



Precinct resources and voter wait times[☆]

Michael C. Herron^{a,*}, Daniel A. Smith^b

^a Dartmouth College, 6108 Silsby Hall, Hanover, NH 03755-3547, USA

^b University of Florida, 234 Anderson Hall, Gainesville, FL 32611-7325, USA



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ABSTRACT

The amount of time that voters wait in line while casting their ballots has been a matter of consternation in electorates across the world and a subject of ongoing academic research in the field of election administration. With this as context, we offer here a study of voting lines that combines observed voter arrival times and measures of precinct processes with simulation results. Empirically, we focus on the town of Hanover, New Hampshire, during the 2014 United States General Election. Voters in Hanover initially authenticate themselves to election officials, mark their ballots in secret, and finally insert said ballots into optical scan tabulating machines. These steps are reasonably generic, and thus the way we study Hanover voters is generalizable to the study of voters in democracies across the world. Our simulations show that line voting evolution can be studied after a simple data-collection plan is implemented, and we show how scholars and election officials can evaluate the effects of changing precinct resources, like the numbers of voter authentication stations and voting booths, on the formation and duration of voting lines.

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1. Introduction

The amount of time that voters wait in line while casting their ballots has been a matter of consternation in electorates across the world. For example, the 2010 General Election in the United Kingdom witnessed a surge of voters that overwhelmed numerous

polling stations, leaving “hundreds of voters...unable to vote... despite [having queued] for hours.”¹ During the 2012 General Election in the United States, there were extensive reports of long Election Day and early voting lines across Florida and other key states; long voting lines were reported in the city of Baltimore; and, some voters in Sandoval County, New Mexico, had to wait as long as five hours to vote, an occurrence attributed to a dearth of adequate voting machines in the county's voting centers.² Finally, Canada suffered from similar problems in its 2015 General Election; long

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* Corresponding author.

E-mail addresses: michael.c.herron@dartmouth.edu (M.C. Herron), dasmith@ufl.edu (D.A. Smith).

¹ See “General election 2010: Polling queues leave hundreds unable to cast vote,” *Guardian US*, May 5, 2010, available at <http://www.theguardian.com/politics/2010/may/07/polling-queues-hundreds-unable-to-vote> (last accessed December 25, 2015).

² On the prevalence of lines in a variety of states, see “Complaints about voter IDs, ballots, long lines in election,” *Reuters*, November 6, 2012, available at <http://www.reuters.com/article/2012/11/06/us-usa-campaign-irregularities-idUSBRE8A51E720121106> (last accessed May 31, 2015). Regarding Baltimore in particular, see “Officials investigate long lines at polls,” *The Baltimore Sun*, November 7, 2012, available at <http://www.baltimoresun.com/news/maryland/politics/bs-md-poll-complaints-investigated-20121107-story.html> (last accessed May 31, 2015). The experiences of Sandoval County, New Mexico, are described at “County takes responsibility for election flub,” *KRQE News 13*, August 26, 2014, available at <http://krqe.com/2014/08/26/county-takes-responsibility-for-election-flub/> (last accessed June 9, 2015) and “Lawsuit alleging long Election Day lines in Sandoval County will move forward,” *KOB 4*, August 26, 2014, available at http://www.kob.com/article/stories/s3543532.shtml#_VXcPtWD5i-Q (last accessed June 9, 2015).

lines were reported during “advanced voting” in the run-up to this election and also on Election Day, leading the *The Globe and Mail* to editorialize that “Canada needs to bring the voting process into the 21st century.”³ These three examples span countries and continents, and they illustrate the complications that extensive lines can cause for voting and, ultimately, perceived electoral legitimacy.

The vernacular of voting in democratic countries differs based on geography. For example, an American “precinct” is roughly equivalent to a “polling station” in the United Kingdom and a “Wahllokal” in Germany. Nonetheless, the basics of voting processes are comparable worldwide (Massicotte et al., 2004). In particular, all voting locations—whether supporting in-person, Election Day voting or early/advanced voting and whether they are precincts with defined and limited jurisdictions or more broadly defined centers with disparate jurisdictions—typically require voters to carry out a sequence of steps consisting of authentication, ballot marking, and ballot insertion into a tabulator or placement in a generic collection device. The exact steps required of an in-person voter in any given voting location will vary depending on applicable voting technology, and the same is true regarding permitted forms of voter identification, but the basic steps taken by in-person voters across the world are roughly similar.⁴

Each of the voting steps noted above—authentication, ballot marking, and ballot insertion—can involve delays and lines. Thus, the study of voting lines writ large and what causes lines to form must treat each distinct step separately. We should not, that is, “black box” the voting process in a way that ignores the fact that voting involves multiple steps, all of which can affect a voter’s overall voting experience and, notably, the amount of time that a voter spends in line.

With this point in mind, we contribute to the literature on voting and waiting in line a study of voting processes in Hanover, New Hampshire. Hanover is a town in the East Coast of the United States, and in-person Hanover voters are required to complete three steps in their overall voting processes. Consistent with our aforementioned arguments about the analysis of voting lines, we treat these steps separately, and our objective is to study line formation in Hanover.⁵

Our approach to this objective is twofold: first, we gathered data on voter processes in Hanover during the 2014 General Election

and, second, we used a simulation to explore these data. Our study is thus illustrative of a hybrid research model, one that combines observed data with a simulation that is more theoretical in nature. The approach described here can be easily transferred to other electoral environments, and it can be used to study how lines might affect certain classes of voters. As will be clear shortly, we focus particular attention on the effect of precinct resources on voting lines, and suppose, for example, that one were concerned that certain voter classes—perhaps certain racial or ethnic groups—disproportionately used resource-poor precincts. Our research design could be used to investigate whether the experiences of these particular voters would have been different under an alternative allocation of resources.

Insofar as our conclusions draw on results from a single voting location, one might be concerned that Hanover may not be representative of precincts across the United States. Indeed, Hanover is a rather small New England town (8636 residents according to the 2010 Census) and is relatively racially/ethnically homogeneous (77.5 percent white, 12.4 percent Asian, and 4.3 percent black) and wealthy (median household income of \$82,875).⁶ Nonetheless, from the perspective of studying precinct processes and the factors that lead to voting line formation, Hanover is in fact quite typical, and see Massicotte et al. (2004, pp. 102–141) for a discussion of the broad similarities across democracies in the way that people vote. As in many thousands of voting locations across the United States and the world, voters in Hanover follow a three-step voting process (authentication, ballot marking, ballot insertion). The voting steps in Hanover are generic, and thus the way we study voters in this location—in particular, how our data on in-precinct, voting processes inform our simulation analysis—is easily generalized to the study of voters in democracies broadly defined.⁷

In what follows we describe how we gathered data on 2014 General Election voting processes in Hanover. The technical requirements inherent in our approach are minimal albeit not completely inconsequential; our data-gathering approach relies on labor and access to an Internet-based server. Among other things, our data on Hanover characterize the arrival times of voters and what we call the *voting-step times* for each of the three steps that all in-person Hanover voters faced in their overall voting processes. Based on our voting data from Hanover—arrivals plus voting-step times—we construct a simulation that allows us to model the formation of lines as a function of precinct resources. By resources we mean here authentication stations, voting booths, and optical scan machines. With our simulations we consider both the resources that Hanover actually used in November, 2014, as well as counterfactuals such as, what would voting line evolution in Hanover have looked like if the town’s precinct had fewer optical scan machine available at its voting precinct? And, how would voting line evolution in Hanover been affected by a drastic reduction in voting booths? Our simulation approach to the study of lines is a general one that has nothing to do with Hanover *per se*. The software that we wrote for the simulation will be made publicly available, and

³ See “Canada needs to bring the voting process into the 21st century,” *The Globe and Mail*, October 15, 2015, available at <http://www.theglobeandmail.com/globe-debate/editorials/canada-needs-to-bring-the-voting-process-into-the-21st-century/article26831411/> (last accessed December 1, 2015) and “You get fed up: Long lines frustrate some voters,” *CTV News*, October 19, 2015, available at <http://www.ctvnews.ca/politics/election/you-get-fed-up-long-lines-frustrate-some-voters-1.2616408> (last accessed December 1, 2015).

⁴ As for late 2015, some American states have no voter identification requirements, e.g., Illinois, and others require forms of identification like driver’s licenses, e.g., Arizona. On Illinois, see <http://www.chicagoelections.com/en/when-you-need-id-to-vote.html> (last accessed December 20, 2015), and on Arizona, <http://www.azsos.gov/elections/voting-election> (last accessed December 20, 2015). Variance in voter identification requirements across states is tracked by the National Conference of State Legislatures, and in particular see the report titled “VOTER IDENTIFICATION REQUIREMENTS — VOTER ID LAWS,” available at <http://www.ncsl.org/research/elections-and-campaigns/voter-id.aspx#Two> (last accessed December 20, 2015). See Schaffer and Wang (2009, pp. 400–401) for a discussion of variance in voter identification requirements across counties.

⁵ Like many jurisdictions, Hanover also allows absentee voting. Absentee voters, who fill out their ballots in the homes, are not subject to lines in the way that in-person voters are. However, absentee voters face other administrative hurdles, i.e., ensuring that their completed ballots are received by relevant election officials, ensuring that they correctly authenticated said ballots, and so forth. Absentee voting is not part of our analysis, but a comprehensive depiction of the election administrative issues that affect voting should consider absentee balloting. On this point, see Oliver (1996) and Alvarez et al. (2008), for example.

⁶ For these statistics on Hanover, see census data at <http://quickfacts.census.gov/qfd/states/33/3333780.html> (last accessed June 5, 2015).

⁷ As an aside, New Hampshire allows voters to register on Election Day; this is known as “Same Day Voter Registration.” On account of this, the authentication process for a Hanover voter can involve a registration step in addition to the steps noted in the body of the article. To keep things simple, our results ignore New Hampshire voters who registered on Election Day 2014; incorporating them into our analysis would be straightforward, however, and we discuss this matter in the conclusion. The National Conference of State Legislatures maintains list of states that offer Same Day Voter Registration, and this list can be found at <http://www.ncsl.org/research/elections-and-campaigns/same-day-registration.aspx> (last accessed May 31, 2015).

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