**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI
NORTHERN DIVISION**

MISSISSIPPI STATE CONFERENCE OF THE
NATIONAL ASSOCIATION FOR THE
ADVANCEMENT OF COLORED PEOPLE; DR.
ANDREA WESLEY; DR. JOSEPH WESLEY;
ROBERT EVANS; GARY FREDERICKS; PAMELA
HAMNER; BARBARA FINN; OTHO BARNES;
SHIRLINDA ROBERTSON; SANDRA SMITH;
DEBORAH HULITT; RODESTA TUMBLIN; DR.
KIA JONES; MARCELEAN ARRINGTON;
VICTORIA ROBERTSON,

        Plaintiffs,

        vs.

STATE BOARD OF ELECTION COMMISSIONERS;
TATE REEVES, *in his official capacity as Governor of
Mississippi*; LYNN FITCH, *in her official capacity as
Attorney General of Mississippi*; MICHAEL WATSON,
*in his official capacity as Secretary of State of
Mississippi,*

        Defendants,

AND

MISSISSIPPI REPUBLICAN EXECUTIVE
COMMITTEE,

Intervenor-Defendant.

**CIVIL ACTION NO.
3:22-cv-734-DPJ-HSO-LHS**

**PLAINTIFFS' RESPONSE IN OPPOSITION TO DEFENDANTS' MOTION FOR THE
COURT TO TAKE JUDICIAL NOTICE**

Plaintiffs the Mississippi State Conference of the National Association for the

Advancement of Colored People, Dr. Andrea Wesley, Dr. Joseph Wesley, Robert Evans, Gary

Fredericks, Pamela Hamner, Barbara Finn, Otho Barnes, Shirlinda Robertson, Sandra Smith,

Deborah Hulitt, Rodesta Tumblin, Dr. Kia Jones, Marcelean Arrington, and Victoria Robertson

(collectively, "Plaintiffs") respectfully request that this Court deny Defendants' Motion for the Court to Take Judicial Notice.

1.   Defendants seek judicial notice of data from the Current Population Survey Voting and Registration Supplement ("CPS"), which is unreliable and disputed.

2.   The CPS is a self-reported, unverified survey of voting behavior administered by the U.S. Census Bureau. Data from the CPS is the subject of considerable controversy in the political science literature as a measure of political participation by race, because of the well-known tendency of survey respondents to over-report voter participation, and the well-known differential rates of over-reporting of voting between Black and White survey respondents, whereby Black respondents tend to over-report voting at higher rates than White respondents.

3.   Defendants initially noticed an expert witness, Dr. Peter Morrison, to introduce and discuss the CPS data, but then chose to withdraw this witness after Plaintiffs' experts contested the accuracy and import of the CPS data.

4.   Because the CPS data as a measure of political participation by race is the subject of reasonable dispute and its accuracy can reasonably be questioned, it is not judicially noticeable under Federal Rule of Evidence 201.

5.   Plaintiffs hereby incorporate in further support of this Motion their accompanying Memorandum of Law and the following exhibits:

Exhibit 1 – November 22, 2023 Responsive Report of Dr. Byron D'Andra Orey

Exhibit 2 – January 29, 2024 Second Rebuttal Report of Dr. Jordan Ragusa

WHEREFORE, pursuant to Rule 201, Plaintiffs respectfully request that this Court deny Defendants' Motion for the Court to Take Judicial Notice. If their motion is granted, Plaintiffs reserve all rights to elicit expert testimony from Dr. Byron D'Andra Orey and Dr. Jordan Ragusa on the unreliability of the CPS voter participation data.

This the 16th day of February, 2024.

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CERTIFICATE OF SERVICE

I, Joshua Tom, do certify that on this day I caused to be served a true and correct copy of

the foregoing by electronic mail to all counsel of record.

This the 16th day of February, 2024.

<div align="right">

/s/ *Joshua Tom*

Joshua Tom

</div>

EXHIBIT 1

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI
SOUTHERN DIVISION**

MISSISSIPPI STATE CONFERENCE OF THE
NATIONAL ASSOCIATION FOR THE
ADVANCEMENT OF COLORED PEOPLE; DR.
ANDREA WESLEY; DR. JOSEPH WESLEY; ROBERT
EVANS; GARY FREDERICKS; PAMELA HAMNER;
BARBARA FINN; OTHO BARNES; SHIRLINDA
ROBERTSON; SANDRA SMITH; DEBORAH
HULITT; RODESTA TUMBLIN; DR. KIA JONES;
MARCELEAN ARRINGTON; VICTORIA
ROBERTSON,

     Plaintiffs,

     vs.

STATE BOARD OF ELECTION COMMISSIONERS;
TATE REEVES, *in his official capacity as Governor of
Mississippi*; LYNN FITCH, *in her official capacity as Attorney
General of Mississippi*; MICHAEL WATSON, *in his official
capacity as Secretary of State of Mississippi,*

     Defendants,

and

MISSISSIPPI REPUBLICAN EXECUTIVE
COMMITTEE,

Intervenor-Defendant.

CIVIL ACTION NO.

3:22-cv-734-DPJ-HSO-LHS

RESPONSIVE EXPERT REPORT OF DR. BYRON D'ANDRA OREY, Ph.D

1. My name is Byron D'Andra Orey. My initial report for this case, dated August 28, 2023, was submitted previously (a Second Amended version was submitted on November 15, 2023). The attorneys for the plaintiff have asked me to provide a rebuttal report that responds to the October 16 Report of Dr. Peter Morrison and the October 23 Report of Dr. Thomas L. Brunell.

2. Dr. Morrison's analysis concerning voter turnout is solely based on data from the Current Population Survey (CPS) Voting Supplement. However, as emphasized in pages 20-21 of my initial report, the CPS lacks verification, leading to concerns about the reliability of its data due to the tendency for voters to overreport their voting behavior on unverified surveys. Overreporting is a significant concern in accurately determining voter turnout figures. Further complicating the issue is a body of literature that points to a heightened tendency of overreporting among Black voters in unverified surveys.[1] This known issue of differential overreporting by race makes it especially problematic for Dr. Morrison to rely solely on an unverified survey to estimate turnout by race in Mississippi.

3. Recent academic advancements, such as the work of Ansolabehere, Fraga and Schaffner (2022), specifically question the CPS's capability in providing accurate estimates of voter turnout by race.[2] This skepticism is rooted in the observed disparities in overreporting rates across racial lines. Specifically, the authors report that the CPS overestimates turnout among Blacks and Hispanics. In contrast to this recent work specifically focused on overreporting by race on the CPS, Morrison relies on outdated sources, such as the Berent and Krosnick (2011) study, which further weakens the credibility of his conclusions. This particular source is based on an analysis of American National Election Survey (ANES) data from 2008, and it fails to address the critical aspect of overreporting *by race* at all. Also importantly, Berent and Krosnick's methods, which did not differentiate between matched voters and matched nonvoters, were directly undermined by later scholarship which employed large-scale databases that were not available in 2011.[3]

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[1] This literature is discussed in detail in, for example, Jenkins, White, Hanmer, and Banks (2021). Vote Overreporting While Black: Identifying the Mechanism Behind Black Survey Respondents' Vote Overreporting, *American Politics Research*, https://doi.org/10.1177/1532673X211022189.

[2] Ansolabehere, Fraga, and Schaffner (2022). The Current Population Survey Voting and Registration Supplement Overstates Minority Turnout, *The Journal of Politics* https://www.journals.uchicago.edu/doi/abs/10.1086/717260.

[3] Enamorado and Imai (2019). Validating Self-Reported Turnout by Linking Public Opinion Surveys with Administrative Records, *Public Opinion Quarterly*, https://imai.fas.harvard.edu/research/files/turnout.pdf. The Enamorado and Imai paper directly responded to an updated version of Berent and Krosnick's paper which was published in *Public Opinion Quarterly* in 2016. In the academic world, Berent and Krosnick's failure to respond to Enamorado and Imai is considered a concession as to the validity of their critique.

4. These issues with overreporting on unverified surveys are an important reason why I based my assessment of turnout on multiple different data sources, including the Mississippi voter file, official election return data, and the Cooperative Election Study (CES)—a survey which unlike the CPS includes independent verification of respondents' registration and voting behavior.

5. Dr. Brunell mentions, on page 1 of his report, that my analysis only examines the 2020 election data. The year 2020 election should not be considered atypical in terms of racial turnout differences. Dr. Brunell references various variables that may impact turnout in a given year, like the weather, but these are random factors that influence all voters, irrespective of race. Analyzing a single election like 2020 allows us to observe the behavior of voters from different racial backgrounds under the same general environmental and situational conditions.

6. Additionally, Dr. Brunell, having access to the CES data, had the opportunity to conduct analyses for other years, which would have allowed for a comparison with my estimate.

7. Dr. Brunell notes, on page 2 of his report, that the CES dataset for Mississippi in 2020 contains two "missing observations." This omission occurred because the respondents in question identified themselves as non-citizens. As a result, I chose not to include them in the dataset, in line with the criterion that only eligible voters should be considered for this analysis.

8. Dr. Brunell comments, on page 2 of his report, on the various weighting schemes for the CES data. Both Dr. Brunell and I arrive at a similar turnout figure among eligible voters using the "commonweight" weighting scheme, with White Mississippians at 59.6% and Black Mississippians at 46.1% according to my calculation. The slight variation in our estimates arises because Dr. Brunell's analysis includes the two respondents who self-identified as non-citizens.[4]

9. Dr. Brunell discusses purported confidence intervals for the CES dataset, as detailed between pages 2 and 4. However, there are several issues with his analysis. Firstly, his methodology for calculating confidence intervals is flawed. Dr. Brunell does not explicitly detail his method for deriving these intervals. Upon reviewing his analysis and code, it seems he employed the "svy" software package within the STATA program, typically used for estimating standard errors and confidence intervals. However, the code he used does not account for the clustered sampling and stratification techniques used in the CES survey. Without specifying the survey design, including clustered sampling and stratification, it is not possible for any statistical package to obtain accurate confidence intervals. The STATA website summarizes this problem as follows: "When some people analyze survey data, they

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[4] Table 16 in my initial report, and Brunell's replication thereof, use the wrong variable. Table 16 has been corrected in my Second Amended Report. Using the correct variable ("vv_turnout_gvm" or "voted_valid_gen") and the registered voter weighting scheme "vvweight," the CES estimate for turnout among registered White voters 86.8%, and for registered Black voters is 72.5%.

say, 'I know I have to use my survey weights, but I will just ignore the stratification and clustering information.' If we follow this strategy, we will obtain the proper design-based point estimates, but *our standard errors, confidence intervals, and test statistics will usually be wrong.*"[5]

10. Taking Dr. Brunell's use of the "svy" package as valid, his conclusions regarding the voter turnout for Black and White citizens involve a visual examination of the plots for the confidence intervals he generates. The overlap of the edges of the bars between the two confidence intervals lead him to overstate that there is no statistically significant difference in turnout rates between Black and White voters. He says on page 3 of his report that because "the intervals for Whites and Blacks overlap" "[t]his means that, from a statistical standpoint, we cannot be confident that the rate of turnout among Blacks and Whites in Mississippi in 2020 was different." However, the literature is clear that a simple visual comparison of confidence intervals is not a valid hypothesis test. Research suggests that such a comparison to test the difference between two variables is overly conservative.[6]

11. Dr. Brunell's suggestion that overlapping confidence intervals imply statistical insignificance is not definitive. The most reliable method to ascertain statistical significance between variables is through a dedicated statistical analysis. Unlike Dr. Brunell, who did not perform an analysis to determine if there was a statistically significant difference between the two variables' coefficients, I have carried out an analysis using Ordinary Least Squares and a bivariate regression model to assess these differences.

12. Dr. Brunell did not conduct hypothesis tests to determine if the coefficient measuring the effect of race on estimated turnout was statistically significant. If he had conducted this hypothesis test using his data, he would have found that the race coefficient is statistically significant at the $p<0.05$ level. Below, I have structured the findings into two parts. This approach mirrors Dr. Brunell's method of handling data. The initial section of the analysis utilizes the full dataset, without the exclusion of the two data points identified as noncitizens (*i.e.*, the same set of respondents considered by Dr. Brunell). The regression model presented in Table 1, which includes the constant and beta coefficient for the independent variable, reveals that when converted into percentages, the turnout rates for the 2020 election were 59.6% for White voters and 45.2% for Black voters. The White turnout is the constant and

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[5] See https://www.stata.com/manuals/svysvy.pdf.

[6] Schenker N, Gentleman JF. On judging the significance of differences by examining the overlap between confidence intervals. *The Am Stat.* 2001;55:182–186. doi: 10.1198/000313001317097960; Payton ME, Greenstone MH, Schenker N. Overlapping confidence intervals or standard error intervals: what do they mean in terms of statistical significance? J Insect Sci. 2003;3:34. doi: 10.1093/jis/3.1.34. Epub 2003 Oct 30. PMID: 15841249; PMCID: PMC524673; Ryan GW, Leadbetter SD. On the misuse of confidence intervals for two means in testing for the significance of the difference between the means. *J Mod Appl Stat Methods.* 2002;1:473–478; Austin PC, Hux JE. A brief note on overlapping confidence intervals. *J Vasc Surg.* 2002;36:194–195. doi: 10.1067/mva.2002.125015.

the Black turnout is the difference between the constant and the beta coefficient estimates. This difference is statistically significant, with a p-value less than .05.

Table 1. Linear Regression: Turnout With Non-Citizens

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
			.	.	.	.	
Black	-.144	.071	-2.05	.041	-.283	-.006	**
Constant	.596	.037	15.98	.001	.522	.669	***
R-squared		0.020	Number of obs			443	
F-test		4.185	Prob > F			0.041	

*** p<.01, ** p<.05, * p<.1*

The second part of my analysis, detailed in Table 2, accounts for the data excluding the two non-citizen respondents. Here, when the coefficients are converted to percentages, the turnout rates depict approximately 59.6% for White voters and 46.1% for Black voters. The coefficient is statistically significant at the .058 level.[7] These results collectively highlight a notable difference in turnout between Black and White voters in the 2020 election, contrary to Dr. Brunell's assessment.

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[7] By convention, thresholds for statistical significance include a p-value <0.10 or, more stringently and more commonly, a p-value <0.05. A p-value of 0.05 means that we can be 95 percent sure that the observed results are not due to random chance. Similarly, the p-value in table 2 is 0.058, very close to the arbitrary 0.05 threshold and well under the more lenient 0.10 threshold. This suggests that we can be 94 percent sure that the observed results are not due to random chance.

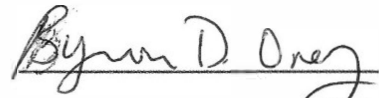**Table 2. Linear Regression: Turnout Without Non-Citizens**

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
			.	.	.	.	
Black	-.135	.071	-1.90	.058	-.275	.005	*
Constant	.596	.037	15.98	.001	.522	.669	***
R-squared		0.018	Number of obs			441	
F-test		3.604	Prob > F			0.058	

*** p<.01, ** p<.05, * p<.1*

13. It should also be noted that Dr. Brunell offers no critique of my ecological inference analysis, which also demonstrated a significant, nearly 10-point gap in turnout between Black and White voters.

14. With respect to the turnout analysis I conducted using the Mississippi Voter File with race information supplied via the Bayesian Improved Surname Geocoding (BISG) technique, Dr. Brunell's key critique is found on pages 4 and 5 of his report. Dr. Brunell points out that the analysis was limited to a large subset of voters, approximately 930,000, rather than encompassing the entire voter file. However, he fails to provide any substantial reasoning to suggest that this subset of voters is not representative of the broader population.

15. In my initial report, the analysis was indeed confined to about 930,000 records from the database. This limitation was due to a coding error, which inadvertently excluded certain voters in a largely random manner.[8] However, this issue was rectified in my Second Amended Report. With that correction, the analysis now accounts for approximately 98% of the 1,313,759 votes cast in the 2020 election. Importantly, the revised data demonstrate that the estimates of Black and White voter turnout remain very close to the initial findings (less than 1% variation statewide). This consistency reinforces the representativeness of the initial subset of voters.

16. Additionally, it is crucial to note that the updated analysis, along with other studies based on verified turnout data, continues to indicate a significant turnout gap of 10-15 percentage points between Black and White voters in Mississippi. This disparity is not only evident in the 2020 election but is also observable in previous elections, as shown by the data in the State's voter file. This persistent gap across different electoral cycles underscores the systemic nature of the turnout disparities between Black and White voters in Mississippi.

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[8] The bug read in the registration dates using an incorrect format: "day-month-year" instead of "month-day-year". Due to this bug, the code dropped records of voters who registered after the 12th day of any month, and also dropped records of voters who registered after March 10, 2020 (rather than after Oct. 3, 2020, 30 days before the 2020 election).

5

Executed on November 22, 2023.

Dr. Byron D'Andra Orey, Ph.D.

EXHIBIT 2

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI
NORTHERN DIVISION

MISSISSIPPI STATE CONFERENCE OF THE
NATIONAL ASSOCIATION FOR THE
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ROBERT EVANS; GARY FREDERICKS;
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BARNES; SHIRLINDA ROBERTSON; SANDRA
SMITH; DEBORAH HULITT; RODESTA
TUMBLIN; DR. KIA JONES; MARCELEAN
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STATE BOARD OF ELECTION
COMMISSIONERS; TATE REEVES, *in his official*
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        Defendants,
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Intervenor-Defendant.

CIVIL ACTION NO.
3:22-cv-734-DPJ-HSO-LHS

SECOND REBUTTAL REPORT OF DR. JORDAN RAGUSA

[1] Scope of Engagement

Plaintiffs' counsel asked me to evaluate the statistical analysis used by Dr. Peter Morrison in his report dated December 11, 2023. Dr. Morrison performs two analyses comparing Black and White political participation in Mississippi—a cluster analysis of voter registration and a difference of proportions test of voter turnout. Based on the results of these two analyses, Dr. Morrison concludes that Black Mississippians have higher rates of both registration and turnout from 2004 to the present compared to White Mississippians.

I am retained at the rate of $250 per hour. I submitted a prior report in this litigation on August 28, 2023 and a prior rebuttal responding to the report of Dr. Thomas Brunell on November 27, 2023. My compensation does not depend on the results of the case, or on the opinions and testimony I may provide. Any opinions expressed in this report are solely my own and do not represent the opinions of my employer.

[2] Opinions

I believe there are numerous fatal flaws in Dr. Morrison's methodology and analysis. I reach this conclusion based on an examination of Dr. Morrison's Appendix C (pgs. 27-29), the cluster analysis report he submitted to Plaintiffs' attorneys, and my own analyses that replicate his results.

As background, the Current Population Survey (CPS) that Dr. Morrison analyzes contains known limitations that bias his results toward a finding of higher Black political participation. Namely, dozens of highly reputable peer reviewed studies show that unverified surveys, including the CPS specifically, over report Black political participation relative to White respondents. I think it is highly likely that Dr. Morrison's conclusions are simply an artifact of these known biases. In other words, I would not use the CPS data set to perform the analysis he describes, and my conclusions as to Dr. Morrison's methodology should not be taken as an endorsement of its use for this purpose.

In his first analysis, a K-means cluster analysis, Dr. Morrison made three undeniable and ultimately fatal errors. First, Dr. Morrison's documentation proves that he used the wrong variable when performing this analysis. He claims to have analyzed voter registration, but his own report shows that he analyzed voter turnout instead. Second, the same documentation reveals that his voter turnout cluster results undermine his substantive claims. And third, my effort to conduct his cluster analysis with the correct variables (voter registration) produces results that are, once again, the exact opposite of his conclusions. All in all, his own data, analysis, and results refute his claim of a historic break in Black political participation in 2004.

Dr. Morrison's second analysis, a difference of proportions test, has several limitations. For example, he compounds the biases in the CPS data by collapsing yearly turnout estimates into an even less precise binary variable that simply indicates whether Black turnout was estimated to be higher than White turnout. In this respect his analysis ignores the size of the supposed turnout gap. Dr. Morrison also ignores the fact that these estimates come with a margin of error and are highly variable. Lastly, a key component of Dr. Morrison's difference of proportions test is the 2004 cut point, but the results of the cluster analysis do not support this break in the data, nor does he offer any theoretical justification for dividing the sample in this manner.

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[3] Current Population Survey Limitations

Dr. Morrison's two analyses, described in Appendix C (pgs. 27-29), rely on the Census Bureau's Current Population Survey (CPS), specifically a series of unvalidated surveys of voting behavior in Mississippi from 1980 to 2022. Although my report focuses on the way Dr. Morrison analyzed these data, namely his use of cluster analysis and a difference of proportions test, it must be noted that the CPS data have known biases. In other words, it is impossible for me to comment on Appendix C and his two analyses without also commenting on the underlying data. I do not endorse the use of CPS data in this context and believe surveys that validate voting behavior are far superior.

It is well known that respondents on surveys like the CPS overreport their voting behavior, a problem often attributed to social desirability bias. Furthermore, dozens of peer reviewed studies show that Black respondents are more likely to overreport voting compared to White respondents. Dr. Morrison does not cite any recent literature showing that Black respondents overreport voting and registration more than White respondents. Indeed, the most recent article he cites is from 2005 (pg. 7, footnote 9). A recently published article by Jenkins et al. (2021) provides a thorough review of this body of work. In a section aptly titled "Overreporting among African Americans" (pg. 441) they conclude that this phenomenon is "one of the most consistently documented aspects of overreporting" and cite roughly a dozen referenced articles that support this conclusion.[1] Another particularly valuable study is a recent paper by Ansolabehere, Fraga, and Schaffner (2022) which concludes that the CPS—the data Dr. Morrison analyzes—overestimates Black and Hispanic turnout compared to non-Hispanic White turnout.[2]

Dr. Morrison dismisses these studies saying simply "I know of no study with anywhere near the historical depth and continuity of the Census Bureau's 43-year CPS survey which might challenge my interpretation that the apparent break is genuine" (pg. 7). I disagree with this claim as the CPS's historic breadth does nothing to minimize racial differences in vote overreporting. Because these biases almost certainly exist in every unvalidated survey, CPS's lengthy time series simply reinforces the problem with each successive survey.

A far superior approach is to use survey data that *validates* voting behavior. On these surveys, any respondent who claims they voted is matched to data from a state voter file. It perhaps goes without saying, but this approach minimizes vote overreporting. Vote validation is widely regarded as the superior methodology today due, in part, to modern techniques that reliably match survey respondents to government records. Dr. Morrison cites a working paper by Berent, Krosnick, and Lupia (2011) to support his claim that these efforts are of limited value. Suffice it to say that this unpublished paper has not gained wide acceptance in the literature. For example, a paper by Ansolabehere and Hersh (2012), peer reviewed and published in the discipline's flagship methodology journal, found that the Berent, Krosnick, and Lupia (2011) working paper used an

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[1] Jenkins, Clinton, Ismail White, Michael Hanmer, and Antoine Banks. 2021. "Vote Overreporting While Black: Identifying the Mechanism Behind Black Survey Respondents' Vote Overreporting." *American Politics Research* 49(5): 439-451.

[2] Ansolabehere, Stephen, Bernard L. Fraga, and Brian F. Schaffner. 2022. "The Current Population Survey Voting and Registration Supplement Overstates Minority Turnout." *The Journal of Politics* 84(3): 1850-1855.

outdated and thus flawed method for validating voter turnout.[3] A more recent paper by Enamorado and Imai (2019) reaches the same conclusion—modern validation methods are highly reliable.[4]

All in all, there is virtually no debate in the current literature. First, it is well known that Black respondents are more likely to over report voting compared to White respondents. Second, vote validation efforts minimize the problem of over reporting. I think it is therefore highly likely that Dr. Morrison's finding of greater Black political participation in recent years is simply an artifact of known flaws in the unvalidated CPS data. Regardless, Dr. Morrison made several clear errors in his statistical analysis, and these errors are easy to prove. Furthermore, Dr. Morrison's own data refute his substantive conclusions.

[4]   Validating Dr. Morrison's Cluster Analysis

In his report Dr. Morrison first discusses a cluster analysis. Cluster analysis is concerned with the relationship among theoretically correlated variables and observations. Cluster analysis and similar techniques—factor analysis and principal components analysis—achieve this by examining how the data "fit together" in a statistical sense.

Dr. Morrison's objective is to ascertain whether the CPS data confirm his belief that there was a historic "break" or "cut point" in the relative rate of political participation by Black and White Mississippians. Based on the cluster analysis results, Dr. Morrison concludes that "a distinct break occurred in the historical pattern of political participation by Mississippi voters" with 2004 separating an earlier period of greater White participation from the current era of greater Black participation (pg. 2).

For the reasons articulated in the prior section, I strongly suspect that this conclusion is simply an artifact of underlying flaws in the CPS data. Nonetheless, this section, and the next, will show that Dr. Morrison's chosen techniques, when *properly* applied to the CPS data, refute his conclusions and reveal that he committed clear errors in his analysis.

Dr. Morrisons's specific technique is known as K-means cluster analysis. As noted above, the word "cluster" refers to the fact that the algorithm reveals how the data fit together in a statistical sense. After running the analysis, the researcher is provided with a list of statistically similar cases based on their mathematical distance from the cluster "mean." Finally, "K" refers to the number of clusters requested by the researcher prior to running the analysis. Notably, Dr. Morrison requested that the algorithm produce only two clusters.

Dr. Morrison claims he performed this cluster analysis on voter registration rates in Mississippi from 1980 to 2022. In Appendix C, he writes that his "first test" is a "K-means cluster analysis test of voter registration rates shown in Table 2" (pg. 27). And yet he never says which variable was used

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[3] Ansolabehere, Stephen, and Eitan Hersh. 2012. "Validation: What Big Data Reveal About Survey Misreporting and the Real Electorate." *Political Analysis* 20:437-459.

[4] Enamorado, Ted, and Kosuke Imai. 2019. "Validating Self-Reported Turnout by Linking Public Opinion Surveys With administrative Records." *Public Opinion Quarterly* 83(4):723-748.

to conduct this analysis. Looking at Table 2 (pg. 5) in his report, there are three variables: the White registration %, the Black registration %, and the Black-White % difference in registration.

Dr. Morrison commits three fatal errors in this analysis. First, Dr. Morrison's cluster analysis report proves that he used a variable for Black voter turnout instead of any registration variable. In other words, Dr. Morrison used a different variable in the analysis than what he claims in his report. Second, Dr. Morrison's analysis produces clusters that contradict his claim of a historic break in 2004. Simply put, his own results are undeniably the opposite of his conclusions. And third, fixing the first error and rerunning Dr. Morrison's cluster analysis with the correct registration variables also refutes the existence of a historic break in 2004. Given these three errors, Dr. Morrison's cluster analysis is fatally flawed, and his conclusions lack any validity.

I have included a copy of Dr. Morrison's cluster analysis report as Appendix A. I was provided this document by Plaintiffs' attorneys. I understand that attorneys for the Defendants produced this report in response to a request for Dr. Morrison's raw data and programming code. In essence, this report contains a record of Dr. Morrison's analysis and results. At the top of page 2 are columns that indicate the observations analyzed and algorithm's cluster groupings. In the first column, under the "row label" heading, we see a count variable for each observation (where 1=1980, 2=1982, 3=1984, and so on). Next to each observation is the raw data Dr. Morrison used for his cluster analysis. For example, we can see that the value for 1980 is 0.595, the value for 1982 is 0.402, the value for 1984 is 0.603, and so on.

Critically, these values match to the Black voter turnout variable in Table 2 of Dr. Morrison's report (pg. 5). In other words, although Dr. Morrison claims that he conducted a "K-means cluster analysis test of voter *registration* rates" (pg. 27, emphasis mine) the cluster analysis report he submitted to the Plaintiffs reveals that he used the Black voter *turnout* variable instead.

My own analysis confirms this. I simply copied Dr. Morrison's Table 2 data into my own software page (Stata 17) and then ran a K-means cluster analysis on the Black voter turnout % variable. Table 1 at the bottom of this section contains Dr. Morrison's raw data, a copy of his cluster results from the document in Appendix A, and my cluster analysis replication. We can see that the cluster assignments (the "1s" and "2s" the columns to the right labeled "cluster results") are an exact match, confirming that Dr. Morrison used a different variable (voter turnout) than what he claims (voter registration). In this respect, there is no statistical test of voter registration rates in his report.

Dr. Morrison also misinterprets his cluster analysis results. Simply put, his own results are contrary to his substantive conclusions. In the cluster results columns in Table 1 below, the "1s" and "2s" indicate how the algorithm classified each year after Dr. Morrison ran his analysis.[5] Recall that Dr. Morrison claims that these groupings produce a clear break in 2004. He says he concludes "with scientific certainty that the 1980-2002 voter registration rates correspond to one cluster and the 2004-2022 voter registration rates correspond to a different cluster" (pg. 27). If the results indeed support Dr. Morrison's conclusion, the years prior to 2004 would be assigned to one cluster while the years from 2004 to the present would be assigned to another cluster.

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[5] It should be noted that that "1s" and "2s" are arbitrary in a substantive sense and can switch directions each time the algorithm is calculated. From a substantive standpoint, they simply reveal the cluster grouping (i.e. which years "go together" in a statistical sense). Although they can switch in directions, the "1s" and "2s" will always reveal the same two clusters.

We see no such pattern in the cluster results. Not only do the groupings show no break occurred in 2004, they show no historic break in any other year. Although the CPS turnout estimates are most certainly flawed for the reasons noted in the prior section, the clusters largely follow the well-known turnout gap between presidential election years and midterm election years. In Dr. Morrison's cluster results and my own, we can see that presidential years, with higher turnout on average, are assigned to cluster "2" while midterm years, with lower turnout on average, are assigned to cluster "1." Only two years deviate from this pattern: 1996 is assigned to the midterm cluster and 2018 is assigned to the presidential cluster.

I reach two conclusions in this section. First, it is undeniable that the methodological claims in Dr. Morrison's report do not match the raw statistical results in his cluster analysis report. Dr. Morrison claims he performed his analysis on voter registration rates and yet his own data and analysis indicate that he used a variable for Black voter turnout. I confirmed this by running my own cluster analysis with Dr. Morrison's data. Second, Dr. Morrison's own cluster analysis results refute his substantive claims. Rather than a sharp break in 2004, which is the basis for his opinions, the results produce two clusters that simply confirm what is known: presidential years have higher turnout than midterm years. I ultimately conclude that Dr. Morrison committed demonstrable errors in his analysis.

Table 1: Validating Dr. Morrison's Cluster Analysis

	Voter Registration			Voter Turnout			Cluster Results	
							Morrison	Ragusa
Year	White %	Black %	Black-White	White %	Black %	Black-White	Clusters	Clusters
1980	85.2	72.2	-13.0	70.9	59.5	-11.4	2	2
1986	77.3	75.9	-1.4	45.8	40.2	-5.6	1	1
1988	80.5	74.2	-6.3	64.2	60.3	-3.9	2	2
1990	70.8	71.4	0.6	35.8	32.5	-3.3	1	1
1992	80.2	78.5	-1.7	69.4	61.9	-7.5	2	2
1994	74.6	46.2	-28.4	69.9	41.7	-28.2	1	1
1996	75.0	59.3	-15.7	67.4	48.8	-18.6	1	1
1998	75.8	71.3	-4.5	41.1	40.4	-0.7	1	1
2000	73.1	73.6	0.5	62.4	58.4	-4.0	2	2
2002	72.1	69.4	-2.7	44.6	41.0	-3.6	1	1
2004	73.9	76.1	2.2	60.2	66.6	6.4	2	2
2006	71.0	72.2	1.2	39.9	50.5	10.6	1	1
2008	75.0	81.9	6.9	68.4	73.1	4.7	2	2
2010	74.2	73.6	-0.6	47.7	48.1	0.4	1	1
2012	82.4	90.8	8.4	71.8	82.7	10.9	2	2
2014	72.8	83.2	10.4	40.3	46.6	6.3	1	1
2016	78.8	81.3	2.5	67.7	69.2	1.5	2	2
2018	71.8	77.9	6.1	51.7	59.8	8.1	2	2
2020	79.2	83.4	4.2	69.8	72.9	3.1	2	2
2022	74.3	72.2	-2.1	47.6	47.0	-0.6	1	1

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[5] Cluster Analysis of Registration Rates

A possible explanation for the conflict between Dr. Morrison's substantive claims and his cluster analysis results is that he selected the wrong variable when preparing the latter document. In other words, perhaps Dr. Morrison performed the analysis with the correct variable when writing his report (a measure of voter registration) and then simply used the wrong variable when producing the raw statistical results for Plaintiffs' counsel.

I explored this possibility by running a series of K-means cluster analyses on each of the three voter registration variables.[6] As earlier, the raw data came from his Table 2. I reproduce his data in my Table 2, below, and present the cluster analysis classifications. If Dr. Morrison's claims about voter registration are correct, one of these variables should produce cluster analysis results that match what he states in his report: that "the 1980-2002 voter registration rates correspond to one cluster and the 2004-2022 voter registration rates correspond to a different cluster" (p. 27). In the end, none of the registration variables support Dr. Morrison's claims.

First, looking at the cluster analysis of the Black-White registration % difference, the results are inconsistent with Dr. Morrison's substantive claims. We can see that the years 1980, 1994, and 1996 are grouped together in the "2" cluster while the remaining years group together in the "1" cluster. Clearly, the algorithm has classified the three years with the largest White registration advantage as belonging to one cluster and every other year as belonging to the other cluster. Critically, there is no obvious historical break in the results, certainly not the sharp break Dr. Morrison cites in his report. I conclude that Dr. Morrison's claims do not rely on the Black-White % difference variable. In fact, this analysis refutes his claim of a 2004 cut point in voter registration.

Second, looking at the cluster analysis of the Black registration % variable, the results are also inconsistent with Dr. Morrison's substantive claims. We can see that algorithm has clustered observations based on a 75% Black registration cut point. Indeed, the cluster labeled "2" contains every year where Black registration is always under 75% and the cluster labeled "1" contains years where Black registration is always over 75%. Once again, there is no obvious historical break in the results, certainly not the sharp break Dr. Morrison cites in his report. I conclude that Dr. Morrison's claims do not rely on the Black registration % variable. In fact, this analysis refutes his claim of a 2004 cut point in voter registration.

Finally, looking at the cluster analysis of the White registration % variable, the results are again inconsistent with Dr. Morrison's substantive claims. We can see that algorithm has clustered observations based on a 76% White registration cut point. Indeed, the cluster labeled "2" contains every year where White registration is always under 76% and the cluster labeled "1" contains years where White registration is always over 76%. In the third and final analysis there is once again no obvious historic break in the results, certainly not the sharp break Dr. Morrison cites in his report. I conclude that Dr. Morrison's claims do not rely on the White registration % variable. In fact, this analysis refutes his claim of a 2004 cut point in voter registration.

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[6] In my statistical software, Stata 17, the code to run this analysis is: *cluster kmeans <variable name>, k(2)*. As noted earlier, "cluster" tells the software to perform a cluster analysis, "kmeans" directs it to use the K-means algorithm, and "k(2)" asks the software to produce two clusters.

Based on the foregoing, I conclude that *none* of the voter registration variables produce clusters that match Dr. Morrison's claims of a 2004 sharp break in the registration data. I find the opposite, in fact, as the cluster analysis groupings refute the claim of a historic break from 2004 to the present. All in all, I am unable to produce *any* cluster analysis result that matches or supports Dr. Morrison's claims of a historic change in Black political participation in 2004. Because Dr. Morrison's results cannot be replicated and are contradicted by his own data, I once again conclude that Dr. Morrison committed demonstrable errors in his analysis.

Table 2: Cluster Analysis of Registration Rates

Year	Black-White	Clusters	Black %	Clusters	White %	Clusters
1980	-13.0	2	72.2	2	85.2	2
1986	-1.4	1	75.9	1	77.3	2
1988	-6.3	1	74.2	2	80.5	2
1990	0.6	1	71.4	2	70.8	1
1992	-1.7	1	78.5	1	80.2	2
1994	-28.4	2	46.2	2	74.6	1
1996	-15.7	2	59.3	2	75.0	1
1998	-4.5	1	71.3	2	75.8	1
2000	0.5	1	73.6	2	73.1	1
2002	-2.7	1	69.4	2	72.1	1
2004	2.2	1	76.1	1	73.9	1
2006	1.2	1	72.2	2	71.0	1
2008	6.9	1	81.9	1	75.0	1
2010	-0.6	1	73.6	2	74.2	1
2012	8.4	1	90.8	1	82.4	2
2014	10.4	1	83.2	1	72.8	1
2016	2.5	1	81.3	1	78.8	2
2018	6.1	1	77.9	1	71.8	1
2020	4.2	1	83.4	1	79.2	2
2022	-2.1	1	72.2	2	74.3	1

[6] Additional Concerns

I have two remaining concerns with Dr. Morrison's cluster analysis. First, K-means cluster analysis requires a strong theoretical basis. Because the researcher must specify the number of clusters to be generated by the algorithm, it is imperative that this decision be guided by an *a priori* justification. Absent a strong theoretical foundation, the researcher is open to the charge that they selected the number of clusters that best aligns with their preferred result. I see no justification or theoretical discussion in Dr. Morrison's report for requesting only two clusters.

Second, the hypothesis test that Dr. Morrison reports in his discussion of the cluster analysis is of no value. After running his cluster analysis, Dr. Morrison says that the "test rules out the null hypothesis here with strict scientific certainty (p < 0.001)" (pg. 27, second paragraph). Notably, Dr. Morrison never says how this test was conducted or what the null hypothesis tests. According to the NCSS documentation, the apparent software used to perform the cluster analysis, it is an ANOVA test of the independent variables.[7] In essence, this test examines which variables best explain the cluster results. For example, say we ran a cluster analysis with five independent variables—the ANOVA test might reveal that only three of the five are significant predictors of the cluster results. Notably, because Dr. Morrison's cluster analysis contains just one variable, the test can *only* identify that variable as the significant one. Once again, this test has no substantive value whatsoever.

[7]   Difference of Proportions Test

Dr. Morrison's second analysis is a difference of proportions test that compares Black and White voter turnout in Mississippi over time. A difference of proportions test asks whether the frequency of some outcome is statistically different from a null hypothesis.

A one-sample difference of proportions test examines the frequency of some outcome compared to a null hypothesis specified by the researcher. For example, say we wanted to know whether a coin used by a referee is fair. We might examine this question by flipping the coin in question twenty times and then simply test whether the proportion of heads is statistically different than 50%.

A two-sample test compares the frequency of some outcome across groups, with the null hypothesis testing whether the proportions are statistically equivalent. For example, say we wanted to test the efficacy of a vaccine. We could randomly assign ten subjects to a control group that receives no vaccine and ten subjects to a treatment group that gets the vaccine. After several months we simply test whether the proportion of subjects who contracted the disease is statistically different in the treatment and control groups.

In these two examples, the outcome under examination is binary—a coin can only produce heads or tails while a vaccine either prevents a disease or it does not. Note that this is precisely how a difference of proportions test is performed; the researcher analyzes the frequency of two mutually exclusive outcomes. I was thus surprised to learn that Dr. Morrison relied upon this test given that his report focuses on numeric data with many values—Black and White voter turnout. Dr. Morrison provides few details to resolve this inconsistency. After discussing variation in Black and White turnout from 1980 to 2022, he simply writes "I rely upon a difference of proportions test (the Fisher's Exact Test)" (pg. 27).

I was able to resolve this discrepancy on my own. I successfully reproduced Dr. Morrison's analysis after some trial and error, and in the process of doing so, discovered that he collapsed the two

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[7] I obtained the NCSS online documentation for K-means cluster analysis from the following link: https://www.ncss.com/wp-content/themes/ncss/pdf/Procedures/NCSS/K-Means_Clustering.pdf.

turnout variables into a dichotomous indicator.[8] In other words, when the CPS estimates that Black turnout exceeded White turnout, Dr. Morrison codes this as a "1," and when the CPS estimates the opposite, Dr. Morrison codes this as a "0." It is easy to spot the flaw with this approach—it ignores the *size* of the purported turnout gap. For example, Dr. Morrison treats the 0.4% Black turnout advantage reported by the CPS in 2010 as equivalent to the 10.9% Black turnout advantage report by the CPS in 2012. Likewise, Dr. Morrison treats the 0.4% Black turnout advantage reported by the CPS in 2010 as the mirror opposite of the 28.2% White turnout advantage reported by the CPS in 1994 (in other words, he classifies these two years as if they are equivalent in magnitude, just in opposite directions).

I wish to reiterate my objections from Section 3, above, that the CPS data significantly overestimate Black turnout and should not be used in this manner. However, Dr. Morrison compounds this flaw by ignoring the relative size of the purported turnout gap and running his analysis on a less precise binary variable. After collapsing the turnout data, Dr. Morrison simply compares the proportions over time. In other words, he performs a two-sample test where the 1980-2002 period is one group and the 2004-2022 period is the other group. His specific analysis is Fisher's Exact Test, which is typically used with small sample sizes.

Before turning to his results, it is important to note what this analysis does *not* test—it does not test whether Black turnout is higher or lower than White turnout within either period. Rather, his test simply asks whether the 1980-2002 period has a different proportion compared to the 2004-2022 period. Given his "remarkable" finding (pg. 5) that Black voter turnout has exceeded White voter turnout from 2004 to the present, this seems like a critical omission from his analysis.

In the end Dr. Morrison's conclusions are based on the fact that between 1980-2002 there were no election years where the CPS estimated that Black turnout exceeded White turnout (the proportion is therefore 0/10). By comparison, from 2004-2022, there were nine election years where the CPS estimated that Black turnout exceeded White turnout (the proportion is therefore 9/10). Given the fact that Dr. Morrison collapses two numeric turnout variables to a less precise binary variable, and selects an arbitrary 2004 cut point to divide the sample in half, it is not surprising that the result is statistically significant.[9]

A final flaw is that Dr. Morrison's difference of proportions test ignores the margin of error in the CPS data and fails to perform any analysis to determine whether the Black and White estimates are statistically different from one another. Because CPS data come from a survey, the estimates of Black and White turnout are just that: estimates. Given the sample size and the variability in each year's survey, the margin of error gives us a range for where the true population value most likely lies (i.e. the true Black and White turnout rate each year). In my view, the omission of any analysis that takes into account the margin of error further undermines Dr. Morrison's conclusions.

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[8] I can validate that this is indeed his analysis by comparing the Pearson Chi-Square test statistic produced by my analysis to the output Dr. Morrison provides in his Appendix Figure 2. Both analyses and tests produce a statistic of 16.364.

[9] On the cut point issue, it could be argued that Dr. Morrison's difference of proportions test should be disregarded entirely given the fatal flaws with his cluster analysis. As noted in Sections 4 and 5, his claim that 2004 represents a historic break in Black political participation has no theoretical basis and his own cluster results refute this conclusion.

I reserve the right to amend or supplement my report considering additional facts, testimony and/or materials that may come to light. Pursuant to 28 U.S.C. 1746, I declare under penalty of perjury that the foregoing is true and correct according to the best of my knowledge, information, and beliefs.

Dr. Jordan Ragusa
January 29, 2024
Charleston, South Carolina

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APPENDIX A

K-Means Cluster Analysis Report

Dataset   Untitled

Minimum Iteration Section ───

Iteration No.	No. of Clusters	Percent of Variation	Bar Chart of Percent
1	2	24.58	|||||||||

Iteration Section ──

Iteration No.	No. of Clusters	Percent of Variation	Bar Chart of Percent
1	2	24.58	|||||||||
2	2	24.58	|||||||||
3	2	24.58	|||||||||

Cluster Means ───

Variables	Cluster1	Cluster2
C3	0.4368	0.6644
Count	10	10

Cluster Standard Deviations ──────────────────────────────────────

Variables	Cluster1	Cluster2
C3	0.05485091	0.07981395
Count	10	10

F-Ratio Section ──

Variables	DF1	DF2	Between Mean Square	Within Mean Square	F-Ratio	Prob Level
C3	1	18	0.2590088	0.004689444	55.23	0.000001

K-Means Cluster Analysis Report

Dataset   Untitled

Distance Section ——

Row Label	Cluster	Dist1	Dist2
1 0.595	2	1.1767	0.5162
2 0.402	1	0.2588	1.9518
3 0.603	2	1.2362	0.4567
4 0.325	1	0.8316	2.5245
5 0.619	2	1.3552	0.3377
6 0.417	1	0.1473	1.8402
7 0.488	1	0.3808	1.3121
8 0.404	1	0.2440	1.9369
9 0.584	2	1.0949	0.5980
10 0.41	1	0.1993	1.8923
11 0.666	2	1.7048	0.0119
12 0.505	1	0.5073	1.1856
13 0.731	2	2.1883	0.4954
14 0.481	1	0.3288	1.3642
15 0.827	2	2.9024	1.2094
16 0.466	1	0.2172	1.4757
17 0.692	2	1.8982	0.2053
18 0.598	2	1.1990	0.4939
19 0.729	2	2.1734	0.4805
20 0.47	1	0.2469	1.4460

Distance Section for Cluster 1 ————————————————————————————————————

Row Label	Cluster	Dist1	Dist2
2 0.402	1	0.2588	1.9518
4 0.325	1	0.8316	2.5245
6 0.417	1	0.1473	1.8402
7 0.488	1	0.3808	1.3121
8 0.404	1	0.2440	1.9369
10 0.41	1	0.1993	1.8923
12 0.505	1	0.5073	1.1856
14 0.481	1	0.3288	1.3642
16 0.466	1	0.2172	1.4757
20 0.47	1	0.2469	1.4460

Count = 10

K-Means Cluster Analysis Report

Dataset   Untitled

Distance Section for Cluster 2

Row Label	Cluster	Dist1	Dist2
1 0.595	2	1.1767	0.5162
3 0.603	2	1.2362	0.4567
5 0.619	2	1.3552	0.3377
9 0.584	2	1.0949	0.5980
11 0.666	2	1.7048	0.0119
13 0.731	2	2.1883	0.4954
15 0.827	2	2.9024	1.2094
17 0.692	2	1.8982	0.2053
18 0.598	2	1.1990	0.4939
19 0.729	2	2.1734	0.4805
Count = 10			

Plots

Plot of C3 vs C3 by Cluster
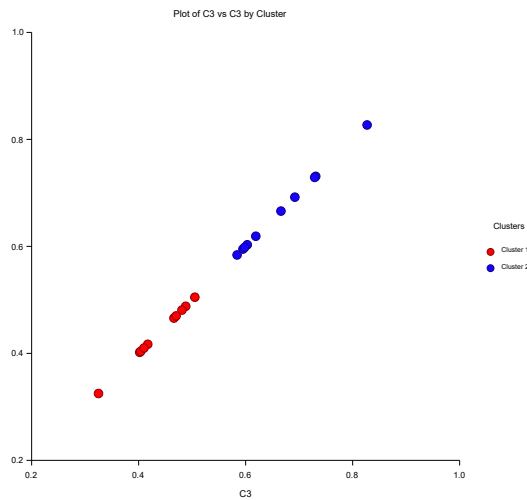
K-Means Cluster Analysis Report

Dataset   Untitled

Procedure Input Settings ——
Autosave Inactive

Variables Tab
-- Variables ---
Cluster Variables: c3
Label Variable: C3

-- Cluster Options ---
Minimum Clusters: 2
Maximum Clusters: 2
Reported Clusters: <Empty>

-- Other Options ---
Random Starts: 3
Max Iterations: 25
Percent Missing: 50

Reports Tab
-- Select Reports --
Minimum Iteration Report   Checked
Iteration Report   Checked
Cluster Means Report   Checked
Cluster Standard Deviations Report   Checked
F-Ratio Report   Checked
Distance Report   Checked
Distance by Cluster Report   Checked

-- Report Options --
Precision: Single
Column Names: Names

Plots Tab
-- Bivariate Plot Format ---
Bivariate Plots   Checked
Show Row Numbers   Unchecked
Show Row Labels   Unchecked

Storage Tab
-- Storage Variable --
Store Cluster ID in Variable: <Empty>