

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ALABAMA
SOUTHERN DIVISION

EVAN MILLIGAN, et al.,

Plaintiffs,

vs.

JOHN H. MERRILL, et al.,

Defendants.

No. 2:21-cv-01530-AMM

Preliminary Expert Report of Baodong Liu, Ph.D.

December 10, 2021

I. Introduction

I have been retained as an expert by counsel for the Plaintiffs in the above-captioned litigation. I have prepared this report pursuant to Federal Rule of Civil Procedure 26(a)(2)(B).

I have been asked to express opinions on whether racially polarized voting (RPV) exists in Alabama, and whether or not RPV has resulted in the defeats of Black-preferred candidates in Alabama Congressional elections.

I am being compensated at \$300 per hour for my work on this case. My compensation is not contingent on or affected by the substance of my opinions or the outcome of this litigation. My work in this matter is ongoing, and I reserve the right to amend, modify, or supplement my analysis and opinions.

II. Background on Racially Polarized Voting

In the landmark *Thornburg v. Gingles* (1986), the Supreme Court provided the precise three-prong dilution test in litigation arising under Section 2 of the Voting Rights Act (VRA). The *Gingles* test asks whether: 1) the racial or

language minority group is “sufficiently large and geographically compact to constitute a majority in a single-member district”; 2) the minority group is “politically cohesive” (meaning its members tend to vote for the same candidate); and 3) the “majority votes sufficiently as a bloc to enable it ... usually to defeat the minority’s preferred candidate.” In particular, the second and the third preconditions under the *Gingles* test have become the legal definition of RPV.

III. Summary of Professional Qualifications

I am a tenured professor of political science in the Department of Political Science at the University of Utah. I have done extensive research regarding the relationship between election systems and the ability of minority voters to participate fully in the political process and to elect representatives of their choice.

My research has won the Byran Jackson Award for the best study/dissertation about racial voting from the Urban Politics Section of the American Political Science Association, and the Ted Robinson Award from the Southwest Political Science Association. The results of my research have been published in peer-reviewed journals, including Social Science Quarterly, American Politics Research, Sociological Methods and Research, PS: Political Science and Politics, Urban Affairs Review, Political Behavior, Journal of Urban Affairs, Southeastern Political Review, and American Review of Politics, among other journals. I am also an author or editor of eight scholarly books including Political Volatility in the United States: How Racial and Religious Groups Win and Lose; Solving the Mystery of the Model Minority; The Election of Barack Obama: How He Won, and Race Rules: Electoral Politics in New Orleans, 1965-2006. I have also served as a member of the Board of Directors/Advisors on many national and international organizations such as the National Association for Ethnic Studies, Urban Affairs Review, Journal of Behavioral and Social Sciences, and International Encyclopedia of Political Science (CQ Press).

As an expert on RPV analysis, I have published peer-reviewed journal articles and books on the cutting-edge techniques used by academic professionals and supported by courts in voting rights cases and on the electoral history of the South. I have served as an expert witness in dilution cases in several states, including Alabama, Arkansas, New York, Louisiana, Utah, and Tennessee. Furthermore, I have provided my expertise to the US Department of Justice and others on census differential privacy policy and methodological issues concerning RPV. I have also been an invited instructor for expert training programs on RPV analysis concerning both the 2010 and 2020 rounds of redistricting.

My applied research and grants have included analyses of ranked-choice voting, economic development, racial voting patterns, public school science education, school districts' economic impact on the local economy, and various citizen surveys. My grants have come from New America, the National Science Foundation, American Political Science Association, the National Humanities Center, Wisconsin Security Research Consortium, Fond du Lac School District, Johnson Controls, Inc, City of Waupaca (WI), the League of Women Voters, American Democracy Project, and Wisconsin Public Service. I also served as the editor of Urban News for the American Political Science Association's Urban Politics Section, and I was elected as a co-chair of the Asian Pacific American Caucus of the American Political Science Association.

I have served as a commentator or opinion writer for the Salt Lake Tribune, ABC4News, Hinkley Forum, NPR, AP, Daily Utah Chronicle, Milwaukee Sentinel Journal, Daily Caller, and KSL, among other media outlets.

At my university, I served as Associate Chair of the Department of Political Science and the Interim Director of the Ethnic Studies Program, the MLK Committee Chair, and a faculty senator.

Attached as Appendix 1 is a curriculum vitae setting forth my professional background, which includes a list of all publications I have authored or co-authored, including forthcoming publications.

IV. Opinions

I have formed the following opinions:

Based on the data available at the time of writing this report, voting in Alabama since 2008 is "racially polarized" in that Black voters in 13 of the 13 elections analyzed have expressed a clear preference for the same candidate, and in each of the elections analyzed, the candidate preferred by Black voters was a Black candidate. Furthermore, this preference was not shared by the white voters who were the majority of the electorate. As a result, the Black preferred candidates were typically defeated in biracial elections in Alabama.

V. Elections Analyzed

In a case challenging a redistricting plan of Congressional districts under Section 2 of the Voting Rights Act, such as this one, I am aware of case law stating that endogenous elections providing a choice between voting for a white candidate and voting for a minority (in this case, Black) candidate are generally considered the most probative for assessing RPV.¹ My focus on

¹ See *Wright v. Sumter Cnty.*, 979 F. 3d 1282, 1292-93 (11th Cir. 2020) ("[E]vidence drawn from elections involving black candidates is more probative in Section Two cases"); *Clark v. Calhoun Cnty.*, Miss., 88

biracial endogenous elections is consistent with scholarly research, which finds that minority voters are mobilized in elections involving a minority candidate running against white candidates.² Congressional elections in the districts at issue in this litigation are called endogenous elections. I identified and reviewed endogenous elections in which there were both a Black candidate and a white candidate (i.e., biracial elections) since 2008.³ The reason to select only biracial elections is because these elections satisfy the necessary conditions on which Black voters and non-Black voters had a realistic opportunity to vote for the candidate of their choice which is not available in uni-racial elections involving only white candidates (or involving only Black candidates). Seven endogenous biracial elections were analyzed in this report.

Since there were only seven such endogenous biracial elections during the period under study, I also identified and reviewed six biracial elections for statewide elected offices in the same period. The elections that did not concern the electoral offices at issue in this matter are called exogenous elections.⁴ Two of these state-wide biracial exogenous elections were for Lt. Governor (2018 and 2014), two were for the 2018 State Auditor election and 2014 Secretary of State election, and the other two were for the presidential elections in 2008 and 2012 which involved a Black candidate, Barack Obama, as the nominee for a major political party. In addition, I reviewed exit poll data from the 2008 presidential primary, presidential general, and Senate general elections in Alabama.

VI. Measurement of RPV

I used the following two-step operational rules to measure whether a particular election is racially polarized: 1) I first estimate the Black and white group support⁵ for the Black candidate in a biracial election; and 2) if in this biracial election the majority of Black voters cast their vote for the Black candidate, and only a minority of white voters cast their vote for the same Black candidate, then this election is racially polarized.

F.3d 1393, 1397 (5th Cir. 1996) ("[E]xogenous elections-those not involving the particular office at issue-are less probative than elections involving the specific office that is the subject of the litigation.").

² Matt A. Barreto. 2012. *Ethnic Cues: The Role of Shared Ethnicity in Latino Political Participation*. University of Michigan Press; Karen M. Kaufmann. 2004. *The Urban Voter: Group Conflict and Mayoral Voting Behavior in American Cities*. University of Michigan Press; .

³ While more recent elections are more probative than distant past elections, my decision to include biracial elections since 2008 also took into consideration of the two census datasets (the 2010 and 2020 datasets) that provided a longitudinal analysis for a period long enough to allow the examination of RPV pattern over time (or lack of).

⁴ Evidence from exogenous elections can be used to supplement evidence from endogenous elections, particularly where there is little data from recent endogenous elections.

⁵ Support is defined as over 50% of votes for a particular candidate.

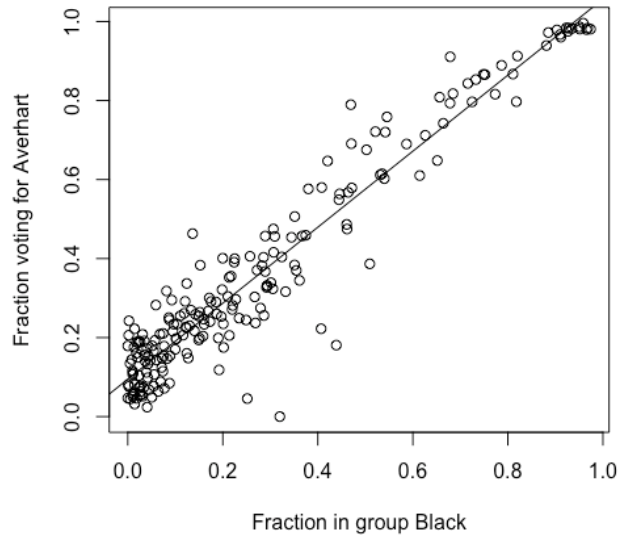
Since voting in the United States takes place in privacy, the only way to determine whether or not RPV existed in a given election is through statistical procedures. In this report, I analyzed the biracial elections using the award-winning Ecological Inference (EI) method developed by Professor Gary King of Harvard University.⁶ EI is a statistical procedure for estimating voting results of voter groups (in this case grouped by race), and it has been widely used as the most-advanced and reliable statistical procedure for RPV estimates in not only academic research but also voting rights cases in the last two decades. To run an EI operation, the specific election return data at the precinct-level needed to be matched with the voting-age population (VAP) data for the non-Hispanic white-majority, and the Black, Hispanic, and “all other” racial groups at the level of the Voting Tabulation District (VTD) or other reporting unit based on the closest census regarding Alabama.⁷

There are other statistical procedures that have been used to analyze RPV. One such procedure that has been used in dilution cases relies on various regression tools. The regression tools are inadequate for the analysis necessary for the RPV analysis here, and I explain why. To demonstrate the use of such regression tools, Figure 1 uses the 2020 Congressional District 1 general election in Alabama as an example. It shows a scatterplot for the relationship between the Black-voter proportion in precincts and the proportion of votes cast for the James Averhart, the Black candidate who ran against the white candidate, Jerry Carl.

⁶ See Gary King, A Solution to the Ecological Inference Problem: Reconstructing Individual Behavior from Aggregate Data (Princeton University Press, 1997).

⁷ I also ran the same EI operations for all the elections analyzed in this report based on the American Community Survey (ACS) data, and results are very similar to those provided in Tables 1 and 2 of this report. Election results were compiled from <https://www.sos.alabama.gov> and, per my specifications, precinct-level results data was provided by Plaintiffs’ counsel using the process described in Appendix 3.

Figure 1
Regression Method to Measure RPV: An Example



Each circle in Figure 1 represents a voting precinct in Congressional District 1. It is clear from Figure 1 that as the fraction in the Black group increases in a precinct, so does Averhart's share of votes. To capture this positive relationship, regression methods use a straight line to make the best fit for the data. The Single Regression Method (also called Goodman Regression) uses the slope and the intercept of the regression line to estimate the Black and non-Black voters' support for Averhart in Congressional District 1. Based on this procedure, it is estimated that the Black voting group provided Averhart with 105.7% of their votes while the non-Black group voted for him at the 9.5% level. Of course, based on the two-step operational rules specified above, the Congressional District 1 election in Alabama in 2020 was racially polarized, in that Black voters overwhelmingly supported Averhart whereas the super-majority of the non-Black voters voted against him.

If the above regression procedure is adopted to analyze all biracial elections in Alabama, it will unfortunately provide a misleading result. Obviously, Averhart's Black support should never surpass the 100% maximum value which is exactly the rule that the Single Regression Method violates in the Congressional District 1 example. There are other limitations of the Single Regression Method that make it a subpar tool for RPV analysis. For example, it assumes that all Black voters, regardless of which precinct they are located, voted at the same rate for the Black candidate in a given election; and in making estimates for racial groups' support for the Black candidate, the Single Regression Method treated all precincts with exactly the same weight

regardless of how many voters in that precinct cast their votes.⁸ As a result of the aforementioned limitations and errors, experts in this field have increasingly replaced the regression-related tools with more advanced statistical procedures.

Thus, rather than regression-related tools, I instead analyzed the biracial elections based on EI method. One of the main reasons to use the EI method in the estimation of single-member district elections, rather than the regression methods, is because it *always* generates realistic estimates.⁹ With respect to the Congressional District 1 election in Alabama in 2020, for example, the EI method estimated that Averhart received 93.3 % of the votes from the Black voter group and 12.6% of the votes from the white voter group. The realistic estimation of group votes is guaranteed through EI's method of bounds feature, which adopts the mathematical rule to determine the maximum and minimum number of votes cast by a particular racial group for a particular candidate. For example, if a precinct has only five Black registered voters and the total votes cast for the only Black candidate in the election is 10, then at least five of the total 10 votes are from non-Black registered voters, which is a mathematical necessity.

EI also provides not only the point estimates for racial voting patterns, but also the standard errors (or 95% confidence interval) associated with these point estimates, which is to be understood as the uncertainty boundaries beyond the point estimates. The point estimates are to be considered as the most likely vote percentages cast for a given candidate by different racial groups in a given election.¹⁰

The point estimates and the uncertainty boundaries can be visually displayed by the EI technology. We can once again use the 2020 Congressional District 1 election as an example. The data at the precinct-level for Black, white, and Hispanic voting age population (VAP) and the votes cast for Averhart and his white opponent, Jerry Carl are available at the time of writing this report. Figure 2 is the Density Plot based on the Ecological Inference (EI) estimations

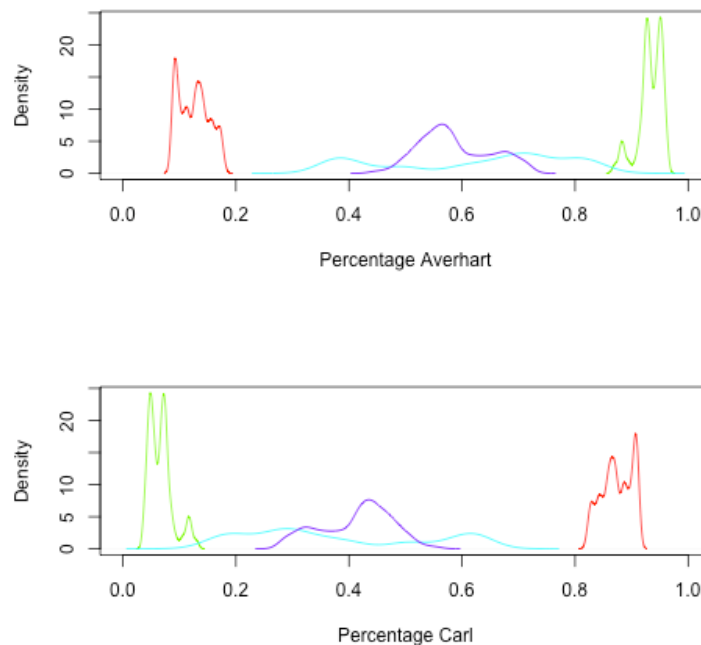
⁸ Because of the clear limitations of the Single Regression Method concerning RPV analysis, some scholars proposed some alternatives such as weighted regression or double-regression method to remedy the specific limitations. But none of the regression tools can avoid a vital mistake in all circumstances, that is, to generate unrealistic estimates (e.g., more than 100% Black support for a Black candidate, or less than 0% support from the non-Black group for a Black candidate).

⁹ For detailed discussions of EI method, compared to previous statistical procedures, see my article: Liu, Baodong. (2007). "EI Extended Model and the Fear of Ecological Fallacy," *Sociological Methods and Research* 36 (1): 3-25.

¹⁰ In statistical analysis, point estimates are estimated through the empirical data on which theorems (especially the central limit theorem) are applied. The point estimates are the exact numbers (for example, Black voters cast exact 86.3% of their vote for a Black candidate) which are "the best" estimation, given the data, but also are "uncertain" in that the reality may be "off" from this best estimation. The extent to which the reality may deviate from it is known as standard errors. Scholars accept conventionally a 95% confidence interval where the lowest possible value and the highest possible value around the best point estimate are specified based on the central limit theorem.

of data for multiple racial groups.¹¹ The red curve on the left shows the boundary of the white vote for Averhart, and the green curve on the right displays that of the Black vote, which is a clear picture of RPV. Note that there are also two other curves in the middle of the plot. These two curves (in blue and pink colors) showed the support for Averhart from Hispanic voters and the “other” minority racial group (which includes, for example, Asians and Indigenous Americans). Note also that the bottom panel shows the plot for Carl.

Figure 2: Density Plot based on EI Operation



VII. The Findings

As explained above, the selection of the elections for my RPV analysis is based on three critical criteria: 1) biracial elections involving at least one Black candidate and one white candidate; 2) endogenous biracial elections supplemented by exogenous biracial elections (i.e., non-Congressional biracial elections); and 3) elections during the last 15 years. My analysis focuses on elections in the last 15 years as more recent elections are most probative in identifying RPV.¹²

¹¹ I used the eiPack R-package to derive the racial estimates for multiple groups.

¹² As a statistical rule, more recent elections help us understand what just happened and predict what will happen in the near future. Biracial endogenous electoral competitions are the most probative elections to analyze.

A) Endogenous Elections

Table 1: Estimated Racial Support for Black Candidate in Endogenous Elections

Election	Black Candidate(s)	White Candidate(s)	% vote cast for Black Cand	Black Support for Black Cand (95% CI) ¹³	White Support for Black Cand (95% CI)	Black-Cand Won?	RPV?
2020 CD1, primary	James Averhart	Kiani Gardner and Frederick Collins	40.2%	53.8% (.52-.56)	16.7% (.13-.20)	Into Runoff	Yes
2020 CD1, general	James Averhart	Jerry Carl	35.6%	93.3% (.88-.96)	12.6% (.09, .17)	No	Yes
2020 CD2, general	Phyllis Harvey-Hall	Barry Moore	34.5%	93.4% (.88-.96)	5.2% (.04-.1)	No	Yes
2020 CD3, general	Adia Winfrey	Mike Rogers	32.4%	92.6% (.88-.95)	6.6% (.03-.12)	No	Yes
2018 CD1, general	Robert Kennedy, Jr.	Bradley Byrne	36.8%	94.6% (.92-.96)	8.1% (.08-.13)	No	Yes
2012 CD7, general	Terri Sewell	Don Chamberlain	75.8%	96.3% (.94-.98)	26.1% (.20-.36)	Yes	Yes
2010 CD7, general	Terri Sewell	Don Chamberlain	72.5%	95.5% (.93-.97)	19.3% (.16-.23)	Yes	Yes

Seven endogenous elections were analyzed. Table 1 shows the results of EI operations on these seven elections during the last decade.

To be more specific, the Black candidate, James Averhart, was involved in two of these five elections. He received 53.8% of votes cast by Black voters and only 16.7% from white voters in the 2020 Democratic primary. Black voters were the majority of the electorate in the primary. Averhart received 93.3% of votes cast by Black voters and 12.6% from white voters in the general election for Congressional District 1. In the 2020 Congressional District 2 general election, Phyllis Harvey-Hall, the Black candidate, received 93.4% of the votes from Black voters and 5.2% from white voters. In the 2020 Congressional District 3 general election, Adia

¹³ See footnote 10 for the explanation of uncertainty estimates (i.e., 95% confidence interval).

Winfrey, the Black candidate, received 92.6% of the votes from Black voters and 6.6% from white voters. In the 2018 Congressional District 1 general election, Robert Kennedy Jr., the Black candidate, received 94.6% of the votes from Black voters and only 8.1% from white voters. The only Black candidate who was able to win a biracial Congressional election in Alabama was Terri Sewell who ran in Congressional District 7 which has been a Black-majority district since the 1990s. Her two contested elections in 2010 and 2012 were both highly racially polarized. In 2010, she won 95.5% of the Black vote but only 19.3% of the white vote. In 2012, as an incumbent running against the same white Republican candidate, Don Chamberlain, Sewell won 96.3% of the Black vote and only 26.1% of the white vote.

These endogenous election analyses revealed the same pattern of RPV which led to the same result in non-Black-majority districts, that is, the defeat of the Black candidate by his/her white opponent in each election despite Black voters' clear support for the Black candidate, though Averhart did make into the Democratic Primary runoff for Congressional District 1 in 2020 and later was defeated in the general election.

It should also be noted that I have examined the RPV pattern, or lack of it, in the Congressional Districts at issue in this litigation by using the election returns in those districts from state-wide elections. My analysis shows consistently that RPV existed in these Congressional Districts in those state-wide biracial elections. I will show the results of RPV analyses in these elections in the following section.

B) Exogeneous Elections

All exogeneous elections analyzed in this report showed a high level of racial polarized voting, as shown in Table 2.

Specifically, Will Boyd and Miranda Joseph as the Black candidates in the 2018 Lt. Governor and State Auditor elections received 95.5% and 95.4% of the votes cast by Black voters, respectively, whereas votes from white voters were as low as 11.0% and 12.1% respectively.

In the 2014 general election, James Fields, a Black candidate running against the white incumbent Republican candidate, Kay Ivey. Fields received 94.0% of the Black vote and 14.9% of the white vote, and was defeated with 36.7% of total votes cast. In the same year, Lula Albert-Kaigler, a Black candidate competed in the Secretary of State election, and received 35.6% of the total votes. She was defeated by her white Republican opponent, John Merrill. She received 95.1% of the Black vote and only 12.0% of the white vote in this highly racially polarized state-wide election.

Table 2. Estimated Racial Support for Black Candidate in Exogenous Elections

Election	Black Candidate	White Candidate(s)	% vote cast for Black Cand	Black Support for Black Cand (st error)	White Support for Black Cand (st error)	Black-Cand Won?	RPV?
2018 Lt Governor	Will Boyd	Will Ainsworth	38.7%	95.5% (.92-.96)	11.0% (.1-.14)	No	Yes
2018 State Auditor	Miranda Joseph	Jim Zeigler	39.5%	95.4% (.93-.96)	12.1% (.11-.14)	No	Yes
2014 Lt Governor	James Fields	Kay Ivey	36.7%	94.0% (.92-.95)	14.9% (.14-.16)	No	Yes
2014 Secretary of State	Lula Albert-Kaigler	John Merrill	35.6%	95.1% (.94-.96)	12.0% (.11-.13)	No	Yes
2012 Presidential	Barack Obama	Mitt Romney	36.9%	93.9% (.90-.96)	13.9% (.13-.17)	No	Yes
2008 Presidential	Barack Obama	John McCain	36.8%	92.0% (.88-.94)	15.0% (.14-.17)	No	Yes

Finally, the 2008 and 2012 presidential elections in Alabama revealed the same consistent pattern of RPV.¹⁴ In 2008 Obama received less than 40% of the total votes cast in Alabama, and thus failed to win Alabama. His defeat was clearly a result of RPV as his Black support was about 92% while his white support was around 14%. Racial bloc voting by the white-majority led to his defeat. Despite running as an incumbent in 2012, Obama was not able to overcome the deep racial divide in Alabama in his reelection. His white vote further declined one percentage point, while his Black support increased by roughly the same margin.

¹⁴ The dataset from the Alabama Secretary of State's website for my analysis of the 2012 presidential election was missing election returns from Bullock, Butler, Hale, and Wilcox Counties. For my Effectiveness analysis, I relied on data that, per my specifications, Plaintiffs' counsel provided to me. I understand that these data consist of statewide election results projected onto Census VTDs retrieved from the Redistricting Data Hub, <https://redistrictingdatahub.org>, with each VTD associated with one or more congressional districts from Plaintiffs' Demonstrative Plans B and D using a Census Block Equivalency File provided by Dr. Moon Duchin.

As mentioned above, I also examined the detailed RPV results in Congressional districts by using state-wide election results in the 2018 Lt. Governor race and the 2012 and 2008 presidential races. In my analysis, the Black candidates lost every Congressional district except CD7 because of RPV. For example, in the 2008 presidential election, the Congressional districts revealed the same pattern. Table 3 provides the RPV statistics based on the same EI operation that was applied to 7 Congressional districts separately.

As shown in Table 3, Black voters were almost uniformly supportive of Obama in the 2008 Presidential election. But CD7 provided the highest level of support for him and made him the winner of the District with 70.1% of the votes cast. This was largely due to the almost universal Black support there (at 97%), and the white bloc voting at the 13% level did not lead to his failure of winning this majority-Black district.

Table 3: the RPV Patterns of Congressional Districts in the 2008 Presidential Election in Alabama

Congressional District	Black Candidate	White Candidate(s)	% vote cast for Black Cand	Black Support for Black Cand (st error)	White Support for Black Cand (st error)	Black-Cand Won?	RPV?
1	Barack Obama	John McCain	36.3%	92.0% (.88-.94)	12.6% (.10-.16)	No	Yes
2	Barack Obama	John McCain	33.4%	90.3% (.83-.93)	8.1% (.06-.13)	No	Yes
3	Barack Obama	John McCain	44.0%	89.5% (.83-.93)	16.2% (.13-.21)	No	Yes
4	Barack Obama	John McCain	22.9%	90.6% (.87-.94)	16.0% (.15-.17)	No	Yes
5	Barack Obama	John McCain	36.6%	88.6% (.86-.91)	24.0% (.22-.25)	No	Yes
6	Barack Obama	John McCain	23.5%	56.6% (.41-.76)	17.1% (.14-.19)	No	Yes
7	Barack Obama	John McCain	70.1%	97.0% (.95-.98)	13.1% (.10-.19)	Yes	Yes

The RPV in the other six districts, however, produced an opposite result. Obama lost all other Congressional districts in Alabama in 2008. Even in CD6 where Obama's Black support was in the 50% range, by far the lowest in Alabama, the white bloc voting at 17% support level for him was enough to defeat him in CD6.¹⁵ The RPV results in CDs 1 through 5 displayed similar patterns as the racial gap was more than 60%, and even reached 80% in CD1. In short, RPV was instrumental in Obama's defeat in all these Congressional districts.

VIII. Review of Exit Polls

The RPV results based on EI in this report regarding Obama's 2008 and 2012 general elections are consistent with the exit poll results conducted by major media networks. Because voters do not register by party in Alabama, the exit polls also help us understand the votes of self-identified Democrats and Republicans. For example, according to the 2008 exit poll, Obama won 98% of Black voters in Alabama, and John McCain, a white Republican, won 88% of white voters. McCain won a majority (51%) of white Democrats, and Obama won only 47% of white Democrats.¹⁶ And, in the 2012 Presidential election, 84% of white people in Alabama voted for Romney while white support for Obama was only 15%.¹⁷

In addition, I reviewed exit poll data for the 2008 Presidential Democratic Primary¹⁸ and the 2008 U.S. Senate elections¹⁹ in Alabama which revealed a similar pattern of racially polarized voting. In the 2008 Primary, Hilary Clinton, a white woman, received 72% of the white vote, and Obama received 84% of the Black vote. In the 2008 Senate race, white voter support for U.S. Senator Jeff Sessions was 89% against Vivian Figures, a Black candidate. Sessions received 58% of the white Democratic vote and 96% of the white Republican vote. Figures won 90% of the black vote.

IX. Effectiveness Analysis: Different Plans Compared

I have also conducted a comparative study of three Alabama Congressional redistricting plans based on their performance in the most recent statewide elections in Alabama. These three plans are the Adopted Congressional Plan, and the two versions of CD Plans provided to me by Plaintiffs' counsel (named as PLSCD_Plan B and PLSCD_Plan D,

¹⁵ Note also that CD6's RPV result showed a higher level of uncertainty based on 95% confidence interval.

¹⁶ See <http://www.cnn.com/ELECTION/2008/results/polls/#val=ALP00p1>. Also see Table 7.1 of my book, *The Election of Barack Obama: How He Won*, for the comparison of RPV in Alabama in 2008, compared to other states (Liu, 2010, p. 117)

¹⁷ See <https://www.amren.com/features/2012/11/race-and-the-2012-election/>.

¹⁸ See <https://abcnews.go.com/images/PollingUnit/ALDemHorizontal.pdf>.

¹⁹ See <http://www.cnn.com/ELECTION/2008/results/polls/#val=ALP00p1>.

respectively). I reported my analysis based on their performance using the 2018 Lt. Governor and 2018 State Auditor election results.²⁰

The most important findings of my comparative study concern CDs 2 and 7. With respect to CD2, the Adopted Congressional Plan led to the defeat of the Black candidates whereas the two Plaintiffs' Plans did not.

Table 4: CD2
Plans Compared, based on the RPV Analysis of the 2018 Lt. Gov Election

Adopted Plan

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.432 (0.404, 0.448)	0.932 (0.897, 0.952)	0.068 (0.048, 0.103)
White	0.425 (0.419, 0.432)	0.043 (0.032, 0.071)	0.957 (0.929, 0.968)
Total	0.424	0.355	0.645

PLSCD PlanB

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.47 (0.454, 0.48)	0.962 (0.946, 0.972)	0.038 (0.028, 0.054)
White	0.433 (0.427, 0.439)	0.08 (0.067, 0.118)	0.92 (0.882, 0.933)
Total	0.448	0.568	0.432

PLSCD PlanD

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.462 (0.448, 0.474)	0.957 (0.939, 0.968)	0.043 (0.032, 0.061)
White	0.451 (0.436, 0.466)	0.092 (0.075, 0.119)	0.908 (0.881, 0.925)
Total	0.452	0.555	0.445

As shown in Table 4, the RPV pattern was present in all three plans. But the Adopted Plan minimized the Black VAP percentage at less than 30% in CD2 while the two Plaintiffs' plans increased it to around 50%. This major difference led to different election outcomes in that Will Boyd, the Black Democratic candidate in the Lieutenant Governor's race, would have been the winner had he run in the CD2 of the Plaintiffs' plans, but would have lost CD2 in the Adopted Congressional Plan.

²⁰ For my effectiveness analysis, I used any-part Black VAP for the Black racial group measurement.

If one evaluates the effectiveness of different plans based on the 2018 State Auditor election results, the CD2 also produces the similar results of the 2018 Lt. Governor election (see Table 5).

Table 5: CD2
Plans Compared, based on the RPV Analysis of the 2018 State Auditor Election

Adopted Plan

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.437 (0.423, 0.456)	0.946 (0.907, 0.967)	0.054 (0.033, 0.093)
White	0.417 (0.407, 0.426)	0.049 (0.037, 0.077)	0.951 (0.923, 0.963)
Total	0.419	0.366	0.634

PLSCD Plan B

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.472 (0.465, 0.48)	0.964 (0.947, 0.973)	0.036 (0.027, 0.053)
White	0.433 (0.423, 0.444)	0.102 (0.085, 0.125)	0.898 (0.875, 0.915)
Total	0.442	0.578	0.422

PLSCD Plan D

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.456 (0.438, 0.467)	0.952 (0.91, 0.967)	0.048 (0.033, 0.09)
White	0.444 (0.434, 0.459)	0.111 (0.075, 0.188)	0.889 (0.812, 0.925)
Total	0.446	0.564	0.436

With respect to CD7, though all three plans produced the same result, that is, the election of the Black candidates in both 2018 state-wide election, the Adopted plan packed the Black voting age population to about 54% while the two Plaintiffs' plans made the district around 50-52% Black majority. The comparisons are shown using the two state-wide election results in Tables 6 and 7.

Table 6: CD7
Plans Compared, based on the RPV Analysis of the 2018 Lt Governor Election

Adopted Plan

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.503 (0.49, 0.513)	0.963 (0.932, 0.975)	0.037 (0.025, 0.068)
White	0.415 (0.406, 0.425)	0.159 (0.13, 0.214)	0.841 (0.786, 0.87)
Total	0.454	0.659	0.341

PLSCD PlanB

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.508 (0.482, 0.523)	0.959 (0.943, 0.973)	0.041 (0.027, 0.057)
White	0.41 (0.397, 0.429)	0.143 (0.11, 0.204)	0.857 (0.796, 0.89)
Total	0.447	0.617	0.383

PLSCD PlanD

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.509 (0.496, 0.523)	0.946 (0.914, 0.964)	0.054 (0.036, 0.086)
White	0.409 (0.394, 0.428)	0.19 (0.153, 0.243)	0.81 (0.757, 0.847)
Total	0.449	0.628	0.372

Table 7: CD7
Plans Compared, based on the RPV Analysis of the 2018 State Auditor Election

Adopted Plan

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.507 (0.498, 0.516)	0.952 (0.93, 0.974)	0.048 (0.026, 0.07)
White	0.396 (0.375, 0.408)	0.162 (0.138, 0.192)	0.838 (0.808, 0.862)
Total	0.449	0.661	0.339

PLSCD PlanB

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.498 (0.487, 0.508)	0.959 (0.934, 0.975)	0.041 (0.025, 0.066)
White	0.398 (0.385, 0.415)	0.132 (0.091, 0.204)	0.868 (0.796, 0.909)
Total	0.443	0.619	0.381

PLSCD PlanD

Group	Turnout	Blk Candidate	Wht Candidate
Black	0.501 (0.491, 0.511)	0.96 (0.929, 0.973)	0.04 (0.027, 0.071)
White	0.401 (0.391, 0.411)	0.155 (0.129, 0.23)	0.845 (0.77, 0.871)
Total	0.444	0.629	0.371

X. Conclusion

The empirical analyses clearly revealed that in 13 out of the 13 elections (100%) in which Black voters expressed a preference for Black candidates, that preference was not shared by white majority voters. This RPV pattern is confirmed not only by the seven endogenous biracial elections, but also by the six statewide biracial elections during the last decade. Despite Black voters uniting cohesively behind their preferred candidates, the white majority voted sufficiently as a bloc to typically defeat all the Black candidates in these elections. The only Black success in winning a biracial endogenous election since the 2008 elections was Terri Sewell who ran in a Black-majority congressional district. Furthermore, it is also shown in this empirical analysis, Obama won only in Congressional District 7 in the 2008 and 2012 elections where Black voters were the majority and white bloc voting was not enough to defeat him, thanks to the very high level of Black-voter cohesion there.

Thus, my empirical analysis indicates that the characteristics of “racial polarization,” meaning Black voters tend to vote for the same candidate and the white majority votes as a bloc to usually to defeat the Black preferred candidate, has been met in the Congressional districts at issue here in recent endogenous and exogenous elections.

My effectiveness analysis also shows that the two plans proposed by Plaintiffs that I analyzed clearly offer Black voters in Alabama more opportunities to elect candidates of their choice than does the Adopted Congressional Redistricting Plan.

XI. Appendices

Appendix 1 is my curriculum vita.

Appendix 2 is the list of voting-rights cases for which I served as an expert witness.

Appendix 3 is the Data Acquisition, Processing, and Aggregation Process

Per 28 U.S. Code § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed on December 10, 2021.

A handwritten signature in black ink, appearing to be 'Baodong Liu', written over a horizontal line.

Baodong Liu, Ph.D.

Appendix 1

Curriculum Vitae

Baodong Liu, Ph.D.

Professor (with Tenure) in Political Science and Ethnic Studies

University of Utah

260 S. Central Campus Drive, Room 3231, Salt Lake City, UT 84112

Tel: Office (801) 585 7987; Fax: (801) 585 6492

E-mail baodong.liu@utah.edu

PROFESSIONAL EXPERIENCE

Professor of Political Science and Ethnic Studies, affiliated with Asian Studies, 2008-present

Associate Chair, Political Science Department, 2015-2017

Interim Director, Ethnic Studies Program, 2011-2013

University of Utah

Courses taught: Advanced Quantitative Methods (graduate), American Political Behavior (graduate), Race and Political Volatility in the US (graduate/undergraduate), Voting, Election and Public Opinion, Racial and Ethnic Politics, Political Analysis, Asian American Contemporary Issues, Social Justice and Inequality, Asian Pacific American Experiences, Methodology in Ethnic Studies.

TRISS Endowed Professor in Political Science, 2007-8

Associate Professor (early promotion to associate professor 2005, early tenure 2006)

Assistant Professor, 2002-2005

Department of Political Science

University of Wisconsin-Oshkosh

Courses taught: Race and Ethnicity in American Politics, Politics of Urban Growth, Political Method, State and Local Government, Political Analysis, American Government, National, state and Local Government.

Assistant Professor of Political Science

Department of Political Science

Stephens College, Columbia, Missouri, 1999 - 2002

Courses taught: Urban and Minority Politics, Legislative Process, American Presidency, Campaigning and Lobbying, Macroeconomics, American Government, and Introduction to Statistics.

Consultant, Expert Witness, Principal Investigator, Opinion Writer/Commentator, 2000-present

Provided research services to the US Department of Justice, New America, Navajo Nation, Southern Coalition for Social Justice, National Science Foundation, Lawyers' Committee for Civil Rights Under Law, Florida State Legislature, Illinois State Legislature, Wisconsin Security Research Consortium, Fond du Lac School District, Johnson Controls, Inc, City of Waupaca (WI), and Wisconsin Public Service, among others.

Served also as a commentator and/or opinion writer for Salt Lake Tribune, ABC4News, Hinkley Forum, NPR, AP, Daily Utah Chronicle, ETtoday, Chinese Americans, Milwaukee Sentinel Journal, Daily Caller, KSL, among other media outlets.

EDUCATION

Ph.D. in Political Science (1999), University of New Orleans, Louisiana

Dissertation: *Black Candidates, White Voters and Racial Context*

Winner of Byran Jackson Award, Urban Politics Section, American Political Science Association, and Winner of Ted Robinson Award for the best research in race and ethnicity, Southwestern Political Science Association

Master of Arts in Political Science (1995), Oklahoma State University, Stillwater, Oklahoma

Bachelor of Laws (1987), The East China University of Political Science and Law, Shanghai, China

Post-Doctoral Educational Program Participant

National Science Foundation's "Local Elections in America Project Workshop," Macalester College, Saint Paul, MN (2009)

Methodological Issues in Quantitative Research on Race and Ethnicity, Inter-University Consortium for Political and Social Research (ICPSR), University of Michigan (2006)

Mapping Your City with GIS Workshop, New Urban Research, Madison, Wisconsin (2005)

Jessie Ball duPont Summer Seminars for Liberal Arts College Faculty, the National Humanities Center, Research Triangle, North Carolina (2001)

PROFESSIONAL PUBLICATIONS (contribution is in the order of authors for publications with multiple authors).

A) Books

Liu, Baodong. *Political Volatility in the United States: How Racial and Religious Groups Win and Lose*. (forthcoming, Lexington Books)

Liu, Baodong. Ed. (2018). *Solving the Mystery of the Model Minority: The Journey of Asian Americans in America*. Cognella Academic Publishing.

Liu, Baodong. (2016). *Race, Ethnicity and Religion in the American Political Arena*. University Readers.

Liu, Baodong. (2015). *Social Research: Integrating Mathematical Foundations and Modern Statistical Computing*. Cognella Academic Publishing.

Liu, Baodong. (2013). *Understanding the Scientific Method: A Social Science Approach*. University Readers.

Liu, Baodong. (2010). *The Election of Barack Obama: How He Won*. Palgrave Macmillan. Reviewed by Hanes Walton, Jr. (2012) for *The American Review of Politics*.

Liu, Baodong and James Vanderleeuw. (2007). *Race Rules: Electoral Politics in New Orleans, 1965-2006*. Lexington Books. Paperback and Hardback. Reviewed by Peter Burns (2008) for *Urban Affairs Review*; also reviewed by Robert Dupont (2008) for *H-Urban*.

Liu, Baodong. (2002). *Making American Democracy Work: Reforms and Debates*. The McGraw-Hill, Inc.

B) Peer-Reviewed Journal Articles

Liu, Baodong, Porter Morgan and Dimitri Kokoromytis. (forthcoming) "Immigration, Nation-State Contexts and Value Changes of Ethnic Chinese" *Athens Journal of Social Sciences*.

Liu, Baodong, Zachary Stickney, and Nicole Batt. (2020). "Authoritarianism for and against Trump," *Journal of Behavioral and Social Sciences* 7(3): 218-238.

Liu, Baodong. (2018). "The Haitian and Cuban American Electorates in South Florida: Evidence from Ten Federal, State and Local Elections, 2008-2014." *National Political Science Review* 19 (1): 51-60.

Wei, Dennis, Weiyi Xiao, Christopher Simon, Baodong Liu, Yongmei Ni. (2018). "Neighborhood, Race and Educational Inequality." *Cities* 73: 1-13.

Simon, Christopher A., Nicholas P. Lovrich, Baodong Liu, and Dennis Wei. (2017). "Citizen Support for Military Expenditure Post 9/11: Exploring the Role of Place of Birth and Location of Upbringing." *Arm Forces and Society* 44 (4): 688-706.

Liu, Baodong, Dennis Wei, and Christopher A. Simon. (2017). "Social Capital, Race, and Income Inequality in the United States." *Sustainability* 9 (2): 1-14.

Liu, Baodong. (2014). "Post-Racial Politics? Counterevidence from the Presidential Elections, 2004-2012." *Du Bois Review: Social Science Research on Race* 11(2): 443-463.

Liu, Baodong. (2014). "Racial Context and the 2008 and 2012 US Presidential Elections." *Athens Journal of Social Sciences* 1(1): 21-33.

Liu, Baodong. (2011). "Demythifying the "Dark Side" of Social Capital: A Comparative Bayesian Analysis of White, Black, Latino, and Asian American Voting Behavior." *The American Review of Politics* 32 (Spring): 31-56.

Byron D'Andra Orey, L. Marvin Overby, Pete Hatemi and Baodong Liu. (2011). "White Support for Racial Referenda in the Deep-South." *Politics & Policy* 39 (4): 539-558 .

Geoffrey M. Draper, Baodong Liu, and Richard F. Riesenfeld. (2011). "Integrating Statistical Visualization Research into the Political Science Classroom." *Information Systems Education Journal* 9 (3): 83-94.

Liu, Baodong. (2011). "Obama's Local Connection: Racial Conflict or Solidarity?" *PS: Political Science and Politics* 44 (1): 103-105.

- Liu, Baodong. (2011). "State Political Geography and the Obama White Vote." *World Regional Studies* 20 (4): 1-15. (in Chinese)
- Liu, Baodong, Sharon D. Wright Austin, and Byron D'Andrá Orey. (2009). "Church Attendance, Social Capital, and Black Voting Participation" *Social Science Quarterly* 90 (3): 576-92.
- Vanderleeuw, James, Baodong Liu, and Erica Nicole Williams. (2008). "The 2006 New Orleans Mayoral Election: The Political Ramifications of a Large-Scale Natural Disaster." *PS: Political Science and Politics* 41 (4): 795-801.
- Liu, Baodong and Robert Darcy. (2008) "Race, Immigration, and Party Strategies in the US Elections," *Íslenska Leiðin*: 33-39.
- Liu, Baodong. (2007). "EI Extended Model and the Fear of Ecological Fallacy," *Sociological Methods and Research* 36 (1): 3-25.
- Liu, Baodong. (2006). "Whites as a Minority and the New Biracial Coalition in New Orleans and Memphis," *PS: Political Science and Politics* 40 (1): 69-76.
- Vanderleeuw, James, and Baodong Liu. (2006). "Racial Polarization or Biracial Coalition? An Empirical Analysis of the Electoral Coalition of Winning Candidates in Urban Elections," *American Review of Politics* 27 (Winter): 319-344.
- Liu, Baodong, and James Vanderleeuw. (2004). "Economic Development Priorities and Central City/Suburb Differences," *American Politics Research* 32 (6): 698-721.
- Vanderleeuw, James, Baodong Liu, and Greg Marsh. (2004). "Applying Black Threat Theory, Urban Regime Theory, and Deracialization: The Memphis Mayoral Elections of 1991, 1995, and 1999," *Journal of Urban Affairs* 26 (4): 505-519
- Liu, Baodong, and James Vanderleeuw. (2003). "Growth Imperative, Postmaterialism and Local Decision-Makers," *Journal of Political Science* 31: 173-96.
- Liu, Baodong. (2003). "Deracialization and Urban Racial Context," *Urban Affairs Review* 38 (4): 572-591.
- Vanderleeuw, James and Baodong Liu. (2002) "Political Empowerment, Mobilization, and Black-Voter Rolloff," *Urban Affairs Review* 37 (3): 380-96.
- Liu, Baodong. (2001). "The Positive Effect of Black Density on White Crossover Voting: Reconsidering the Social Interaction Theory," *Social Science Quarterly* 82 (3): 602-615.
- Liu, Baodong. (2001). "Racial Context and White Interests: Beyond Black Threat and Racial Tolerance," *Political Behavior* 23 (2): 157-80.
- Liu, Baodong, and James Vanderleeuw. (2001). "Racial Transition and White-Voter Support for Black Candidates in Urban Elections," *Journal of Urban Affairs* 23 (3/4): 309-22.
- Liu, Baodong. (2001). "Interests and Opinions among African-Americans: A Test of Three Theories," *the Texas Journal of Political Studies* 21 (2): 113-24.

Liu, Baodong, and James Vanderleeuw. (1999). "White Response to Black Political Power: the Case of New Orleans, 1980-1994." *Southeastern Political Review* 27 (1): 175-188.

C) Book Chapters, Encyclopedia Entries and other Peer-reviewed Articles

Liu, Baodong, Nadia Mahallati, and Charles Turner. (2021). "Ranked-Choice Voting Delivers Representation and Consensus in Presidential Primaries" Available at SSRN: <https://ssrn.com/abstract=3822879> or <http://dx.doi.org/10.2139/ssrn.3822879>

Liu, Baodong. "The Growth of Scientific Knowledge through Social Computing Networks" (2021). *The 19th International E-Society Conference Proceedings*.

Liu, Baodong. (2014). "Racial Context and the 2008 and 2012 US Presidential Elections" in Yannis A. Stivachtis and Stefanie Georgakis Abbott, ed. *Addressing the Politics of Integration and Exclusion: Democracy, Human Rights and Humanitarian Intervention*. Athens: Atiner publications. (Also published in *Athens Journal of Social Sciences*.)

Liu, Baodong. (2011). "Mayor" in *International Encyclopedia of Political Science*. CQ Press.

Liu, Baodong. (2011). "Roll-off" in *International Encyclopedia of Political Science*. CQ Press.

Liu, Baodong and Carolyn Kirchhoff. (2009) "Mayor", *Encyclopedia of American Government and Civics*, eds. Michael A. Genovese and Lori Cox Han. New York: Facts on File.

Liu, Baodong and Robert Darcy. (2006). "The Rising Power of Minorities and the Deracialization of U.S. Politics" in Gillian Peele, Christopher J. Bailey, Bruce E. Cain, and B. Guy Peters, ed. *Developments in American Politics 5*. Hampshire, UK: Palgrave Macmillan/Macmillan Publishers.

D) Book Reviews

Liu, Baodong. (2010). Review of Zoltan L. Hajnal, *America's Uneven Democracy: Race, Turnout, and Representation in City Politics* in *American Review of Politics* 31 (summer): 157-160.

Liu, Baodong. (2008). Review of Rodney E. Hero, *Racial Diversity and Social Capital*, in *Urban Affairs Review* 44 (1):146-149.

Liu, Baodong. (2006). Review of Peter Burns, *Electoral Politics Is Not Enough*, in *American Review of Politics* 27 (Spring): 186-189.

Liu, Baodong. (1999). Review of Terry Nichols Clark and Vincent Hoffmann-Martinot (ed), *The New Political Culture*, in *American Review of Politics* 20: 99-102.

E). Other Publications/Editorials

Liu, Baodong. (2021). "Asian Americans and Minority Voters: The New Destination of Partisan Competitions?". ETtoday. January 8, 2021. (in Chinese/Taiwanese)

Liu, Baodong. (2020). “Checks and Balances and the End of Trump Legal Battles”. ETtoday. Dec. 29, 2020. (in Chinese/Taiwanese)

Liu, Baodong. (2020). “Trump’s Legal Battles and the New Beginning of the Electoral Laws?”. ETtoday. Nov. 10, 2020. (in Chinese/Taiwanese)

Liu, Baodong and Feng Ling. (2018). “Liberalism or Conservatism: Which One Contributes to America More?” *Chinese Americans*, No. 1565. (in Chinese).

Liu, Baodong. (2018). “The Lawsuit against Harvard and Asian-American Attitude toward Affirmative Action,” *Chinese Americans*, No. 1207. (in Chinese).

Liu, Baodong. (2016). “Lu Xun’s Attack on Old Chinese Regime and St. Augustine’s Self Examination,” *Overseas Campus* (in Chinese).

Liu, Baodong. (2015). “Will Christianity Bring about Democracy?” *Overseas Campus* 130 (June): 40-43. (in Chinese)

Liu, Baodong. (2011). “New Ethnic Studies Major at the U: Education for the 21st Century” *Diversity News* 2011 (Fall). <http://diversity.utah.edu/newsletter/fall-2011/ethnic-studies-degree.php>.

Liu, Baodong (2008). “The Urban Politics Field as We Know It.” *Urban News* 22 (1): 1-2.

Liu, Baodong. (2008). “Negative Campaigning a Desperate Strategy,” *The Daily Utah Chronicle*. Guest Column. October 20, 2008.

Liu, Baodong. (2007). “The 2006 Midterm Election: Angry Voters? Yes! Clear Vision? No!” *Wisconsin Political Scientist* XIII (2): 9-10.

Liu, Baodong. (2006). “Midterm Election Results Show No Clear Future Vision.” Guest Column, *Advance-Titan*. Nov. 9, 2006: A5.

Liu, Baodong and James Vanderleeuw. (2003). “Local Policymakers and Their Perceptions of Economic Development: Suburbs, Central Cities and Rural Areas Compared” *Wisconsin Political Scientist* IX (1): 4-7.

SOFTWARE DEVELOPMENT/GRANTS

diaglm, the author of the R software statistical package for diagnosing and visualization of violations of linear and nonlinear statistical modeling, published at GitHub (bblpo/diaglm). 2019.

diagglm, the author of the R software statistical package for diagnosing and visualization of violations of nonlinear statistical modeling, published at github (bblpo/diagglm). 2019.

Principal Investigator, “Authoritarianism in the Global Ethnic Chinese Communities”, a grant proposal supported by University Sabbatical Leave and Asia Center Travel Award. 2020. \$1500

Principal Investigator, with Co-Pi, Mike Cobbs (North Carolina State University) and Richard Engstrom (University of Houston). “Understanding the Support for Ranked-Choice Voting,”

initial grant proposal supported by Political Reform Program, New America. Washington D.C. 2020. \$40,000

Co-PI, with Dennis Wei (PI) and Reid Ewing. “Urban Form, Amenity, and Upward Mobility in the United States,” initial grant proposal submitted to Russell Sage Foundation, 2017. (rejected)

Co-PI, with Annie Isabel Fukushima (PI). “Victimhood, Human Trafficking and Immigration: Victimhood in the Face of Criminal Charges.” American Council of Learned Societies Collaborative Research Program. 2015-16. (rejected)

Co-PI, with Dennis Wei (PI) and Chris Simon. “Amenity, Neighborhood and Spatial Inequality: A Study of Salt Lake County,” Interdisciplinary Research Pilot Program (IRPP), College of Social and Behavioral Science, the University of Utah, 2015. \$10,000.

Co-PI, with Annie Isabel Fukushima (PI). “Victimization, Human Trafficking and Immigrants: Mixed Methods analysis of the Perceptions of Victimhood in U.S. Courts (2000 – 2015),” submitted to National Institute of Justice, 2015. \$997,407. (rejected)

Co-PI, with Daniel McCool. “The Efficacy of American Indian Voting: A Pilot Project” Research Incentive Grant, College of Social and Behavioral Science, the University of Utah. (2014-). \$7500.

I have provided my Expert Witness Opinions on federal voting rights cases such as *Traci Jones et al vs. Jefferson County Board of Education et al*, (Alabama, 2019); *CMA v. Arkansas* (Arkansas, 2019); *Navajo Nation, et al, vs. San Juan County, et al*, (Utah District, 2012); *League of Women Voters of Florida, et al v. Detzner, et al*, (Florida, 2012); *Anne Pope et. al. v. County of Albany and the Albany County Board of Elections* (N.D., NY 2011); *Radogno, et al v. State Board of Elections, et al*, (N.D., IL, 2011); *NAACP v. St. Landry Parish et al*, (W.D. LA 2003); *Arbor Hill Concerned Citizens Neighborhood Association et al v. County of Albany* (N.D. NY 2003); *Hardeman County Branch of NAACP v. Frost* (2003).

Expert Instructor, Racially Polarized Voting and Political Participation: EI and EZI. Expert Preparation Program, Community Census and Districting Institute. A grant supported by Ford Foundation and Southern Coalition for Social Justice, Duke University, Durham, North Carolina. 2010.

Principal Investigator, 2010-2012. A Multi-level Analysis of Obama Racial Coalition in 2008 and 2012. A project funded by the PIG grant of College of Social and Behavior Sciences, the University of Utah.

Co-PI. Educational Succession Movements in U.S. Metropolitan Areas, proposal submitted to Seed Grants, the University of Utah. 2009. Rejected.

Recipient, Faculty Sabbatical Grant, 2008. University of Wisconsin Oshkosh, grant offered, but finally declined the offer due to job change.

Grant Director/Faculty Advisor, 2008. The WiscAMP program, National Science Foundation.

Principal Investigator, 2007. Wisconsin Research and Development Capacity Study. A project funded by Wisconsin Security Research Consortium.

Principal Investigator, 2007. The Impact of Industrial Involvement on Science Education in Wisconsin. A project funded by Johnson Control, Inc.

Principal Investigator, 2007. The Impact of Fond du Lac School District on Local Economic Development. A project funded by Fond du Lac School District.

EI Methodologist, 2007. Retrogressive Effects of H.B. No. 1565 on Latino Voters in the Bexar County Metropolitan Water District, TX.

Principal Investigator, 2006. The Impact of Economic Development on Citizen Opinions. A project funded by City of Waupaca, Wisconsin Public Services.

Principal Investigator, 2006. Leading the Big Easy: Will the Biracial Coalition Sustain Katrina? Institute on Race and Ethnicity, University of Wisconsin System. 2006.

Methodological Issues in Quantitative Research on Race and Ethnicity, Inter-University Consortium for Political and Social Research (ICPSR), Institute of Social Research, University of Michigan, 2006.

Off-Campus Program Grant, Faculty Development, the University of Wisconsin-Oshkosh, 2006.

GIS and Social Research, Small Research Grant, Faculty Development Program, the University of Wisconsin-Oshkosh, 2005.

Principal Investigator, Getting the White Votes, American Political Science Association Research Grant, Washington D.C., 2003.

Principal Investigator, A Comparative Study of Urban Elections, Faculty Research Development Grant, the University of Wisconsin-Oshkosh, Oshkosh, Wisconsin, 2004.

Principal Investigator, Getting the White Votes, Faculty Research Development Grant, the University of Wisconsin-Oshkosh, Oshkosh, Wisconsin, 2003.

Advanced Graduate Student Travel Grant, the American Political Science Association, 1999

AWARDS AND HONORS

Nominee for the Career & Professional Development Center, Faculty Recognition Program, University of Utah. 2018.

Winner of A Showcase of Extraordinary Faculty Achievements (for publication of my book, Social Research: Integrating Mathematical Foundations and Modern Statistical Computing, San Diego: Cognella Academic Publishing), With commendation from the J. Willard Marriott Library and the Office of the Vice President for Research. University of Utah. 2016

Nominee for the Social and Behavior Science College Superior Research Award (senior scholar category), nominated by the political science department in both 2011 and 2012.

Professor of Political Science (National 985-Plan Supported Foreign Scholar), Taught Summer Class at School of Government, Nanjing University, Nanjing, China. 2012.

TRISS Endowed Professorship for Excellence, University of Wisconsin Oshkosh, 2007-8

Artinian Award for Professional Development, Southern Political Science Association, 2004

Byran Jackson Award for the best research/dissertation in racial and ethnic politics in an urban setting, Urban Politics Section, the American Political Science Association, 1999

Ted Robinson Award for the best research in race and ethnicity, Southwestern Political Science Association, 1999

Who's Who in America, 2001-2006, Marquis, USA.

Davis Summer Research Grant, Stephens College, 2001

Firestone Baars Grant for Faculty Development, Stephens College, 1999-2001

Vice President Discretion Grant for Research, Stephens College, 2001, 2000

Advanced Graduate Student Travel Grant, the American Political Science Association, 1999

Graduate Student Travel Grant, University of New Orleans, 1997

The Best Graduate Student Paper Award, Department of Political Science, Oklahoma State University, 1993

Pi Sigma Alpha, National Political Science Honor Society, 1994

PROFESSIONAL POSITIONS

Member, Review Board, Journal of Behavioral and Social Sciences. 2019-

Member, Board of Directors, National Association for Ethnic Studies, 2013-2015

Editorial Board, Urban Affairs Review, 2008-2011

Editorial Advisor, International Encyclopedia of Political Science, CQ Press, 2005-2011

Editor, Urban News, Urban Politics Section, American Political Science Association, 2004-2010

Chair, Urban Politics Program, Southern Political Science Association Annual Convention, 2008

Co-Chair, Asian Pacific American Caucus, American Political Science Association, 2004-2006

Member, American Political Science Association Small Research Grant Committee, 2005

AS A JUDGE OR REVIEWER OF WORKS OF OTHER SCHOLARS FOR ACADEMIC JOURNALS OR PRESSES

2001-present

Perspectives; Politics and Religion; American Political Science Review; Lexington Books; Journal of Behavioral and Social Sciences; The National Science Foundation; Sage Publications, W. W. Norton & Company, Inc; McGraw Hill Publishing; Journal of Politics; National Political Science Review, Political Analysis; Social Science Quarterly; Urban Affairs Review; Political Research Quarterly; Politics and Policy; Journal of Urban Affairs; American Politics Research; Public Opinion Quarterly; Political Behavior; Sociological Methods and Research

PROFESSIONAL AND COMMUNITY SERVICES

Reviewer, University URC Faculty Scholarly Grant Program, 2020

Chair, Faculty Tenure and Promotion Committee, Political Science, 2019-2020

Member, Curriculum Overhaul Committee, Ethnic Studies, 2018-2019

Member, Faculty Tenure and Promotion Committee, Political Science, 2018-2019

Chair, Faculty Tenure and Promotion Sub-Committee, Ethnic Studies, 2017-2018

Member, Graduate Committee, political science department, the University of Utah, 2014-2018

Member, Executive Committee, political science department, the University of Utah, 2014-2018

Faculty Senator, the University of Utah, 2015-2018

Chair, American Politics Field, political science department, the University of Utah, 2014-2018

Member, GC Building Committee, Social Science Lab, 2015-2018

Expert Volunteer for Utah Fair Redistricting Legal Team, 2017

Member, Assistant Vice President for Diversity Search Committee, 2015-2016

Member, Ad Hoc Graduate Committee for Writing, 2015-2016

Chair, Faculty Joint Appointment Search Committee, ethnic studies program and theatre department, the University of Utah, 2014-2015

Member, Betty Glad Foundation Committee, political science department, the University of Utah, 2014-2015

Chair, Awards Committee, National Association for Ethnic Studies, 2014

Faculty Mentor to Junior Faculty, Department of Political Science, 2013-2018

Chair, University of Utah MLK Committee. 2012-2013.

Member, Graduate School Dean Search Committee, 2013.

Member, University Diversity Leadership Team, the University of Utah. 2010-2013.

Member, University Teaching Program Committee, the University of Utah, 2011-2013.

Member, University Diversity Curriculum Committee, Undergraduate Studies, the University of Utah, 2011-2013.

Judge, The Research Day of College of Social and Behavioral Science, 2011-2013.

Member, Organizing Committee, International Conference on Urbanization and Development in China, University of Utah, August 2010.

Member, Retention, Promotion, and Tenure Committee, Department of Political Science, the University of Utah. 2011-2013.

Assistant Director, Ethnic Studies Program, the University of Utah. 2010-2011.

Committee Member, Undergraduate Studies, Department of Political Science, the University of Utah. 2009-2011.

Committee Member, Utah Opportunity Scholarship, the University of Utah, reviewing and making decisions on more than 200 applications. 2009-2010.

Member, Ethnic Studies Positions Exploration Committee, the University of Utah. 2009-2010.

Member, Marketing Committee, Department of Political Science, the University of Utah. 2009-2010.

Guest Speaker, "Obama and the 2008 Presidential Election: A Spatial Analysis" at the Graduate Seminar titled Introduction of Survey Research in Higher Education. College of Education. The University of Utah. Feb. 3, 2009.

Special Speaker, "Obama and the Minimum Winning Coalition" Ethnic Studies Works in Progress Presentation. The University of Utah. Dec., 5, 2008.

Special Speaker, "Election 2008: A Symposium," Hinckley Institute of Politics, University of Utah. October 6, 2008.

Special Speaker, "Predicting the 2008 Presidential Election Outcomes" Discussion on the 2008 Presidential Election. Political Science Department, the University of Utah. Sept. 25, 2008.

Political Commentator for reporting from Salt Lake Tribune, AP, EFE Hispanic News Services, Milwaukee Journal Sentinel, WHBY, KFRU radio stations, the Post-Crescent, Oshkosh Northwestern, Columbia Missourian, and the Daily Utah Chronicle (December 1999 to present)

Faculty Representative for University of Wisconsin-Oshkosh, ICPSR, University of Michigan, 2007-8

Member, Board of Trustees, Wisconsin International School, 2007-8

Member, UWO Office of Institutional Research Advisory Board, 2007-8

President, Northeast Wisconsin Chinese Association, 2007 (executive vice president, 2006)

Member, Program Evaluation Committee. College of Letters and Science, University of Wisconsin-Oshkosh, 2007-8

Member, Political Science Curriculum, Center for New Learning, University of Wisconsin-Oshkosh, 2007-8

Moderator, Oshkosh City Forum, Mayoral Candidates' Debates, March 23, 2005

Grant Reviewer, Faculty Development Program. University of Wisconsin-Oshkosh, 2004-8

Member, African American Minor Counsel. University of Wisconsin-Oshkosh, 2006-.

Member, Search Committee for University Foundation President. University of Wisconsin-Oshkosh, 2005-2006.

Member, Faculty Senate Libraries & Information Services Committee. University of Wisconsin-Oshkosh, 2005-2008.

Chair/Member, Curriculum Committee, Dept. of Political Science, University of Wisconsin-Oshkosh, September 2002-8

Chair, Budget Committee, Dept. of Political Science, University of Wisconsin-Oshkosh, September 2007-8

Member, Personal Committee, Dept. of Political Science, University of Wisconsin-Oshkosh, September 2007-8

Member, Search Committee, Dept. of Political Science, University of Wisconsin-Oshkosh, September 2002-8

Faculty Director, the Stephens College Model UN Team, National Model United Nations Conference, New York, New York, (3/2002)

Chair, Political Science Search Committee, Stephens College (August 2001 to May 2002)

Member, Editorial Advisory Board, Collegiate Press, San Diego, California (2000 to 2001)

Chair, Harry Truman Scholarship Committee, Stephens College (2000 to 2002)

Member, Strategic Planning and Budgeting Committee, Stephens College (2000 to 2002).

CONFERENCE PAPER/PROCEEDINGS

Liu, Baodong. "Racial Prejudice behind the Anti-Affirmative Action Attitude of Asian Americans" paper presented at the Western Political Science Association Annual Conference. San Diego. 4/2019.

Liu, Baodong, Porter Morgan and Dimitri Kokoromytis. "Immigration, Nation-State Contexts and Value Changes of Ethnic Chinese" paper presented at the Midwest Political Science Association Annual Conference. Chicago. 4/2019.

Baodong Liu. "The Strategical Religious Voter", paper presented at the Midwest Political Science Association Annual Meeting. Chicago, Illinois. 4/2018.

Baodong Liu, Nicole Batt and Zackery Stickney. "Authoritarianism for and against Trump", paper presented at the Annual Meeting of Behavioral and Social Sciences, Las Vegas, Nevada. 2/2018.

Baodong Liu. "The Strategic Religious Voter", paper presented at the Oxford Symposium on Religious Studies, Oxford, UK. 3/2016.

Baodong Liu. "The Political Fate of Religious Minorities in the U.S. Presidential Elections." paper presented at the 19th Annual American Association of Behavioral and Social Sciences. Las Vegas, Nevada. 2/2016.

Baodong Liu. "The Political Fate of Religious Minorities in the U.S. Presidential Elections." paper presented at the Hawaii University International Conferences on Arts, Humanities, Social Sciences and Education. Honolulu, Hawaii. 1/2016.

Baodong Liu. "Statistical Inference and Visualization of Big Data in Urban Research", paper presented at the 3rd International Conference on China Urban Development, Shanghai, China. 6/2015.

Baodong Liu. "Race, Religion, and U.S. Presidential Elections," paper presented at the Annual Convention of National Association for Ethnic Studies, Oakland, California. 4/2014.

Baodong Liu. "Racial Context and the 2008 and 2012 US Presidential Elections," paper presented at the 11th Annual International Conference on Politics & International Affairs, Athens, Greece. 6/2013.

Baodong Liu. "Deracialization in the Post-Obama Era," presented at the National Black Political Scientist Association Annual Meeting. Las Vegas, Nevada. 3/2012.

Baodong Liu. "Obama's Racial Coalition," paper presented at the Southwestern Social Science Association Annual Meeting. Las Vegas, Nevada. 3/2011.

Geoffrey M. Draper, Baodong Liu, and Richard F. Riesenfeld. "Integrating Statistical Visualization Research into the Political Science Classroom" Information Systems Educators Conference. 2010. Nashville, Tennessee. 10/2010.

Baodong Liu. "Space and Time: An Empirical Analysis of 2008 Presidential Election," paper delivered at the Annual American Political Science Association Conference, Toronto, Canada, 9/2009.

Baodong Liu. "Sequential and Spatial Voting: An Analysis of the 2008 Democratic Primaries," paper presented at the 2009 Midwest Political Science Association Annual Conference, Chicago, Illinois, 4/2009.

Baodong Liu. "Social Capital, Race, and Turnout," paper presented at the 2008 Midwest Political Science Association Annual Conference, Chicago, Illinois, 4/2008.

Baodong Liu and Lori Weber. "Social Capital and Voting Participation," paper presented at the 2008 Southern Political Science Association Annual Meeting, New Orleans, Louisiana, 1/2008.

Baodong Liu. "The 2006 New Orleans Mayoral Election," paper presented at the 2007 Midwest Political Science Association Annual Conference, Chicago, Illinois, 4/2007.

James Vanderleeuw, Baodong Liu, and Erica Williams. "The Political Ramifications of a Large-Scale Natural Disaster," paper presented at the 2006 annual conference, the American Political Science Association, Philadelphia, 9/2006.

Baodong Liu. "EI Extended Model and the Fear of Ecological Fallacy," paper presented at the 2006 Midwest Political Science Association Annual Meeting, Chicago, Illinois, 4/2006.

Baodong Liu. "The Fear of Ecological Fallacy and the Methods to Conquer It" paper presented at the Western Political Science Association Annual Meeting, Oakland, CA, 4/2005.

Baodong Liu. "The Whites Who Stayed in the City," paper presented at the 2004 Midwest Political Science Association Annual Meeting, Chicago, Illinois, 4/2004.

Baodong Liu. "Whites as a Minority and the New Biracial Coalition," paper presented at the 2004 Southern Political Science Association Annual Meeting, New Orleans, Louisiana, 1/2004.

Baodong Liu and James Vanderleeuw. "Economic Development Priorities and Central City/Suburb Differences," presented at the 2003 Midwest Political Science Association Annual Meeting, Chicago, Illinois, 4/2003.

James Vanderleeuw, Baodong Liu, and Greg Marsh, "Divided Leadership and Racial Reflexivity in Memphis: An Analysis of the 1991, 1995 and 1999 Mayoral Elections," presented at the 2003 Southwestern Political Science Association Annual Meeting, San Antonio, Texas, 4/2003.

Baodong Liu. "White Votes Count: The Effect of Black Candidates' Qualifications on White Crossover Voting," paper presented at the 98th American Political Science Association Conference, Boston, Massachusetts, 9/2002.

Baodong Liu. "Searching for a 'Qualified' Black Candidate," *Proceedings of the 97th American Political Science Association Conference*, San Francisco California, 9/2001.

Baodong Liu. "In Defense of an Ethical Rational Choice Theory," paper delivered at the 2001 Jessie Ball duPont Fund Summer Seminars for Liberal Arts College Faculty, the National Humanities Center, Research Triangle, North Carolina, 6/2001.

Baodong Liu. "Reconsidering Social Interaction Theory," presented at the 2001 Western Political Science Association Annual Meeting. Las Vegas Nevada, 3/2001.

James Vanderleeuw, Baodong Liu, and John Johnson. "Economic Development Priorities of City Administrators: A Report on a Survey of City Administrators in Texas," presented at the 2001 Louisiana Political Science Association Convention, Lamar Texas, 3/2001.

Baodong Liu. "Racial Transition: Explaining the Curvilinear Relationship between Black Density and White Crossover Voting," *Proceedings of the 96th American Political Science Association Conference*, Washington DC, 9/2000.

Baodong Liu and James Vanderleeuw. "Racial Transition: Explaining the Curvilinear Relationship between Black Density and White Crossover Voting," presented at *the 96th American Political Science Association Conference*, Washington DC, 9/2000.

Baodong Liu. "Electoral Law and the Russian Party System: A Comparative Study," presented at *the 58th Midwest Political Science Association Conference*, Chicago Illinois, 4/2000.

James Vanderleeuw and Baodong Liu. "Rolling Off in the Context of Context," presented at *the 30th Southwestern Political Science Association Conference*, Galveston Texas, 3/2000.

Baodong Liu. "The Changing Nature of Electoral Competition in Japan." Roundtable Discussant, *the 52nd Association of Asian Studies Annual Meeting*, San Diego California, 3/2000.

Baodong Liu. "Racial Context and White Voting Strategies," presented at *the 95th American Political Science Association Conference*, Atlanta Georgia, 9/1999.

Baodong Liu. "The President's Support in Congress: A Test of U.S. China Policy, 1980-1994," *The 1997 Southern Political Science Association Convention*, Norfolk Virginia, 11/1997.

Baodong Liu. "Examining the Race Line: White Voting Behavior in New Orleans, 1980-1994," *The 27th Southwestern Political Science Association Conference*. New Orleans Louisiana, 3/1997.

Baodong Liu. "Intrapartisan Defeats and the Nomination Strategies of the Japanese Liberal Democratic Party in the 1993 Election," *The Sixth Annual Graduate Student Research Symposium*. Oklahoma State University. Stillwater Oklahoma, 2/1995.

INVITED SPEAKER, ROUNDTABLE/PANEL DISCUSSANT

Baodong Liu. "The 2020 Presidential Election and the Future of American Democracy", invited lecture given to Chinese Americans on Zoom. 9/2020.

Baodong Liu, Michael Cobb, and Richard Engstrom. "Understanding the Support for Ranked-Choice Voting in Two Southern Cities" talk given at the Electoral Reform Research Group, Research Development Conference. Washington D.C. 2/2020.

Baodong Liu. "Nation-State Context and Authoritarian Value Changes of Ethnic Chinese." Talk given at the workshop of The Clash of Authoritarianisms: Secularism versus Islamism in Turkey, University of Utah. 4/2019

Baodong Liu. "Trump's Voters," Panel Discussion on Presidential Primaries. Hinckley Institute of Politics. The University of Utah. Salt Lake City, Utah. 3/2016

Baodong Liu. "Big Data in the Social Sciences," The Consortium for Research on China and Asia (CROCA) and Policy at the Podium. The University of Utah. Salt Lake City, Utah. 11/2014.

Baodong Liu. "Deracialization in the Historial Perspective," the National Black Political Scientist Association Annual Meeting. Las Vegas, Nevada. 3/2012.

"Educating the Best Students in the 21st century: the New Ethnic Studies Major at the University of Utah," a presentation provided to the University Diversity Division Fall Retreat (8/12/2011), the Ethnic Studies Program (8/17/2011), and the Community Council (9/13/2011), at the University of Utah.

"Quantitative Analysis: Ecological Inferences and the Voting Rights Law," a Ford Foundation Project, Duke University. July 24-28, 2010.

"Election 2008: A Symposium," Hinckley Institute of Politics, University of Utah. October 6, 2008.

"IMMIGRATION TODAY: What are the Issues?" League of Women Voters of the Oshkosh Area Public Forum, November 12, 2007.

Theme Panel: "Bleaching" New Orleans? Power, Race, and Place After Katrina, the American Political Science Association Annual Meeting, Philadelphia, September 2, 2006.

"2006 Midterm Election Preview," American Democracy Project, the University of Wisconsin, Oshkosh, November 2, 2006.

"Analysis on the 2006 Midterm Election Results," American Democracy Project, the University of Wisconsin, Oshkosh, November 9, 2006.

"The Politics of New Americans: Studying Asian American Political Engagement," the American Political Science Association Annual Meeting, Washington, D.C. September 3, 2005.

"Significance of Voting Rights Act," Lawyers' Committee for Civil Rights under Law, National Asian Pacific American Legal Consortium, Mexican American Legal Defense and Educational Fund, Washington DC: June 17-18, 2004.

"Protecting Democracy: Defining the Research Agenda for Voting Rights Reauthorization," the Civil Rights Project, Harvard University, Cambridge, MA. May 10, 2004.

Chair, the Politics of Ethnicity and Self-Determination Panel, International Studies Association-Midwest Conference, St. Louis, Missouri, November 2, 2001.

PROFESSIONAL MEMBERSHIP

Pi Sigma Alpha, National Political Science Honor Society
American Political Science Association
Western Political Science Association
Midwest Political Science Association
Association for Asian American Studies
Association of Chinese Political Studies

Southwestern Political Science Association

Serve as an Advisor/Committee Member for the following Graduate Students

Nicole Batt (Ph.D Dissertation Chair)
Jake Peterson (Ph.D Dissertation Chair)
Matt Haydon (Ph.D. Dissertation Chair)
Porter Morgan (Ph.D. Committee)
Charles Turner (Ph.D Committee)
Geri Miller-Fox (Ph.D Committee)
Alex Lovell (Ph.D Committee)
Samantha Eldrudge (Ph.D Committee)
Leslie Haligan-Park (Ph.D Committee)
Nicole Cline (Master Committee Chair)
Oakley Gordon (Master Committee)
Michael McPhie (Master Committee)

Appendix 2
Voting Rights Cases in which I served as an Expert Witness

Milligan, et al. v. Merrill, et al., Case No. 2:21-cv-01530-AMM (Alabama, 2021)
Traci Jones et al vs. Jefferson County Board of Education et al, (Alabama, 2019)
CMA v. Arkansas, (Arkansas, 2019)
Navajo Nation, et al, vs. San Juan County, et al, (Utah, 2012)
League of Women Voters of Florida, et al v. Detzner, et al, (Florida, 2012)
Anne Pope et. al. v. County of Albany and the Albany County Board of Elections (N.D., NY 2011)
Radogno, et al v. State Board of Elections, et al, (N.D., IL, 2011)
NAACP v. St. Landry Parish et al, (W.D. LA 2003)
Arbor Hill Concerned Citizens Neighborhood Association et al v. County of Albany, (N.D. NY 2003)
Hardeman County Branch of NAACP v. Frost, (TN, 2003)

Appendix 3

Description of the Data Acquisition, Processing, and Aggregation Process

Data Acquisition

1. Acquired 2016, 2018, and 2020 precinct-level shapefiles from the Voting and Election Science Team. Joined those shapefiles to 2016, 2018, and 2020 precinct-level election returns from the Alabama Secretary of State's office, which were processed and cleaned by OpenElections.
 - a. Acquired and cleaned 2014 precinct-level election returns from the Alabama Secretary of State's office, and joined those to the 2016 precinct-level shapefile acquired from the Voting and Election Science Team.
 - b. Since absentee and provisional vote is reported at the county level, distributed the county-level absentee and provisional vote for each candidate to the precincts in the county, proportional to the share of the candidate's vote total in the county that was reported from each precinct.
2. Acquired 2020 Census Block shapefiles, total population by race and ethnicity, and voting age population by race and ethnicity directly from the Census FTP portal.
3. Acquired 2010 Census block total population by race and ethnicity, and voting age population by race and ethnicity, directly from the Census FTP portal.
4. Acquired VTD block assignment files, congressional district block assignment files, state house district block assignment files, and state senate district block assignment files from the Census website.
5. Acquired the draft congressional, state house, and state senate plans from a member of the Alabama Permanent Legislative Committee on Reapportionment.

Data Processing

1. For datasets that were on the 2020 census block level (total population, voting age population, VTD assignment, congressional district assignment, state house district assignment, and state senate district assignment), joined these datasets to the 2020 Census block shapefile.
2. For datasets that were not on the level of the census block (2014, 2016, 2017, 2018, and 2020 election returns – precinct), disaggregated them down to the 2020 census block level. Then joined them to the 2020 Census block shapefile.
3. For the 2010 Census block data, used the Census' Block Relationship File to measure the area overlap between the 2010 and 2020 census blocks. Then distributed the 2010 census block population data to the 2020 census blocks, proportionally to the land area overlap between the 2010 and 2020 census blocks.

Data Aggregation

1. Aggregated the full block-level dataset up to the level of the 2020 voting districts, taking into account (a) discontinuities in voting districts and (b) splits of voting districts by any of the implemented and proposed plans.