IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

FAIR FIGHT ACTION, et al.,	)	
	)	
Plaintiffs,	)	
	)	
v.	)	Civ. Action No. 1:18-cv-05391-SCJ
	)	
BRAD RAFFENSPERGER, in his official capacity as Secretary of State of the State of Georgia, et al.,	)	
	)	
Defendants.	)	

EXPERT REPORT OF MICHAEL C. HERRON

William Clinton Story Remsen 1943 Professor,
Department of Government
Dartmouth College
6108 Silsby Hall
Hanover, NH 03755-3547

February 18, 2020

Michael C. Herron, Ph.D.

Contents

1 Summary of conclusions

1 Registered voters in Georgia who cast their ballots on election day are required to use the polling places assigned to them by elections officials. Between the General Elections of 2014 and 2018, a total of 459 of 2,516 polling places used in Georgia closed, and this affected over a million registered voters in the state. In particular, voters assigned to closed polling places were by necessity assigned new polling places in time for the 2018 General Election. In addition, some registered voters in Georgia were assigned new polling places for the 2018 General Election even though the polling places they used in 2014 had not closed.

2 Prior to *Shelby County v. Holder* (2013), per the Voting Rights Act significant changes in election administration practices in Georgia—like large-scale polling place adjustments—had to be cleared by the United States federal government before they could be implemented. The *Shelby County* decision vitiated this requirement.

3 The adjustments made to Georgia's polling places between 2014 and 2018 were not racially neutral. In particular, black registered voters were disproportionately more likely than white registered voters to have their polling places changed beween 2014 and 2018. In addition, polling places with a black majority of registered voters in 2014 were more likely to be closed than polling places without a black majority.

4 Existing literature in political science shows that being assigned to a new polling place can have negative effects on a state's registered voters and in particular can impact subsequent election turnout. I find evidence that voter turnout in Georgia is consistent with this general result.

5 In particular, there are two ways to vote in Georgia: absentee (either via mail or in-person) and on election day. Among Georgia registrants who did not move between 2014 and 2018, those who received new polling places between 2014 and 2018 were less likely to vote on election day in 2018. These individuals were also less likely to vote overall in the 2018 General Election. These findings hold as well when restricting attention to politically engaged registered voters in Georgia, namely, those who voted in the 2014 General Election.

6 These results on turnout in the 2018 General Election show that the precinct-related administrative decisions made by elections officials in Georgia in the time period 2014 to 2018 portended downstream consequences for election turnout. Insofar as precinct adjustments in Georgia between 2014 and 2018 were not racially neutral, these downstream consequences were not racially neutral, either.

2 Overview of report

7 In the matter of *Fair Fight Action, Inc., et al. v. Brad Raffensberger, et al.*, I have been engaged by plaintiffs' counsel to assess the extent to which polling place adjustments were made in Georgia between the 2014 and 2018 General Elections. I was also asked to analyze whether the adjustments in this time period, to the extent that they existed, were racially neutral (meaning that they affected all racial groups in Georgia approximately equally) or were not racially neutral (meaning that they affected some racial groups more than others). With respect to a potential interaction between polling place adjustments and race, I was asked in particular to focus on white and black registered voters in Georgia. These are the two largest racial groups in the state and together constitute over 90 percent of Georgia's population.[1]

8 In this report, I use the term "polling place" to mean a physical address where individuals can cast ballots on election day. A polling place is distinct from a precinct, which per O.C.G.A. § 21-2-2 "means a geographical area... from which all electors vote at one polling place."[2] I can thus write of a polling place that has closed—meaning, election day voting no longer takes place at said place. While a precinct in the sense of O.C.G.A. § 21-2-2 can be adjusted, as a geographical area it cannot be said to have closed.

[1] *QuickFacts Georgia*, United States Census Bureau (as of July 1, 2019), available at `https://www.census.gov/quickfacts/GA` (last accessed February 14, 2020).

[2] For the text of O.C.G.A. § 21-2-2, see `https://law.justia.com/codes/georgia/2010/title-21/chapter-2/article-1/21-2-2` (last accessed February 14, 2020).

9 In public discourse, "polling places" and "precincts" are sometimes used interchangeably.[3] However, since this report's primary focus is on the literal places in Georgia where Georgia voters cast ballots, I distinguish between these terms as described in the paragraph above.

10 The focus of this report on election day polling places in Georgia reflects the fact that election day voting is a major component of voter turnout in contemporary Georgia statewide elections. In the 2014 General Election, total turnout in Georgia was 2,597,088 voters of whom 1,641,657 (approximately 63 percent) cast their ballots on election day.[4] The other Georgia voters in this election cast absentee ballots, either by mail or in-person, prior to November 4, 2014.[5] In the 2016 General Election, total voter turnout in

[3]Mark Niesse and Nick Thieme, *Precinct closures harm voter turnout in Georgia, AJC analysis finds*, The Atlanta Journal-Constitution (December 13, 2019), available at `https://www.ajc.com/news/state--regional-govt--politics/precinct-closures-harm-voter-turnout-georgia-ajc-analysis-finds/11sVcLyQCHuQRC8qtZ6lYP` (last accessed February 14, 2020).

[4]This turnout number is based on the number of rows in the 2014 General Election turnout file, available from the Georgia Secretary of State at `https://elections.sos.ga.gov/Elections/voterhistory.do` (last accessed November 23, 2019). The turnout number differs slightly from the election turnout figure of 2,596,947 that appears in the Secretary of State's results summary of the 2014 General Election. See `https://results.enr.clarityelections.com/GA/54042/149045/en/summary.html` (last accessed February 6, 2020) for this summary. The reason that I use the Georgia Secretary of State's turnout file as the source for total turnout in Georgia in the 2014 General Election is to maintain consistency with data used in this report. In particular, the 2014 General Election turnout file can be linked to the voter-level datasets that, as explained later, I use to draw conclusions about the extent to which precinct adjustments in Georgia in the period 2014 to 2018 were racially neutral.

[5]Georgia voters casting in-person votes prior to an election are said in the state to vote in-person absentee as opposed to mail absentee. In other states, in-person absentee voters would be classified as "early" voters. Methods of voting are described by the Georgia Secretary of State at `https://sos.ga.gov/index.php/elections/ways_to_vote_in_georgia` (last accessed December 6, 2019).

Georgia was 4,166,929 of whom 1,736,828 voters (approximately 41.7 percent) cast ballots on election day.[6] In 2018, approximately 46.4 percent of Georgia voters cast their ballots on election day. Thus, while in-person, election day voting is not presently used by all Georgia voters, in the three most recent statewide elections in Georgia it was used by a large percentage of them.

11 When voting on election day in Georgia, eligible voters must cast their ballots at polling places assigned by election officials. A Georgia voter who wishes to cast a ballot on election day does not have a choice over which polling place he or she is permitted to use.

12 In the time period between elections, jurisdictions in the United States, like states or counties, may consider changing the polling places to which their registered voters are assigned. In Georgia, changing polling places was historically regulated by Sections 4 and 5 of the federal Voting Rights Act. This legislation mandated that so-called "covered jurisdictions"—of which Georgia was one—had to clear proposed election administration changes with federal authorities prior to implementing said changes.[7]

[6]Parallel to the fn. 4, the 2016 overall turnout number differs slightly from the 2016 turnout figure (4,165,405) reported by the Georgia Secretary of State on its election website. See `https://results.enr.clarityelections.com/GA/63991/184321/en/summary.html` (last accessed February 6, 2020).

[7]*About Section 5 of The Voting Rights Act*, The United States Department of Justice, available at `https://www.justice.gov/crt/about-section-5-voting-rights-act` (last accessed February 10, 2020).

13 On June 25, 2013, the United States Supreme Court in *Shelby County v. Holder* ruled that Section 4 of the Voting Rights Act is unconstitutional. This ended the requirement that election jurisdictions in Georgia receive permission prior to implementing changes to the way that they administer elections.[8]

14 Post-*Shelby County*, a jurisdiction in Georgia can, for example, close some of its existing polling places and assign the registered voters who would have voted at these places to new places that may or may not have previously existed. Or, a jurisdiction in Georgia can change its polling places without closing any of them by, for example, shifting registered voters from a set of existing polling places to a different set of places. A jurisdiction that carries out the sort of administrative adjustments described above can be said to have engaged in an exercise called "reprecincting."

15 I use the term "reprecincting" to refer to changes either in precinct boundaries or polling places. Notwithstanding the distinction between polling places (physical addresses where voters cast ballots) and precincts (geographical areas from which voters cast ballots in polling places), this is how the term is used in the academic literature on election administration.

16 As I will demonstrate in this report, numerous counties in Georgia engaged in reprecincting between the 2014 General Election and the 2018

[8]For details pertaining to *Shelby County v. Holder*, see `https://www.oyez.org/cases/2012/12-96` (last accessed February 10, 2020).

General Election. Not all 159 counties in the state engaged in reprecincting exercises between these two statewide elections, however, and there was variance across the counties that did engage in reprecincting in the extent to which they adjusted their polling places.

17 Scholars have shown that registered voters whose polling places change—that is, registrants who have been "reprecincted"—have lower likelihoods of voting in future elections (Brady and McNulty, 2011; Amos, Smith and Ste. Claire, 2017). This finding implies that reprecincting procedures are not necessarily politically neutral. Such a lack of neutrality would be induced if, for example, in a jurisdiction of interest the likelihood of being reprecincted in a given time period varied by voter type, i.e., by racial or partisan group.

18 With this discussion of polling places and reprecincting as background, I accomplish the followings tasks in this report.

1. I characterize the extent to which polling places in Georgia closed between the 2014 and 2018 General Elections in the state. This entire time period is post-*Shelby County*.

2. I assess the extent to which the 2014-2018 polling place closures in Georgia were racially neutral, and I find that they were not. This conclusion is based on three approaches to studying polling place closures, all of which show that black registered voters in Georgia were dispro-

portionately affected by closed polling places in the state compared to white registered voters.

3. I analyze registered voters in Georgia whose addresses did not change between 2014 and 2018. I focus on these "non-movers" because the only reason that these individuals would have been assigned to new polling places between 2014 and 2018 is if they were reprecincted in some fashion. In contrast, movers in Georgia, by virtue of their moving, may be assigned to new polling places if they move sufficiently far from their original residences. I characterize the extent to which non-movers in Georgia were affected by the reprecincting across Georgia that took place between 2014 and 2018 and find that non-moving black registered voters in Georgia were disproportionately affected by the reprecincting in the state compared to white registered voters.

4. I show that non-moving, reprecincted registrants in Georgia had lower voter turnout rates in the 2018 General Election compared to non-moving, non-reprecincted registered voters. In other words, receiving a new polling place in the period 2014-2018 is associated with lower turnout in November 2018. This finding holds even restricting attention to politically active registered voters in Georgia.

3 Qualifications

19 This section of the report describes my background and explains why I am qualified to render an opinion on the reprecincting in Georgia that took place between 2014 and 2018.

20 I am the William Clinton Story Remsen 1943 Professor of Government and Chair of the Program in Quantitative Social Science at Dartmouth College in Hanover, New Hampshire. I have taught at Dartmouth since 2003 and previously was on the faculty of Northwestern University. I have served as a visiting professor at Harvard University (July 2008–January 2009), the University of Rochester (September 2006–December 2006), and the Hertie School of Governance in Berlin (August 2011–August 2012). I have also served as a visiting scholar at the Hertie School of Governance (August 2016–July 2017).

21 In January 1998, I received a doctorate in the field of Political Economy from the Graduate School of Business at Stanford University. I also have a master's degree in statistics from Stanford University (June 1995), a master's degree in political science from the University of Dayton (August 1992), and a bachelor's degree in mathematics and economics from Carnegie-Mellon University (May 1989).

22 I have published many peer-reviewed, scholarly articles on election administration. Among other subjects, I have written on the effects of ballot formats, patterns in invalid votes, the availability of early voting, and polling place congestion. My articles rely on statistical analyses, and my ongoing research agenda focuses heavily on issues in election administration.

23 I have published in many political science journals including the field's top general journals (*American Political Science Review*, *American Journal of Political Science*, and *Journal of Politics*). I have published in specialty journals as well (*Election Law Journal*, *American Politics Research*, and *Legislative Studies Quarterly*). All of these journals are peer-reviewed. My *curriculum vitae*, which lists all of my published papers, including those authored within the last ten years, is attached to this report as an appendix.

24 I was a testifying expert for plaintiffs in *League of Women Voters of New Hampshire et al. v. William M. Gardner et al.* (226-2017-CV-433) and in *Veasey et al. v. Abbott et al.* (265 F. Supp. 3d 684 (S.D. Tex. 2017)) and a testifying expert for defendants in *Jennings v. Elections Canvassing Commission of Florida* (2006 WL 4404531 (Fla.Cir.Ct.)). These cases relate to aspects of election law and election administration.

25 The methodologies used throughout this report are typical of, and in some cases identical to, techniques that I have used in the past and continue to use regularly as part of my academic research. The statistical calculations

that I made as part of the report were generated using the R statistical computing environment, Version 3.6.1 (R Core Team, 2019), and Stata Version 14 (StataCorp, 2015).

26 I am being paid at a rate of $400/hour for work on this report.

4 Data used in this report

27 My report's empirical results on the reprecincting carried out in Georgia between 2014 and 2018 draw on a variety of different sources of data. I describe these sources in this section of the report.

28 After characterizing the report's data sources, I then describe some data manipulations that I carried out on them prior to drawing conclusions.

4.1 Georgia voterfiles

29 To analyze the extent to which Georgia's polling places were changed between the 2014 and 2018 General Elections and to assess whether changes to these places were racially neutral, I must identify the registered voters in Georgia whose polling places were constant in this time period and those whose polling places changed. Key to these tasks are lists of registered voters in Georgia that date to 2014, 2016, and 2018.[9]

[9]The Georgia Secretary of State distinguishes between active and inactive registered voters, and it is my understanding that the voterfiles that I use in this report include both types. This conclusion is based on the following logic. As of 2018

30 Registered voters in Georgia are enumerated in what the Georgia Secretary of State calls a "voter registration list." A generic term for such a list is a statewide *voterfile*, and I use that term throughout this report. A voterfile consists of a list of registered voters in a state with accompanying demographic details. According to the Georgia Secretary of State, the Georgia voterfile contains demographic fields that, among other things, track registered voter race, gender, and date of birth.[10]

31 In some states, like Georgia and its neighboring state of Florida, voterfiles are public documents. In other states, like New Hampshire, voterfiles are not public.

4.1.1 Overview of Georgia voterfiles

32 The three Georgia voterfiles that I use in this report have effective dates of October 24, 2014, October 26, 2016, and October 15, 2018. This means, for example, that the foremost voterfile lists registered voters in Georgia as of October 24, 2014, and the lattermost, registered voters as of October

General Election, the Georgia Secretary of State reports that there were 6,428,581 active registered voters in the state along with 507,235 inactive voters. For these two figures, see "HISTORICAL VOTER REGISTRATION STATISTICS," available at `https://sos.ga.gov/admin/files/Voter%20Registration%20Statistics%20Historical%20-%20Updated%2011-26-18.pdf`(last accessed February 15, 2020). The sum of active and inactive registered voters in Georgia is, according to the Georgia Secretary of State, 6,935,816. My 2018 voterfile contains information on 6,928,150 registered voters in Georgia, and this latter number is quite close to 6,935,816.

[10]For details on the demographic variables that are included in Georgia voterfiles, see *ORDER VOTER REGISTRATION LISTS AND FILES*, Georgia Secretary of State, available at `https://sos.ga.gov/index.php/elections/order_voter_registration_lists_and_files` (last accessed February 7, 2020).

15, 2018. Hereinafter I refer to the three aforementioned voterfiles as the *2014 voterfile*, the *2016 voterfile*, and the *2018 voterfile*, respectively.

33 Georgia voterfiles include official voter registration numbers, which to the best of my knowledge are unique to individual registrants. Each Georgia voter registration number is eight digits long, and these numbers can be used to track individual registered voters across voterfiles.

34 I discuss my 2014, 2016, and 2018 Georgia voterfiles below, and in the processes of this explain that what I call the 2014 voterfile is actually a subset of the complete 2014 Georgia voterfile. For the moment, though, it suffices to note that I verified that my 2014 voterfile does not contain duplicate voter registration numbers. I carried out this verification as an integrity check on the 2014 voterfile. For the same purpose I verified the uniqueness of voter registration numbers in the 2016 and 2018 voterfiles as well.

35 Any individual who registered to vote in Georgia between the effective dates of the 2014 and 2018 voterfiles used in this report will appear in the latter but not the former. There are 5,245,872 individuals in the 2014 voterfile who also appear in the 2018 voterfile. Thus, approximately 86.7 percent of the 6,053,385 individual records in the 2014 voterfile can be linked to records in the 2018 voterfile.

36 Some of my conclusions about polling place changes in Georgia between 2014 and 2018 are based on analyses of registered voters who appear in both the 2014 and 2018 Georgia voterfiles. That said, the aforementioned set of 5,245,872 registered voters who appear in these two files is an important one.

4.1.2 The 2014 Georgia voterfile

37 I now present some details on the 2014 Georgia voterfile.

38 The 2014 voterfile that I use in this report is one component of a larger SQLite database, produced by the State in discovery, that itself contains 12 separate tables.[11] SQLite is a standard electronic format for a database, and I was able to access the database provided to me without difficulty. Of the 12 tables in the database, I use two in this report.

39 The SQLite database table titled "Voters" (6,053,391 rows) lists registered voters in Georgia in 2014. This table, one of 12 in the database that I described above, is what I call the 2014 voterfile.

40 While the 2014 voterfile contains 6,053,391 registered voters, six of these individuals have no associated county. In particular, the 2014 voterfile

[11]The SQLite database is contained in a file named "STATE-DEFENDANTS-00089546.DB3." I was provided this file by Counsel. Counsel provided me as well with a file named, "STATE-DEFENDANTS-00089546_Metadata.xlsx." This file is an Excel spreadsheet, and Column S in the spreadsheet states that the last modification date of the SQList database was October 24, 2014. I use this date as the effective date for the voterfile that is part of the SQList database.

has 28 fields in it, one of which is named "countyId," which I understand to be an elision of "county identifier." For the six aforementioned registered voters, this field is zero and thus erroneous.

41 Outside of the six problematic registered voters, all other registered voters in the 2014 voterfile have "countyId" values of between one and 159, reflecting the fact that Georgia consists of 159 counties. I drop the six individuals who have no county identifier from the report's analysis and thus say from this point onward that the 2014 voterfile contains 6,053,385 total registered voters. None of the conclusions in this report depend qualitatively on the six dropped registered voters whose county codes in the 2014 voterfile are invalid.

42 Beyond specifying county, the "Voters" table that makes up my 2014 Georgia voterfile contains *inter alia* registered voter names, addresses, and dates of birth. These data fields are found in Georgia voterfiles. However, the table does *not* include a variable for registered voter race, and this explains why I wrote, above, that the 2014 voterfile used in this report is a subset of the actual 2014 Georgia voterfile. In an upcoming section of this report, I return to the implications of the fact that registered voter race is missing from my 2014 voterfile. To the best of my knowledge, the State has not produced via discovery a complete 2014 Georgia voterfile.

43 Beyond the "Voters" table in the 2014 SQLite database, the second table from this database that I use in this report is titled "Consolidations." This table contains precinct and polling place information. Of the table's rows, 2,531 are associated with polling places that have valid county identification numbers. And, 2,516 of the rows in "Consolidations" have unique addresses. To the best of my knowledge, this implies that some Georgia precincts in 2014 shared polling places.[12]

44 The "Consolidations" table in the SQList database contains a data field called "consolidationID," which I understand to be an elision of "consolidation identifier." This field also appears in the "Voters" table. Using the presence of "consolidationID" in both the"Voters" table and the "Consolidations" table, I merge polling place details from the latter table into the former.[13] By polling place details, I mean the name of each associated precinct and its physical street address in Georgia.[14] Based on this merge, I can identify the polling place for every registered Georgia voter who appears

[12]For example, there are two precincts in "Consolidations" whose polling place is 103 Broad Street N, Abbeville GA 31001. To the best of my understanding, these precincts are named, "Abbeville North 2" and "Abbeville North 5." While these two precincts use the same physical voting place, they have different identifying numbers in the "Consolidations" table, 156005 and 156011, respectively. The "Consolidations" table lists two different polling names for these places, "COURTHOUSE 2A" and "COURTHOUSE 5A," respectively. Even if these denote separate rooms or other spaces in 103 Broad Street, I treat them as have identical places insofar as they have the same street address.

[13]The "consolidationID" field in the "Consolidations" table contains 3,094 unique entries, which is consistent with the 3,094 rows in the table. I verified that every consolidationID in the "Voters" table appears in the "Consolidations" table.

[14]Precinct names and polling places are contained in the following three fields in the Consolidations table: "pollName," "pollAddress," and "pollCityStateZip."

in the 2014 voterfile.

45 I hired a research assistant to geolocate the 6,053,385 registered voters in Georgia as of the 2014 General Election. By this I mean that I requested that my assistant determine the latitude and longitude of each voter's residential address that appears in the 2014 voterfile. This geoplace exercise was succesful for approximately 99.13 percent of Georgia's 6,053,385 registered voters in 2014.[15]

46 Based on voters' latitudes and longitudes, I can infer which census block group almost every 2014 registered voter in Georgia was located in. By "almost every," I mean approximately 99.13 percent. Below I discuss census block groups and how I use them in this report. For the moment, though, it is sufficient to note that a census block group is a geographical unit that is used by the United States Census Bureau. The intention of the geoplace exercise I mentioned above is to use residential address data in the 2014 voterfile to determine the census block group in which each registered voter in Georgia lived as of the effective date of the 2014 voterfile.

[15]My research assistant used ESRI ArcMap to geolocate registered voter addresses in Georgia. An address can be difficult to geolocate in the presence of street or address changes or if there is disagreement between the Census Bureau, the United States Postal Service, and surveyors as to where a particular address is truly located. For example, the town of Pearson, Georgia, contains a street named "Cody Bazemore Lane." The United States Postal Service recognizes this street name. However, ESRI ArcMap and `Google Maps` do not, the latter thinking that the street name is actually "Robert D. Bazemore Lane."

4.1.3 The 2016 Georgia voterfile

47 I now turn to the 2016 Georgia voterfile that I use in this report.

48 The 2016 voterfile used here is contained in a text file that, to the best of my knowledge, was created by the Georgia Secretary of State. This file is pipe-delimited, meaning that its fields are separated by the pipe symbol (|). This is a standard format for a text-based data file. The 2016 Georgia voterfile lists 6,653,011 registered voters.

49 For reasons that will be clear shortly, I use the 2016 voterfile only for the purpose of identifying the races of the registered voters who are listed in it. Registered voter race codes consist of short (one or two letter) abbreviations that specify the self-designated races of all of the registered voters in the 2016 voterfile. This voterfile has 351 erroneous race codes.

4.1.4 The 2018 Georgia voterfile

50 I now turn to the 2018 Georgia voterfile that I use in this report.

51 The 2018 voterfile used here, like the aforementioned 2016 voterfile, is contained in a text file that, to the best of my knowledge, was created by the Georgia Secretary of State. This file is pipe-delimited like its 2016 counterpart and lists 6,928,150 registered voters. Of those, none has an erroneous county code, and 18 have erroneous race codes.

52 There are 63 fields in the 2018 voterfile, one of which is voter race.[16] As noted above, there are 18 registered voters in the 2018 voterfile whose race fields contain erroneous codes.[17] When in this report I discuss the racial breakdown of Georgia registered voters in 2018, I disregard these 18 individuals. This small set of registered voters is minuscule compared to the 6,928,150 registered voters in the 2018 voterfile.

Table 1: Distribution of race among registered voters in the 2018 Georgia voterfile

Race	Count	Percent
White	3,731,324	53.86
Black	2,068,437	29.86
Unknown	680,117	9.82
Hispanic	200,698	2.90
Asian/Pacific Islander	147,260	2.13
Other	91,299	1.32
American Indian/Alaskan	8,997	0.13
Total	6,928,132	100.00

53 Table 1 describes the distribution of registered voter race in the 2018 Georgia voterfile. The rows are sorted by size of racial group, and it is clear that white registered voters make up the majority (approximately 54

[16]There are actually two fields in the 2018 voterfile that describe registered voter race, but these fields are redundant. One such field, named "race," consists of two-letter race group abbreviations, i.e., "AI" and "WH." The second field, named "race_desc," consists of expansions of these abbreviations, i.e., "American Indian or Alaskan Native" and "White not of Hispanic Origin," respectively.

[17]In particular, the "race" field for these 18 registered voters is "F" (11 cases) and "M" (seven cases). I suspect, but do not know, that these represents gender codes ("F" for female and "M" for male) that are erroneously placed in race fields. In the 18 cases of interest here, the field "race_desc" is also erroneous insofar as this field for the 18 cases contains a date as opposed to a race group description.

percent) of registered voters in Georgia. The next largest group is black registered voters (approximately 30 percent), following by registered voters with unknown races (approximately 10 percent). Beyond black and white registered voters, no other race group in Georgia makes up more than three percent of the total Georgia registered voter pool.[18]

4.2 Voter history files

54 The Georgia Secretary of State maintains lists of registered voters who participated in elections in Georgia. These lists, which are publicly available, are contained in what are known as *voter history files*.[19]

55 A voter history file for a given election consists of a set of voter registration numbers, each of which is associated with a registered Georgia voter who cast a ballot in said election. Voter history files also indicate how—on election day or absentee—each voter cast his or her ballot.

56 For the purposes of this report, I downloaded voter history files for the 2014 and 2018 General Elections.[20] Using the fact that Georgia voter

[18] Table 1 does not report confidence intervals for the percentages in it (the rightmost column of the table). This is because the table contains results from the complete 2018 Georgia voterfile. The 2018 voterfile does not consist of a sample of registered voters in Georgia as of its effective date, October 15, 2018; the file contains literally the universe of these individuals.

[19] *Elections Division Voter History Files*, Georgia Secretary of State, available at `https://elections.sos.ga.gov/Elections/voterhistory.do` (last accessed February 16, 2020).

[20] The source for the history files is noted in fn. 4. The names of the 2014 and 2018 files that I downloaded are "31979.TXT" and "34147.TXT," respectively.

history files and voterfiles are indexed by voter registration numbers, each of which corresponds to a unique registered voter in Georgia, I merged election turnout data from the 2014 and 2018 voter history files into my 2014 and 2018 voterfiles, respectively. From this merge, I can determine which registered voters in the 2014 and 2018 voterfiles voted in the 2014 and 2018 General Elections, respectively, as well as whether each individual voted on election day.

4.3 Georgia polling places used in 2018

57 I have already described how the SQLite database from which I generated my 2014 voterfile also contains information about precincts used in the 2014 General Election. I noted this when discussing two tables ("Voters" and "Consolidations") that are part of the database.

58 Through discovery in this litigation, the State provided an SQLite database for the 2018 General Election.[21] The format of the 2018 SQLite database is essentially equivalent to that of the 2014 SQLite database that I discussed above.

59 In particular, the 2018 SQLite database contains 12 tables, among them a table listing registered voters ("Voters") and a table with polling place information ("Consolidations"). The "Voters" table contains a field called

[21]This database is named, "STATE-DEFENDANTS-00089548.DB3," and it was provided to me by plaintiffs' Counsel.

"consolidationID," and this field can be used to associate each registered voter in "Voters" with his or her polling place in the 2018 General Election.

60 Using voter registration numbers, which appear in my 2018 voterfile and in the 2018 "Voters" table that is part of the 2018 SQLite database provided by the State, I merged each registered voter's "ConsolidationID" into the 2018 voterfile. Then, using "ConsolidationsID," I merged polling place details from the "Consolidations" table into the voterfile.

61 There are 10,080 registered voters in my 2018 voterfile who do not appear in the 2018 "Voters" table. For this set of individuals (approximately 0.15 percent of the overall voterfile), I do not have polling place details.

4.4 Census data

62 I have thus far described sources of data on Georgia registered voters and where they voted on election day in the 2014 and 2018 General Elections. In my analysis, below, of these voters, I also draw on data from the American Community Survey (ACS), a product of the United States Census Bureau.[22] In particular, I use the 2010-2014 ACS to characterize the citizen voting age population (CVAP) of block groups in Georgia.[23] In my discussion of the

[22] On the ACS, see the Census Bureau description at `https://www.census.gov/programs-surveys/acs` (last accessed February 8, 2020).

[23] *Citizen Voting Age by Race and Ethnicity 2010-2014*, United States Census Bureau (February 1, 2016), available at `https://www.census.gov/data/datasets/2014/dec/rdo/2014-cvap.html` (last accessed February 8, 2020).

2014 voterfile, I noted that a census block group is a geographical unit used by the census.[24] There are 5,533 block groups in Georgia, and together these units partiton the state geographically. This means that they are exclusive (do not overlap) and exhaustive (together they cover all of Georgia).

63 Census block groups are the second smallest geographical units for which the census reports results. The reason that this report uses block groups as opposed to blocks, which are smaller, is because the ACS does not include CVAP data at the block level.

4.5 Identifying polling places that closed in Georgia between 2014 and 2018

64 I now describe how I determine which polling places in Georgia closed between the 2014 and 2018 General Elections. I include such a discussion in the data section of this report as it reflects data manipulations. To preview what follows, I identify closed polling places in Georgia by assessing the extent to which the physical addresses of polling places used in the 2014 General Election were also used in the 2018 General Election.

65 If a given registered voter's polling place was closed between the 2014 and 2018 General Elections, this means that said registered voter was assigned to a new polling place as of November 2018.

[24] For the hierarchy of census geographical units, see `https://www2.census.gov/geo/pdfs/reference/geodiagram.pdf` (last accessed February 8, 2020).

66 It is important to distinguish a precinct (a geographical unit) from its associated polling place, and this because multiple precincts can in principle use a single polling place. Earlier I noted that to the best of my understanding, in the 2014 General Election, there were 2,531 precincts in Georgia but only 2,516 polling places (note that 2,516 is 15 fewer than 2,531). This appears to be indicative of some precincts sharing polling places. I noted above that in the 2018 General Election there were also fewer polling places than there were precincts.

67 The two "Consolidations" tables that I have previously discussed include polling place addresses (the variable name in "Consolidations" is "pollAddress"). These addresses are for the most part unique across counties; when they are not unique (e.g., four polling places in 2014 have an address of "000 MAIN STREET," I add county names to said addresses. Then, I say that a polling place in 2014 closed prior to 2018 if its address was used in 2014 but not in 2018.

68 There are various inconsistencies and minor errors in the 2014 and 2018 polling place address lists that I extracted from the 2014 and 2018 State-provided SQLite databases. For example, the Welcome Community Center, used as a polling place in 2014 and in 2018, is located at *1792* Welcome Rd, Newnan, GA 30263.[25] However, in the 2014 "Consolidations" table,

[25]For this address, see `https://www.facebook.com/pages/Welcome-Community-Center/757936997574418` (last accessed February 17, 2020).

this address appears as *1972* Welcome Rd. I presume that this reflects a transposition of digits in a street address as opposed to a polling place that moved.

69 Another example of inconsistent addresses across 2014 and 2018 lists of polling places is a fire station used in 2014 and 2018 as a polling place in Ludowici, GA 31316. Per the 2018 SQLite database, this fire station is located at 3218 Marcus Nobles Highway. Per the 2014 database, however, the polling place is located at 000 Marcus Nobles Highway.

70 A third example of inconsistent addresses is as follows. In the 2014 General Election, there was a polling place at 101 Barr *Road*, Bowdon, GA 30108. However, in 2018, there was a polling place at 101 Barr *Avenue*, Bowdon, GA 30108. Despite this minor inconsistency in street addresses in 2014 and 2018, I assume that these two polling places are actually located at the same place.

71 I attempted to correct as many errors like the above as I could. In many cases, I was able to identify and resolve polling place address discrepancies by comparing polling places that had identical names in 2014 and 2018 yet different addresses. The name of each polling place can be found in the variable called "pollName" in the 2014 and 2018 "Consolidations" tables.[26]

[26]In some cases, I found errors in polling place addresses that were consistent across time. For example, the Rome Civic Center is a polling location in Rome, GA. Its street address is 400 Civic Center *Drive*. In both the 2014 and 2018 "Consolidations" tables,

72 Before comparing polling place addresses to determine which 2014 places closed prior to the 2018 General Election, I removed all punctuation marks from the 2014 and 2018 polling place addresses that I have. The reason that I did this is because, among other things, I did not want inconsistencies in the use of periods to lead me to think that two polling places that in reality are in the same place are actually different. For example, one could reasonably refer to Georgia Highway 125 as "GA HWY 125" or "GA HWY. 125"

73 I note that the polling place data that I have includes some places with missing zip codes in the "Consolidations" field named "pollCityStateZip." These missing zip codes are not problematic for me because I do not compare polling place zip codes in the 2014 and 2018 General Election.

74 Henceforth, when I state that a given Georgia polling place closed between the 2014 and 2018 General Elections, this means that the address for the polling place used in 2014 does not appear in the list of polling place addresses from 2018.

75 My method of determining which polling places closed in Georgia between 2014 and 2018 does not depend on comparing official polling place or precinct identifiers across these years. In my professional experience as a

this address is listed as 400 Civic Center *Dive*. Errors that are consistent across time do not cause problems in comparing polling place addresses in 2014 and those in 2018.

scholar of election administration, county election officials sometimes renumber polling places and precincts without necessarily adjusting them. If, say, a Georgia county were to have renumbered its precincts between 2014 and 2018 but not closed any associated polling places in this time period, my method for identifying closed polling places would not erroneously conclude otherwise.

4.6 Identifying Georgia registered voters who did not move between 2014 and 2018

76 Earlier I noted that Georgia voterfiles contain unique voter registration numbers. I merge my 2014 and 2018 voterfiles using these numbers.

77 Such a merging exercise allows me to assess if any registered voters in Georgia moved within the state between the 2014 and 2018 General Elections. To do this, I create an overall address field for each registered voter in my 2014 and in 2018 voterfiles by concatenating each voter's street address, city, and five digit zip code. After concatenating voter addresses, I remove spaces, ensure that all address characters are lower case, and remove punctuation marks as well.

78 For example, suppose that a registered Georgia voter lived at 206 Washington St. SW, Atlanta, GA 30334. This individual would have an address string of, "206washingtonstswatlanta30334."

79 I then assume that a Georgia registered voter whose concatenated address in 2014 is the same as his or her concatenated address in 2018 did not move between these two years. I similarly assume that registered voters whose address fields differed between 2014 and 2018 moved between these years.

80 My use of concatenated address fields in 2014 and 2018 has two minor limitations. First, my asserting that a difference between a registered voter's overall address in the 2014 and 2018 voterfiles implies that said registered voter moved within Georgia between 2014 and 2018 may not capture the true extent to which such a voter moved in this time frame. This is because I cannot count how many times a voter whose address changed between 2014 and 2018 actually moved in this time period. A registered voter who moved twice between 2014 and 2018 would from my perspective appear the same as a registered voter who moved only once in this period.

81 Second, if a registered voter moved within Georgia between 2014 and 2018 and, prior to 2018, moved back to the exact same address from which he or she started, I would classify this individual as a non-mover even though the individual in fact had moved twice between 2014 and 2018.

82 To the extent that these two issues affect my characterizations of registered Georgia voters who moved within Georgia between 2014 and 2018, they will cause me to understate the extent of registered voter movers in the

state.

83 Lastly, I cannot use my address comparison method for counting moving registered voters to enumerate registrants who moved out of Georgia between 2014 and 2018. This is because the 2018 Georgia voterfile lists only voters who were registered in Georgia itself.

84 Of the 5,245,872 registered voters who appear in both the 2014 and 2018 Georgia voterfiles, I find that 1,625,661 (approximately 30.1 percent) moved between these two years.

4.7 Data limitations and underestimates of the extent to which black registered voters were affected by 2014-2018 polling place changes in Georgia

85 The data sources that this report brings to bear on the relationship between race and polling place changes made in Georgia between 2014 and 2018 are valuable. However, like all data sources used to investigate an aspect of election administration, they have limitations.

86 In this section of the report I discuss two data limitations. First, I comment on the implications of the fact that I do not have access to a 2012 Georgia voterfile. Second, I describe the consequences of the fact that the 2014 voterfile used in the report does not contain a field that describes the

race of each registered voters in Georgia.

4.7.1 Lack of a 2012 Georgia voterfile

87 To the best of my knowledge, the defendants in this litigation have not produced a 2012 Georgia voterfile during discovery.

88 My lack of access to a 2012 voterfile means that the results in this report cannot engage the full extent of polling place changes that have occurred in Georgia since *Shelby County*. This Supreme Court decision was handed down on June 25, 2013, and the effective date of the 2014 voterfile used here is October 24, 2014. Polling place changes promulgated in Georgia between these two dates are thus beyond the scope of this report.

89 Although I do not have direct evidence on the extent of polling place changes in Georgia prior to the effective date of the aforementioned 2014 voterfile, I have indirect evidence that some polling places in the state were indeed changed between the 2012 General Election and October 24, 2014. Here I provide evidence from two Georgia counties, Warren and Forsyth.

90 Per my 2014 voterfile, Warren County had one polling place in the 2014 General Election, located at 48 Warren St., Warrenton GA 30828. This county is approximately 60 percent black and had 5,436 resident as of 2018.[27] However, according to a September 2019 report titled, "Democracy

[27]For these details on Warren County, which come from the 2018 American Community Survey, five year estimates, see `https://data.census.gov/cedsci/table?q=`

Diverted," issued by the Leadership Conference Education Fund, Warren County closed 83 percent of its polling places between 2012 and 2018 (p. 64). This statement can hold only if Warren County polling places were closed between the 2012 General Election, which the aforementioned report used as a baseline for its analysis of precinct and polling place changes in Georgia, and the 2014 General Election.[28]

91 Regarding Forsyth County, this is another Georgia county that adjusted its precincts and polling places between 2012 and the 2014 General Election. Forsyth County was approximately four percent black with 236,612 residents as of 2018.[29] In the period leading up to the 2014 General Election, the county's Board of Voter Registration and Elections reduced its number of precincts from 25 to 16.[30]

---

warren%20county%20Georgia%20demographics&g=0500000US13301&tid=ACSDP5Y2018.DP05(last accessed February 18, 2020).

[28] *Democracy Diverted*, Leadership Conference Education Fund (September 2019), available at http://civilrightsdocs.info/pdf/reports/Democracy-Diverted.pdf (last accessed February 12, 2020).

[29] For these details on Forsyth County, which come from the 2018 American Community Survey, five year estimates, see https://data.census.gov/cedsci/table?q=forsyth%20county%20Georgia%20demographics&g=0500000US13117&tid=ACSDP1Y2018.DP05(last accessed February 18, 2020).

[30] *Election Summary Report*, Forsyth County, State of Georgia (November 6, 2012), available at https://www.forsythco.com/Portals/0/Documents/Voter/ElectionResults/2012_11_06/GEMS%20ELECTION%20SUMMARY%20REPORT.pdf(last accessed February 18, 2020) and *Election Summary Report*, Forsyth County, State of Georgia (November 4, 2014), available at https://www.forsythco.com/Portals/0/Documents/Voter/ElectionResults/2014_11_04/11.4.14%20GEMS%20ELECTION%20SUMMARY%20REPORT.pdf(last accessed February 18, 2020. See as well Brande Poulnot, *Forsyth County's Proposed Voting Precinct Changes Set To Be Decided Nov. 4*, The Patch (October 15, 2013), available at https://patch.com/georgia/cumming/forsyth-countys-proposed-voting-precinct-changes-set-to-be-decided-nov-4 (last accessed February 16, 2020).

92 Without a 2012 voterfile or another source of information that describes Georgia's polling places as of November 2012, I cannot comment on the extent of precinct changes in Georgia that predate this report. Regardless, to the extent that there were any, it follows that my report's results on the consequences of the polling place changes in Georgia that occurred between 2014 and 2018 underestimate the consequences in Georgia wrought by these types of changes since 2012.

4.7.2 Lack of individual race details in the 2014 voterfile

93 I noted earlier that my 2014 voterfile lacks a field for registered voter race. Insofar as I need to know information about the races of registered voters in Georgia as of the 2014 General Election in order to assess the extent to which polling place changes in Georgia after 2014 were racially neutral, I deal with this lacuna in two distinct ways.

94 *Racially homogeneous census block groups.* Some registered voters in 2014 resided in census block groups that were racially homogeneous, or almost racially homogeneous, with respect to citizen voting age population. If, for example, a 2014 registered voter's address placed her in a census block group whose citizen voting age population was 100 percent black, then it follows that this registered voter is also black. I can infer this even though the 2014 voterfile that I use here lacks a race field. A similar statement applies to a registered voter who lived in 2014 in a racially homogeneous

white census block group; such a registered voter must be white.

95 This logic leads to a homogeneous census block group analysis wherein I focus on registered voters who live in census block groups in Georgia that are at least 95 percent black or at least 95 percent white.

96 The advantage of such an analysis is that it alleviates the problems caused by the fact that the 2014 voterfile lacks a race field. The disadvantage of this approach, however, is that it allows consideration only of places in Georgia that are almost all black or almost all white.

97 *Linking 2014, 2016, and 2018 voter registration records.* Another approach to dealing with the lack of a race field in the 2014 voterfile is to use race information for Georgia registered voters that is contained in the 2016 and 2018 voterfiles. This approach covers more registered voters in 2014 than the homogeneous census block group approach described above, but, as I explain below, it comes at a cost of selecting against black registered voters.

98 When linking the 2014, 2016, and 2018 voterfiles, I transfer race data for registrants in the 2014 file from the 2016 and 2018 voterfiles. This is not problematic for registered voters in Georgia who appear in the 2014 voterfile and then either in the 2016 or 2018 voterfiles (or in both). However, registrants who appear in the 2014 voterfile, but in neither the 2016 nor the 2018 voterfile, cannot be considered in analyses that link the 2014, 2016, and

2018 voterfiles.

99 There are 6,053,385 registered voters in the 2014 voterfile. Using the common registration number field to link the 2014, 2016, and 2018 Georgia voterfiles, I transfer race details from the 2016 file into the 2014 file. This characterizes the races of 5,892,947 registered voters. I find an additional 8,113 registered voters in the 2014 voterfile whose registration numbers do not appear in the 2016 voter file but do appear in the 2018 voterfiler. For this group, I transfer race information to 2014 from the 2018 voterfile.

100 When this exercise is complete, I have race information on all 6,053,385 registered voters in the 2014 voterfile except for 152,325 (approximately 2.52 percent).

101 A set of 152,325 registered voters is substantial, and this particular set is most likely not representative with respect to race of all 2014 Georgia registered voers. This is because the set of registered voters in Georgia who were registered in 2014 and then later in either 2016 or 2018 (and thus appear in both the 2014 and in either the 2016 and/or 2018 voterfiles) selects against movers. This means that movers will be disproportionately unrepresented (and non-movers disproportionately represented) among registered voters in Georgia who were registered in both 2014 and then in 2016 and/or 2018. The set of registered voters in Georgia who were registered in both 2014 and then again in 2016 and/or 2018 also selects against registered voters who passed

away between 2014 and 2018.

102 Any set of registered voters that selects against movers is problematic because black individuals on average move more frequently than white individuals.[31] Therefore, on account of moving propensity, black registered voters as of 2014 are disproportionately less likely compared to white registered voters to be part of a collection of registered voters in Georgia who were registered in 2014 and later in 2016 and/or 2018. Put another way, there are fewer black registered voters in my sample of registered voters who were registered in 2014 and later in 2016 and/or 2018 than there should be.

103 Accordingly, any analysis in this report that uses 2016 and 2018 race data in place of 2014 race data selects against black registered voters.[32]

104 As I explain later in this report in the context of specific analyses, this presumably leads to *underestimates* of the relationship between race and polling place changes in Georgia in the period 2014 and 2018. Thus, to the extent that my analyses using 2016 and 2018 race data in 2014 conclude that these changes were not racially neutral, these conclusions are conservative.

[31] *Americans Moving at Historically Low Rates*, United States Census Bureau (November 16, 2016), available at `https://www.census.gov/newsroom/press-releases/2016/cb16-189.html` (last accessed February 10, 2020).

[32] This point is not obviated by the argument that an individual in the 2014 voterfile, but in neither the 2016 nor 2018 voterfiles, was not a registered voter in 2016 and 2018 and thus cannot have had his or her polling place changed between 2014 and 2018. A full assessment of the racial neutrality (or lack thereof) of polling place changes carried out in Georgia between 2014 and 2018 requires the races of all registered voters who, by virtue of being registered to vote in 2014, were vulnerable to such changes.

To the extent that polling place changes in Georgia in the time frame 2014 and 2018 were not racially neutral and in fact affected black registered voters more than white registered voters, the true extent of such non-neutrality is equal to or greater than what I find in this report.

5 Assessing the racial neutrality of polling place changes in Georgia, 2014 to 2018

105 In this section of my report, I describe this report's results on the extent to which polling places changes in Georgia in the time period 2014 to 2018 were racially neutral. This section consists of four parts.

106 First, I provide some basic counts of closed polling places in Georgia, 2014 to 2018, and show that polling place closure rates varied across Georgia.

107 Second, I assess in three ways the extent to which polling place closures in Georgia in the time period 2014 to 2018 were racially neutral. These ways consist of an analysis of racially homogeneous census block groups in Georgia; an analysis which links the 2014, 2016, and 2018 voterfiles; and, an analysis of majority black polling places in Georgia. The conclusions of these three approaches to the question of racial neutral of polling place closures in Georgia in the time period 2014 to 2018 are qualitatively identical: black registered voters in Georgia were disproportionately affected by the

polling place changes in Georgia that occurred between 2014 and 2018.

108 Third, I consider the set of registered voters in Georgia who received new polling places in 2018 compared to 2014. This set of individuals is more numerous than those whose polling places closed in this time frame, and this is because a registered voter in Georgia could have been assigned between 2014 to 2018 to a new polling place even if this voter's polling place in 2014 did not close. This leads me to enumerate the set of registered voters in Georgia who received new polling places sometime between 2014 and 2018, and based on this enumeration I assess whether the process that produced new polling place assignments among registered Georgia voters was racially neutral. I find that it was not, and this conclusion is qualitatively identical to the conclusions, broadly construed, of my assessment of polling closures alone.

109 Fourth, I examine voter turnout rates in the 2018 General Election in Georgia and in particular compare turnout rates among registered Georgians who received a new polling place between 2014 and 2018 and those who did not. I carry out this analysis because it addresses possible downstream effects of the polling place changes made in Georgia between 2014 and 2018. I find evidence that registered voters in Georgia who received new polling places in the period 2014 to 2018 were less likely to vote in 2018, and in particular less likely to vote on election day, compared to registered voters in Georgia who did not receive new polling places in the period 2014 to 2018.

5.1 Identifying polling place closures in Georgia between 2014 to 2018

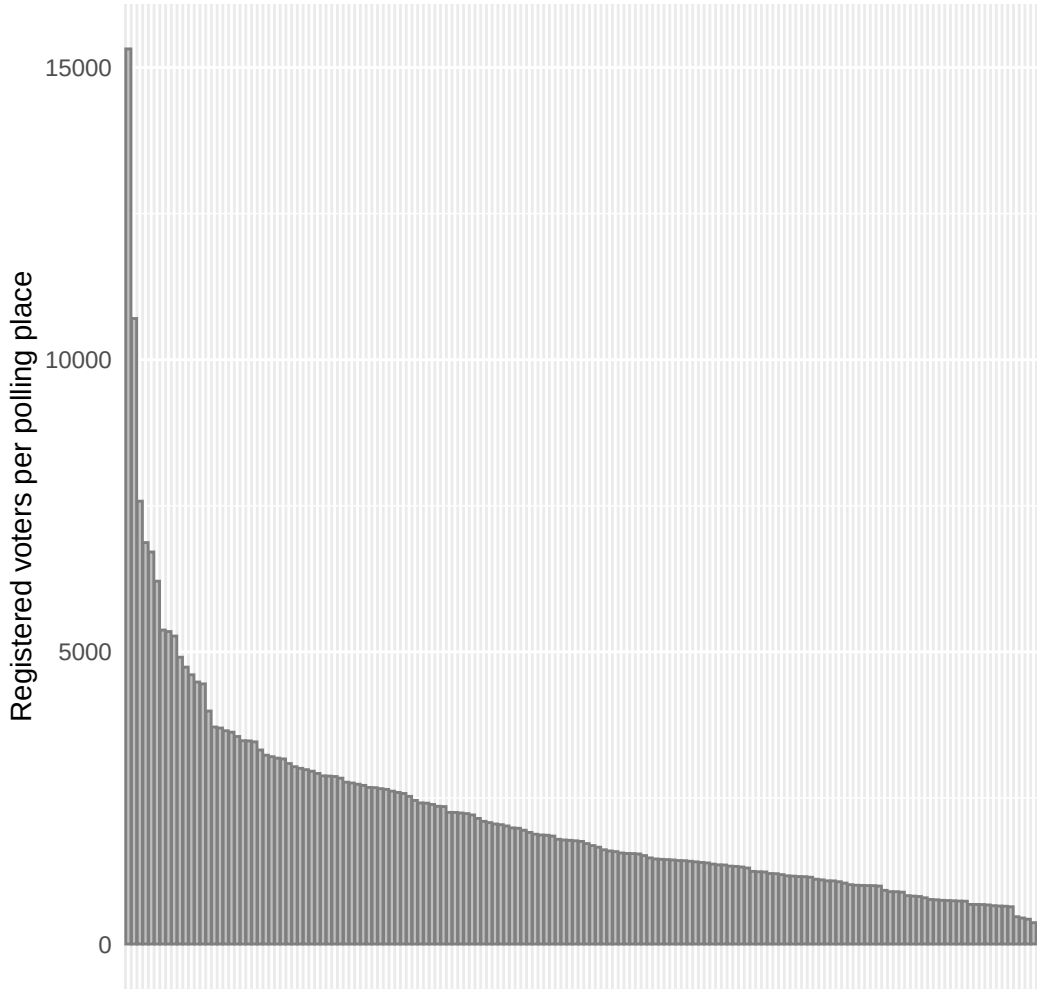
110 There were 2,516 polling places in Georgia in the 2014 General Election and 2,349 such places in the 2018 General Election. The difference between these two numbers is *not* the number of polling place closures between 2014 and 2018, and this is because the total count of Georgia polling places in 2018 includes places that were added between the 2014 and 2018 General Elections.

111 Before detailing polling place closures in Georgia *per se*, I note that the state's 159 counties varied in the extent that they contained polling places in 2014. This is evident in Figure 1, which is a barplot with 159 bars, one per Georgia county. The height of each bar is the ratio of a county's total registered voter pool in 2014 divided by the number of polling places in the county.

112 The tallest bar in Figure 1 is associated with Stephens County. As of 2018, this county had 25,676 total residents and one polling place. The second tallest bar is Rabun County, which as of 2018 had 16,457 residents and one polling place.[33] To the extent that Georgia's polling places are a

[33]The demographics for Stephens County and Rabun County are from the 2018 American Community Survey, five year estimates, available at `https://data.census.gov/cedsci/table?q=Stephens%20county%20Georgia%20demographics&g=0500000US13257&tid=ACSDP5Y2018.DP05&layer=county&vintage=2018&cid=DP05_0001E`and `https://data.census.gov/cedsci/table?q=Rabun%20County%20Georgia%`

Figure 1: Registered voters per polling place in 2014, by county



Note: each bar in the figure represents one Georgia county.

form of resources available to the state's registered voters, Figure 1 shows that there was variability across Georgia in the availability of these resources

20demographics&g=0500000US13241&hidePreview=false&tid=ACSDP5Y2018.DP05&layer=county&cid=DP05_0001E&vintage=2018(last accessed February 16, 2020).

in 2014, that is, at the start of the time period analyzed in this report.

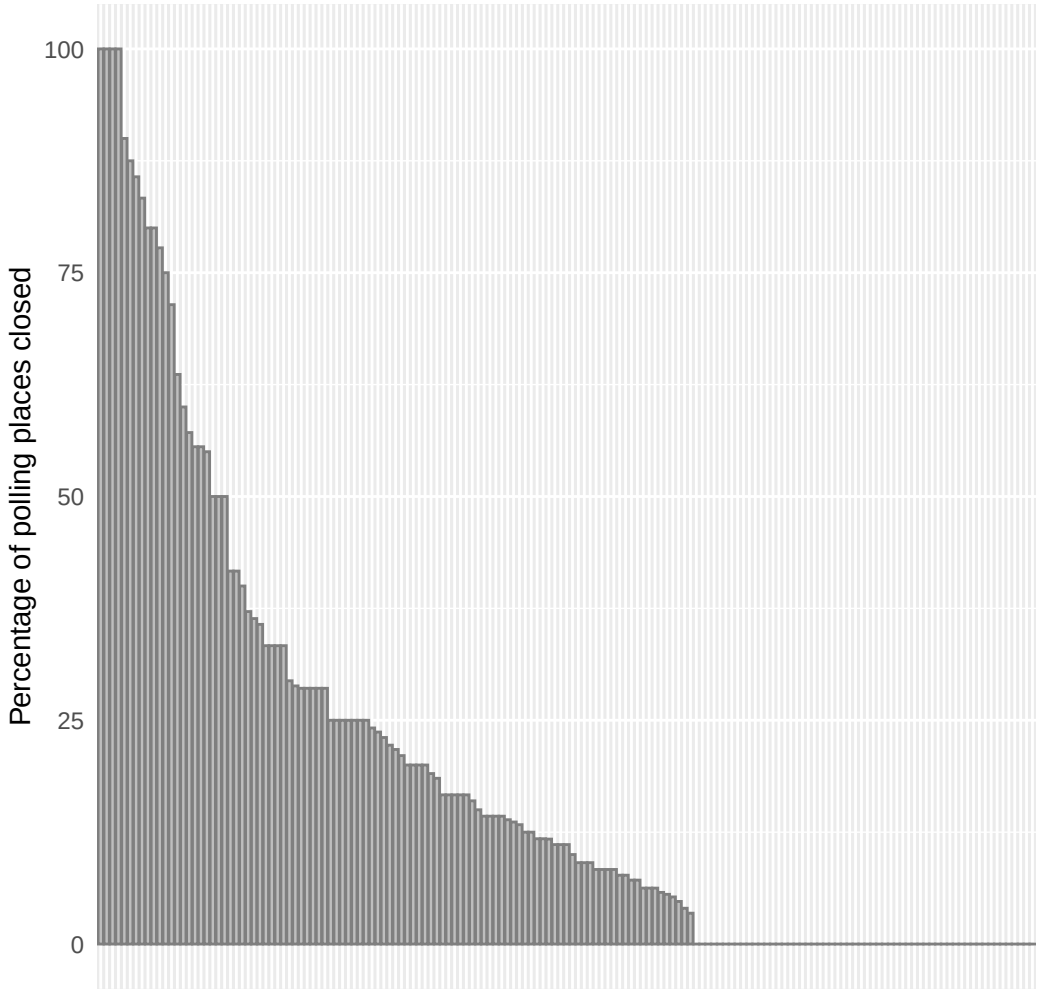
113 I assembled a list containing the polling places that appeared in the 2014 voterfile but did not appear in the 2018 voterfile. This lists contains 459 polling places, and this is the total number of polling places that, to the best of my knowledge, closed in Georgia between the 2014 and 2018 General Elections.

114 The rate of polling place closure by county varied across Georgia. This is depicted in Figure 2, which is a bar plot with 105 bars. The height of each bar describes the percentage of a county's precincts whose polling places closed between 2014 and 2018, and it is evident in this figure that four counties in Georgia closed all (100 percent) of their 2014 polling places. This does not mean, of course, that voters in these counties had nowhere to vote on election day in 2018. Rather, this finding means that every registered voter in these four counties had a new place to vote on election day in 2018 compared to where he or she voted on election day in 2014.

115 I noted that there are 101 bars in Figure 2. Insofar as there are 159 counties in Georgia, it follows that 58 counties in the state did not close any polling places between the 2014 and 2018 General Elections.

116 Figure 2 shows percentages rather than raw numbers of polling places closed, and this is because Georgia counties varied in 2014 in the

Figure 2: Percentages of polling places closed, 2014 to 2018, by county

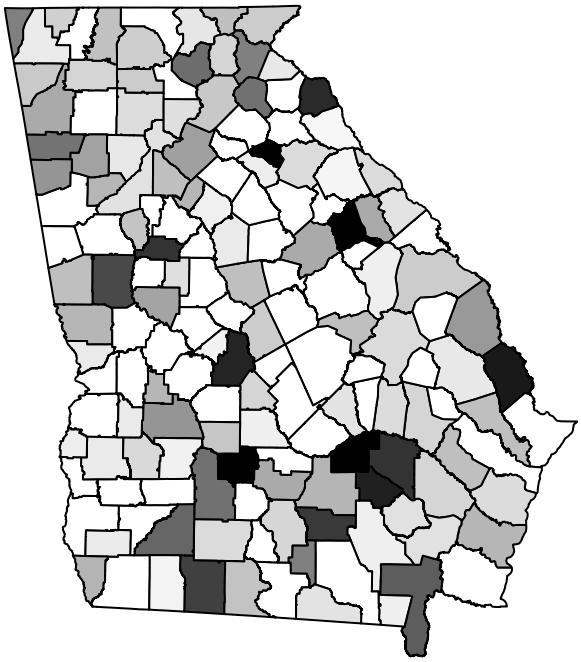


Note: each bar in the figure represents one Georgia county.

number of precincts that they had. If Figure 2 were to plot raw numbers of closed polling places, it would risk being confounded by the fact that more populous counties in Georgia may have more such closures simply because

they have more polling places in the first place.

Figure 3: Map of Georgia counties and percentages of precincts closed, 2014 to 2018



Note: county shading proportional to percentage of precincts closed.

117 Figure 3 shows the spatial distribution of polling place closure rates across Georgia. The darker a county in the map, the greater the closure percentage. In contrast, lightly shaded counties had low polling place closure percentages.

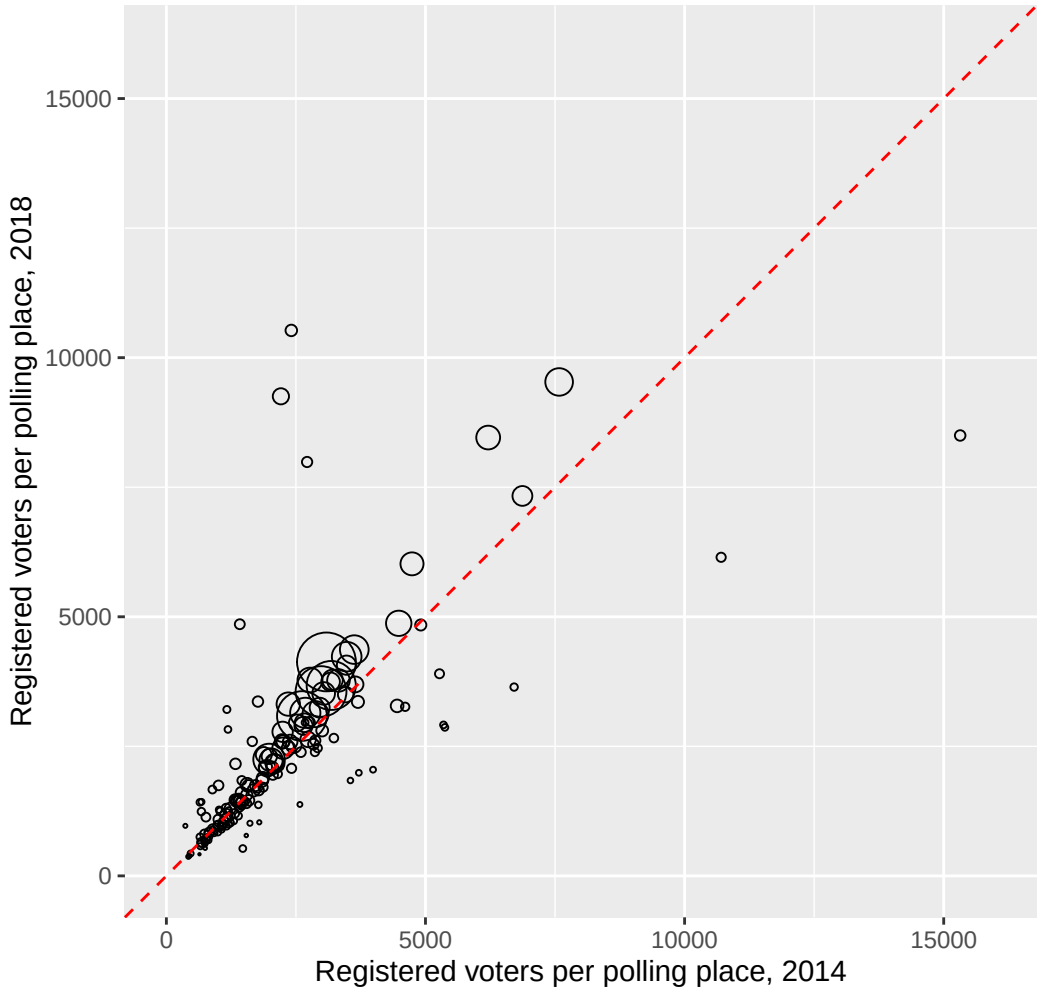
118 The implication of Figure 3 is that 2014-2018 polling place closure rates varied spatially. It is not the case, that is, that all geographic regions of Georgia had similar rates of polling place closure. This was evident in Figure 2's barplot as well.

119 The consequence of polling place closures across Georgia is that many counties had more registered voters per precinct address in 2018 than in 2014. This is shown in Figure 4.

120 In particular, Figure 4 plots by county registered voters per polling place for 2014 and for 2018, and the figure contains a dashed 45-degree line. Each point in the figure denotes a county, and there are 159 points in the figure. Each point is sized proportionally to the number of registered voters in the county in 2018. This is because larger counties are more meaningful statistically than smaller counties, all things equal.

121 County points that lie above the pictured dash line in Figure 4 had more registered voters per polling place in 2018 than in 2014. As the figure shows, most Georgia counties had more registered voters per polling place

Figure 4: Registered voters per polling place, 2014 to 2018, by county



Note: county points are sized in proportion to total registered voters in 2018

address in 2018 than in 2014. The exceptions to this rule are a set of sparsely populated counties whose points lie below the 45-degree line in Figure 4.

5.2 Polling place closures and race

122 In the overview of this report, I noted that the objective of this report is assessing whether polling place closures in Georgia between 2014 and 2018 were racially neutral. I turn to this matter now.

123 I have already written that the 2014 Georgia voterfile in this report does not contain a field for registered voter race, and this complicates my assessments of the extent to which polling place closures in the time period 2014-2018 were racially neutral. As described earlier, I offer two approaches to dealing with this matter.

5.2.1 Assessing the racial neutrality of polling place closures using racially homogeneous block groups

124 The analytical approach in this section of the report builds on the brief discussion of racially homogeneous census block groups that appeared earlier in this report. It proceeds as follows.

125 There are 69 census block groups in Georgia in which, based on the 2010-2014 American Community Survey, all citizens of voting age were black. There are similarly 112 census block groups in which all citizens of voting age were white. Any registered voter in Georgia who lives in a block group that is 100 percent black (white) must be black (white) himself or herself.

126 Similarly, if I consider a block group in Georgia that is 99 percent black (white) based on citizen voting age population, I can be almost certain that almost every registered voter in such a block is black (white).

127 Table 2 presents the rates of polling place closures for registered voters in Georgia who lived in racially homogeneous (or near homogeneous) block groups. It allows homogeneity to range from 100 percent down to 95 percent. This is apparent in the table row titled "Cutoff," which ranges from 100 to 95.

Table 2: Polling place closure rates in racially homogeneous block groups

Cutoff	Blacks	Whites	Black closure rate	White closure rate	Difference
100	47,600	88,130	26.84	24.07	2.76
99	65,600	121,589	25.00	24.05	0.95
98	103,202	204,831	25.50	23.84	1.66
97	137,478	321,050	23.15	21.60	1.55
96	184,814	415,889	21.89	20.61	1.28
95	227,210	538,947	19.81	20.36	-0.55

128 Each row in Table 2 is associated with a given homogeneity cutoff. For a registered voter in 2014 to be included in the top row, the individual must have resided in 2014 in a completely (100 percent) homogeneous census block group. For a registered voter in 2014 to be included in the table's second row, the individual must have lived in 2014 in a census block group that was at least 99 percent black or white. The other rows in Table 2 are characterized similarly.

129 The columns in Table 2 titled "Blacks" and "Whites" report the number of registered black and white voters, respectively, who in 2014 lived in racially homogeneous or near homogeneous census block groups. For example, 47,600 registered black voters in Georgia in 2014 lived in census block groups in which 100 percent of the citizen voting age population was black. The comparable white figure is 88,130 registered voters.

130 The column in table 2 named "Difference" reports the black-white difference in polling place closure rates, and the key finding in Table 2 is as follows: the black-white differences in the table are positive down to a homogeneity cutoff of 95 percent. This implies that, in areas of Georgia where we can be certain or reasonably certain of racial composition, black registered voters in 2014 had their polling places closed at greater rates than white registered voters. Indeed, among black registered voters and white registered voters in completely racially homogeneous census block groups, there is almost a three percentage point difference between black and white polling place closure rates.

5.2.2 Assessing the racial neutrality of polling place closures using race data from the 2016 and 2018 voterfiles

131 I now turn to my second approach at dealing with the fact that the 2014 voterfile lacks a race field. This approach uses race information from the 2016 and 2018 voterfiles in place of 2014 race data.

132 To recap my method that combines the 2014, 2016, and 2018 Georgia voterfiles, of the 6,053,385 registered voters in Georgia as of 2014, there are 5,901,060 (approximately 97.48 percent) who remained registered in 2016 and/or in 2018. I can determine this by comparing voter registration numbers in my 2014 voterfile with voter registration numbers in the 2016 and 2018 voterfiles. Insofar as the latter two voterfiles contain fields for race, I can use the data in these fields to characterize race as of 2014.

133 As alluded to earlier, this approach has limitations related to the fact that not all registered voters on the rolls in 2014 were also registered in 2016 and/or in 2018. The limitations are twofold. First, the approach misses approximately 2.52 percent of Georgia registered voters from 2014. Second, and this was discussed at some length earlier, it is based on individuals in Georgia who maintained their registration status in 2014 and later in 2016 and/or 2018. This selects against movers, which is correlated in the United States with voter registration.[34] Thus, analyzing only those 2014 Georgia registered voters who were also registered in later years in Georgia leads to a sample of individuals that is disproportionately non-moving. More broadly, any feature that leads an individual to register to vote and then to stay registered will be disproportionately present in a sample of 2014 Georgia registrants that is also registered in 2016 and/or 2018.

[34]For example, see the April 2019 Census Bureau report, "Voting and Registration in the Election of November 2018," Table 7, available at `https://www.census.gov/data/tables/time-series/demo/voting-and-registration/p20-583.html` (last accessed February 9, 2020).

134 Table 3 breaks down the 2014 voterfile by race group and closed polling place status. The largest racial group consists of which registered voters, of whom there are over three million. The rows in Table 3 are sorted by rate of polling place closure.

Table 3: Polling place closure rates by race

Race	Registered voters	Closed	Percent closed
White	3,382,774	564,248	16.68
Black	1,793,723	301,291	16.80
Unknown	440,377	79,856	18.13
Hispanic	121,369	19,727	16.25
Asian/Pacific Islander	93,003	12,410	13.34
Other	66,081	10,671	16.15
American Indian/Alaskan	3,385	519	15.33

135 Table 3 shows that the black polling place closure rate in 2014 (approximately 16.80 percent) is greater than the white polling place closure rate (approximately 16.68 percent). This yields a black-white difference of 0.12 percentage points. Like the earlier homogeneous census block group analysis, this analysis finds that black registered voters had polling place closure rates greater than white registered voters.

5.2.3 Black majority precincts and polling place changes

136 For another perspective on the polling place closures that took place in Georgie between 2014 and 2018, I classified each of the 2,516 polling places that were used in the 2014 General Election as having a black majority or

not. To carry out this classification exercise, I assume that a registered voter associated with a given polling place in 2014 is black if and only if this individual can be linked to a registration record of a black individual in 2016 or 2018.

137 My use of this method of classifying black registered voters means that I am selecting against black registered voters. I am confident that some black registered voters who appear in the 2014 voterfile cannot be linked with 2016 or 2018 registered voters because, for example they passed away or moved out of Georgia between 2014 and 2018. I treat these individuals as non-black, and this means that I am almost certainly classifying as white a collection of registered voters in 2014 who are actually black. My results in this section of the report thus understate the number of black majority polling places.

Table 4: Closures among black majority polling places

Black majority	Closed	Count
No	No	1,625
No	Yes	349
Yes	No	432
Yes	Yes	110

138 Table 4 reports the results of classifying the 2,516 polling places in use in Georgia in 2014 based on black registered voter majority status. The top two rows of Table 4 describe the 1,974 polling places that do not have

a black majority. The bottom two rows of Table 4 provide counts of polling places that have a black majority. There are 542 of these.

139 Table 5 in turn describes polling place closure rates by black majority status. In particular, the closure rate among non-black majority polling places is approximately 17.7 percent. In contrast, the closure rate among black majority polling places is approximately 20.3 percent.

Table 5: Closure rates in black majority polling places

Racial group	Polling places	Closure rate
Not black majority	1,974	17.68
Black majority	542	20.30

140 It thus follows from Table 5 that black majority polling place in 2014 were more likely to close than non-black majority precincts. The gap in closure rates between these two types of precincts is approximately 2.6 percentage points. This implies that polling place closures in Georgia in the period 2014 to 2018 were not racially neutral and in particular that such closures disproportionately affected black majority polling places in Georgia in the time period 2014 to 2018.

141 To ensure that the results in Table 5 are not dependent on my use of 50 percent as a potentially arbitrary threshold for characterizing black majority precincts, I repeated the calculations that support Tables 4 and 5 using 60 percent as a cutoff for a black supermajority district. Here, the

prefix "super" on "supermajority" denotes that the threshold for identifying a majority black district is greater than 50 percent. The result of this exercise is Table 5.

Table 6: Closure rates in black supermajority polling places

Racial group	Polling places	Closure rate
Not black majority	2,106	17.76
Black majority	410	20.73

142 Among polling places that are at least 60 percent black, the polling place closure rate is approximately 20.7 percent. Among other polling place, the close rate is lower, approximately 17.8 percent. It thus follows that there is no qualitative difference between the results in Table 6 (black majority polling places need to be at least 60 percent black) and Table 5 (black majority polling places need to be at least 50 percent black). Together these two tables imply that, black majority polling places were disproportionately likely to close in Georgia between 2014 and 2018. This implies that precinct address closures in Georgia in this period were not racially neutral.

5.3 Race and new polling place assignments among non-movers in Georgia in the period 2014 to 2018

143 The results in this report have thus far focused on the rates at which polling places closed in Georgia between the 2014 and 2018 General Elections. However, polling place closure is not the only way that a Georgia

registered voter in 2014 could have been affected by reprecincting exercises that took place in Georgia between the two aforementioned general elections. Namely, a registered voter in Georgia could have been assigned a new polling place between 2014 and 2018 even if the voter's original polling place had not been closed. This observation leads me to analyze the rates at which Georgia registered voters in 2014 were assigned to different polling places in 2018, regardless of whether or not such a reassignment was due to a polling place closure.

5.3.1 Overview of non-movers

144 The set of individuals who can contribute to an analysis of the types of registered voters who received new polling places in the period 2014 and 2018 is limited to those Georgia registered voters who appear in both the 2014 and 2018 voterfiles and who did not move between 2014 and 2018. The reason for such a focus on non-movers in particular is that registered voters in Georgia who moved between 2014 and 2018 may have, by virtue of moving, caused themselves to be placed in new precincts, thus receiving new polling places. It would incorrect to attribute new precincts due to moving to a reprecincting exercise.

145 My analysis of non-movers in Georgia who were registered to vote in Georgia between 2014 and 2018 selects against black registered voters. This is because, as I have already, black individuals tend to move more than white

individuals. Therefore, the conclusions that I describe in this section of my report based on non-movers will understate the effects on black registered voters.

146 Table 7 describes the racial breakdown of 5,245,862 registered voters who appear in the 2014 and 2018 Georgia voterfiles and who have valid 2018 race codes. Ten registered voters are dropped from this table, which explains why 5,245,862 is ten fewer than 5,245,872, the total number of registered voters in 2014 who can be matched to a record in 2018.

Table 7: Distribution of race among registered voters in both the 2014 and 2018 Georgia voterfiles

Race	Count	Percent
White	3,020,291	57.57
Black	1,596,440	30.43
Unknown	376,139	7.17
Hispanic	106,813	2.04
Asian/Pacific Islander	83,047	1.58
Other	58,880	1.12
American Indian/Alaskan	4,252	0.08
Total	5,245,862	100.00

147 Per Table 7, slightly over 57 percent of Georgia registered voters who appear in both the 2014 and 2018 voterfiles are white. The next largest racial group is black with approximately 30 percent. Approximately seven percent of Georgia registered voters who appear in both the 2014 and 2018 voterfiles have unknown races, and slightly more than two percent are Hispanic.

5.3.2 The distribution of race among non-moving Georgia registered voters

148 Table 8 describes the racial breakdown of 3,620,211 non-moving Georgia registrants who were registered to vote in both 2014 and 2018, and the structure of this table parallels that of the previous Table 7, which covered both movers and non-movers in Georgia. Table 8 uses race codes from the 2018 voterfile and drops individuals with clearly erroneous race codes.

Table 8: Distribution of race among non-moving registered voters in both the 2014 and 2018 Georgia voterfiles

Race	Count	Percent
White	2,175,030	60.08
Black	1,026,693	28.36
Unknown	254,885	7.04
Hispanic	67,006	1.85
Asian/Pacific Islander	57,617	1.59
Other	36,745	1.01
American Indian/Alaskan	2,235	0.06
Total	3,620,211	100.00

149 The numbers and percentages in Table 8 show that focusing on non-movers in Georgia between 2014 and 2018 leads to a disproportionately more white, and disproportionatley less black, set of registrants. This is evident in the fact that approximately 60 percent of non-movers are white yet approximately 57.6 percent of all Georgia registrants are white (both percentages, of course, condition on a registered voter being in both the 2014 and 2018 voterfiles). Similarly, approximately 28.4 percent of non-movers are black

while approximately 30.4 percent of all registrants are black. Thus, black registered voters are underrepresented, and white registered voters overrepresented, among non-moving registrants in Georgia between 2014 and 2018.

150 Overall the Georgia-wide percentage at which non-movers who were registered in both 2014 and 2018 received new polling places is approximately 18 percent. This covers non-moving registered voters whose polling places were closed between 2014 and 2018 and also those whose polling places were not closed yet were nonetheless assigned to new such places.

151 Table 9 breaks down by new polling place status all non-moving registered voters in Georgia who appear in both the 2014 and 2018 voterfiles. This table covers 3,619,508 registrants, which is 703 fewer than 3,620,211. The reason for this discrepancy is that a very small number of Georgia registered voters have unknown polling places in either 2014 or 2018, and for this small set of individuals it is not possible to determine if they had new polling places in 2018 compared to 2014.

152 The key result in Table 9 is that black voters who were registered as of 2014 were assigned to new polling places at greater rates than white registered voters. Among non-moving registered voters with polling places in 2018 compared to 2014, approximately 59 percent are white. This percentage *increases* to approximately 60 among non-moving registered voters who were not assigned new precincts in 2018 compared to 2014. This increase is evident

Table 9: Distribution of race and new polling place status among non-moving registered voters in both the 2014 and 2018 Georgia voterfiles

Race	New place	Not new place	Difference
White	59.37	60.26	0.89
Black	28.85	28.23	-0.62
Unknown	7.61	6.91	-0.70
Hispanic	1.80	1.86	0.06
Asian/Pacific Islander	1.32	1.65	0.33
Other	1.00	1.02	0.02
American Indian/Alaskan	0.05	0.06	0.01
Total	100.00	100.00	

in Table 9's *positive* value in the "Difference" column for white registered voters.

153 In contrast, Table 9's black percentage change *decreases* from almost 29 to approximately 28 percentage points when looking at from non-moving registered voters who were not assigned new polling places in 2018 compared to 2014 compared to those who were assigned new polling places. This increase is evident in Table 9's *negative* value in the "Difference" columns for black registered voters.

154 The black and white comparisons in Table 9 are underestimates of the extent to which black registered voters in Georgia, in contrast to white registered voters, received new polling places in 2018 compared to 2014. This is because Table 9 by design selects against movers (who are disproportionately black). Black registered voters who received new polling places in 2018 compared to 2014 and moved in this time period are not

incorporated in Table 9. Even so, Table 9 shows that the assignment of new polling places in Georgia between 2014 and 2018 was not racially neutral and in particular that black registered voters were more likely than white registered voters to be assigned to new polling places.

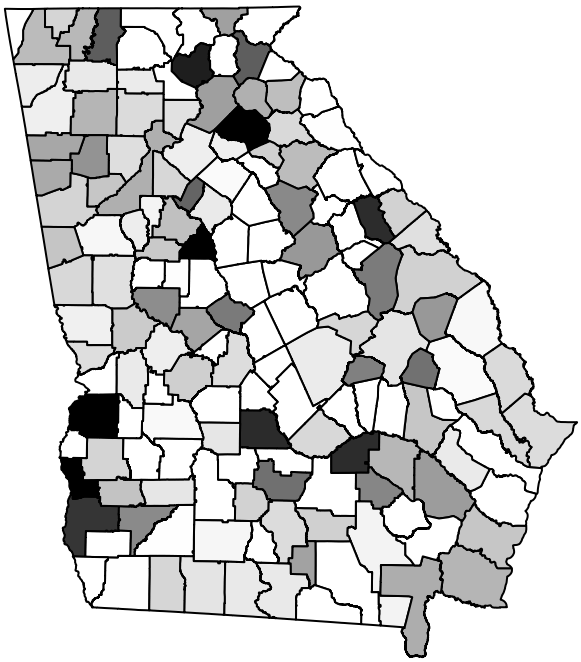
5.3.3 Variance across Georgia counties in the rates at which non-movers received new polling places in 2018 compared to 2014

155 The statewide new polling place rate of approximately 18 percent notwithstanding, there was considerable variance across Georgia's 159 counties in the rates at which non-movers received new polling places. This can be seen in Figure 5, which is a map of Georgia counties shaded by the percentage of non-movers who had new polling places in 2018 compared to 2014.

156 The implication of Figure 5 is that any complications that Georgia registered voters faced on account of having been assigned new polling places between 2014 and 2018 would not have been uniformly distributed across the state. Instead, these complications would have been concentrated in a set of counties.

157 For Georgia's 159 counties, rates of the extent to which non-moving registered voters in Georgia received new polling places in 2018 compared to 2014 are displayed in Figure 6.

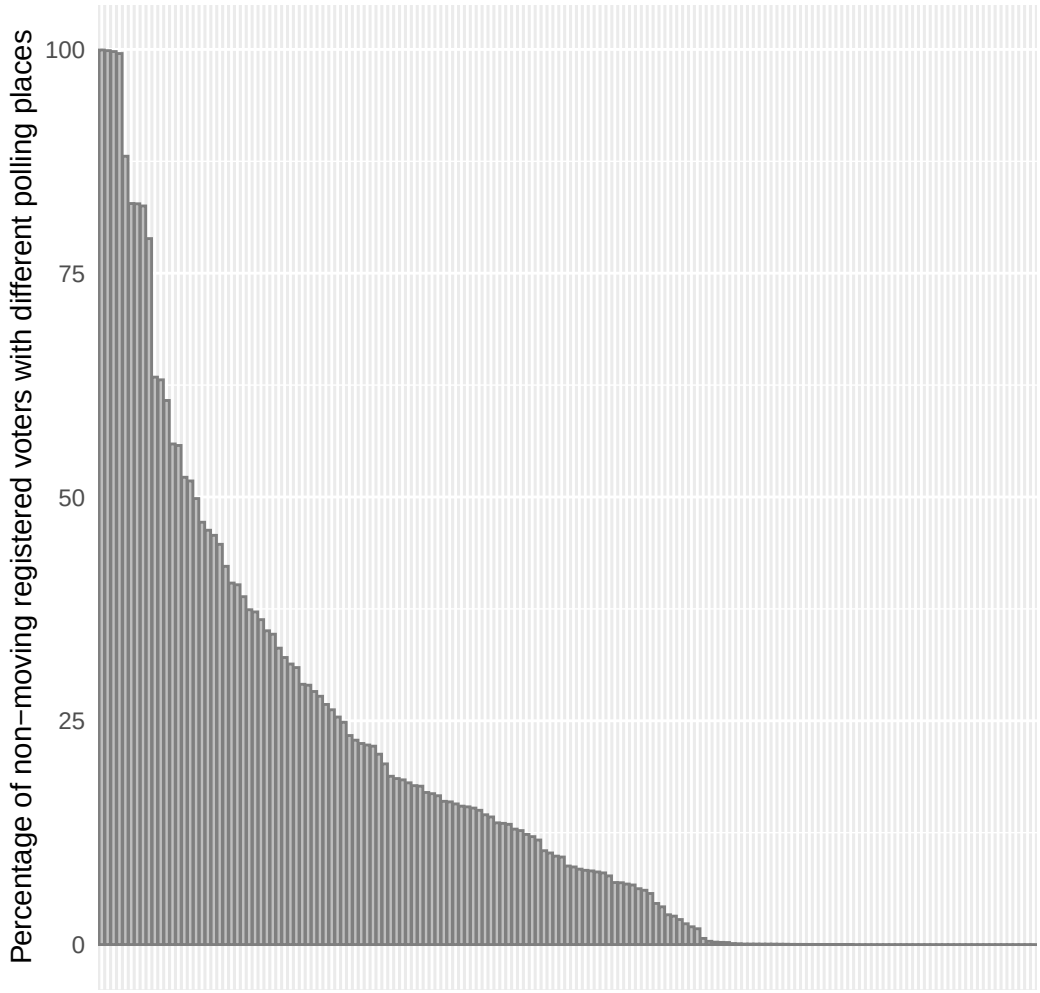
Figure 5: Map of Georgia counties and the extent to which non-moving registered voters had new polling places in 2018 compared to 2014



Note: county shading proportional to percentage of non-movers who had new polling places in 2018 compared to 2014.

158 Figure 6 is a barplot. As in earlier barplots presented in this report, each vertical bar in the figure corresponds to a single Georgia county, and the

Figure 6: Rates at which non-moving registered voters in Georgia had new polling places in 2018 compared to 2014, by county



Note: each bar in the figure represents one Georgia county.

height of a bar indicates the percentage of non-moving registered voters in a county who had new polling places in 2018 compared to 2016. The tallest bar

(100 percent) is from Butts County, where all 9,747 non-moving registered voters had new polling places in 2018.[35] The next tallest bar corresponds to Jackson County, and its height is very close to 100 percent.

159 Of Georgia's 159 counties, 31 contained no non-moving registered voters who were assigned new polling places in 2018 compared to 2014. Moreover, 51 counties had between zero and ten non-moving registered voters who had new polling places in 2018. These 49 counties are the reason behind the area to the right of the vertical bars in Figure 6. In this area, bars have either no height at all or only a tiny height that is essentially not visible.

5.3.4 Racial variance across counties in the rates at which non-movers received new polling places in 2018 compared to 2014

160 I now turn to the subject of racial variance across Georgia counties in the rates at which non-moving voters received new polling places in 2018 compared to 2014.

161 For each Georgia county, I identify the number of white non-moving registered voters who received new polling places in 2018 compared to 2014 and the number of white non-moving registered voters. The ratio of these

[35]Butts County had five polling places in 2016, and they were located at the Butts County Community Center, Jenkinsburg City Hall, Macedonia Baptist Church (called "Stark" in the 2016 precinct list), Towaliga Baptist Church, and Worthville Baptist Church. As of 2018, Butts County had one place polling, located at the Election Office Administration Building.

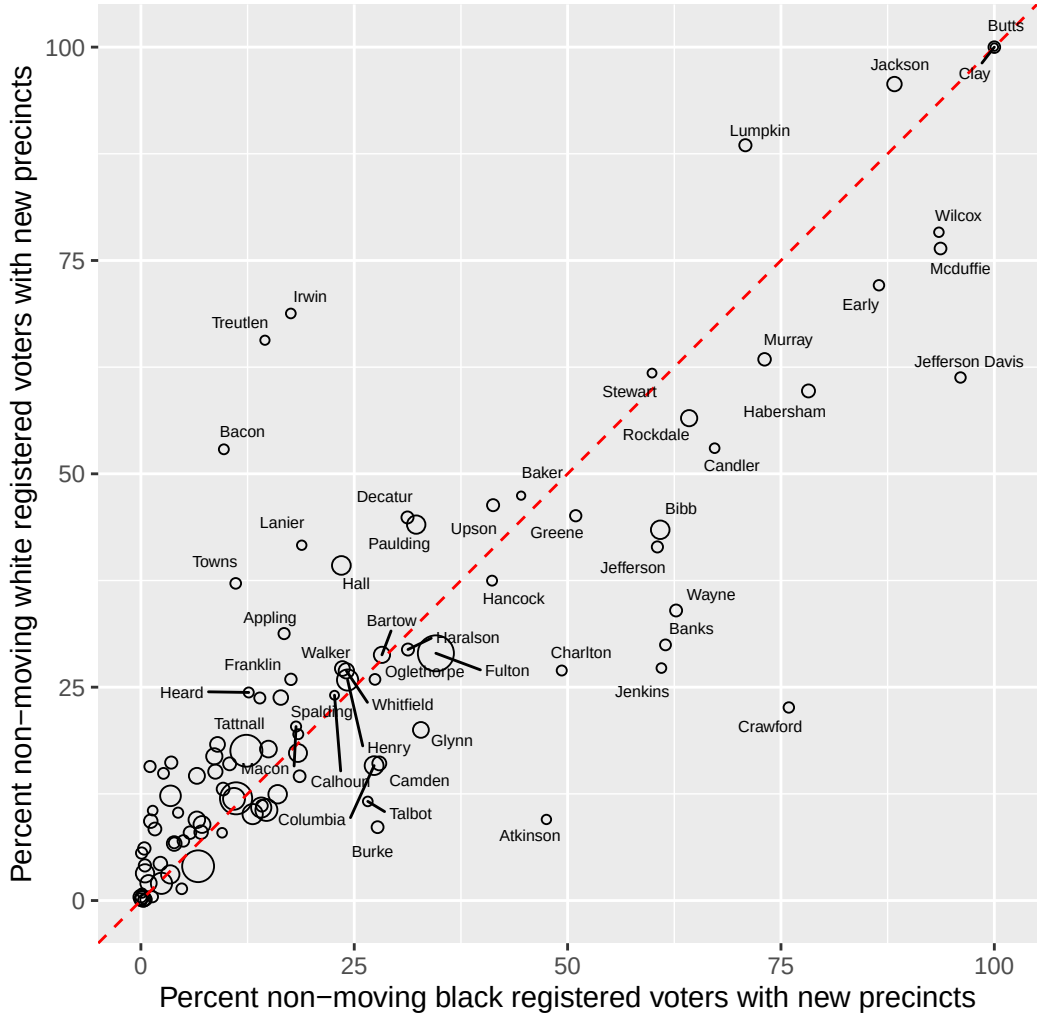
two quantities (multiplied by 100) yields the percentage of white non-movers who received new polling places in 2018.

162 I carry out a similar calculation for black registered voters and plot the white percentage of non-movers who had new polling places against the corresponding black percentage. This yields Figure 7, in which each point denotes a Georgia county. County points in the figure are sized proportionally to total number of registered voters in 2018.

163 Insofar as Figure 7 is based on comparing 2014 polling places to 2018 polling places, by construction it incorporates only registered voters in Georgia who appear in both the 2014 and 2018 voterfiles. The figure, therefore, selects on non-moving status, meaning that registered voters in Georgia as of 2014 who moved prior to 2018 are not included in the figure.

164 The scatterplot in Figure 7 contains a dashed 45-degree line. Counties whose points fall on the line had identical white and black new polling place rates (among non-moving registered voters who appear in the 2014 and 2018 Georgia voterfiles); counties whose points fall above the 45-degree line had greater white new polling place rates than corresponding black rates; and, counties whose points fall below the pictured 45-degree line had greater black new polling place rates than white new precinct rates.

Figure 7: Rates at which non-moving registered voters were assigned new polling places, by race and county



Note: county point size proportional to number of registered voters in 2018.

165 There is a small collection of counties in Figure 7 in which the white new polling place rate is much greater than the corresponding black

rate. The counties of Bacon, Irwin, and Treutlen are exemplars of this. Crawford County illustrates the opposite pattern: the black new polling place rate is much greater than the corresponding white rate. Roughly, Figure 7 shows that there is a large collection of counties (56 in particular) in which black registered voters received new polling places at rates greater than white registered voters.

5.4 New polling places and voter turnout in the 2018 General Election

166 I now consider the extent to which receiving a new polling place in the time period 2014 to 2018 is associated with turnout in the 2018 General Election. This is an important subject because it speaks to potential consequences of the fact that thousands of Georgia registered voters received new polling places between 2014 and 2018. I have already shown that the extent to which 2014 registered voters in Georgia received new polling places in the period 2014 to 2018 was not racially neutral. Now I ask whether there is evidence that receiving a new polling place has downstream consequences for voters. If so, this would compound the lack of racial neutrality in the reprecincting that occurred in Georgia between 2014 and 2018.

5.4.1 Statewide turnout in the 2018 General Election

167 Statewide, among non-moving Georgia registrants who received new polling places between 2014 and 2018, the 2018 General Election turnout rate was approximately 62.9 percent. Among non-moving Georgia registrants who did not receive new polling places, the 2018 turnout rate was approximately 64.2 percent. Thus, receiving a new polling place in the period 2014 to 2018 is associated with a 2018 General Election turnout gap of approximately 1.35 percentage points.

5.4.2 Turnout in the 2018 General Election broken down by race

168 I now disaggregate this Georgia-wide result by race. To that end, Table 10 focuses on non-movers in Georgia who were registered to vote in both 2014 and 2018. The table breaks down these registered voters by the race groups that have appeared throughout this report and also by the extent to which the registered voters received new polling places between 2014 and 2018.

Table 10: 2018 General Election turnout by race

Race	2014 voters	New place	Not new	Difference
White	2,172,086	67.03	68.01	-0.98
Black	1,024,340	60.63	62.57	-1.94
Unknown	254,348	47.84	48.32	-0.49
Hispanic	66,903	44.60	47.20	-2.60
Asian/Pacific Islander	57,499	49.12	49.45	-0.33
Other	36,657	49.60	51.90	-2.30
American Indian/Alaskan	2,227	41.95	48.75	-6.80

169 Consider the top row of Table 10. According to this row, of the approximately 2.1 million non-moving white registered voters in 2014 who were also registered in 2018, approximately 67 percent of those who received new polling places between 2014 and 2018 turned out to vote in 2018. In contrast, approximately 68 percent of those who did not receive new polling places between 2014 and 2018 turned out to vote in 2018. In other words, a white registered voter receiving a new polling place in the period 2014 to 2018 is associated with a turnout drop of approximately one percentage point.

170 Now I turn to the approximately one million non-moving black voters covered in Table 10. The 2018 turnout rate among those individuals who received new polling places between 2014 and 2018 is approximately 60.6 percent, and the corresponding turnout rate for black registered voters who did not receive new polling places is approximately 62.6 percent. Thus, a black registered voter receiving a new polling place in the period 2014 to 2018 is associated with a turnout drop of approximately two percentage points.

171 With respect to its focus on racial groups in Georgia, this report has for the most part restricted its attention to black and white registered voters, the two largest racial groups in Georgia's registered voter pool. Looking beyond these groups, Table 10 highlights a sizable Hispanic effect. Namely, non-moving Hispanic registered voters who received new polling places between 2014 and 2018 were less likely to vote in the 2018 General Election

compared to non-moving Hispanic registered voters who did not receive new polling places between in this time frame.

172 Among non-moving black and white registered voters in Georgia who were on the voter rolls in both 2014 and 2018, those who received new polling places between 2014 and 2018 had lower turnout rates in the 2018 General Election. This statement applies to every race group considered in Table 10. Such a result testifies to the non-racial neutrality of downstream consequences of the extent to which registered voters in Georgia received new polling places in the time period 2014 to 2018.

173 I now take all of the registered voters described in Table 10 and consider the subset of this group that consists of individuals who voted in the 2014 General Election. I then re-calculate the statistics in the table, and this yields Table 11.

Table 11: 2018 turnout by race among 2014 voters

Race	2014 voters	New place	Not new	Difference
White	1,256,834	87.44	87.70	-0.26
Black	529,624	87.51	88.40	-0.88
Unknown	95,376	82.05	81.91	0.14
Hispanic	18,985	80.04	80.43	-0.39
Asian/Pacific Islander	16,253	81.45	82.59	-1.14
Other	13,551	81.66	83.35	-1.69
American Indian/Alaskan	723	86.27	81.80	4.47

174 Table 11 restricts attention to ostensibly politically active individuals. This is evident in the higher turnout percentages compared to the earlier Table 10.

175 Even among politically active registered voters, being assigned a new voting place between 2014 and 2018 is associated with lower 2018 General Election turnout. This follows from the fact that the percentages in the "Not new place" column in Table 11 are, for most of the racial groups in the table (this statement includes white and black registered voters), greater than corresponding percentages in the "New place" column. Moreover, the black decrease in 2018 General Election turnout is greater in magnitude than the white decrease.

5.4.3 Election day turnout in the 2018 General Election

176 I now consider election day turnout in the 2018 General Election. If polling place changes led to decreased turnout, as suggested by the analysis above, then I would expect to see similar if not greater effects on election day turnout *per se*.

177 Parallel to the analyses shown above, Table 12 reports election day turnout rates in the 2018 General Election by race. For example, among non-moving white registered voters, approximately 27 percent of those who received new polling places between 2014 and 2018 voted on election day in November 2018. In contrast, approximately 31 percent of registered voters

Table 12: 2018 General Election turnout by race, election day only

Race	2014 voters	New place	Not new	Difference
White	2,172,086	26.57	31.22	-4.65
Black	1,024,340	21.45	24.28	-2.83
Unknown	254,348	19.92	22.40	-2.49
Hispanic	66,903	23.83	27.29	-3.46
Asian/Pacific Islander	57,499	22.51	25.63	-3.12
Other	36,657	21.22	24.95	-3.73
American Indian/Alaskan	2,227	16.67	25.17	-8.51

who did not receive new polling places between 2014 and 2018 voted on election day in November 2018. The difference between these two quantities is negative, indicating that, for white registered voters, receiving a new polling place in the 2014 to 2018 time frame is associated with a decreased likelihood of voting on election day in the 2018 General Election.

178 I find a similar, albeit of smaller magnitude, finding for the election day turnout rate in the 2018 General Election among non-moving black registered voters. Moreover, all of the differences in Table 12 are negative. This implies that, for non-moving registered voters of all races, receiving a new polling place in the 2014 to 2018 time frame is associated with a decreased likelihood of voting on election day in the 2018 General Election.

179 Table 13 restricts attention to non-moving registered voters who voted in the 2014 General Election. Among these individuals, receiving a new polling place between 2014 and 2018 is associated with lower election day turnout in the 2018 General Election. This regularity is apparent in all

Table 13: 2018 turnout by race among 2014 voters, election day only

Race	2014 voters	New place	Not new	Difference
White	1,256,834	31.33	37.61	-6.27
Black	529,624	26.57	30.35	-3.77
Unknown	95,376	28.91	33.34	-4.42
Hispanic	18,985	36.48	41.78	-5.31
Asian/Pacific Islander	16,253	32.68	40.42	-7.74
Other	13,551	30.43	35.47	-5.04
American Indian/Alaskan	723	27.45	38.16	-10.71

race groups, as the negative "Difference" entries in Table 13 makes clear.

6 Conclusion

180 This report assesses polling place closures made across Georgia in the 2014 to 2018 time period. As of 2014, there were 2,516 polling places in the state. By 2018, 459 had closed, and this affected over one million registered voters in Georgia, all of whom were assigned new polling places in time for the 2018 General Election.

181 Using a variety of approaches and data on millions of Georgia registered voters, I have shown that black registered voters, compared to white registered voters, were disproportionately affected by Georgia's polling place closures in the period 2014 to 2018. This implies that the polling place closures that took place in Georgia were not racially neutral.

182 Existing literature in political science provides evidence that eligible voters whose voting places change are less likely to vote in future elections. I have shows that patterns in turnout in Georgia in the 2018 General Election are consistent with this result. Compared to individuals whose polling places in Georgia did not change prior to the 2018 General, those registered voters who were assigned new polling place between 2014 and 2018 were less likely to vote, and less likely to vote on election day, in November 2018. Such downstream effects of polling place closures will magnify the racial biases in the closures themselves.

7 Appendix: *curriculum vitae* of Michael C. Herron

Michael C. Herron

Dartmouth College
Department of Government
6108 Silsby Hall
Hanover, NH 03755-3547

Phone: +1 (603) 646-2693
Mobile: +1 (603) 359-9731
Email: michael.c.herron@dartmouth.edu
Homepage: http://www.dartmouth.edu/~herron

Academic appointments

William Clinton Story Remsen 1943 Professor, Department of Government, Dartmouth College. July 2013–present.

Chair, Program in Quantitative Social Science, Dartmouth College. July 2015–present.

Visiting Scholar, Hertie School of Governance, Berlin, Germany. August 2016–July 2017.

Chair, Program in Mathematics and Social Sciences, Dartmouth College. July 2014– June 2015.

Professor, Department of Government, Dartmouth College. July 2009–June 2013.

Visiting Professor of Applied Methods, Hertie School of Governance, Berlin, Germany. August 2011–August 2012.

Associate Professor, Department of Government, Dartmouth College. July 2004–June 2009.

Visiting Associate Professor, Department of Government, Harvard University. July 2008–January 2009.

Visiting Associate Professor, Wallis Institute of Political Economy, University of Rochester. September 2006–December 2006.

Visiting Assistant Professor, Department of Government, Dartmouth College. July 2003–June 2004.

Assistant Professor, Department of Political Science, Northwestern University. September 1997–June 2004.

Faculty Associate, Institute for Policy Research, Northwestern University. September 2002–June 2004.

Education

PhD Business (Political Economics), Stanford University, January, 1998.
Dissertation: Political Uncertainty and the Prices of Financial Assets
Committee: David Baron, Darrell Duffie, Douglas Rivers, and Barry Weingast

MS Statistics, Stanford University, June 1995.

MA Political Science, University of Dayton, August 1992.

BS Mathematics and Economics, with University Honors, Carnegie Mellon University, May 1989.

Fellowships

Elizabeth R. and Robert A. Jeffe 1972 Fellowship, Dartmouth College. September 2010–June 2011.

Fulbright Scholar Program fellowship for research and teaching at the Heidelberg Center for American Studies, Heidelberg University, September 2009 - February 2010 (declined).

Post–doctoral Research Fellow, Center for Basic Research in the Social Sciences, Harvard University. September 2000–August 2001.

Publications

Journal articles

"Voting lines, equal treatment, and early voting check-in times in Florida" (with David Cottrell and Daniel A. Smith). Forthcoming, *State Politics & Policy Quarterly*.

"Early voting changes and voter turnout: North Carolina in the 2016 General Election" (with Hannah L. Walker and Daniel A. Smith). *Political Behavior* 41(4): 841-869. 2019.

"Mail-in absentee ballot anomalies in North Carolina's 9th Congressional District." *Election Law Journal* 18(3): 191-213. 2019.

"Relative age effects in American professional football" (with Jack F. Heneghan). *Journal of Quantitative Analysis in Sports* 15(3): 185-202. 2019.

"Mortality, Incarceration, and African-American Disenfranchisement in the Contemporary United States" (with David Cottrell, Javier M. Rodriguez, and Daniel A. Smith). *American Politics Research* 47(2): 195-237. 2019.

"Pedagogical Value of Polling Place Observation By Students" (with 31 co-authors). *PS: Political Science & Politics* 51(4): 831-847. 2018.

"All in the family: German twin finishing times in the 2016 women's Olympic marathon" (with David Cottrell). CHANCE 31(3): 20-28. 2018.

"An Exploration of Donald Trump's Allegations of Massive Voter Fraud in the 2016 General Election" (with David Cottrell and Sean J. Westwood). *Electoral Studies* 51(1): 123-142. 2018.

"Student Sorting and Implications for Grade Inflation (with Zachary D. Markovich). *Rationality and Society* 29(3): 355-386. 2017.

"Race, *Shelby County*, and the Voter Information Verification Act in North Carolina" (with Daniel A. Smith). *Florida State University Law Review* 43: 465-506. 2016.

"Precinct Resources and Voter Wait Times" (with Daniel A. Smith). *Electoral Studies* 42(2): 249-263. 2016.

"A Careful Look at Modern Case Selection Methods" (with Kevin M. Quinn). *Sociological Methods & Research* 45(3): 458-492. 2016.

"Precinct Closing and Wait Times in Florida during the 2012 General Election" (with Daniel A. Smith). *Election Law Journal* 14(3): 220-238. 2015.

"Race, Party, and the Consequences of Restricting Early Voting in Florida in the 2012 General Election" (with Daniel A. Smith). *Political Research Quarterly* 67(3): 646-665. 2014.

"The Effects of House Bill 1355 on Voter Registration in Florida" (with Daniel A. Smith). *State Politics & Policy Quarterly* 13(3): 279-305. 2013.

"Blacks, Hispanics, and Whites: A Study of Race-based Residual Vote Rates in Chicago." *American Politics Research* 41(2): 203-243. 2013.

"Alvin Greene? Who? How did he win the United States Senate nomination in South Carolina?" (with Joseph Bafumi, Seth J. Hill, and Jeffrey B. Lewis). *Election Law Journal* 11(4): 358-379. 2012.

"Souls to the Polls: Early Voting in Florida in the Shadow of House Bill 1355" (with Daniel A. Smith). *Election Law Journal* 11(3): 331-347. 2012.

"Leapfrog Representation and Extremism: A Study of American Voters and their Members in Congress" (with Joseph Bafumi). *American Political Science Review* 104(3): 519-542. 2010.

"Economic Crisis, Iraq, and Race: A Study of the 2008 Presidential Election" (with Seth J. Hill and Jeffrey B. Lewis). *Election Law Journal* 9(1): 41-62. 2010

"Prejudice, Black Threat, and the Racist Voter in the 2008 Presidential Election" (with Joseph Bafumi). *Journal of Political Marketing* 8(4): 334-348. 2009.

"Voting Technology and the 2008 New Hampshire Primary" (with Walter R. Mebane, Jr., and Jonathan N. Wand). *William & Mary Bill of Rights Journal* 17(2): 351-374. 2008.

"Ballot Formats, Touchscreens, and Undervotes: A Study of the 2006 Midterm Elections in Florida" (with Laurin Frisina, James Honaker, and Jeffrey B. Lewis). *Election Law Journal* 7(1): 25-47. 2008.

"Gerrymanders and Theories of Lawmaking: A Study of Legislative Redistricting in Illinois" (with Alan E. Wiseman). *Journal of Politics* 70(1): 151-167. 2008.

"Estimating the Effect of Redistricting on Minority Substantive Representation" (with David Epstein, Sharyn O'Halloran, and David Park). *Journal of Law, Economics, and Organization* 23(2): 499-518. 2007.

"Did Ralph Nader Spoil Al Gore's Presidential Bid? A Ballot-Level Study of Green and Reform Party Voters in the 2000 Presidential Election" (with Jeffrey B. Lewis). *Quarterly Journal of Political Science* 2(3): 205-226. 2007.

"Assessing Partisan Bias in Voting Technology: The Case of the 2004 New Hampshire Recount" (with Jonathan N. Wand). *Electoral Studies* 26(2): 247-261. 2007.

"Term Limits and Pork" (with Kenneth W. Shotts). *Legislative Studies Quarterly* 31(3): 383-404. 2006.

"Black Candidates and Black Voters: Assessing the Impact of Candidate Race on Uncounted Vote Rates" (with Jasjeet S. Sekhon). *Journal of Politics* 67(1): 154–177. 2005.

"Government Redistribution in the Shadow of Legislative Elections: A Study of the Illinois Member Initiatives Grant Program" (with Brett A. Theodos). *Legislative Studies Quarterly* 24(2): 287–312. 2004.

"Studying Dynamics in Legislator Ideal Points: Scale Matters." *Political Analysis* 12(2): 182–190. 2004.

"Logical Inconsistency in EI-based Second Stage Regressions" (with Kenneth W. Shotts). *American Journal of Political Science* 48(1): 172–183. 2004.

"Overvoting and Representation: An examination of overvoted presidential ballots in Broward and Miami-Dade counties Counties" (with Jasjeet S. Sekhon). *Electoral Studies* 22: 21–47. 2003.

"Using Ecological Inference Point Estimates as Dependent Variables in Second Stage Linear Regressions" (with Kenneth W. Shotts). *Political Analysis* 11(1): 44–64. 2003.

"Cross-contamination in EI-R" (with Kenneth W. Shotts). *Political Analysis* 11(1): 77–85. 2003.

"A Consensus on Second Stage Analyses in Ecological Inference Models" (with Christopher Adolph, Gary King, and Kenneth W. Shotts). *Political Analysis* 11(1): 86–94. 2003.

"The Butterfly Did It: The Aberrant Vote for Buchanan in Palm Beach County, Florida" (with Jonathan N. Wand, Kenneth W. Shotts, Jasjeet S. Sekhon, Walter R. Mebane, Jr., and Henry E. Brady). *American Political Science Review* 95(4): 793–810. 2001.

"Interest Group Ratings and Regression Inconsistency." *Political Analysis* 9(3): 260–274. 2001.

"Leadership and Pandering: A Theory of Executive Policymaking" (with Brandice Canes–Wrone and Kenneth W. Shotts). *American Journal of Political Science* 45(3): 532–550. 2001.

"Law and Data: The Butterfly Ballot Episode" (with Henry E. Brady, Walter R. Mebane, Jr., Jasjeet S. Sekhon, Kenneth W. Shotts, and Jonathan N. Wand). *PS: Political Science & Politics* 34(1): 59–69. 2001.

"Cutpoint–Adjusted Interest Group Ratings." *Political Analysis* 8(4): 346–366. 2000.

"Estimating the Economic Impact of Political Party Competition in the 1992 British Election." *American Journal of Political Science* 44(2): 326–337. 2000.

"Artificial Extremism in Interest Group Ratings and the Preferences versus Party Debate." *Legislative Studies Quarterly* 24(4): 525–542. 1999.

"Post–Estimation Uncertainty in Limited Dependent Variable < Models." *Political Analysis* 8(1): 83–98. 1999.

"Measurement of Political Effects in the United States Economy: A Study of the 1992 Presidential Election" (with James Lavin, Donald Cram, and Jay Silver). *Economics & Politics* 11(1): 51–81. 1999.

"The Influence of Family Regulation, Connection, and Psychological Autonomy on Six Measures of Adolescent Functions" (with Melissa R. Herman, Sanford M. Dornbusch, and Jerald R. Herting). *Journal of Adolescent Research* 12(1): 34–67. 1997.

Book chapters

"Wait Times and Voter Confidence: A Study of the 2014 General Election in Miami-Dade County" (with Daniel A. Smith, Wendy Serra, and Joseph Bafumi). In *Races, Reforms, & Policy: Implications of the 2014 Midterm Elections*, Christopher J. Galdieri, Tauna S. Sisco, and Jennifer C. Lucas, eds. Akron, OH: University of Akron Press. 2017.

"A Dynamic Model of Multidimensional Collective Choice" (with David P. Baron). In *Computational Models in Political Economy*, Ken Kollman, John H. Miller, and Scott E. Page, eds. Cambridge, MA: The MIT Press. 2003.

"Law and Data: The Butterfly Ballot Episode" (with Henry E. Brady, Walter R. Mebane Jr., Jasjeet Singh Sekhon, Kenneth W. Shotts, and Jonathan Wand). In *The Longest Night: Polemics and Perspectives on Election 2000*, Arthur J. Jacobson and Michel Rosenfeld, eds. Berkeley: University of California Press. 2002.

Book reviews

The Timeline of Presidential Elections: How Campaigns Do (and Do Not) Matter, Robert S. Erikson and Christopher Wlezien. *Political Science Quarterly* 128(3): 552-553. 2013.

Voting Technology: The Not-So-Simple Act of Casting a Ballot, Paul S. Herrnson, Richard G. Niemi, Michael J. Hanmer, Benjamin B. Bederson, and Frederick C. Conrad. *Review of Policy Research* 25(4): 379-380. 2008.

Other publications

"If more states start using Ohio's system, how many voters will be purged?" (with Daniel A. Smith). *The Washington Post*, Monkey Cage, June 17, 2018.

"Do we have a right not to vote? The Supreme Court suggests we don't" (with Daniel A. Smith). *New York Daily News*, June 12, 2018.

"Nearly 4 million black voters are missing. This is why" (with David Cottrell, Javier M. Rodriguez, and Daniel A. Smith). *The Washington Post*, Monkey Cage, April 11, 2018.

"We can't find any evidence of voting fraud in New Hampshire" (with David Cottrell and Sean Westwood). *The Washington Post*, Monkey Cage, February 28, 2017.

"We checked Trump's allegations of voter fraud. We found no evidence at all" (with David Cottrell and Sean Westwood). *The Washington Post*, Monkey Cage, December 2, 2016.

"High ballot rejection rates should worry Florida voters" (with Daniel A. Smith). *Tampa Bay Times*, October 28, 2012.

"Logistic Regression." *The Encyclopedia of Political Science*, George Thomas Kurian, James E. Alt, Simone Chambers, Geoffrey Garrett, Margaret Levi, and Paula D. McClain, eds., Washington, D.C.: CQ Press. 2010.

"Using XEmacs Macros to Process ASCII Data Files." *The Political Methodologist* 13(2): 13–18. 2005.

"Ohio 2004 Election: Turnout, Residual Votes and Votes in Precincts and Wards" (with Walter R. Mebane, Jr.), in "Democracy At Risk: The 2004 Election in Ohio," report published by the Democratic National Committee. 2005.

"Poisson Regression." *The Encyclopedia of Social Science Research Methods*, Alan Bryman, Michael Lewis-Beck, and Tim Futing Liao, eds. Thousand Oaks, CA: Sage Publications, 2003.

"Pork barrel race to the bottom" (with Brett A. Theodos). *Illinois Issues* 29(2): 22–23. 2003.

"Teaching Introductory Probability Theory." *The Political Methodologist* 10(2): 2–4. 2002.

"Ballot cost Gore thousands of votes" (with Henry E. Brady and Jonathan N. Wand). *The San Diego Union–Tribune*, p. G3, November 19, 2000.

Work in progress

"Did ballot design oust an incumbent senator? A study of the 2018 midterm election in Florida" (with Michael D. Martinez and Daniel A. Smith).

Awards

Best Paper Award, State Politics and Policy Section, 2013 Annual Meeting of the American Political Science Association. *Getting Your Souls to the Polls: The Racial Impact of Reducing Early In-Person Voting in Florida* (with Daniel A. Smith).

Grants

Committee for Scholarly Innovation and Advancement Awards, Dartmouth College, February, 2014. Project title: "The Dynamics of Voting Lines in Miami-Dade County." Financial support: $32,000.

The Rockefeller Center for Public Policy and the Social Sciences, Dartmouth College, May, 2006. Project title: "Large Scale Survey of Americans in Multiple Congressional Districts." Financial support: $8,500.

National Science Foundation, SES-041849, July, 2004. Project title: "A Ballot-Level Study of Intentional and Unintentional Abstention in Presidential Election Voting." Financial support: $65,749.

Nelson A. Rockefeller Center for the Social Sciences, Dartmouth College, January, 2004. Project title: "Intentional Invalid Votes in Leon County, Florida." Financial support: $1,115.

American Enterprise Institute, August, 1999. Project title: "Tenure in Office and Congressional Voting" (with Kenneth W. Shotts). Financial support: $182,500.

University Research Grants Committee, Northwestern University, February, 1999. Project Title: "Representation, Policy Uncertainty, and Divided Government." Financial support: $4,087.

Stanford University Graduate School of Business, 1997–1998 Academic Year. Dissertation Research Grant.

Recent conference presentations

"Ballot design, voter intentions, and representation: A study of the 2018 midterm election in Florida," 2019 Annual Meeting of the American Political Science Association, Washington, DC.

"Ballot design, voter intentions, and representation: A study of the 2018 midterm election in Florida," Election Sciences, Reform, and Administration conference, 2019, University of Pennsylvania.

"Did ballot design oust an incumbent senator? A study of the 2018 midterm election in Florida," Congressional Elections & the Presidency: Politics in 2018, March 30, 2019, Saint Anselm College, Manchester NH.

"Estimating the Differential Effects of Purging Inactive Registered Voters," 2018 Annual Meeting of the American Political Science Association, Boston MA.

"Estimating the Differential Effects of Purging Inactive Registered Voters," Election Sciences, Reform, and Administration conference, 2018, University of Wisconsin-Madison.

Keynote address, "Mortality, Incarceration, and African-American Disenfranchisement," *Balancing the Scales: The United States in an Age of Inequality*, November 11, 2016, John F. Kennedy Institute, Freie Universität Berlin.

"Missing Black Men and Representation in American Political Institutions," 2016 Annual Meeting of the Midwest Political Science Association, Chicago, IL.

Invited seminars

University of Iowa, 1999
Boston University, 2000
Dartmouth College, 2000
Harvard University, 2000
University of Minnesota, 2000
University of Rochester, 2000
University of Wisconsin, Madison, 2000
Yale University, 2000
Columbia University, 2001
University of California, Berkeley, 2002
University of Illinois, 2002
Brown University, 2003
Temple University, 2003
University of Chicago, 2003
New York University, 2004
Princeton University, 2004
University of Michigan, 2005
George Washington University, 2006
Emory University, 2006
Harvard University, 2007
Loyola Law School, 2007
Columbia University, 2007
University of Chicago, 2007
Yale University, 2007
Stanford University, 2008
Columbia University, 2008
Northwestern University, 2008
Princeton University, 2008
Duke University, 2009
Hertie School of Governance, 2010
Emory University, 2010
University of Mannheim, 2011
University of Heidelberg, 2011
University of Passau, 2012
University of Göttingen, 2012
Freie Universität Berlin, 2012
Laval University, 2012
University of Montreal, 2012
Middlebury College, 2013
University of Illinois, Champaign, 2013
University of Illinois, Chicago, 2013
University of Wisconsin, Madison, 2013
Yale University, 2014
University of Virginia, 2015
University of California, San Diego, 2015
American University, 2015
Massachusetts Institute of Technology, 2015
Princeton University, 2015
University of California, Los Angeles, 2016
The Ohio State University, 2016
Freie Universität Berlin, 2016
Deutsch-Amerikanisches Institut, Nürnberg, 2017
Universität Bonn, 2018
Freie Universität Berlin, 2018
Northwestern University, 2018
University of Pittsburgh, 2019
University of Salzburg, 2019
Universität Bonn, 2019
Freie Universität Berlin, 2019
Humboldt University, 2019
University of North Carolina, Charlotte, 2019

Professional activities

Division Chair, Representation and Electoral Systems, 2017 Annual Meeting of the Midwest Political Science Association.

Associate Editor, *Research & Politics*. November, 2016–present.

Editorial Board, *American Politics Research*, September, 2015–present.

Editorial Board, *Political Analysis*, January, 2010–present.

Editorial Board, *USENIX Journal of Election Technology and Systems*, March, 2013–June, 2016.

Editorial Board, *American Political Science Review*, 2010–2012.

Editorial Board, *American Journal of Political Science*, 2006–2009.

"Race, Voting Procedures, and New Developments in Voting Rights," panel organized for the 2013 Annual Meeting of the Midwest Political Science Association.

Division Chair, Formal Theory, 2007 Annual Meeting of the American Political Science Association.

Co-editor, *The Political Methodologist*, Fall, 2004–Spring, 2006.

Publications Committee, Society for Political Methodology, 2005–2006, 2015–present.

Dartmouth College activities

Chair, American Politics Search Committee, Department of Government, August 2018–March 2019.

Chair, Committee on Priorities, July 2015–June 2016.

Committee on Priorities, July 2013–June 2015.

American politics search committee, Department of Government, August 2014–December 2014.

Research Computing Director search committee, October 2013–October 2014.

Senior Search Committee, Department of Government, 2013.

Research Computing Advisory Committee, Spring 2013.

Chair, American Politics Search Committee, Department of Government, 2012-2013.

Recruitment Planning Committee, Department of Government, 2010 and 2012-2013.

Committee on Standards, 2008-2010.

Task Force on Collaboration and Social Software, 2007-2008.

Biostatistics search committee, Dartmouth Medical School, 2006-2007.

Research Computing Oversight Committee, 2006.

Council on Computing, 2005-2007.

Clement Chair search committee, Department of Government, 2005-2006.

Northwestern University activities

Program Committee, Mathematical Methods in the Social Sciences, 2001-2002.

American Politics Search Committee, Department of Political Science, 2000–2001, 2001-2002.

Formal Theory Search Committee, Department of Political Science, 1997–1998.

Teaching interests

Statistical methods: introductory and applied statistics, research design, computing in R, Bayesian statistics.

American politics: representation, election irregularities, election administration.

Political economy: game theory.

Reviewer for

American Journal of Political Science
American Political Science Review
American Politics Quarterly
American Politics Review
British Journal of Political Science
Cambridge University Press
Chapman & Hall
Congress & the Presidency
Du Bois Review
Economics & Politics
Election Law Journal
Electoral Studies
Emerging Markets Finance & Trade
Interest Groups & Advocacy
Int'l Journal of Environmental Research and Public Health
John Wiley & Sons, Inc.
Journal of Legal Studies
Journal of Money, Credit and Banking
Journal of Politics
Journal of Public Economics
Journal of Race, Ethnicity, and Politics
Journal of Theoretical Politics
Journal of Women, Politics & Policy
Legislative Studies Quarterly
The National Science Foundation
Nonprofit Policy Forum
Perspectives on Politics
Policy Studies Journal
Political Analysis
Political Behavior
Political Research Quarterly
Political Science Quarterly
Political Science Research and Methods
Political Studies
Politics & Gender
Politics, Groups, and Identities
Polity
Prentice Hall Higher Education Group
Proceedings of the National Academy of Sciences
Public Administration
Public Choice
Public Opinion Quarterly
PS: Political Science and Politics
Quarterly Journal of Economics
Quarterly Journal of Political Science
The Social Science Journal
Social Science Quarterly
Sociological Methods & Research
The Sociological Quarterly
Springer
State Politics & Policy Quarterly
Time-Sharing Experiments for the Social Sciences
The University of Michigan Press
W. W. Norton & Company
World Politics

Foreign language

German: C1 (telc Prüfung, Ausstellung July 27, 2017).

Other employment

Intelligence Analyst and Military Officer, United States Air Force, Foreign Technology Division, Wright–Patterson Air Force Base, 1989–1992.

References

Amos, Brian, Daniel A. Smith and Casey Ste. Claire. 2017. "Reprecincting and Voting Behavior." *Political Behavior* 39(1):133–156.

Brady, Henry E. and John E. McNulty. 2011. "Turning Out to Vote: The Costs of Finding and Getting to the Polling Place." *American Political Science Review* 105(1):115–134.

R Core Team. 2019. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing.
URL: *https://www.R-project.org*

StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: R Foundation for Statistical Computing.
URL: *https://www.stata.com*

I declare under penalty of perjury that the foregoing is true and correct. Executed this 18th day of February 2020, at Hanover, New Hampshire.

Michael C. Herron, Ph.D.

CERTIFICATE OF SERVICE

I hereby certify that, on February 18, 2020, I caused to be served the foregoing **REPORT OF PLAINTIFFS' EXPERT WITNESS MICHAEL C HERRON** by filing it through the Court's ECF system, which will serve the following counsel:

Chris Carr, Esq.
Attorney General
Dennis Dunn, Esq.
Deputy Attorney General
Russell Willard, Esq.
Senior Assistant Attorney General
Georgia Office of the Attorney General
40 Capitol Square
Atlanta, GA 30334
ccarr@law.ga.gov
ddunn@law.ga.gov
rwillard@law.ga.gov

Joshua Barrett Belinfante, Esq.
Vincent Robert Russo, Jr., Esq.
Brian Edward Lake, Esq.
Carey Allen Miller, Esq.
Alexander Denton, Esq.
Special Assistant Attorneys General
Robbins Ross Alloy Belinfante Littlefield, LLC
500 Fourteenth St., N.W.
Atlanta, GA 30318
Telephone: (678) 701-9381
Fax: (404) 856-3250
jbelinfante@robbinsfirm.com
blake@robbinsfirm.com
vrusso@robbinsfirm.com
cmiller@robbinsfirm.com
adenton@robbinsfirm.com

Bryan P. Tyson, Esq.
Bryan F. Jacoutot, Esq.
Diana LaRoss, Esq.
Special Assistant Attorneys General
Taylor English Duma LLP
1600 Parkwood Circle
Suite 200
Atlanta, GA 30339
Telephone: (678) 336-7249
btyson@taylorenglish.com
bjacoutout@taylorenglish.com
dlaross@taylorenglish.com

/s/ Leslie J. Bryan
Leslie J. Bryan
Georgia Bar No. 091175