EXHIBIT 3

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF NORTH CAROLINA

NORTH CAROLINA STATE CONFERENCE OF THE NAACP, *et al.*, Plaintiffs, v. DAMON CIRCOSTA, in his official capacity as Chair of the North Carolina State Board of Elections, *et al.*, Defendants.	No. 1:18-cv-01034

SUPPLEMENTAL EXPERT REPORT OF MICHAEL C. HERRON

Plaintiffs' Exhibit 315

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1 Introduction

1 In the matter of *North Carolina State Conference of the NAACP, et al. v. Roy Asberry Cooper III*, I wrote an expert report, served on September 16, 2019, and a rebuttal report, served on November 15, 2019. This present report supplements these two earlier reports.

2 The subject of my two prior reports in this litigation was the extent to which registered voters in North Carolina have been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that per Senate Bill 824 (hereinafter SB 824) may be used as forms of identification for the purposes of voting. According to SB 824, there are three categories of Department of Transportation identification documents that can be used in this way: (1) valid and unexpired driver's licenses and nonoperator identification cards; (2) otherwise valid driver's licenses and nonoperator identification cards that have been expired for one year or less; and, (3) expired driver's licenses and nonoperator identification cards issued to individuals who are at least 65 years of age and which were valid and unexpired as of the individual's 65th birthday.[1]

3 To address the extent to which registered voters in North Carolina have been issued these three types of Department of Transportation-administered forms of photographic identification, my prior two reports in this litigation analyzed the contents of a list of registered voters (the "August 2019 no-match list"), prepared by North Carolina officials, that consisted of registered voters who, as of August 24, 2019, appear not to have been issued such forms of identification.

4 It is my understanding that officials in the State Board of Elections created the August 2019 no-match list by comparing records of registered voters in North Carolina (e.g., their names, birth dates, and other identifying details) as of August 24, 2019, with records of individuals who at that time had been issued driver's licenses or other forms of Department of Transportation photographic identification sufficient under SB 824 for the purposes of voting. A registered voter in North

[1] See Section 1.2(a) of SB 824.

Carolina whose identifying details did not, as of August 2019, appear among the identifying details of individuals who had been issued driver's licenses or other forms of Department of Transportation photographic identification sufficient under SB 824 for the purposes of voting would appear on the August 2019 no-match list.

5 Among other things, my initial expert report in this litigation described the racial and ethnic breakdown of voters who were on the State Board of Elections's August 2019 no-match list.

6 In my initial expert report, I concluded that, "Among all racial groups that are tracked by the State Board of Elections, white registered voters in North Carolina have the lowest no-match rate. This means that, compared to other racial groups, white voters in North Carolina ostensibly have the highest rates of possession of drivers licenses and non-operator identification cards." ¶ 3. I concluded as well that, "Black registered voters in North Carolina have a greater no-match rate than white registered voters. From this it follows that black voters ostensibly have a lower rate of possession of drivers licenses and non-operator identification cards than do white voters." ¶ 4. And, I found that, "Hispanic registered voters in North Carolina have a greater no-match rate than non-Hispanic registered voters. Thus, Hispanic voters ostensibly have a lower rate of possession of drivers licenses and non-operator identification cards than do non-Hispanic registered voters." ¶ 5.

7 Accordingly, I wrote in my initial expert report that, "Registered voters on the no-match list are burdened by SB 824 more than registered voters who are not. Thus, via its analysis of the composition of the no-match list, this report shows that the burdens of SB 824 will not be spread evenly among North Carolina registered voters. Rather, they will be concentrated on black and Hispanic registered voters." ¶ 7.

8 As of December 2021, it is my understanding that the North Carolina State Board of Elections has not created a post-August 24, 2019, update of its no-match list, one that contains the

names of registered voters in North Carolina who, as of late 2021, do not appear to have been issued driver's licenses or other forms of Department of Transportation photographic identification sufficient under SB 824 for the purposes of voting. Were the State Board of Elections to have created such an updated list, I would analyze it here. In particular, I would assess *inter alia* whether Black and Hispanic registered voters were disproportionately identified as non-matching compared to White and non-Hispanic voters, respectively. This would allow me to assess with recent data (late 2021 being more recent than August 2019) whether Black and Hispanic registered voters in North Carolina continue to be disproportionately less likely to have been issued Department of Transportation-administered forms of identification sufficient under SB 824 for the purposes of voting.

9 In October 2021, I received from the North Carolina State Board of Elections and the North Carolina Department of Transportation a set of confidential files sufficient for me to create my own no-match list ("the October 2021 no-match list"). In what follows, I describe these files and analyze the types of voters—in particular, their races and ethnicities—on the October 2021 no-match list.

10 I am being paid at a rate of $550/hour for work in this litigation, the same rate that I was paid for my work on the August 2019 no-match list. My compensation is contingent neither on the results of the analyses described herein nor on the contents of this supplemental report. An updated *curriculum vitae* appears in Appendix A.

11 Within the past four years, I was a testifying expert for defendants in *Law, et al. v. Whitmer et al.* (Case No.: 20 OC 00163 1B) and a testifying expert for plaintiffs in *Alliance for Retired Americans, et al. v. Matthew Dunlap, et al.* (Civil Action No. CV-20-95), *Michigan Alliance for Retired Americans, et al. v. Jocelyn Benson, et al.* (Civil Action No. 2020-000108-MM), and in *League of Women Voters of New Hampshire, et al. v. William M. Gardner, et al.* (226-2017-CV-433). Beyond these cases, I was deposed in *League of Women Voters of Florida v. Laurel M. Lee* (Case No. 4:21-cv-186-MW/MAF), *Fair Fight Action, Inc., et al. v. Brad Raffensberger, et al.* (Civ.

Act. No. 1:18-cv-05391-SCJ) and in *Caroline Casey, et al. v. New Hampshire Secretary of State, et al.* (Civil No. 19-cv-149-JL).

12 My written and oral testimony was credited by courts in their written opinions in *Law et al. v. Whitmer et al.*, *Donald J. Trump for President, Inc. v. Stephen Bullock et al.* (Case No.: 6:20-cv-00066-DLC), *League of Women Voters of New Hampshire et al. v. William M. Gardner et al.*, and in *Veasey et al. v. Abbott et al.*. My opinions and testimony have never been found by a court to be unreliable.

2 Summary of conclusions

13 This Supplemental Report includes the following conclusions.

I. Based on an algorithm that matches records in a list of voters provided to me by the North Carolina State Board of Elections with records in a set of files provided by the North Carolina Department of Transportation, I identify 7,143,626 registered voters in North Carolina who as of October 2021 are non-deceased and eligible to participate in elections. These individuals consist of both active (6,322,546) and inactive (821,080) registered voters. In North Carolina, active and inactive voters are eligible to turn out and vote.

II. Using my record matching algorithm, I identify 667,051 registered voters in North Carolina who have not been issued valid forms of Department of Transportation-administered photographic identification that are sufficient under SB 824 for the purpose of voting. These individuals constitute approximately 9.34 percent of the registered voter pool in North Carolina as of October 2021.

III. With my record matching algorithm, I identify 232,086 Black registered voters in North Carolina who have not been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that under SB 824 can be used as forms of identification for the purposes of voting. This corresponds to a Black no-match rate of approximately 15.88 percent, meaning that approximately 15.88 percent of all Black

registered voters in North Carolina have not been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that under SB 824 can be used as forms of identification for the purposes of voting.

IV. My algorithm similarly identifies 288,077 White registered voters who have not been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that per SB 824 can be used as forms of identification for the purposes of voting. This corresponds to a White no-match rate of approximately 6.16 percent. Therefore, according to my algorithm, the rate at which Black registered voters in North Carolina have not been issued licenses and other forms of photographic identification suitable for voting is approximately 2.58 times the rate of White registered voters.

V. According to my algorithm, there are 31,940 Hispanic registered voters in North Carolina who have not been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that per SB 824 can be used as forms of identification for the purposes of voting. The rate at which this describes Hispanic voters is approximately 13.60 percent. My algorithm shows as well that there are 412,708 non-Hispanic registered voters in North Carolina who have not been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that per SB 824 can be used as forms of identification for the purposes of voting. The rate at which non-Hispanic registered voters can be described this way is approximately 8.06 percent. Therefore, the rate at which Hispanic registered voters in North Carolina appear not to have been issued licenses and other forms of photographic identification suitable for voting is 1.69 times the corresponding rate for non-Hispanic registered voters.

VI. To the best of my knowledge, my algorithm that matches State Board of Elections records of voters with Department of Transportation records of license holders in North Carolina comports with the language of SB 824. However, to facilitate an analysis of the racial and ethnic impacts of including forms of identification not in SB 824, I developed an alternative algorithm that analyzes the impact of adding forms of identification to those so included:

(i) licenses described by the Department of Transportation as canceled, suspended, or denied and (ii) learner's permits. Based on this alternative algorithm, there are 117,314 Black registered voters in North Carolina who have not been issued Department of Transportation-administered form of photographic identification sufficient for the purposes of voting as well as 206,321 White registered voters. The rate at which Black registered voters in North Carolina have not been forms of identification suitable for voting is 1.82 times the rate of White registered voters.

VII. Based on this same alternative algorithm, I identify 21,701 Hispanic registered voters in North Carolina who have not been issued Department of Transportation-administered form of photographic identification sufficient for the purposes of voting and 260,877 corresponding non-Hispanic registered voters. According to the alternative algorithm, the rate at which Hispanic registered voters in North Carolina have not been issued licenses and other forms of photographic identification suitable for voting is 1.82 times the rate of non-Hispanic registered voters.

3 Creating the October 2021 no-match list

14 The October 2021 no-match list that I describe in this supplemental expert report consists of a list of registered voters in North Carolina whom I conclude have not, as of October 2021, been issued licenses and other forms of photographic identification, administered by the state's Department of Transportation, that under SB 824 can be used as forms of identification for the purposes of voting.

15 I created the October 2021 no-match list by comparing records in a State Board of Elections database that lists registered voters in North Carolina with records in a Department of Transportation database that lists license holders. The general approach I implemented to create the October 2021 no-match list—comparing records across multiple databases—was used as well by the State

Board of Elections when it created the August 2019 no-match list.[2]

3.1 Matching registered voters in North Carolina with license records

16 To identify the registered voters in North Carolina who belong on the October 2021 no-match list, I developed an algorithm that has three steps. These steps are similar to those implemented by the State Board of Elections when it created the August 2019 no-match list.

17 First, using a confidential list of registered voters in North Carolina provided to me by the State Board of Elections (the "September 2021 voterfile"), I created a set of nine matching fields, each of which incorporates voter identifying details. For example, one such field is a concatenation of a voter's first name, last name, birth date, and the last four digit's of the voter's social security number. Appendix B contains details on the September 2021 voterfile.

18 Second, using confidential data provided to me by the Department of Transportation on North Carolina residents to whom licenses and other forms of photographic identification have been issued (the "October 2021 Department of Transportation database"), I created the same nine matching fields that I created for the September 2021 voterfile. Appendix C contains details on the October 2021 Department of Transportation database.

19 Third, I identified all registered voters in North Carolina for whom at least one of nine matching fields in the September 2021 voterfile can be linked to a corresponding field in the October 2021 Department of Transportation database (temporarily putting aside the matters of expired licenses and registered voters who appear deceased based on the status of their licenses, subjects which I address later). This exercise defines the set of registered voters in North Carolina for whom none of the nine matching fields in the September 2021 voterfile can be linked to a corresponding

[2]Throughout this supplemental report, I describe the August 2019 no-match list as being created by the North Carolina State Board of Elections. To the best of my knowledge, officials in this organization created the list. I do not have information on the extent to which officials in the North Carolina Department of Transportation and in the North Carolina Department of Justice were also involved in this process.

field in the October 2021 Department of Transportation database. The October 2021 no-match list consists of this latter set of registered voters.

3.2 Matching fields

20 My set of nine matching fields used to connect records in the September 2021 voterfile with records in the October 2021 Department of Transportation database builds on and augments the matching fields used by the North Carolina State Board of Elections when it created the August 2019 no-match list. My matching fields are more conservative than those used by the State Board of Elections, meaning that they are more permissive in allowing for matches between records in the September 2021 voterfile and records in the October 2021 Department of Transportation database. Matching fields that are more permissive generate a more conservative no-match list insofar as permissive fields lead to more matches—and thus a smaller no-match list, all things equal.

21 Table 1 lists the nine matching fields used in this supplemental expert report. For the records of a registered voter in the September 2021 voter file to be matched to the records of a license holder in the October 2021 Department of Transportation database, the records must match with at least one of the fields in Table 1.

Table 1: Matching fields used to create the 2021 no-match list

	Name			Soundex			
Field	First	Middle	Last	Last	SSN4	DOB	License
1	✓		✓		✓	✓	
2		✓	✓		✓	✓	
3	✓			✓	✓	✓	
4		✓		✓	✓	✓	
5	✓	✓	✓		✓		
6	✓	✓	✓			✓	
7	✓	✓		✓	✓		
8	✓	✓		✓		✓	
9							✓

Note: SSN4 denotes the last four digits of an individual's social security number; and, DOB denotes an individual's birth date.

22 For example, my first matching field (top row of Table 1) is a concatenation of an individual's first name, last name, last four digits of the individual's social security number, and the individual's birth date. The second matching field is similar except that it substitutes middle name for first name.

23 Four matching fields in Table 1 (numbers one, two, five, and six) include registered voter last names. Analogous to these are four fields (numbers three, four, seven, and eight) that substitute *Soundex last names* for last names. An individual's Soundex last name is a phonetic coding of the person's last name that reflects the sounds of the initial letters of the name. For example, the Soundex coding of "Smith" is identical to the Soundex coding of "Smyth" and also identical to the Soundex coding of "Smythe." Similarly, the Soundex codings for "school" and "schooll" are the same. By incorporating Soundex last names, my nine matching fields allow for minor spelling discrepancies in last names.

24 The ninth matching field in Table 1 is a license number. I include this matching field in my set of nine fields because the license number of an individual who registered to vote in North Carolina using a Department of Transportation-administered license as a form of identification is, to the best of my knowledge, recorded in official State Board of Elections records and in the September 2021 voter file.

25 In Paragraph 20, I stated that my matching fields were more permissive than the fields used by the North Carolina State Board of Elections when it constructed the August 2019 no-match list. The State Board of Elections allowed for seven matching fields, none of which included Soundex last names. In addition, all of the State Board of Elections's matching fields that included a license number also included another individual-level identifying feature, like birth date. In contrast, my ninth matching field consists of a license number alone. Therefore, individuals matched across a given voterfile and a license database using the algorithm implemented by the State Board of Elections in 2019 will also be matched across the voterfile and license database using my algorithm.

And, my algorithm allows for matches between voterfile and license database records that are not permitted by the State Board of Elections's 2019 algorithm. Hence, my algorithm is more conservative in the sense of matching fields.[3]

3.3 Deceased registered voters

26 I classify a registered voter who is listed in the September 2021 voterfile as deceased if the voter is matched to at least one license record in the October 2021 Department of Transportation database associated with a deceased license holder. For the purposes of analyzing the composition of the October 2021 no-match list, I disregard registered voters whom I classify as deceased.

3.4 License expiration dates

27 Licenses in the Department of Transportation database have expiration dates. Under SB 824, an expired license is sufficient for the purposes of voting if it has been expired for less than one year or if the associated license-holder is at least 65 years old and the license was valid as of the holder's 65th birthday. A license that does not fit these criteria cannot be used for voting. For the purposes of creating the October 2021 no-match list, I disregard licenses that, on account of expiration dates, cannot under SB 824 be used for the purpose of voting.

3.5 Uniqueness of matching fields

28 After I created my nine matching fields in the September 2021 voter file, I calculated the number of fields that are missing data. For example, some records in the September 2021 voter file do not contain the last four digits of a registrant's social security number. For these registrants, I can only use matching fields six, eight, and nine.

[3]Counsel forwarded me an email dated September 23, 2019, and written by Mr. Paul Cox of the North Carolina Department of Justice. Attached to this email was an SQL script, "Holmes_SBOE_POD_004027 - No_Match_Code_v3.txt," that to the best of my knowledge was used to generate the State Board of Elections's no-match list. The script, in particular the code following the comment "## Determine Matches," includes the seven matching fields referenced in the body of the report.

29 Of matching fields that do not have missing data, I also calculated the percent that are unique. These percentages, along with missingness rates, are in Table 2.

Table 2: Features of matching fields in the North Carolina voter file

Field	Non-missing	Unique	% Missing	% Unique
1	6,696,250	6,694,891	6.4282	99.9797
2	6,263,176	6,261,919	12.4799	99.9799
3	6,696,250	6,694,924	6.4282	99.9802
4	6,263,176	6,261,965	12.4799	99.9807
5	6,263,154	6,261,264	12.4802	99.9698
6	6,658,224	6,653,887	6.9596	99.9349
7	6,263,154	6,261,199	12.4802	99.9688
8	6,658,224	6,652,266	6.9596	99.9105
9	6,324,518	6,324,187	11.6227	99.9948

30 This table—in particular, the percentages in the "% Unique" column, which are close to 100—shows that the nine matching fields used in my algorithm are practically unique. This makes it very unlikely that multiple records in the September 2021 voterfile will be linked to a single record in the October 2021 Department of Transportation database.

4 Analysis of the October 2021 no-match list

31 The October 2021 no-match list is a set of registered voters (non-deceased and either active or inactive) whose records in the 2021 September voterfile cannot be matched to records in the 2021 October Department of Transportation database. The North Carolina statewide *no-match rate* is the percent of North Carolina registered voters who are on the no-match list. This rate can be disaggregated by voter subgroup. For example, the *Black no-match rate* is the percent of Black registered voters in North Carolina who are on the October 2021 no-match list as a share of all Black registered voters in the state.

4.1 Types of Department of Transportation-administered licenses

32 I have already noted that, per Section 1.2a of SB 824, Department of Transportation licenses that are "valid and unexpired," Department of Transportation licenses that have been "expired for one year or less," and expired Department of Transportation licenses associated with license holders who are at least 65 years of age and which were unexpired as of the individuals' 65th birthdays are sufficient for the purposes of voting. Accordingly, per SB 824, my matching algorithm excludes licenses described by the Department of Transportation as canceled, suspended, or denied from the set of Department of Transportation-administered licenses sufficient under SB 824 for the purposes of voting.

33 Moreover, N.C. Gen. Stat. § 20-30(1) ("Violations of license, learner's permit, or special identification card provisions") states that it is unlawful for a person

> To display or cause to be displayed or to have in possession a driver's license, learner's permit, or special identification card, knowing the same to be fictitious or to have been canceled, revoked, suspended or altered.

34 The North Carolina Department of Motor Vehicles distinguishes between permits and driver's licenses ("To get a North Carolina learner permit, an individual must be at least 18 years old and apply in person at an N.C. Division of Motor Vehicles driver license office. (Individuals at least 18 years old may also apply for a driver license.)"[4], and to the best of my understanding permits are not treated by SB 824 as sufficient for the purposes of voting. Therefore, for the purposes of creating the October 2021 no-match list, my matching algorithm does not incorporate learner permits as forms of Department of Transportation identification suitable for voting.

[4]See "Getting a License or Learner Permit," *The Official North Carolina DMV website*, October 22, 2021, available at `https://www.ncdot.gov/dmv/license-SB824id/driver-SB824licenses/new-SB824drivers/Pages/license-SB824learner-SB824permit.aspx` (last accessed December 15, 2021).

4.2 Counts and rates at which groups of voters appear on the October 2021 no-match list

35 Based on the database matching algorithm described here, Table 3 reports no-match rates for North Carolina overall ("Statewide"), by race group ("Race"), and by ethnicity ("Ethnicity"). The "Voters" column in the table refers to the total number of registered voters of a given group who are part of my algorithm's matching process, the "No-match" column contains the number of these voters who could not be matched to Department of Transportation license records using nine matching fields, and "% No-match" is the percentage of no-matches. Within Table 3's race and ethnicity sections, groups are sorted by size.[5]

Table 3: No-match rates, statewide, by race, and by ethnicity

Group	Voters	No-match	% No-match
Statewide	7,143,626	667,051	9.34
Race			
White	4,679,845	288,077	6.16
Black	1,461,911	232,086	15.88
Unknown race	599,213	98,760	16.48
Other	199,249	20,620	10.35
Asian	106,811	9,457	8.85
American Indian / Alaska Native	52,777	9,465	17.93
Two or more races	43,361	8,458	19.51
Native Hawaiian / Pacific Islander	459	128	27.89
Ethnicity			
Not Hispanic	5,121,796	412,708	8.06
Unknown ethnicity	1,787,026	222,403	12.45
Hispanic	234,804	31,940	13.60

36 Per my matching algorithm, the top row of Table 3 shows that, as of October 2021, there are 667,051 registered voters in North Carolina who had not been issued forms of Department of Transportation-administered identification sufficient under SB 824 for the purposes of voting. This

[5]There are 118 non-deceased registered voters in the September 2021 voter file who match to license records in the October 2021 Department of Transportation database that lack status codes, which are described in Appendix C. I assume, conservatively, that these 118 registered voters have a Department of Transportation-administered license sufficient under SB 824 for voting.

is equivalent to a statewide no-match rate of 9.34 percent.[6]

37 There are 232,086 Black registered voters in North Carolina on the October 2021 no-match list, corresponding to a Black no-match rate rate of 15.88 percent.[7] Therefore, of Black registered voters in North Carolina, my matching algorithm finds that 15.88 percent have not been issued forms of Department of Transportation-administered identification sufficient under SB 824 for the purposes of voting. The Black no-match rate is 2.58 times as large as the White no-match rate of 6.16 percent, this based on 288,077 White registered voters.[8] Therefore, Black registered voters in North Carolina have less access by a factor of 2.58 to Department of Transportation-administered forms of identification sufficient under SB 824 for the purposes of voting compared to White registered voters.

38 With respect to ethnicity, there are 31,940 Hispanic registered voters on the October 2021 no-match list and 412,708 non-Hispanic registered voters.[9] The Hispanic no-match rate is 13.60 percent, which is roughly 69 percent larger than the non-Hispanic no-match rate of 8.06 percent.[10] Therefore, compared to non-Hispanics, Hispanic registered voters in North Carolina have less access by a factor of 1.69 to Department of Transportation-administered forms of identification sufficient under SB 824 for the purposes of voting.

39 Black and White registered voters are the two largest racial groups in the North Carolina electorate. Beyond these two groups, Table 3 shows that there are over 146,000 other North Carolina registered voters who have not been issued Department of Transportation-administered forms of identification sufficient under SB 824 for the purposes of voting. This includes 9,457 Asian registered voters, 9,465 American Indian / Alaska Native registered voters, 8,458 registered voters

[6]This statewide no-match rate is rounded and thus approximate. Throughout this Supplemental Report, I round no-match rates to two decimal places and, to keep language simple, do not repeatedly use the word, approximate.

[7]The Black no-match rate is calculated by dividing 232,086 by 1,471,911.

[8]The ratio of 2.58 is found by dividing 15.88 by 6.16.

[9]In my State Board of Elections data (the September 2021 voterfile), the ethnicity of a registered voter is distinct from the voter's race. Hispanic registered voters can thus be Black, White, or any other race.

[10]The ratio of 13.6 to 8.06 is 1.69.

of multiple races, and 98,760 registered voters whose race is not specified in the September 2021 voterfile.

4.3 An alternative October 2021 no-match list

40 To the best of my knowledge, my algorithm that matches State Board of Elections records of voters with Department of Transportation records of license holders in North Carolina comports with the language of SB 824. However, to facilitate an analysis of the racial and ethnic impacts of including forms of Department of Transportation-administered identification not in SB 824, I developed three alternative algorithms that analyze the impact of adding forms of identification to those so included: (i) licenses described by the Department of Transportation as canceled, suspended, or denied and (ii) learner's permits. The alternative algorithms treat either permits or licenses classified by the Department of Transportation as canceled, suspended, or denied, or both, as sufficient for the purpose of voting.

41 Appendix D describes the results of three alternative specifications of the October 2021 no-match list. Here I describe only the alternative which treats both permits and licenses classified by the Department of Transportation as canceled, suspended, or denied, or both, as sufficient for the purpose of voting.

42 Based on this alternative algorithm, I conclude that 429,415 registered voters in North Carolina have not been issued licenses and other forms of Department of Transportation-administered photographic identification that are sufficient for the purposes of voting. Of these, there are 117,314 Black registered voters as well as 206,321 White registered voters. Under my alternative algorithm, the rate (8.02 percent) at which Black registered voters in North Carolina have not been issued licenses and other forms of photographic identification suitable for voting is 1.82 times the rate (4.41 percent) of White registered voters.[11]

[11] The ratio of 8.02 to 4.41 is 1.82.

43 Similarly based on my alternative algorithm, I conclude that there are 21,701 Hispanic registered voters as well as 260,877 non-Hispanic registered voters who have not been issued licenses and other Department of Transportation-administered forms of photographic identification suitable for voting. Thus, the rate (9.24 percent) at which Hispanic registered voters in North Carolina have not been issued licenses and other forms of photographic identification suitable for voting is 1.82 times the rate (5.09 percent) of White registered voters.[12]

5 Forms of identification not administered by the Department of Transportation

44 For the purposes of voting, SB 824 allows for forms of identification other than Department of Transportation-administered licenses. Among these are United States passports, tribal identification cards, military identification cards, and student identification cards. I do not have access to any databases on federal forms of identification (e.g., passports and military identification cards). Nor do I have access to databases on student or tribal identification cards.

45 Were I to have access to databases on forms of identification listed in SB 824 beyond Department of Transportation-administed licenses, I would apply the algorithm described in this report to these databases. This would allow me to count the number of registered voters in North Carolina who, for example, have been issued United States passports and military identification cards.

46 I would not expect that adding forms of identification to the list of acceptable forms of identification for the purposes of voting would change the racial disparities I have identified in the October 2021 no-match list, by which Black registered voters in North Carolina lack forms of Department of Transportation-administered licenses sufficient under SB 824 for the purposes

[12]The ratio of 9.24 to 5.09 is 1.82.

of voting at greater rates than White voters (and similar for Hispanic registered voters vis-a-vis non-Hispanic registered voters).

47 In *United States of America v. The State of North Carolina* (Civil Action No. 1: 13-CV-861), Dr. Charles Stewart III wrote an expert report that, among other things, summarized the results of a matching algorithm like the one described here. Dr. Stewart's expert report concerned House Bill 589, a piece of legislations that, like SB 824, imposed a photo identification requirement in North Carolina for the purposes of voting.

48 In crafting his expert report on HB 589, Dr. Stewart had access to a Department of Transportation database like the one described here, a file that listed United States passport holders, a file listing holders of military identification, and a file listing veterans. After matching registered voters in North Carolina to a Department of Transportation database, Dr. Stewart found that, after adding passports to the list of acceptable forms of identification for the purposes of voting, subsequently adding forms of military identification and veterans identification cards had only a marginal effect on the statewide no-match rate in North Carolina. Thus, the addition of a list of United States passport holders was the most consequential for Dr. Stewart's matching algorithm, once a Department of Transportation database had been incorporated into it.[13]

49 A similar phenomenon was noted in an expert report authored by Dr. Kevin Quinn in *Alberta Currie, et al. v. State of North Carolina, et al.* (No. 13-CVS-1419). As described on p. 14, paragraph 51, of his expert report in *Jabari Holmes, et al. v. Timothy Moore, et al.* (18 CVS 15292), in *Currie* Dr. Quinn calculated matches between a voter database and a Department of Transportation database and then added passports, military identification, and veterans identification. Of matches resulting from these latter forms of identification, "U.S. passports accounted for 86% of [them]."

[13] See Table 5 on p. 36 of "Declaration of Charles Stewart III, Ph.D. (Amended)."

50 Although I do not have access to a list of United States passport holders, the 2020 edition of the *American National Election Study* surveyed 287 residents of North Carolina in the period surrounding the 2020 General Election, of whom 257 were queried as to whether they held valid United States passports. Of these, Black individuals responded positively at a rate of approximately 29.3 percent and White individuals, at a rate of 49.5 percent. Incorporating survey weights changes these percentages slightly—the Black rate becoming 35 percent and the White rate, 47.6 percent—but not in a qualitative way. In North Carolina, then, the White passport possession rate appears greater than the Black passport possession rate.[14]

51 In sum, while I do not have access to databases that would allow me create an October 2021 no-match list that incorporates the full set of forms of identification that are sufficient under SB 824 for the purposes of voting, my inability to access such databases has not unduly biased my characterization of the Black-White gap in identification possession rates in North Carolina. In fact, were I to have access to a list of United States passport holders, I could ultimately end up with an October 2021 no-match list with a lower statewide no-match rate than the no-match list described in Table 3 (because adding passports would resolve some non-matching registered voters) but one with a greater Black-White racial disparity (because White residents of North Carolina hold passports at greater rates than Black residents).

6 Conclusion

52 In August 2019, the North Carolina State Board of Elections created a list of registered voters who have not been issued Department of Transportation-administered forms of identification that under SB 824 are sufficient for the purposes of voting. This list, which I analyzed in my initial expert report in this litigation, consists of hundreds of thousands of registered voters. Moreover, both Black and Hispanic registered voters are disproportionately represented on it.

[14] In the 2020 American National Election Study, the variable `V201590` specifies whether respondents reported having valid passports. Survey weights are found in variable `V200010a`.

53 In this Supplemental Report, I described how I updated the State Board of Elections's list of registered voters who have not been issued Department of Transportation-administered forms of identification that under SB 824 are sufficient for the purposes of voting. My update used confidential data supplied to me by the North Carolina State Board of Elections and the North Carolina Department of Transportation.

54 I have shown here that, as of October 2021, hundreds of thousands of registered voters in North Carolina continue to lack Department of Transportation-administered forms of identification that under SB 824 are sufficient for the purposes of voting. Moreover, as of late 2021, Black and Hispanic registered voters lack these forms of identification at rates greater than Whites and non-Hispanics, respectively. In particular, I identified 232,086 Black registered voters (15.88 percent of all Black registered voters in North Carolina) who lack access to Department of Transportation-administered forms of identification. This constitutes a rate of non-identification possession that is 2.57 times the corresponding rate for White voters.

55 For purposes of analyzing the racial and ethnic impacts of adding additional forms of Department of Transportation-administered photographic identification to those allowed under SB 824, I offered three alternative lists of voters who lack access to these forms of identification. Within each of these lists, Black voters have less access to forms of voter identification than do White voters and similarly for Hispanic and non-Hispanic voters. These racial and ethnic regularities held in August 2019 and continue to hold in October 2021.

A *Curriculum vitae* of Michael C. Herron

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Academic appointments

William Clinton Story Remsen 1943 Professor, Program in Quantitative Social Science, Dartmouth College. July 2021–present.

William Clinton Story Remsen 1943 Professor, Department of Government, Dartmouth College. July 2013–June 2021.

Chair, Program in Quantitative Social Science, Dartmouth College. July 2015–June 2020, July 2021 - 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

"Auditing the 2020 General Election in Georgia: Residual Vote Rates and a Confusing Ballot Format (with David Cottrell, Felix E. Herron, and Daniel A. Smith). Forthcoming, *Election Law Journal*.

"Vote-by-mail ballot rejection and experience with mail-in voting" (with David Cottrell and Daniel A. Smith). *American Politics Research* 49(6): 577-590. 2021.

"Voting lines, equal treatment, and early voting check-in times in Florida" (with David Cottrell and Daniel A. Smith). *State Politics & Policy Quarterly* 21(2): 109-138. 2021.

"Postal Delivery Disruptions and the Fragility of Voting by Mail: Lessons from Maine" (with Daniel A. Smith). *Research & Politics* 8(1): 1-12. 2021.

"Voting by Mail and Ballot Rejection: Lessons from Florida for Elections in the Age of the Coronavirus" (with Anna Baringer and Daniel A. Smith). *Election Law Journal* 19(3): 289-320. 2020.

"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.

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"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" (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.

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"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

"In two political battlegrounds, thousands of mail-in ballots are on the verge of being rejected" (with Daniel A. Smith). *The Conversation*, October 23, 2020. Available at `https://theconversation.com/in-two-political-battlegrounds-thousands-of-mail-in-ballots-are-on-the-verge-of-being-rejected-148616`.

"Rejected mail ballots pile up in Florida" (with Daniel A. Smith). *Tampa Bay Times*, October 16, 2020. Available at `https://www.tampabay.com/opinion/2020/10/16/rejected-mail-ballots-pile-up-in-florida-column`.

"Minor postal delays could disenfranchise thousands of Florida vote-by-mail voters" (with Daniel A. Smith). *Tampa Bay Times*, August 14, 2020. Available at `https://www.tampabay.com/opinion/2020/08/14/minor-postal-delays-could-disenfranchise-thousands-of-florida-vote-by-mail-voters-column`.

"Want to know how many people have the coronavirus? Test randomly" (with Daniel N. Rockmore). *The Conversation*, April 13, 2020. Available at `https://theconversation.com/want-to-know-how-many-people-have-the-coronavirus-test-randomly-135784`.

"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

"Race and the Reduction of Early In-Person Voting in Georgia" (with Enrijeta Shino and Daniel A. Smith).

"Evidence from Maine on the effect of the COVID-19 pandemic on methods of absentee ballot delivery."

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

Congressional testimony

"Voting in America: The Potential for Polling Place Quality and Restrictions on Opportunities to Vote to Interfere with Free and Fair Access to the Ballot," Subcommitee on Elections, Committee on House Administration, United States House of Representatives. June 11, 2021.

Awards

Elizabeth Howland Hand-Otis Norton Pierce Award for outstanding undergraduate teaching, Dartmouth College, 2020-21.

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

"Auditing the 2020 General Election in Georgia: Residual vote rates and a confusing ballot format," 2021 Annual Meeting of the Southern Political Science Association, conducted remotely.

"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.

"A Simulation Study of Precinct Resources and Voter Wait Times in Hanover, New Hampshire," New Research on Election Administration and Reform, 2015, Massachusetts Institute of Technology, Cambridge, MA.

"Rejected Absentee Ballots in Florida," 2015 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, Fall 2019–present.

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.

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 Quantitative Analysis in Sports
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
Race and Social Problems
Science Advances
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.

B The September 2021 voterfile

56 Officials in the State Board of Elections provided me with a confidential list of registered voters in North Carolina, valid as of September 28, 2021. Lists of registered voters are often called voterfiles, which is a term I use throughout this report. The September 2021 voterfile is contained in a file, `VOTER_REG_wo_comments.csv`, that I downloaded from a secure State Board of Elections server.

57 The September 2021 voter file is tab-delimited and includes records of 16,224,991 total voters. I focus in this report only on the 7,156,271 registered voters in North Carolina whom the State Board of Elections denotes as active (6,326,597 such individuals) or inactive (829,674). For this designation, the key field in the voterfile is called `status_cd`. Registered voters who have values of this field that are "A" are active, and those with "I" are inactive. A voter in North Carolina can be denoted as inactive "if [the voter's] county board of elections has had no contact with [the] voter for two federal election cycles – a total of four years – and the voter has not voted during that time."[15] Inactive voters in North Carolina are nonetheless registered voters in the state.

58 The September 2021 voterfile contains 72 distinct fields, and Table 4 lists the fields used in this report.

59 In the course of processing the September 2021 voterfile, I standardized driver's license numbers by removing spaces and padding these numbers on the left with zeroes so that each license number consists of 12 digits; first and last names by removing spaces and non-alphanumeric characters; last four social security numbers by removing spaces; and, status codes by removing spaces.

[15] See "County Boards of Elections Begin Regular Voter List Maintenance Processes," *North Carolina State Board of Elections*, January 14, 2021, available at `https://www.ncsbe.gov/news/press-releases/2021/01/14/county-boards-elections-begin-regular-voter-list-maintenance` (last accessed November 19, 2021).

Table 4: Key fields in the September 2021 voterfile

Field description	Name in voterfile
Birth date	birth_dt
Driver's license number	dl_num
Ethnicity	ethnicity_lbl
First name	first_name
Last name	last_name
Last four digits of social security number	ssn
Race	race_lbl
Status	status_cd

Note: fields listed alphabetically by description.

60 I verified that all birth dates in the September 2021 voterfile consist of ten characters, representing two digits for month, two for day, four for year, and two dashes. Regarding voterfile values of last four digits of social security numbers, there are 6,696,334 entries that consist of four digits, 231,834 missing entries, and 228,103 entries that consist of a single space; I treat the latter entries as missing.

61 I define a voter's age as the number of complete years lived as of October 11, 2021, the effective date of the October 2021 Department of Transportation database.

C The October 2021 Department of Transportation database

62 The Department of Transportation provided me with a set of ascii files that contain details on licenses that have been issued to residents of North Carolina. I downloaded these files from a secure website, and the set of files constitutes the October 2021 Department of Transportation database. The files were accompanied by an Excel spreadsheet ("DMV Systems Data Dictionary OCT21.xlsx") that describes the files' contents and layouts.

63 *Citizen file*. To the best of my knowledge, the citizen file that is part of the Department of Transportation database consists of a list of North Carolina residents who have been issued licenses administered by the Department of Transportation. The citizen file has 14,962,845 lines, each line corresponding to a single individual. From this file I extracted the following variables: license number, first name, middle name, last name, birth date, last four digits of social security number, and date upon which license holder passed away (if any).

64 For the purposes of this report, I say that a record in the Department of Transportation citizen file is associated with a deceased license holder if the record's deceased date field is not empty. Of the citizen file's 14,962,845 records, there are 1,771,222 with non-empty deceased dates.

65 *Status file*. To the best of my knowledge, the status file that is part of the 2021 Department of Transportation database consists of codes that describe the statuses of licenses that have been issued to residents of North Carolina. The file has 15,367,769 lines, each of which corresponds to the status of a single license. From the status file, I extracted license numbers and status codes.

66 Status codes of licenses are listed in Table 5 along with descriptions based on documentation provided by the Department of Transportation.

Table 5: Department of Transportation license status codes

Status	Description	Count
1	Active	9,414,260
E	Inactive	3,132,764
B	Deceased	1,765,933
7	Suspended	570,039
A	Eligible for reinstatement	385,715
D	Medical cancellation	57,259
4	Canceled	36,107
9	90 day renewal denied	5,613
-	Missing	53
8	Denied	26
All		15,367,769

67 The Department of Transportation documentation on its database includes a status code of six, which means "transfered - suspended." There were no status codes of six in the status file provided to me by the Department of Transportation, and the code of six thus does not appear in Table 5. There are also 53 status codes in the status file that are blank. None of the conclusions in this report are qualitatively sensitive to these 53 apparently missing status codes.

68 There are more status codes (15,367,769) than there are unique license codes (14,878,237) in the status file. It is my understanding that this reflects the fact that a single North Carolina resident can be issued multiple licenses.[16]

69 In the body of the report, I describe a no-match table based on excluding Department of Transportation licenses that were either canceled, suspended, or denied. I say that a given license code is associated with a license that is canceled, suspended, or denied if there is not a code other than four, six, seven, eight, or nine present in all of the status codes associated with the license code.

[16]This was noted in an email sent to me by Mr. Neil Dalton of the North Carolina Department of Justice on November 22, 2021 ("No, the two status code entries are associated with the same customer but for two different issuances (e.g. a regular license issuance and a CDL permit issuance).")

70 *Driver ID file*. To the best of my knowledge, the driver ID file that is part of the 2021 Department of Transportation database consists of codes that describe important license features. From this file I extract license numbers, expiration dates, and group codes. I verified that there are no duplicated license numbers in the driver ID file.

71 Table 6 reports group codes, their descriptions, and their counts in the driver ID file. There are 14 licenses with missing group codes, and this has no qualitative consequences for this report.

Table 6: Department of Transportation license group codes

Group code	Description	Count
	Driver's license	12,344,779
I	ID card	2,038,787
P	Permit	205,504
3	Transfered-Suspended	170,644
1	Active	121,419
2	Canceled	81,948
M	Motorcycle	407
T	Temporary permit	25
-	Missing	14
4	Motorcycle permit	3
All		14,963,530

72 For the purposes of the analysis in this report, I say that a given license is a permit if its group code is either "P," "T," or "4."

73 There are 85,293 license codes in the driver ID file that do not appear in the status file. I cannot determine the statuses of these licenses.

D Alternatives to the October 2021 no-match list

74 This appendix describes three alternatives of the matching algorithm I used to create the October 2021 no-match list. Each specification has an associated alternative October 2021 no-match list, whose contents are summarized in Table 3 in the body of this report.

75 To create my first alternative of the October 2021 no-match list, I treat permits as sufficient for the purposes of voting.

76 In my second alternative of the October 2021 no-match list, licenses described by the Department of Transportation as canceled, suspended, or denied are treated as sufficient for the purposes of voting.

77 Finally, in my third alternative of the October 2021 no-match list, I treat both permits and licenses described by the Department of Transportation as canceled, suspended, or denied as sufficient for the purposes of voting.

D.1 Alternative 1

78 My first alternative October 2021 no-match list is described in Table 7. According to this alternative, 8.73 percent of registered voters in North Carolina—over 620,000 individuals—have not been issued licenses suitable for the purposes of voting. The Black no-match rate in this alternative is 14.71 percent and the White rate, 5.82 percent. Thus, in the first alternative October 2021 no-match list, the rate at which Black voters have not been issued licenses that have been neither canceled, suspended, or denied licences is 2.52 times the rate at which White voters have not been issued such licenses.[17]

79 Continuing with the first alternative, the rate (11.99 percent) at which Hispanic voters have not been issued licenses that have been neither canceled, suspended, or denied licences is

[17] The ratio of 14.71 to 5.82 is 2.52.

Table 7: No-match rates by race (canceled, suspended, or denied licenses not allowed, learner permits allowed)

Group	Voters	No-match	% No-match
Statewide	7,143,626	623,958	8.73
Race			
White	4,679,845	272,477	5.82
Black	1,461,911	215,038	14.71
Unknown race	599,213	92,611	15.46
Other	199,249	18,132	9.10
Asian	106,811	8,451	7.91
American Indian / Alaska Native	52,777	9,165	17.37
Two or more races	43,361	7,958	18.35
Native Hawaiian / Pacific Islander	459	126	27.45
Ethnicity			
Not Hispanic	5,121,796	386,747	7.55
Unknown ethnicity	1,787,026	209,048	11.70
Hispanic	234,804	28,163	11.99

1.59 times the rate (7.55 percent) at which White voters have not been issued such licenses.[18]

D.2 Alternative 2

80 The second alternative October 2021 no-match list treats licenses described by the Department of Transportation as canceled, suspended, or denied as sufficient for the purposes of voting. However, this alternative does not treat learner permits in this way. No-match rates for this alternative are in Table 8.

81 Table 8's no-match rates are noticeably greater than those in Table 7. That these two tables differ in a significant way implies that Department of Transportation-administered licenses that are canceled, suspended, or denied have more of a consequence for no-match rates—and thus accessibility of voting under SB 824—than do learner permits.

82 When (1) permits are not treated as forms of photographic identification sufficient for the purposes of voting but (2) canceled, suspended, or denied licenses are sufficient in this way, the

[18]The ratio of 11.99 to 7.55 is 1.59.

Table 8: No-match rates (canceled, suspended, or denied licenses allowed, learner permits not allowed)

Group	Voters	No-match	% No-match
Statewide	7,143,626	473,299	6.63
Race			
White	4,679,845	222,075	4.75
Black	1,461,911	134,807	9.22
Unknown race	599,213	79,633	13.29
Other	199,249	15,329	7.69
Asian	106,811	8,967	8.40
American Indian / Alaska Native	52,777	5,661	10.73
Two or more races	43,361	6,722	15.50
Native Hawaiian / Pacific Islander	459	105	22.88
Ethnicity			
Not Hispanic	5,121,796	287,295	5.61
Unknown ethnicity	1,787,026	160,444	8.98
Hispanic	234,804	25,560	10.89

statewide no-match rate in North Carolina is 6.63 percent. There are over 470,000 individuals on the second alternative October 2021 no-match list. On this list, the White no-match rate (4.75 percent) is smaller than the Black no-match rate (9.22 percent), by a factor of 1.94.[19]

83 Similarly, the Hispanic no-match rate under Alternative 2 of the October 2021 no-match list is 10.89 percent, which is greater than the corresponding non-Hispanic no-match rate of 5.61-percent. In particular, the Hispanic no-match rate in Table 8 is 94 percent greater than the corresponding non-Hispanic rate.[20]

D.3 Alternative 3

84 Finally, my third alternative October 2021 no-match list treats both permits and Department of Transportation-administered licenses described as canceled, suspended, or denied as sufficient for the purposes of voting.

[19]The ratio of 9.22 to 4.75 is 1.94.
[20]This is based on 10.89 divided by 5.61.

85 According to Table 9, as of October 2021, 6.01 percent of North Carolina registered voters—429,415 individuals—have not been issued driver's licenses or other forms of Department of Transportation-administered identification sufficient for the purposes of voting. This result holds even allowing permits and canceled, suspended, or denied licenses to be sufficient for the purposes of voting.

Table 9: No-match rates (canceled, suspended, or denied licenses allowed, learner permits allowed)

Group	Voters	No-match	% No-match
Statewide	7,143,626	429,415	6.01
Race			
White	4,679,845	206,321	4.41
Black	1,461,911	117,314	8.02
Unknown race	599,213	73,360	12.24
Other	199,249	12,792	6.42
Asian	106,811	7,959	7.45
American Indian / Alaska Native	52,777	5,353	10.14
Two or more races	43,361	6,213	14.33
Native Hawaiian / Pacific Islander	459	103	22.44
Ethnicity			
Not Hispanic	5,121,796	260,877	5.09
Unknown ethnicity	1,787,026	146,837	8.22
Hispanic	234,804	21,701	9.24

86 Across race groups in North Carolina, in Alternative 3 of the October 2021 no-match list White voters have the lowest no-match rate, 4.41 percent. Black voters have a no-match rate of 8.02 percent. The ratio of Black to White no-match rates is roughly 1.82.[21] Thus, in this alternative, Black voters have no-match rates 82 percent greater than White voters.

87 Across ethnic groups in North Carolina, in Alternative 3 of the October 2021 no-match list non-Hispanic voters have the lowest no-match rate of 5.09 percent. Hispanic voters have a no-match rate of 9.24 percent. The ratio of Hispanic to non-Hispanic no-match rates is roughly 1.82.[22] Therefore, Hispanic voters have no-match rates 82 percent greater than non-Hispanic

[21]This is based on 8.02 divided by 4.41.
[22]This is based on 9.24 divided by 5.09.

voters.

88 In all three alternatives to the October 2021 no-match list, and in the original October 2021 no-match list itself, there are hundreds of thousands of registered voters across North Carolina who have not been issued Department of Transportation-administered licenses sufficient for the purposes of voting. Moreover, in all these no-match lists, Black rates of not having been issued such licenses are greater than corresponding White rates. Similarly, Hispanic rates of not having been issued licenses sufficient for the purposes of voting are greater than non-Hispanic rates.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted,

Executed on: 12/20/2021

Michael Herron