

Exhibit M

**UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF ARKANSAS
CENTRAL DIVISION**

THE CHRISTIAN MINISTERIAL
ALLIANCE, PATRICIA BREWER,
CAROLYN BRIGGS, LYNETTE BROWN,
MABLE BYNUM, and VELMA SMITH, on
behalf of themselves and all other similarly
situated persons,

Plaintiffs,

vs.

JOHN THURSTON, in his official capacity as
the Secretary of State of Arkansas,

Defendant.

CIVIL ACTION

Case No. 4:23-cv-471-DPM-DRS-JM

THREE-JUDGE PANEL

REBUTTAL REPORT OF BAODONG LIU, PH.D

I have been asked to express my opinion on the expert report dated September 16, 2024 submitted by Mr. Thomas M. Bryan (the “Bryan Report”), an expert for the Defendant in the above-captioned litigation, focusing on his assertions concerning the role of “partisan performance” in the design of CD2 in the 2021 Enacted Plan, as discussed in Parts VIII through X of his report. I have also been asked to address whether Mr. Bryan’s analysis supports or undermines the analysis and opinions set forth in the expert report I submitted in this case on September 16, 2024 (“my report” or “Liu Report”).

It is my opinion that there are fundamental flaws with Mr. Bryan’s methods and conclusions, including:

(1) Mr. Bryan’s methodology lacks basic scientific rigor and many of his conclusions are a result of ecological fallacy which occurs when overarching conclusions are made about specific individuals or subgroups simply based on observations of larger groups or populations;

(2) Mr. Bryan’s analysis therefore fails to demonstrate that the design of CD2 in the 2021 Enacted Plan was driven by the consideration of partisan advantage, and his assertions regarding the role of political performance in the design of the 2021 Enacted Plan are unsupported conjecture.

(3) For related reasons, Mr. Bryan’s discussion of apparent cracking in Southeastern Pulaski County and differential turnout rates are speculative and unpersuasive;

Therefore nothing in the Bryan Report undermines my opinions as set forth in my report, which are based on more rigorous and empirical methods.

I. Mr. Bryan’s Methods and Conclusions on Political Influence are Fundamentally Flawed

Mr. Bryan’s report asserts that “politics” is the “most obvious explanation for why D2 is drawn the way it was” (Bryan Report at 15). He appears to base that assertion on various

observations concerning what he calls the “political performance” of the 2021 Enacted Plan (*Id.* at 85). Specifically, he contends that the 2021 Enacted Plan “provides the best performance for Republicans” as compared to the 2011 Enacted plan and two hypothetical alternative maps he designed (*Id.* at 85). Primarily, he examines votes cast in several different 2020 and 2022 general elections and concludes that the 2021 Enacted Plan would have led to “2.0 to 2.7 percentage points” increase for the Republican candidates in 2020, and “2.0 percentage points” increase in 2022 “compared to how it actually performed under the 2011 Enacted Plan” (*Id.* at 15). In addition to claiming that “The 2021 Enacted Plan performs better politically for Republicans across the board, in all of both the 2020 and 2022 races”, the Bryan Report concludes that “the evidence does not support race being the predominant factor” in the creation of CD2, and that “The evidence does not show that Black voters were singled out for unequal treatment or the dilution of their electoral power” (*Id.* at 17).

But the data upon which the Bryan Report relies do not actually support his conclusions. To adequately support a conclusion that “the best political performance for Republicans in D2” explains the 2021 Enacted Plan, rather than the “objective ... to infringe Black voting strength in D2” (*Id.* at .17), one would need to compare the effect of party affiliation with the effect of race on the configuration of CD2 of the 2021 Enacted Plan, using rigorous empirical statistical analyses and controlled comparison like the ones I employed in my report. But the Bryan Report does nothing of the sort.

Instead of presenting any empirical findings of the comparison between race and party, the Bryan Report simply engages in the descriptive analysis of election results in different congressional districts and districting plans, and it does so from only the perspective of political party, without any effort to analyze whether the political effects that the Bryan Report describes

would actually be better explained by consideration of race. It is notable that the tables in the parts of Mr. Bryan’s report where he provides his “political performance” observations report only the vote shares of the Republican candidates according to the maps he is comparing, and his analysis of those Tables does not discuss racial demographics or assess whether consideration of race could explain his observations (*see* Bryan Report at 59-60, 64-66, 84, Tables VIII.A.1 - VIII.A.3, VIII.B.1 - VIII.B.5, IX.G.1).

In the whole Bryan Report, there is no single statistical test conducted. The Bryan Report does not conduct or incorporate statistical analyses to disentangle whether racial disparities could be driving the partisan patterns he observed (or vice versa). Most of the time, the report lists descriptive statistics for one variable at a time. As Mr. Bryan admitted “My analysis is a simple mathematical calculation and reporting of Arkansas’s election results and is not a definitive or scientific analysis of election results” and is “not proof of political gerrymandering” (*Id.* at 54 n.44). The Bryan Report lacks any analysis supporting any conclusion about a relationship (or lack of relationship) between race and party tested by using actual elections. In sum, the Bryan Report does not disentangle the role of race vis-à-vis party.

By contrast, my report analyzes both race and partisanship together and demonstrates statistically why race is a significant factor even after controlling for the partisan effect, as one must in order to disentangle the role of race vis-à-vis party.

In addition, because the Bryan Report focuses on comparing the 2021 Enacted Plan to the previous redistricting plan and hypothetical alternatives, it includes no analysis of the extent to which voters of different parties are moved into, or retained, or moved out of CD2.

Essentially, the discussions in the Bryan Report of the “political performance” reason for the movements of voters are univariate or bivariate descriptive statistics which cannot be used to

make any conclusions on the true determinant of a redistricting process. To understand why Mr. Bryan's method runs afoul of the law governing all scientific endeavors, let us use a simple illustration. First of all, one should never use the same variable (let's call it variable "A") to explain the role of that same variable A (i.e., at most a univariate descriptive analysis) because it is simply circular. To draw empirical conclusions based on quantitative data, one must at the very least perform analyses involving at least two variables ("A" and "B") at the same time, generally referred to as a "bivariate" analysis. And even still, if the investigation involves only two variables at a time, then the most one can definitively establish is that there is correlation (or lack thereof) between the two variables. That is why in my own report I did not draw conclusions based solely on univariate or even simple bivariate analysis. Instead, I compare the role and party simultaneously in my tables and then perform a statistical test to distinguish how the specific role of race vis-à-vis that of party reveals the treatment of voters by the 2021 Enacted Plan. In short, to distinguish whether it is race, or alternatively party performance, that explains better the configuration of CD2 in the 2021 Enacted Plan, the researcher has to engage in a controlled comparison that compares race against party in the same investigative procedure simultaneously. My report does this, and the Bryan Report does not.

Thus, when the Bryan Report compares the different Republican performances in his tables under the 2011 and 2021 Enacted Plans (*see* Bryan Report at 59-60, 64-66), he is engaging, at most, a bivariate analysis. No matter what results are displayed in his tables, one has no way to determine that the Republican performance is the reason for how CD2 in the 2021 Enacted Plan was designed. Needless to say, by looking at those tables one cannot rule out race as a significant factor in how the CD2 of the 2021 Enacted Plan was designed. This is a textbook example of one of the most fundamental errors a social scientist can commit in quantitative

research, called “ecological fallacy.” Ecological fallacy happens when the researcher jumps to a conclusion about individuals or a subset group simply based on an aggregate-level data distribution. That is what the Bryan Report does when it attempts to draw conclusions about the role of party from univariate statistics at the aggregate level alone.

Because of these methodological flaws, the Bryan Report does not show through actual empirical analysis that the increase of Republican shares is statistically significant. Nor does the Bryan Report answer the relevant question: whether race or party better explains the boundaries of CD2. In other words, none of the election data discussed in the Bryan Report does anything to disprove that the design of CD2 reflects a focus on race over other considerations. The Bryan Report therefore does not undermine my conclusions that: (1) race was a significant factor in the configuration of CD2 in the 2021 Enacted Plan; (2) voters’ partisan preference is not a statistically supportable alternative explanation for the observed differences in how white and Black voters were sorted into and out of CD2; (3) voters’ race as compared to their partisan preference better explains the changes made to that district specifically within Pulaski County.

The best available way to disentangle the role of party vis-à-vis that of race in the design of the 2021 Enacted Plan is to use scientifically accepted methods to make valid estimates about the racial and partisan distributions, as I did in my report. Only by using empirical statistical methods to compare race and party, more specifically holding party constant to examine the effect of race (or vice versa, holding race constant to examine the effect of party), can one draw a meaningful conclusion (rather than speculate) on specific questions such as how white Democratic voters, as opposed to Black Democratic voters, were indeed treated by the 2021 Enacted Plan.

Unlike the Bryan Report, my report is able to disentangle the role of race vis-à-vis party with a high-level of confidence because I employ rigorous and objective statistical methods that he does not.

II. Specific examples of Mr. Bryan’s flawed approach and unsupported conclusions

In this section, I catalogue some specific examples from the Bryan Report to illustrate the fundamental flaws of its methods and conclusions.

a. The limitations of Mr. Bryan’s Findings on Partisan Cracking

Mr. Bryan denied that “the map drawer was motivated to compromise Black voting strength as the predominant objective of the plan” (Bryan Report at 85). But based on his own examination of which racial group, compared to others, had a greater chance to be retained in CD2 in the 2021 Enacted Plan, Mr. Bryan admitted that CD2 “also has very high core retention, which is a reflection of high core retention of WNH [white, non-Hispanic], offset by lower rates of core retention of APB [any part Black] and Hispanics” (*Id.* at 52). In other words, he admits that white persons were disproportionately included in the redrawn CD2, while Black persons and other persons of color were disproportionately excluded. The Bryan Report’s admission of the low rate of core retention of any part Black persons in CD2 is exactly what I indicated in my report. But unlike Mr. Bryan, I further analyzed through empirical statistical tests whether that low retention of Black voters in CD2 can be better explained by race or party.

The Bryan Report identifies evidence consistent with some form of vote “cracking” in Southeast Pulaski County (“cracking”—a widely accepted shorthand for the phenomenon he describes—is my term, not his). Specifically, he notes that the 2021 Enacted Plan removed voters from CD2 in Pulaski County and then did “further divide them into D1 and D4” in order to “displace” a group of voters across multiple districts (*Id.* at 68). As I pointed out in my report,

“Pulaski County was the only county split within CD2, and it was split three ways, making it unique and noteworthy in analyzing how voters in Pulaski County are moved out of CD2 and how the core is retained in CD2” (see Liu Report at 26). The Bryan Report offers an unsupported conclusion that the apparent cracking he describes was targeted at “Democratic voters,” as opposed to Black voters (Bryan Report at 68). But the Bryan Report concedes this conclusion is mere “conjecture” (*Id.* at 68). Specifically, the Bryan Report states: “It is my conjecture that the further subdivision of Pulaski’s precincts into two separate districts may have been politically motivated—so as not to displace all of those Democratic voters into a single district” (*Id.* at 68). In other words, Mr. Bryan admits that his determination that the cracking in CD2 was “politically motivated” rather than racially motivated is based on no evidence or statistically supported analysis whatsoever. Simply put, Mr. Bryan did not disentangle race and party, and did not provide any analysis to support his contention that it is partisan cracking rather than racially motivated cracking.

b. The limitations of the Bryan Report’s discussion of voter turnout

To support its conclusion that partisan motivation could explain the changes made to CD2, the Bryan Report includes discussion of different levels of voter turnout in the areas that were moved into CD2 (Cleburne County) and out of CD2 (precincts in Southeastern Pulaski County). He argues that because of the “above average” turnout of Cleburne County and the “below average” turnout in the precincts that were moved out of CD2, “This difference between a high turnout majority Republican area and a low turnout majority Democratic area amplifies the political outcome of such a swap” (Bryan Report at 72-73).

Generally speaking, there is nothing wrong with Mr. Bryan’s considering how those voters who do not turn out to vote in a particular election (called the non-voters in the American

political science literature) are treated by the redistricting plan. My report considered non-voters as well, as I explain below.

However, it is notable that the Bryan Report does not discuss the relative turnout of different racial groups or even of different partisan groups. The Bryan Report discusses how the overall turnout can be determined for a given election in a given area or in a given set of precincts, and how these overall turnout rates in certain areas may affect election outcomes. The Bryan Report discusses no empirical evidence about which party's voters are more likely to turn out in the areas that it discusses, or how levels of turnout vary by racial groups. It also presents no evidence about how, for example, white Democratic voters may be different from Black Democratic voters in a same election, as far as turnout level is concerned. Therefore, his discussion of differential turnout rates again has no scientific value to disentangle race from party.

If anything, Mr. Bryan's turnout-based analysis is consistent with my own conclusions, due to well-documented disparities in voter turnout by race. Based on Mr. Bryan's turnout analysis, "Cleburne County exceeded [the state average turnout rate], with 41.5% turnout. By comparison, the 13 precincts moved from D2 to D1 and D4 in the 2021 Enacted Plan only had 28.0% turnout" (Bryan Report at 73). This finding, in fact, is entirely consistent with my conclusion that race is the better explanation than partisan factor. The lower turnout in the precincts moved out of CD2, and the much higher turnout in Cleburne County which was moved in, need to be considered in light of the two areas' racial composition. That is because American elections often show a racial gap in terms of who actually turned out to vote, with white voters often turning out at higher rates than Black voters. In other words, white voters usually have not only numeric advantage because of their majority status but also the turnout advantage. This

difference in turnout can often magnify the impact of changes in the racial composition of a district such as occurred with CD2 here, because the substitution of higher-turnout white voters for lower-turnout Black voters can have an outsized impact on impairing Black voters' electoral strength.

By contrast, my report considers actual racial/partisan turnout rates, and furthermore, the rates of actual non-voters in multiple elections. In particular, the EI RxC method allowed me to compute the proportion of voters who did not vote for either major party in the 2020 presidential election, as well as those who did not participate in either of the 2022 and 2018 major-party gubernatorial primaries. These voters who did not align with either major party (typically because they did not vote, although some may have voted third party) are broken down by race in addition to their non-voting party affiliation. In doing so, my report sorted out exactly how the 2021 Enacted Plan treated partisan voters *and non-voters* differently (white Democrats, Black Democrats, white Republicans, Black Republicans, white others including non-voters, and Black others including non-voters) based on their assignment categories relative to CD2 (Core/Into/Out).

In short, I was able to show that by controlling party affiliation—including voters who did not affiliate with either major party—race still explains better how voters are treated by the 2021 Enacted Plan (e.g., moved out of CD2). For example, as my report explained, my Modified Envelope Method analysis using 2020 presidential vote shares found that “With respect to those voters who didn’t vote, or voted for minor party candidates . . . the Black voters are much less likely to be assigned to CD2 from the envelope counties than are white voters (85% v. 98%)” (Liu Report at 18 & Table 3). And similar patterns were observed using gubernatorial primary participation data (Liu Report at 20, Tables 4 & 5). In other words, my empirical analyses show

that among voters who affiliated with neither political party, it is Black voters, specifically, who were disproportionately excluded from CD2. That means that not only is there strong statistically significant evidence that Black voters were indeed disproportionately moved out of CD2 from Pulaski County, even when they share the same party affiliation with the white voters—my analyses show the same or even stronger patterns with respect to voters who did not support either party.

III. Conclusion

This report examines important limitations of Mr. Bryan's analyses, explaining why the data he discusses do not provide empirical support for his claims that the differential treatment of Black voters in the design of CD2 in the 2021 Enacted Plan can be explained by political considerations, and not by racial considerations. In sum, the fundamental problem that pervades Mr. Bryan's report is that by relying mainly on overly simplistic descriptive statistics, he has not even attempted to disentangle race and party. The fundamentally flawed methods also make his discussion of apparent cracking in Southeastern Pulaski County and differential voter turnout uninformative to the issue of whether the changes made to CD2 reflect racial or partisan considerations. By contrast, my expert report uses the best available analytical methods from my field to assess whether racial or partisan considerations more likely explain the changes made to CD2 in the 2021 Enacted Plan. Indeed, my analysis of the assignment categories (Core/Into/Out) showed the exact differing effects of the 2021 Enacted Plan on each of the four racial-partisan subgroups (Black Democrats, white Democrats, Black Republicans and white Republicans), both in the District as a whole and within Pulaski County specifically. In addition, my EI RxC operations allow me to estimate and account for the proportion of voters who did not support

either party along racial and partisan lines, accounting for non-voters in a more specific and informative way than the Bryan Report's discussion of turnout.

In short, the conclusion of my expert report—that consideration of race was a statistically significant factor in the design of the Second Congressional District, and that consideration of voters' partisan preferences is not a statistically supportable alternative explanation for the apparent consideration of race—is thoroughly supported by rigorous empirical analysis based on widely accepted statistical tests. Because he relies on fundamentally flawed methods and his own unsupported conjecture, the Bryan Report's analysis lacks any such empirical basis for his contrary conclusions, and nothing in the Bryan Report undermines my opinions as set forth in my report.



Date: September 23, 2024

Dr. Baodong Liu