using these timestamps we can, for example, identify early voters who had not checked-in when polls closed at 7:00pm on a given day of early voting but nonetheless cast ballots. Per Florida state law, any elector in line at 7:00pm is allowed to cast a ballot.¹³

We have EViD check-in times from six Florida counties, Alachua, Broward, Hillsborough, Miami-Dade, Orange, and Palm Beach, and Table 1 lists corresponding numbers of EViD timestamps. In the 2012 General Election, there were 2,409,097 total early ballots cast in Florida, and in 2016, 3,876,753 early ballots.¹⁴ Our EViD data thus cover approximately 39 percent and 44

¹²For example, Sarasota County uses a different electronic voting system for its early voters (phone call with Cathy Fowler, office of the Sarasota Supervisor of Elections, on March 31, 2017).

¹³See "The 2017 Florida Statutes," Title IX ELECTORS AND ELECTIONS, Chapter 100, Section 100.011, available at http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0100-0199/0100/Sections/0100.011.html (last accessed December 15, 2017).

¹⁴2012 General Election turnout statistics are located at <http://dos.myflorida.com/media/693340/2012ballotscast.pdf> (last accessed December 10, 2017), and comparable 2016 General Election statistics at <http://dos.myflorida.com/media/697842/2016-ge-summaries-ballots-by-type-activity.pdf> (last accessed December

percent of total ballots cast in Florida in the 2012 and 2016 General Elections, respectively.¹⁵

Table 1: EVID check-ins by county, 2012 and 2016 General Elections

	2012	2016
Alachua	39,269	51,097
Broward	248,550	422,806
Hillsborough	166,877	242,127
Miami-Dade	235,724	475,826
Orange	127,246	255,101
Palm Beach	124,500	240,260
Total	942,166	1,687,217

EViD timestamps, one per early voter, are not subject to potential self-reporting biases and hence are presumably more accurate than surveys of voter times or even within-polling place observations of when voters checked-in. Moreover, EViD timestamps as associated with official Florida voter identification numbers, which we can link to the nearly 14 million individual voter registration records in Florida’s statewide voter file. To this end, we merge our EViD timestamps with statewide voter files that cover the 2012 and 2016 General Elections.¹⁶

In 2012, all 67 of Florida’s counties offered between six and 12 daily hours of early voting over an eight-day period (Saturday through Saturday) that ended immediately prior to the General Election, November 6, 2012. In 2016, after long-lines in 2012 had apparently convinced the state

10, 2017).

¹⁵The numbers in Table 1 do not include 115 EViD check-in times (28 from 2012 and 87 from 2016) that are listed as midnight. We are suspicious that these times are not accurate and hence drop them. Given the total number of EViD votes cast, dropping 115 cases is negligible.

¹⁶Per Table 1, we recorded 942,166 early voters across our six counties in 2012 and 1,687,217 early voters in 2016. Of those 2012 early voters, 40,455 could not be matched to the registration records we have from the January 2014 statewide Florida voter extract file. Of the 2016 early voters, 969 could not be matched to the registration records we have from the January 2016 statewide Florida voter extract file. In any analysis that uses demographic or partisan information about the voters, we drop those voters who could not be matched to registration records.

legislature to grant counties more flexibility in offering early voting opportunities, counties were permitted to offer up to 12 hours of early voting per day, spread over 14 days, ending the final Sunday before the November 8, 2016, General Election. Counties were permitted to offer a maximum of 168 total hours of early voting.¹⁷

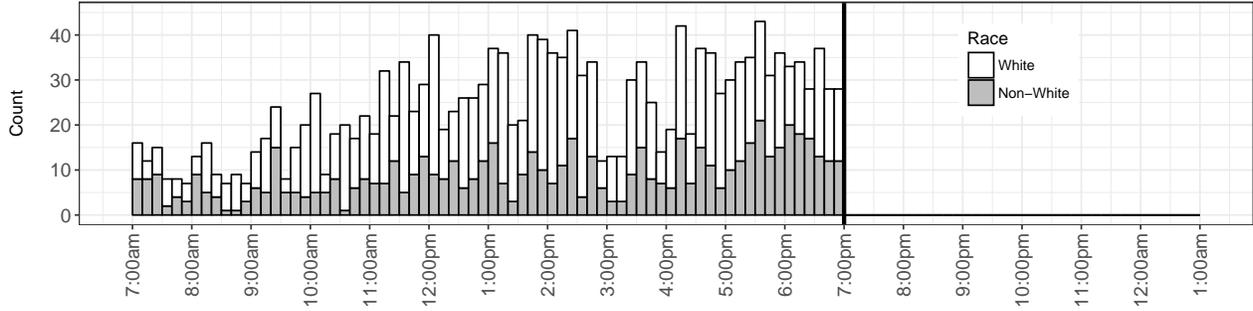
Figure 1 displays the distribution of EViD check-in times on the last Saturday (November 3) of the 2012 General Election early voting period in two different polling locations in Florida, one at the Fred B. Karl County Center in Hillsborough County and the other at the West Kendall Regional Library in Miami-Dade County. The histograms in this figure describe in ten minute blocks the number of voters who checked into these two polling stations. The counts begin with the first voter who checked-in just as polls opened at 7:00am, and they end with the last voter who checked-in.

Several features of Figure 1 are notable. First, both panels in the figure contain vertical black lines at 7:00pm. This is the time beyond which additional voters were not allowed to join a (possibly existing) voting line. In the Hillsborough County location (Figure 1a), no check-ins occurred after 7:00pm, and from this it follows that, at 7:00pm, there was no voting line. In contrast, the Miami-Dade location (Figure 1b) had many post-7:00pm check-ins, the last one of which occurred around 1:00am on Sunday, November 4. We thus know that the last-voting voter at West Kendall Regional Library waited at least almost six hours to vote.

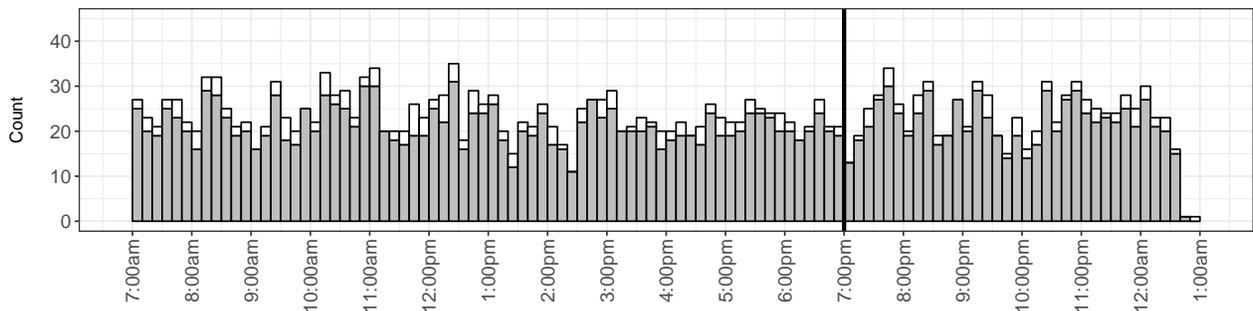
Figure 1 incorporates information on voter self-reported race/ethnicity, and corresponding details are depicted via bar shading. Early voters at the Fred B. Karl County Center were primarily white, although there were periods on November 3 when the fraction of non-white votes was disproportionately high, e.g., toward the end of the day. At the West Kendall Regional Library, though, the vast majority of early voters were non-white. The fraction of non-white voters appears plausibly consistent across November 3.

¹⁷See Florida Governor Rick Scott's statement, issued in the aftermath of the 2012 General Election, available at <http://www.flgov.com/2013/01/17/governor-rick-scott-statement-on-election-reforms/> (last accessed March 31, 2017).

Figure 1: Early voting check-in times on Saturday, November 3, 2012, in two Florida locations



(a) Fred B. Karl County Center, Hillsborough County



(b) West Kendall Regional Library, Miami-Dade County

Lastly, and very roughly speaking, we observe a flatter or more-uniform distribution of check-in times at Karl County Center than in West Kendall Library. We will draw on this fact later, when we try to determine which early voters in our six counties waited in line, and here we provide some intuition. As illustrated in Figure 1, it appears that early voting locations in Florida that shut down very late had flatter distributions of check-in times. We suspect that this is evidence of persistent lines. In contrast, the non-uniformity of check-in times that we observe in Figure 1a is consistent with more of an ebb and flow of early voters. We know that there was not a line to vote at Karl County Center at 7:00pm on Saturday, November 3, this despite the fact that, per check-in times, the Center was regularly processing voters.

Figure 1 highlights the value of EViD check-in times as well as their limitations; check-ins are not linked to arrivals. All data sources have advantages and disadvantages, and we will draw on

the former and attempt to work with the latter as we turn to results.

Results

We present results in two sections. First, we describe patterns in check-in times across the 2012 and 2016 General Elections with particular attention to race/ethnicity and partisanship. Second we consider the consequences of extensive early voting wait times.

Who waits?

Our analysis of who waits to vote turns in large part on check-in times that occurred *after* 7:00pm on a day of early voting. Any voter with such a late check-in must have waited to vote.

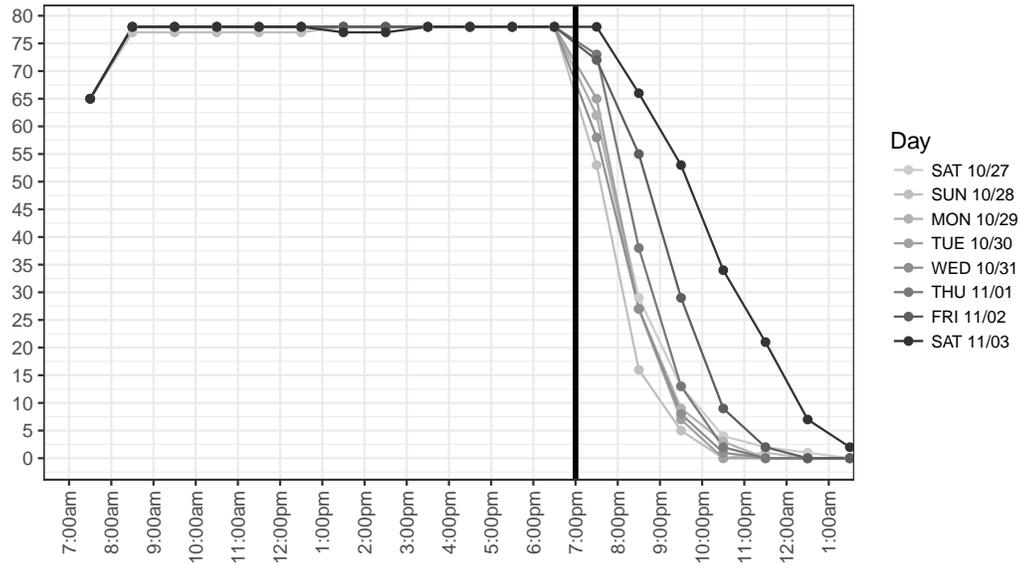
Early voting in 2012

Across our six Florida counties of interest, there were 78 early voting stations in 2012. These serviced a total of 942,166 voters in the eight day long, 2012 early voting period.¹⁸

Figure 2 describes by day of early voting and by hourly window the number of locations across our six counties that actively served voters. All locations served early voters virtually the entire day, and this is evident in the flat line, for the most part pegged a bit under 80 prior to 7:00pm, at the top of the figure; the sole exception occurred at the earliest time of the day, during which a few early voting stations did not have any active voters.

¹⁸This ignores the small number of EViD check-in times that look suspicious; see fn. 15. In addition, locations where two or fewer individuals recorded votes were dropped from our analysis. The EViD data from Orange County and Palm Beach County in 2012 and 2016, from Miami-Dade County in 2016, and from Broward County in 2016 was not accompanied with voting locations for each early voter. To determine the location at which these voters cast their ballots, we match their voter IDs to a masterfile in Florida that records the location of every vote.

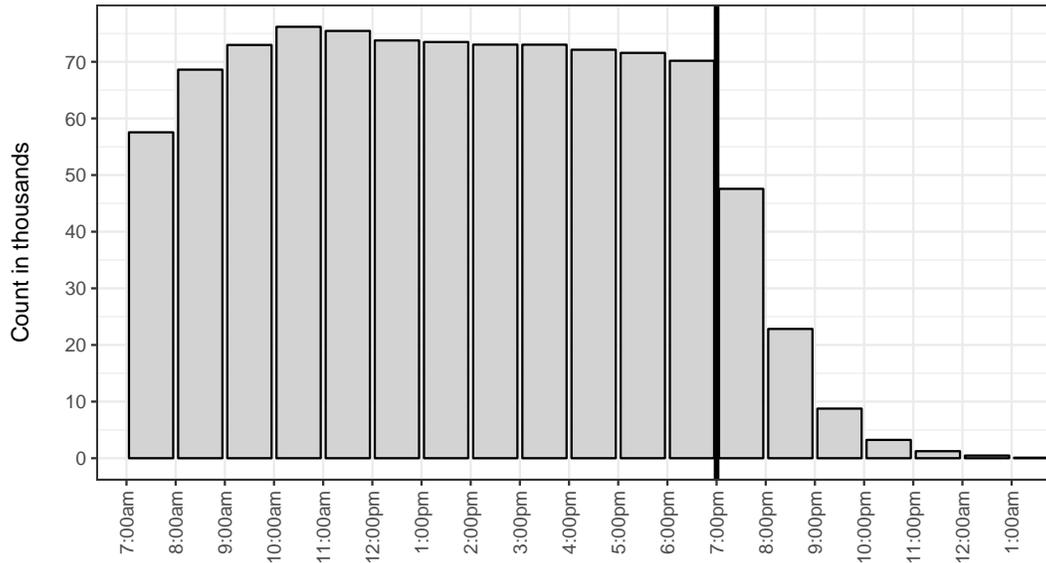
Figure 2: Number of locations where early votes were cast, 2012 General Election



After 7:00pm, however, Figure 2 shows that check-in uniformity across locations quickly changed. On initial days within Florida’s eight-day long early voting period, there was a steep drop in active locations starting at 7:00pm; note the vertical black line at this time. Even with this drop, however, there were still at least five open locations at 9:00pm on every day of early voting. Then, on the last two days of early voting, November 2 and 3, many early voting locations were open well beyond 7:00pm. On the final Saturday of early voting, over 30 locations were still open at 9:00pm, and a few locations continued processing voters through midnight.

Figure 3 displays the total number of voters who voted early by the hour of the day at which they checked-in. Prior to 7:00pm, EViD check-ins were distributed fairly uniformly across the day with a small peak before noon. From 7:00am to 7:00pm, our aggregated six counties consistently served approximately 70,000 Florida early voters per hour. Then, after 7:00pm, at which point new voters could not join existing voting lines, the number of voters served per hour dropped drastically—albeit but not entirely. A total of 83,250 (8.8%) early voters in 2012 across the six counties cast ballots after 7:00pm. These represent individuals who were in line at the time the

Figure 3: Distribution of check-in times among early voters by hour, 2012 General Election

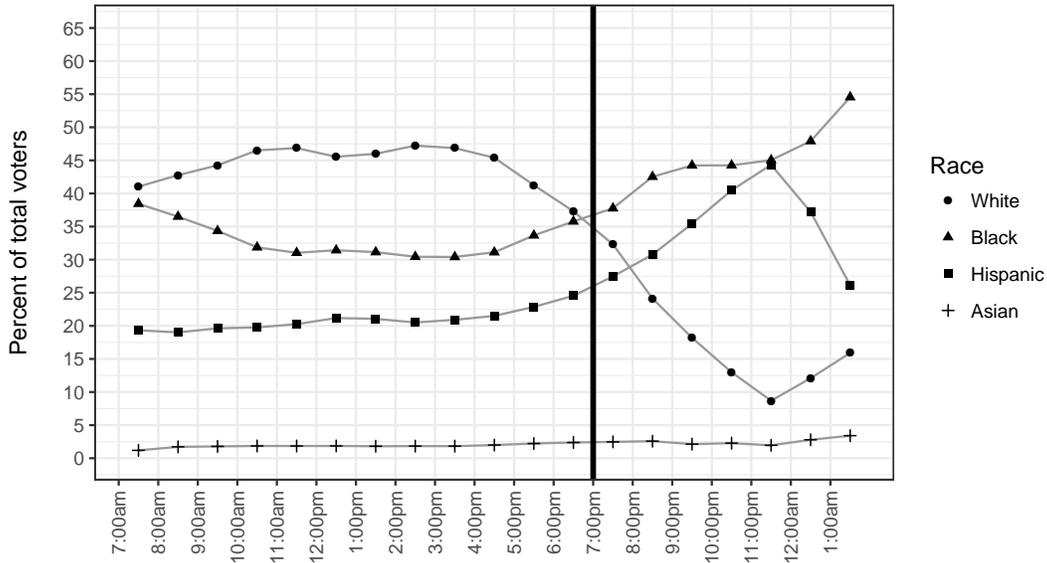


polls closed and were allowed to continue to wait to vote. We know that all of these voters had to wait in this way although we do not know precisely how long each waited. Of this group, 36,120 voted after 8:00pm. These voters waited at least one hour to vote, and 13,567 voters, who checked-in after 9:00pm, must have waited at least two hours to vote.

Aggregating across locations, Figure 4 describes the composition of the 2012 early voting pool by race/ethnicity and by hour of check-in. For most of the day, whites were the majority racial group, followed by blacks, Hispanics, and Asians. This ranking is similar to, but does not mirror, Florida’s registered voter pool. In the December 2012 Florida voter file, which lists 12,580,602 individuals, approximately 66.4 percent are white, 13.9 percent Hispanic, 13.6 percent black, and 1.63 percent Asian. As in years prior, blacks in Florida in 2012 were disproportionate users of the state’s early voting period (Herron and Smith 2012).

What is striking in Figure 4, however, is the racial/ethnic composition of the early voting pool immediately before and then after 7:00pm. Simply put, the pool becomes rapidly non-white starting around 7:00pm; by the 8:00pm-9:00pm window, the pool is less than 25 percent white.

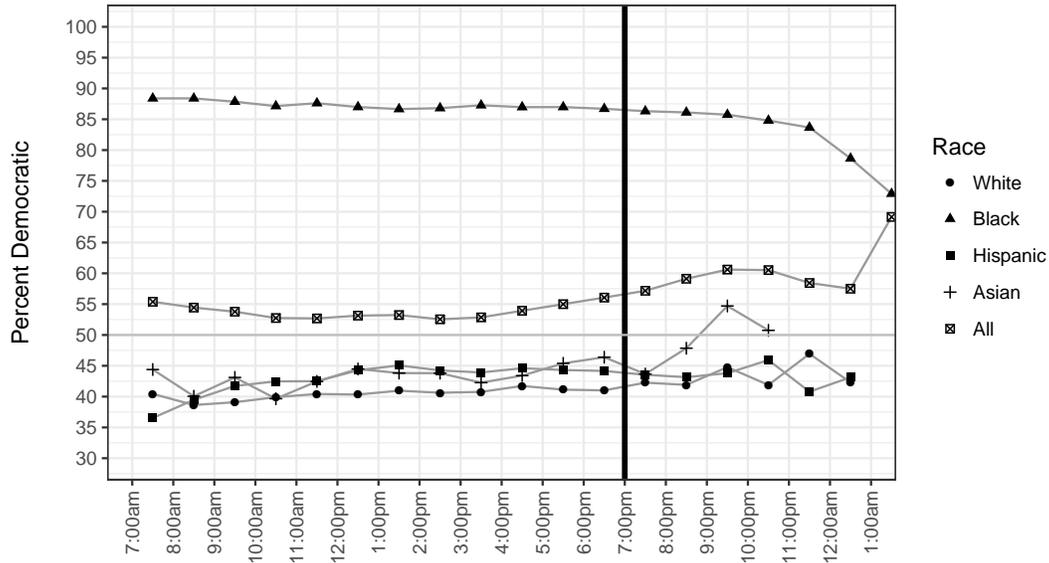
Figure 4: Racial/Ethnic composition of early voters by hour, 2012 General Election



The party registration of the early voting pool varies slightly with time although not nearly as starkly as its racial/ethnic composition. This is illustrated in Figure 5, which describes by hour the partisan breakdown of all early voters in our six counties as well as the party breakdown of the four aforementioned racial/ethnic groups. While Democrats made up 54% of all those who voted early in our set of Florida counties, we can see from the black line in the figure that this percentage varied by hour of the day. Notably, Democrats composed a greater share of the voters in both the early hours of voting and the hours after 7:00pm. Hence, Democrats were disproportionately affected by voting lines that forced voters to cast their ballots after 7:00pm.

If we consider the breakdown of party registration by race/ethnicity, as in Figure 5, we can see how this effect might largely be due to the aforementioned racial/ethnic patterns of voting. For example, black early voters in Florida were almost entirely Democratic, regardless of when they checked-in to vote. Similarly, the party registration of Hispanic voters—the least Democratic group in the six counties—remained relatively constant throughout the day. However we do see a slight trend for white and Asian early voters, who became increasingly likely to be registered

Figure 5: Partisan composition of early voters by hour and by race, 2012 General Election



Democratic as time progressed.

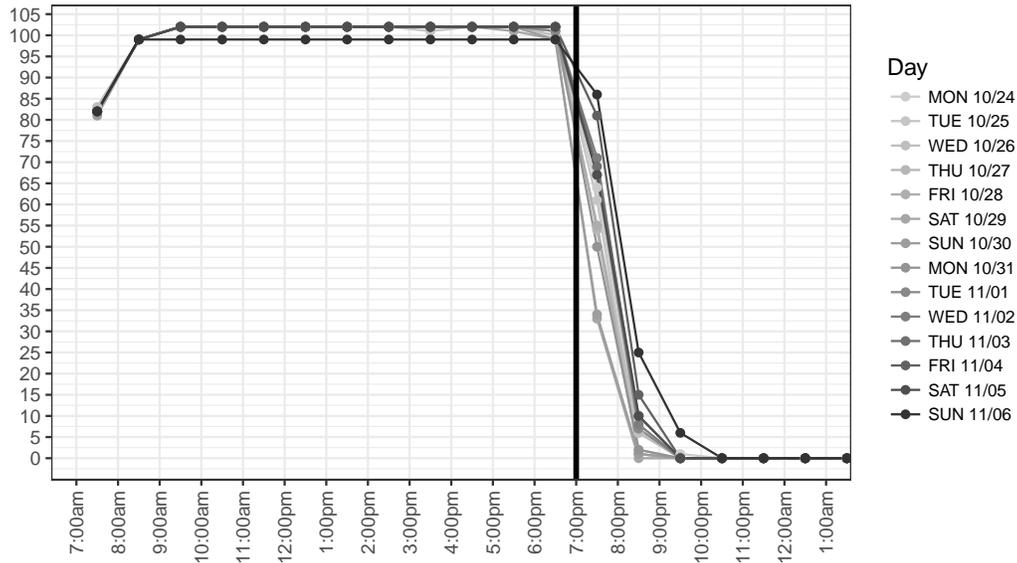
Early voting in 2016

We now turn to early voting in the 2016 General Election. By the time this election had occurred, Florida had increased its number of early voting days from eight to 14, ostensibly in an effort to reduce voting location congestion. Was this change effective? Figure 6 is analogous to the earlier figure that described active early voting locations. Our six counties had 104 early voting stations in place for the 2016 General Election.

The most important aspect of Figure 6 is the pictured dropoff in voter check-ins that occurred after 7:00pm. There were indeed check-ins that took place after this time but not nearly as many as in 2012. On the busiest day in 2012, more than half of the polling locations were open past 9:00pm and more than five were open past midnight. On the busiest day in 2016, only six locations were open past 9:00pm and not one early voter cast a ballot after 10:00pm.

In the introduction, we commented on improvements in voter wait times that others, using

Figure 6: Number of locations where early votes were cast, 2016 General Election



surveys, have found in 2016 compared to 2012, and Figure 6 is consistent with findings in the 2012 (Stewart 2013) and 2016 (Stewart 2017) versions of the SPAE. See Table 2. Early voting in 2016—at least in the six Florida counties—appears to represent an improvement over 2012 in terms of reducing congestion, which is presumably tied not only to the expanded number of sites but also to the number of days and hours of allowable early voting.¹⁹

Late voting in 2012 versus 2016

Figure 7 provides a race/ethnicity-based perspective on the 2012 versus 2016 comparison for our six counties. For three key racial/ethnic groups in Florida—black, Hispanic, and white—the figure reveals the total number of check-ins by time, aggregated across all days in the 2012 and

¹⁹We use the verb “appears” here because of voting-level sorting that may affect the types of individuals in Florida who cast their ballots prior to a given Election Day. When the Florida state legislature changed the state’s early voting period between 2012 and 2016, voters may have altered their most preferred voting times.

Table 2: Wait times of Florida respondents in the SPAE, 2012 and 2016 General Elections

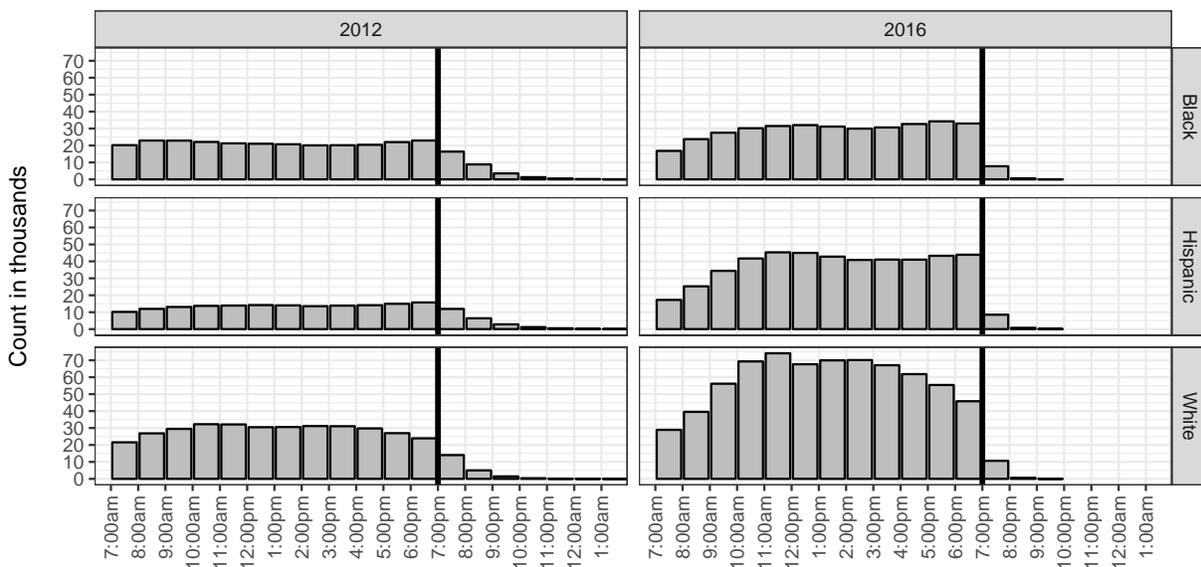
	2012	2016
Not at all	23	49
Fewer than 10 minutes	21	35
10 - 30 minutes	35	20
31 minutes - 1 hour	24	4
More than 1 hour	28	1
I don't know	1	1

Note: ignores individuals with missing responses to the SPAE wait time question, which was "Approximately, how long did you have to wait in line to vote?"

2016 early voting periods.

Figure 7 shows clearly that, not only did more voters check-in for early voting in 2016 compared to 2012, but fewer voters voted past 7:00pm. This is the case for black, Hispanic, and white voters. Moreover, non-white early voters in Florida had disproportionately late check-ins in 2012. We already have seen evidence of this, but Figure 7 shows as well how this problem did not appear in 2016. There were slightly more non-whites with late check-ins in 2016, but the magnitude of the white versus non-white gap shrunk between the two years.

Figure 7: Distribution of voter check-ins, 2012 General Election versus 2016 General Election



Even though 2016 attracted far more early voters than 2012, the changes made to the early voting period appears to have reduced the congestion outside of the polls. The increased number of days and hours may have helped, as these six counties still served roughly the same number of early voters per day in 2016 (approximately 120,516) as they did in 2012 (approximately 117,771).

Effects of waiting to vote

We now consider the effects on future electoral political participation of waiting in line to vote. In particular, we focus here on the consequences of waiting in an early voting line in the 2012 General Election on turnout in the 2016 General Election.

We have already noted that the individual-level EViD files we have include Florida voter identification numbers, and this enables us to link these files with statewide Florida voter files. These latter files specify the elections in which voters participated and, if so, whether they voted absentee, early in-person, or on Election Day. Thus, for any early voter in 2012 we can determine whether the individual voted in the 2016 General Election, assuming that this individual still lived in Florida as of November, 2016.²⁰

The difficulty in our exercise here is twofold. First, while we know voter check-in times from our EViD data, we do not know associated voter wait times *per se*. To determine wait times precisely we would have to know early voter arrival times, which are not collected by election officials or anyone else for that matter. Second, early voters who voted at, say, 9:00am on a given day of early voting may be systematically different from those who voted at 6:00pm. Consequently, estimating the effect of voting after closing time—when we know voters have waited in line—is potentially confounded by voter-level selection. Hence, we need to ensure that we control for differences across early voters as best as we can so that selection into time of early voting does not

²⁰When a registered voter moves within Florida, the voter maintains the same voter identification number. Our estimates in this section are thus not confounded by the possibility of 2012 early voters moving across county lines within Florida.

confound our estimates of the effect of waiting on future turnout.

Our approach is as follows. We condition on race/ethnicity, partisanship (as before, measured by party registration), gender, age, and previous voting history. And, we make the following assumption: individuals who voted at Florida early voting locations which stayed open well past the 7:00pm cutoff time are more likely to have waited in line than those who voted in locations that closed before 7:00pm or at this time exactly. Moreover, we assume that those who voted just before the 7:00pm cutoff in early voting locations that stayed open late are more likely to have waited in line than those who voted earlier in the day. We cannot know for sure if these assumptions hold, but there are reasons to believe that they do.

Take, for example, the two polling locations in Figure 2. The first location—the Karl County Center in Hillsborough County—closed on time on November 3, 2012. Therefore, we assume that the Karl Center was not a congested polling location and that the voters who voted just before 7:00pm did not have to wait in much of a line. If they did have to wait in line to vote, then the line remarkably stopped just in time for the final early voter to check-in right before 7:00pm. While this is technically possible, it would be remarkably coincidental.

On the other hand, the second location in Figure 2—the West Kendall Library in Miami-Dade County—remained open until around 1:00am on November 3. We know with certainty that this last voter waited in line to vote. In fact, because all voters had to arrive before 7:00pm in order to check-in, we know with certainty that he or she waited at least six hours to vote. Moreover, we can be fairly confident that the voters who voted just before 7:00pm here also waited in line. Voting that continues past 7:00pm is indicative of a polling place that was operating essentially at capacity at 7:00pm. Hence, those voters who voted just before 7:00pm are similarly likely to have been caught up in a long voting line.

With the above assumptions as background, our strategy for distinguishing voters who waited in line from voters who did not wait in line is first to identify those who voted in an early voting polling place that closed well past 7:00pm from those who voted in a polling place that closed on

time. In other words, we attempt to compare voters who cast their ballots in places like the Karl County Center to voters who voted in places like the West Kendall Library. More specifically, we want to compare those individuals who voted closest to the 7:00pm cutoff, since those are the individuals who we are most confident were affected by the congestion that caused polling locations to close late.

Therefore, we create a variable that identifies all early voters who voted at a polling location on a day where the last voter checked-in past 7:30pm. These are voters who cast ballots at locations where we know the line at the end of the day was at least 30 minutes long. We call this variable *Over*. Conditioning on race/ethnicity, partisanship, gender, age, and previous voting record (whether the voter voted in the 2008 General Election), we use a logistic regression to estimate the effect of voting at a polling location that is congested in 2012—one that goes “over” 7:30pm—on the probability of voting in 2016:

$$\Pr(\text{Voted16}_i = \text{yes}) = \text{logit}^{-1}(\beta + \alpha_{\text{Over}} + \gamma_{\text{Hour}} + \sigma_{\text{Over} \times \text{Hour}} + \nu_{\text{Gender}} + \rho_{\text{Race/Ethnicity}} + \tau_{\text{AgeGroup}} + \psi_{\text{Party}} + \pi_{\text{Voted08}})$$

In the above model, i denotes our collection of 2012 early voters who appear in the history of Florida voting in 2008; *Hour* indicates the hour of the day in 2012 at which each voter checked-in, between 7:00am and 7:00pm; *Gender* indicates whether the voter identifies as male or female; *Race/Ethnicity* indicates if the voter self-identifies as white, black, Hispanic, or Asian; *AgeGroup* classifies voters according to their 2016 age and bins them into 10-year age groups (20-29, 30-39, 40-49, 50-59, 60-69, and 70+); and, *Voted08* and *Voted16* are indicators for participation in the 2008 and 2016 General Elections. All told we estimate our logistic regression based on 758,266 individuals, and coefficient estimates appear in Table 4 in the appendix.²¹

²¹Our regression is estimated only using individuals who voted before 7:00pm. In addition, we restrict attention to individuals who are registered either Democrat, Republican, or Independent, or have recorded no party affiliation. Finally, we drop registered voters who have no recorded gender,

Per the left column of Table 4, having voted in 2008 in Florida is positively associated with subsequent voting in 2016, and being older is associated with greater turnout, *ceteris paribus*. Our age estimates in Table 4 are presumably underestimated; the regression model excludes the youngest voters in 2016, who could not legally register to vote in Florida in 2008, and younger registered voters are, *ceteris paribus*, less likely to turnout (Shino and Smith 2016). Table 4 also shows that, *ceteris paribus*, men vote less often than women and that whites vote often than non-whites. This gender finding is consistent with Leighley and Nagler (2014) although the race result is not.

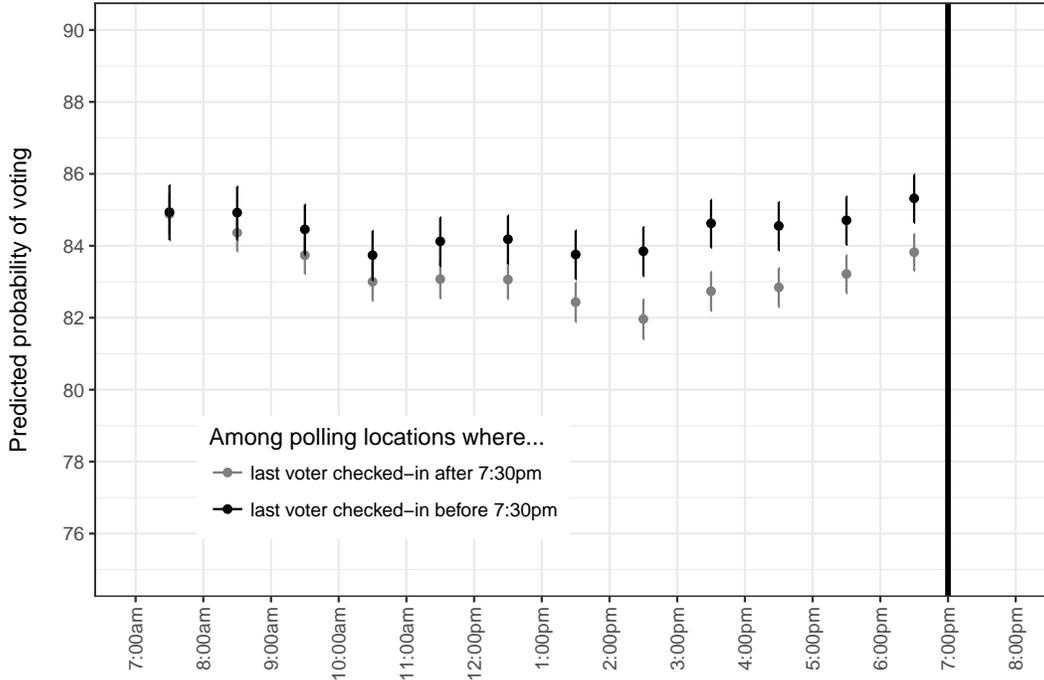
Our objective is not to explore the relationship between demographic covariates and turnout in Florida in 2016. Rather, we want to know about the marginal effects of waiting in line, and to this end Figure 8 displays graphically the probability of voting in 2016 of a 50-year old black male who is a registered Democrat and voted in 2008.

Figure 8 estimates are conditioned on each hour of the early voting day in 2012. Its black points are the estimated probabilities of voting in 2016 conditional on voting at a polling location that closed *before* 7:30pm; based on our discussion above, these estimates reflect individuals who likely did not wait in line. In contrast, the grey points in Figure 8 are the estimated probabilities of voting in 2016 conditional on casting an early ballot at a polling location that closed *after* 7:30pm. These estimates reflect individuals who likely did wait in line to vote. Hence, the difference between the figure's two sets of estimates should reflect the effect of waiting in line. Moreover, the effect should be most isolated as one compares voters casting ballots closer to 7:00pm.

One can see that, beginning at around 2:00pm, there is a small albeit negative difference between individuals who voted in congested polling places compared to those in non-congested polling places. This might suggest that the lines started in the early afternoon and why a difference is induced so early. Hence, the reason there is no difference between congested and non-congested polling places earlier in the day is plausibly because long lines have yet to form. As congested

race, or birthdate.

Figure 8: Probability of voting in 2016, given 2012 check-in time



polling places become congested in the afternoon, we begin to see a small but significant effect on future participation, an effect which suggests that voting lines slightly dampen future electoral participation. However, the effect is small, amounting to no more than roughly a percentage point difference.

Voting probability plots for other demographic groups are similar, and rather than showing these we generalize effect sizes to our complete sample. Table 3 reports estimates, along with 95% confidence intervals, of the change in probability of voting in 2016 based on time of early vote in 2012.²² The numbers in Table 3 can be thought of as average treatment effects where the treatment

²²We generated the results in Table 3 with a simulation. Our simulation (500 repetitions) drew from a multivariate normal distribution where the mean vector consists of values of the coefficient vector corresponding to the left-hand column in Table 4. The covariance matrix for the multivariate normal is the estimated covariance matrix from our logistic regression.

on individuals in our sample is being forced to wait in a line in 2012.

Time	Mean	Low	High
7:00am	-0.03%	-0.08%	-0.02%
8:00am	-0.38%	-0.92%	-0.19%
9:00am	-0.50%	-1.21%	-0.25%
10:00am	-0.52%	-1.22%	-0.26%
11:00am	-0.74%	-1.72%	-0.36%
12:00pm	-0.80%	-1.81%	-0.38%
1:00pm	-0.97%	-2.17%	-0.46%
2:00pm	-1.37%	-3.11%	-0.66%
3:00pm	-1.37%	-3.13%	-0.65%
4:00pm	-1.23%	-2.81%	-0.59%
5:00pm	-1.10%	-2.50%	-0.51%
6:00pm	-1.14%	-2.60%	-0.52%

Table 3: Effect on probability of turnout of waiting in line, by time of 2012 early vote

The estimates in Table 3 are all negative, indicating that waiting in line in 2012 led to decreased turnout probabilities in 2016. The magnitude of the estimates range from very small (e.g., a 0.03 percentage point difference in turnout probabilities associated with waiting to vote at 7:00am) to slightly over one percentage point later in the day.

Overall, our findings on the effects of lines—they depress future turnout, albeit barely—are similar to the conclusions in Pettigrew (2017). In particular, Pettigrew argues that each hour an in-person voters spends waiting in line to vote is associated with a one percentage point drop in future turnout. To the best of our knowledge, Pettigrew is the first scholar to try to estimate the effect of waiting in line to vote on the later propensity to vote, and our results are qualitatively similar to his.

In the interests of transparency, we want to draw attention to the sample of registered Florida voters whose turnout decisions in 2016 were analyzed with a logistic regression. We estimated our regression using individuals who were registered to vote in Florida in 2008, 2012, and 2016. This means that our analysis excludes the youngest registrants in Florida who were not legally permitted to be registered in Florida as of the 2008 General Election; individuals who moved to

Florida from out of state between the years of 2008 and 2016; registered Floridians who died, were convicted of committing a felony, or adjudicated mentally incompetent between 2008 and 2016; and, individuals who moved out of the state between 2008 and 2016.

A potential concern is that, by selecting against younger voters, we are biasing our estimates of the effect of waiting in line on future turnout. To this end, there is a literature on waiting in line in hospitals, and studies of the willingness of individuals to leave emergency rooms without being seen find that being young is a risk factor for this behavior (Sun et al. 2007; Clarey and Cooke 2011; Shaikh et al. 2012). In other words, young individuals seems unduly sensitive to wait times. If this is true, then by excluding relatively younger voters in our regression model, we are making our results about the effect of waiting on future turnout conservative.

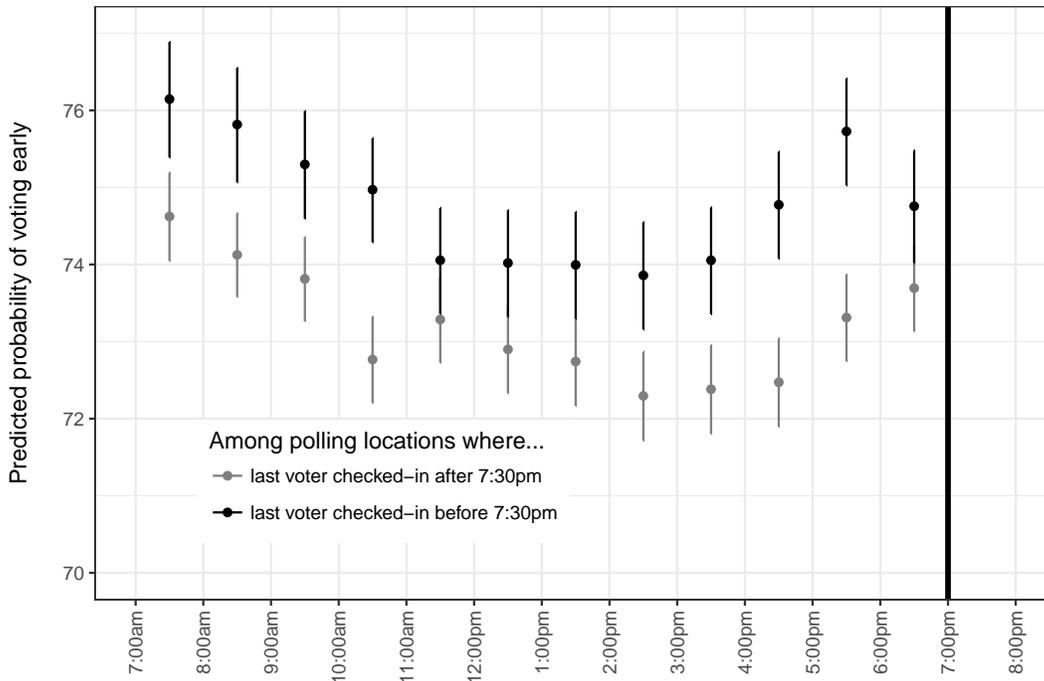
As noted, our regression analysis also selects against, say, recent movers and individuals who became felons between 2008 and 2016. We do not know of any theoretical or empirical reasons to think that these types of individuals are systematically different in terms of sensitivity to voting lines.

Now restricting attention to 2016 voters only, we consider a second logistic regression that analyzes whether these individuals voted early in 2016—or, in contrast, voted in another fashion. Corresponding regression results are in the right column of Table 4, and Figure 9 contains a plot of early voting probabilities that is structured similarly as our earlier probability plot.

Figure 9 shows that the 2016 voters whom we identify as having waiting in an early voting line in 2012 were less like to vote early in 2016, *ceteris paribus*. This is intuitive (voters responded to high costs of early voting but choosing an alternative way to vote) and highlights a downstream consequence of voting lines. The percentage point gaps (black dot to grey dot) are around one to two points, which is small albeit not negligible. Early voting, after all, was designed as a convenience, and Figure 9 suggests that the value of this convenience can be lost in the shadow of a previous bad experience.

There is a U-shape to the points in Figure 9, and we can only speculate as to what is responsible

Figure 9: Probability of voting early in 2016, given 2012 check-in time and conditional on voting in 2016



for this. We know from the number of post-7:00pm closing times that, in 2012, early voting locations were congested in the evening. We suspect that morning early voting hours also suffered from congestion albeit from a different source, when individuals stopped by to vote, say, before going to work. If lines discourage future early voting, this pattern would yield a U-shape as in Figure 9. It is also interesting to note that early voters in 2012 who voted at locations that closed before 7:30pm also have a U-shape in their early voting probabilities. We suspect this is because these locations probably suffered from morning and evening lines, albeit not very long ones.²³

²³This discussion suggests that employed individuals may be disproportionately sensitive to waiting in line to vote, which would be consistent with the relationship between affluence and tolerance for waiting in a supermarket line (e.g., Bennett 1998). There is no employment data in the Florida statewide voter files, but a relationship between work opportunities and one's willingness

A full analysis of Figure 9 is beyond our scope. But, what is most important about the figure is that it highlights how voting experiences can affect forms of future political participation. Wanting to vote early, but not doing so on account of fear of lines, imposes a cost on voters, and future research on election administration needs to pay attention to the way that electoral experiences, both positive and negative, can accumulate over time and potentially affect future choices.

Conclusion

The extent to which all voters in an election are treated equally depends in part on whether the cost of voting in the election is distributed uniformly across voters. Administrative aspects of elections that affect the cost of voting are thus part of the overall calculus of whether an election was characterized by equal treatment or the lack thereof. A notable administrative aspect of elections is the presence of voting lines, and lengthy voting lines in recent United States General Elections have been of concern, both to scholars and election officials. Burdensome wait times not only impose opportunity costs on those forced to wait in line, but they can also discourage future electoral participation.

Research on voting lines is challenged by the lack of observational data on who waits to vote. Other than noting the times at which polls officially closed and recording information about which voters cast their ballots after voting lines were capped, there is little data collected by election officials that might distinguish between those who waited in line to vote from those who did not. Notwithstanding a limited number of exceptions, local election officials do not maintain official records on line evolution or how long individual voters waited (Herron et al. 2017).

To overcome the lack of data that identifies who waits in line to vote, scholars have relied on surveys that ask respondents to recall their experiences at the polls and report the length of time that they waited to vote (Stewart III 2013; Pettigrew 2016). These survey-based analyses to wait in line is worth considering in future research.

have illuminated important variation in wait times across geographies and racial/ethnic groups, but associated with them is the caveat that survey responses are subject to biases associated with self-reporting.

With these points in mind, we contribute to the literature on voting lines by analyzing early voter check-in times in Florida's 2012 and 2016 General Elections. Using electronic voting check-in time stamps from Alachua, Broward, Hillsborough, Miami-Dade, Orange, and Palm Beach Counties, we are able to identify the exact day and time at which many thousands of voters checked-in to vote. These check-in times not only provide novel insight into voting patterns across time but, given some natural assumptions, also allow us to characterize individual voters who likely waited in line to vote. Of course, despite their advantages, EViD check-in times are not a panacea in the quest to understand voting lines and their consequences, as such times do not specify how long an individual may have waited to vote.

Our analysis reveals that Florida's early voting period in 2012 had a significant number of voters who voted past the official 7:00pm closing time and, therefore, must have waited in line to vote. These voters were disproportionately black, Hispanic, and Democratic—a finding that coincides with survey results on voting lines. In 2016, we find that congestion observed in 2012 had all but vanished. Voters rarely voted late into the night in 2016, and most early voting locations in our Florida counties of interest closed promptly. Even though the counties we study in 2016 served as many individual per day as they had in 2012, they appear to have been more prepared to handle the high rates of early voting.

We estimated the effect that waiting in line has on future electoral participation. Using temporal variation in voting across polling locations, we found a very slight negative effect on turnout, amounting to no more than a one percentage point decrease in the propensity to vote. The result is similar to that identified by Pettigrew (2016). The effect is small in magnitude, which is normatively pleasing, but any negative effect on future turnout is normatively troubling. Not only are some voters penalized by waiting in line, but a small number of these individuals appear to

be dissuaded from voting in the future, thus lessening their voices. We offered some evidence as well that long early voting lines dissuade voters from casting early ballots. To the extent that early voting is a form of “convenience” voting, this result shows how the value of this convenience can be compromised by long lines, something that most observers would classify as administrative failures.

Overall, our evidence shows that the 2012 General Election in Florida did not treat all voters equally with respect to time spent waiting in line. Minority voters in 2012 voters faced disproportionately long lines—thus, disproportionately high costs of voting—and then, in some cases, a small downstream effect of a decreased propensity to vote. Our results illustrate how administrative aspects of elections, like the resource allocation decisions that influence whether an election will have lines or not, should be understood not just as administrative in nature but also as relevant to underlying fairness and the extent to which voters are treated in a like manner.

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Appendix

Table 4: Regression results predicting voter behavior in 2016

	<i>Dependent variable:</i>	
	Voted in 2016	Voted early in 2016
	(1)	(2)
8:00am	-0.001 (0.039)	-0.018 (0.026)
9:00am	-0.037 (0.037)	-0.046* (0.025)
10:00am	-0.091** (0.036)	-0.064*** (0.024)
11:00am	-0.062* (0.036)	-0.112*** (0.024)
12:00pm	-0.058 (0.036)	-0.114*** (0.025)
1:00pm	-0.089** (0.036)	-0.115*** (0.025)
2:00pm	-0.083** (0.036)	-0.122*** (0.025)
3:00pm	-0.024 (0.036)	-0.112*** (0.025)
4:00pm	-0.030 (0.036)	-0.074*** (0.025)
5:00pm	-0.018 (0.036)	-0.023 (0.025)
6:00pm	0.030 (0.037)	-0.075*** (0.026)
Over	-0.004 (0.033)	-0.082*** (0.023)
8:00am & Over	-0.141*** (0.007)	0.094*** (0.005)
9:00am & Over	-0.252*** (0.010)	0.330*** (0.007)
10:00am & Over	-0.048*** (0.010)	0.077*** (0.007)
11:00am & Over	-0.145*** (0.026)	0.100*** (0.020)
12:00pm & Over	0.326*** (0.012)	0.180*** (0.012)
1:00pm & Over	0.823*** (0.013)	0.413*** (0.012)
2:00pm & Over	1.085*** (0.013)	0.421*** (0.011)
3:00pm & Over	1.208*** (0.014)	0.326*** (0.011)
4:00pm & Over	0.854*** (0.014)	-0.032*** (0.012)
5:00pm & Over	-0.439*** (0.067)	-0.070 (0.057)
6:00pm & Over	-0.277*** (0.010)	-0.101*** (0.008)
Gender: male	0.064*** (0.011)	-0.103*** (0.007)
Race: Black	0.792*** (0.008)	0.317*** (0.007)
Race: Hispanic	-0.039 (0.046)	-0.008 (0.031)
Race: Asian	-0.049 (0.044)	0.004 (0.030)
Age group: 30-39	-0.049 (0.043)	-0.032 (0.030)
Age group: 40-49	-0.072* (0.043)	0.042 (0.029)
Age group: 50-59	-0.078* (0.043)	0.025 (0.030)
Age group: 60-69	-0.090** (0.043)	0.018 (0.030)
Age group: 70+	-0.129*** (0.043)	0.003 (0.030)
Party: independent	-0.134*** (0.043)	-0.003 (0.030)
Party: none	-0.121*** (0.043)	-0.037 (0.030)
Party: Republican	-0.107** (0.043)	-0.045 (0.030)
Voted08: yes	-0.111** (0.044)	0.026 (0.031)
Constant	1.038*** (0.031)	0.316*** (0.022)
Observations	758,266	669,507
Akaike Inf. Crit.	510,128.400	818,232.000

Note: *p<0.1; **p<0.05; ***p<0.01