REDISTRICTING RULES AND RACE

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Abstract

We the explore the extent to which traditional redistricting principles—contiguity, communities of interest, political subdivisions, incumbent protection, Section 5 of the Voting Rights Act, preservation of district core, and compactness—affect the racial composition of congressional districts. Of these, only the principles which mandate preservation of the core elements of the districts and compactness have a statistically significant effect on the change in the average percent black for states which engaged in redistricting following the 2000 Census. Both of these redistricting rules reduce the average percentage black across the states, but the effect of compactness is highly contingent upon the level of racial segregation in a state. When the distribution of African-Americans is highly concentrated, a compactness rule increases the average percentage of blacks in state congressional districts by about three percentage points. Simulations based on these findings show that no state would increase its average percentage black if it were redrawing districts under a compactness rule and low levels of segregation. In sharp contrast, thirty out of the forty-three states we considered would have had congressional districts with a higher average level of black composition if they had redrawn their boundaries while operating under a compactness rule and high levels of black segregation. While the overall effects are modest, typically just fractions of a percentage point, even small changes can overturn victories in close elections. Our findings illustrate that the impact of an ostensibly race neutral standard like the compactness principle can have dramatically different effects on the racial composition of congressional districts depending on the distribution of blacks within a state.

The controversial practice of creating majority-minority election districts has led to a fierce debate over whether this policy benefits blacks. Critics assert that packing African-Americans into a small number of legislative districts increases the conservatism of surrounding areas (e.g., Bullock 1995; Cameron, Epstein, and O'Halloran 1996; Lublin 1997; Swain 1995). According to this view, African-Americans would benefit more from the creation of "minority influence districts" (Lublin 1997)—districts where blacks constitute the swing vote that is crucial to a candidate's victory. Supporters of racial redistricting either downplay the unintended consequences of packing (e.g., Engstrom 1995; Grofman and Handley 1998; Petrocik and Desposato 1998) or champion the descriptive representation that typically accompanies majority-minority districts (e.g., Davidson 1992).

Obscured in this debate is the fact that line drawers often are constrained by a number of rules that govern the redistricting process in their respective states. Indeed, if the principle of population equality changed the face of legislative redistricting in the 1960s (e.g., *Baker v. Carr* 1962, *Wesberry v. Sanders* 1964, *Reynolds v. Sims* 1964), a new set of principles is transforming redistricting today (Altman 1998a; Cannon 1999). Recent court decisions (e.g., *Shaw v. Reno* 1993, *Miller v. Johnson* 1995) have elevated the place of "traditional districting practices" such as compactness, contiguity, and the preservation of communities of interest, and at the same time questioned the constitutionality of using race as the "predominant factor" in drawing districts. In a decision that appeared to confer special status upon compactness, the majority in *Bush v. Vera* (1996) stated that a "reasonably compact district" may pass strict scrutiny without having to defeat rival plans. Thus, the shift in the tenor of court rulings since *Baker v. Carr* suggests that mapmakers have a strong incentive to comply with the redistricting requirements of their state.

And yet, some challenge the notion that standards such as compactness are in fact neutral. Using sophisticated computer simulations, Altman (1998b) shows that the impact of compactness depends on upon the distribution of minority voters. In a state with a compactness standard, racial minorities become a majority of the district's voters only if they are both numerous and concentrated. When there is a compactness standard and minorities are not sufficiently concentrated, their percentages in any given district will be low. Indeed, the percentage of minorities in a district may not reach appreciable levels unless line drawers go to extreme lengths to connect clusters in non-compact districts. In an earlier critique of compactness standards, Lowenstein and Steinberg (1985) argue that such requirements are biased in favor of Republicans because of the way political strength is distributed in the United States (e.g., high concentrations of African-American voters that get packed into a small number of inner city districts).

While Lowenstein and Steinberg's (1985) anecdotal characterization may be accurate for some urban areas, the impact of compactness standards on the percentage of African-American voters in districts throughout the country remains an empirical question. We investigate this question using demographic and migration data for U.S. congressional districts after the most recent round of redistricting. In doing so, we find support for Altman's (1998b) assertion that population geography matters. States with a compactness standard experienced a decrease in the average level of African-Americans across their congressional districts after the 2000 redistricting. In states with an unequal distribution of blacks, the presence of a compactness requirement resulted in an increase in the average level of African-Americans across congressional districts. Empirically, the overwhelming majority of states with compactness

standards also have high levels of racial segregation, suggesting *contra* Lowenstein and Steinberg that a compactness rule may not adversely affect African-Americans.

The rest of the paper proceeds as follows. In the next section, we discuss the redistricting process for congressional districts in the forty three states that were involved in the process after the 2000 Census. We discuss our data and methods in the third section and present the results of a regression analysis in the fourth. In the fifth and final section, we discuss the implications of our findings.

Redistricting in the United States

Because redistricting is a matter that has been left to state legislatures (Butler and Cain 1992), the precise mix of principles guiding the process varies widely. Observers of the redistricting process at the congressional level have found seven principles to be particularly important.

- The principle of *contiguity* mandates that a district be in one piece. A district is considered contiguous if all parts of the district touch one another at more than one point.
- Mapmakers often strike to preserve *communities of interest*, or groups of people united by common social, political, economic, or ethnic similarities. The courts have discarded some plans on the grounds that they disregard communities of interest.
- District lines should be drawn in ways that adhere to existing *political subdivisions*, such as city or county lines or local, state and federal districts.
- *Incumbent protection* refers to the practice of drawing lines in such a way that most incumbents are relatively safe (or that very few districts are "in play").

- *Section 5 of the Voting Rights Act of 1965* requires that certain areas of the country ("covered jurisdictions") to obtain pre-clearance from the U.S. Attorney General or the U.S. District Court for the District of Columbia for any changes with reference to voting, including redistricting plans.[1] The Justice Department or court must review the plans in order to prevent the dilution of minority voting strength.
- *Preservation of district core* mandates that boundaries be drawn in a way that preserves the core of existing districts. This practice is thought to maintain voter continuity and minimize voter confusion.
- *Compactness* refers to extent to which a district's geography is dispersed around its center. Districts that extend far from the center of the district may indicate that line drawers have engaged in racial or partisan gerrymandering.

Table 1 presents the requirements of the forty-three states that underwent redistricting after the 2000 Census.[2]

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[1] Some states (e.g., Alabama) are entirely subject to pre-clearance. In others (e.g., California), certain sections of the state must obtain pre-clearance.

[2] We compiled Table 1 using data from websites of the National Committee for an Effective Congress (NCEC) (www.ncec.org) and the Center for Voting and Democracy (CVD) (www.fairvote.org). The CVD reported whether a state "required," "prohibited," or "allowed" a requirement. We considered a standard operational only if a state required its use. As it turns out, very few states merely allowed a rule. Seven states (Alaska, Delaware, North Dakota, South Dakota, Vermont, Wyoming, and Montana) consist of a single at-large district so they are excluded from the analysis.

Table 1 about here.

There is considerable variation in the extent to which a state adopts one or more of these guidelines. Only a single state, South Carolina, is governed by all seven redistricting standards, and just one other, Alabama, is governed by six. The overwhelming majority of states that participate in redistricting adhere to at least one of the seven standards (29), although a sizeable number (14) do not have any formal guidelines. No single characteristic links the cases in this latter category, as it includes states both big (Pennsylvania) and small (Rhode Island), states with regular boundaries (Colorado) and irregular boundaries (Michigan), and states in all four regions of the country. Although this matter need not detain us now, explaining the adoption of particular standards clearly is an area that is ripe for research.

More important for our purposes, the state level variation in Table 1 provides an ideal opportunity to evaluate the argument that the impact of compactness depends upon on the distribution of African-Americans in a state. With the exception of the slight under-representation of the northeast, there is healthy variation among the 18 states that adhere to a compactness rule. The list includes states that lean Democratic (Maryland, Washington) as well as states that vote Republican (Utah, Idaho). Most significantly, there are likely to be differences in the distribution of blacks across these 18 states—consider, for example, the comparison between South Carolina and Nevada, or Mississippi and Nebraska. In short, the combination of real world variation in compactness requirements and racial segregation permit us to build upon Altman (1998b) and subject Lowenstein and Steinberg's (1985) argument to an empirical test. It is to our data and methods that we now turn.

Data and Methods

The nature of the reapportionment process, which adds and subtracts congressional districts from states, complicates our task in an unusual way. While it would seem natural to analyze data on the percentage of African-Americans at the district level, nearly half of the states that engaged in redistricting gained or lost seats. Given that both the shape and number of congressional districts change in the course of redistricting, it is difficult to compare districts over time. Thus, our analysis examines the change in the average percentage of African-Americans in state congressional districts after the redistricting which followed the 2000 Census. Our dependent variable—the change in the percentage of African-Americans—is a statewide average.[3] This measure obviously masks a tremendous amount of variation that occurs at the level of congressional district. However, it is the workings of the redistricting process itself that prevent us from conducting our analysis at the district level. Fortunately, collecting data on our independent variables posed very few difficulties.

Determining whether a particular redistricting standard was operating in a state was relatively straightforward. As a general rule, states either require compliance with a rule or they do not, permitting the creation of a series of dichotomous variables (1= rule required). This series of variables will permit us to test the argument that cross-sectional variation in the

[3] Unless otherwise noted, we obtained data from the CVD and the NCEC. There were six states for which NCEC and CVD did not have demographic data. In those cases, we obtained the pre-redistricting demographic data from the 1990 U.S. Census and post-redistricting demographic data from state legislative research assistants, individuals involved in the redistricting process, or state librarians.

adoption of compactness standards has an impact on the change in the average percentage of blacks in state congressional districts.

In order to test the argument that the effect of compactness is contingent upon the distribution of African-Americans, we created a measure of racial segregation for each state. Using county population figures archived at the University of Michigan's Population Studies Center, we calculated the Index of Dissimilarity (ID) for each state.[4] The closer the ID is to 1, the more segregated African-Americans are in a state. In our data, the ID runs from a minimum of 0.33 (South Carolina) to a maximum of 0.93 (Nebraska). Altman's (1998b) argument suggests that the coefficients on the compactness variable and the interaction between compactness and racial segregation will be significant and signed in opposite directions. If the coefficients are significant but there is no difference in sign, the impact of compactness is uniform across states with and without the requirement.

In addition to the presence or absence of a compactness rule, differences in the average percentage of blacks in state congressional districts might be the result of migration. To control for this possibility, we collected data on African-American migration that took place across states during the time period of our study. We obtained these data from the 1990 and 2000 U.S. Census, calculating the change in percent black for each state.

Finally, we included a variable that denotes the number seats won or lost by a state. Although a majority of our cases did not experience a seat change, several lost or gained as many as two seats. The likelihood that this process would have an effect on the average percentage of blacks in a district was great, so we included a term for it in the model.

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[4] According to Harrison and Weinberg (1992), the ID is the most widely used measure of spatial distribution. See the Appendix for more information on calculating the ID.

Empirical Results

In this section we report the results of an ordinary least squares regression. Our model analyzes the effect of redistricting rules, migration, and demographic variables on the change in average percent black in state congressional districts.[5] We considered seven traditional redistricting principles: contiguity, preservation of communities of interest, respect for political subdivisions, incumbent protection, pre-clearance requirements from Section 5 of the Voting Rights Act, preservation of district core, and compactness. According to the findings reported in Table 2, only two of the seven principles, *preservation of district core* and *compactness*, have statistically significant effects. The coefficients on both of these terms are negative and significant at the $p <. 05$ level, indicating that each rule reduces the average percentage black. In particular, congressional redistricting in states which are required to preserve the essential elements of each districts reduced the average percentage of African-Americans in their districts by about a half percent. States with a compactness rule had almost one and a half percent fewer blacks as the -1.46 coefficient indicates.

Table 2 about here.

These effects may not appear large, but it is important to remember that the range on our dependent variable is quite limited. That is, the average percentage of blacks in state

[5] Consistent with Table 1, we restrict our attention to the 43 states that engaged in redistricting. We tried running the models in this section with all 50 states and a dummy variable denoting whether the state was involved in redistricting. Our substantive findings did not change.

congressional districts did not increase or decrease dramatically after the 2000 redistricting cycle. Of states with two or more congressional districts, the largest reduction in average percent black was only 1.73 while the largest gain was only about a third of a percentage point (0.34). Thus while small in an absolute sense, the estimated effects of core preservation and compactness are larger than the average change across all 43 states which engaged in redistricting (-0.39).

Several of the geographic and demographic variables listed in Table 2 also affect these statewide averages. The coefficient on *black segregation* indicates that states with geographically concentrated populations of African-Americans experience approximately a 1.5% reduction in their average district-level proportion black for each unit increase in dissimilarity. However, this effect interacts with the compactness principle. Consistent with the predictions of Altman's (1998b) computer simulations, the effect of compactness is contingent upon the geographic distribution of blacks. When the distribution of African-Americans is highly concentrated, a compactness rule increases the average percentage of blacks in state congressional districts. Indeed, for each unit change in the *black dispersion X compactness* variable, the dependent variable increases by almost 3 percentage points.

What is even more striking about this last finding is that the model controls for black migration into and out of the states. The direction of the effect for black migration was somewhat of a surprise, however. As Table 2 reveals, black migration to a state depressed the average percentage black. On its face this result seems counterintuitive. All else held constant, one might suspect that increased black migration to a state would increase the average proportion black in state congressional districts. Empirically, however, this was not the case as the -0.44 ($p < .05$) coefficient on the *black migration* term shows that states with net black inflow ended up

with a reduced average percent black in their congressional districts.[6] A negative effect for black migration may be possible if the overall level of migration into a state swamps the increase in African-Americans.[7]

The findings in Table 2 were robust to alternative specifications. In analyses not reported here, we included terms for the number of congressional districts in a state as well as regional dummy variables to control for spatial autocorrelation. None of these variables had statistically significant effects, nor did they alter the sign or significance of the variables in the original version of model.

While the utility of R-squared measure is contested (King 1986), readers who track these statistics will note that our model accounts for over sixty percent of the variance according to the 0.62 R-squared measure. Even correcting for the number of independent variables our model explains almost half of the variance if we use the more conservative adjusted R-squared statistic.

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[6] There is a negative correlation -0.55 ($p < .001$) between change in black statewide population and our dependent variable. Three of the states with some of the largest gains in their black populations–Florida (about +1%), Georgia (about +2%) and Maryland (about +3%)–have some of the largest district average changes, -1.0%, -1.5%, and -1.7% respectively. Conversely, of the nine states with the largest reductions in black population, all nine have slightly negative changes in average portion black but their changes are much smaller than the states with big increases in black population.

[7] Of course if the population gain (or loss) were large enough the state would gain (or lose) a congressional seat. We have a variable in the model to account for gain or loss of congressional districts.

More importantly in our opinion, the root mean squared error of this model is small compared to others we tried, providing a rationale for adopting this model over alternative specifications.

Violations of the assumptions of regression are a serious concern, especially with a data set of only forty-three observations, so we performed several diagnostic tests. We found no evidence of omitted variables from Ramsey's (1969) test. Similarly, there was no evidence of heteroskedasticity using Cook and Weisberg's (1983) test. The variance inflation factor (Chatterjee, Hadi, and Price 2000) indicates multicollinearity is only an issue for our *compactness* and black *segregation X compactness* interaction. However, we expect these two variables to be related since one is a function of the other. The presence of multicollinearity does not trouble us here because the multicollinearity should make our tests for these coefficients more conservative (i.e. less likely to reject null hypothesis). There was some evidence of outliers and influential cases judging from graphical inspections. When we re-ran our analysis without the five most egregious and influential outliers (Oregon, Tennessee, Missouri, South Carolina, and Nevada) our substantive findings did not change except for the *preservation of district core* term which became insignificant. When we omit influential outliers, the fit of the model improved considerably.[8]

To gain some perspective on the findings from Table 2, we plotted the expected values of the change in the average percent black for a number of states with a compactness rule.

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[8] The coefficients and standard errors (in parentheses) of the significant variables for the model without these cases are as follows: *compactness* = -1.98 (0.57), *black segregation* = -1.34 (0.51), *black segregation X compactness* = 3.75 (0.85), and *black migration* = -0.41 (0.08). The R-squared = 0.76, adjusted R-squared = 0.65, and the Root MSE = 0.29.

Figure 1 about here.

Despite the court's characterization of compactness as an objective standard, its impact can vary widely, depending on patterns of racial segregation. For a state that adopts the modal level of redistricting rules and takes on the average values of our other independent variables—including racial segregation—a compactness rule results in a 0.4 decrease in the average percentage of African-Americans across congressional districts. For states like Mississippi or South Carolina, where levels of racial segregation are relatively low, a compactness rule generates nearly 0.7 and 0.6 reductions, respectively, in the average percentage of African-Americans. In states like Utah and Nebraska, where blacks are concentrated in certain parts of the state, the average change in the percentage of African-Americans increased by 0.2 and 0.3 points, respectively.

Figures 2a and 2b plot the expected values and their standard errors of all our cases under the hypothetical scenario in which each state undergoes redistricting with a compactness rule.[9] In Figure 2a, the states were assigned the sample minimum on the *black segregation* variable (0.33). That is to say, we assumed that there was a relatively even distribution of African Americans throughout the state. In Figure 2b, the 43 states were assigned the sample maximum on the *black segregation* variable (0.93). In both cases, the black dashes represent the change in the average percent black in state congressional districts (with 95% confidence intervals denoted by the small box around each dash).

[9] We used the *Clarify* computer software routine in Stata 7.0 to compute the expected values (King, Tomz, and Wittenberg 2000). The standard errors were derived by taking the square root of the standard deviation divided by 1000, which was the number of simulated parameters generated by *Clarify*.

Figures 2a and 2b about here.

The comparison between these two figures is important. In the first hypothetical simulation, all states experience a decrease in the average percentage of blacks in state congressional districts. In other words, all 43 states depicted in Figure 2a are expected to have congressional districts that are on average "less black" if these states were to redraw their congressional district lines under a compactness rule and take on the lowest level of segregation we observed in our sample. By contrast, 30 out of 43 states in Figure 2b (Ohio through Hawaii) would increase their percent black. Of course, the precise amount of the change in either case is contingent upon the other factors we included in our model—the other redistricting rules adopted by a state, black migration, and the change in the number of districts—which were left at the actual values for each of the states.

These figures show that the presence or absence of a compactness requirement leads to important differences in the composition of congressional districts. Specifically, the overall average percentage black depends on levels of geographic concentration and whether states adopt a compactness rule. The absolute size of these effects may seem small, typically 1 to 2 percentage points at best, but even tiny changes in district composition can have important political effects. For example, in the 2000 congressional elections, an increase of less than one-tenth of one percentage point in the percentage of black constituents in would have elected three

Democrats instead of three Republicans, leaving the Republicans with a single seat majority instead of the 221 seats they held after the 2000 election.[10]

Despite what we think are some surprisingly strong findings, we would be remiss if we did not acknowledge the weaknesses of this study. In the first place, we relied heavily upon the data collected by civic and interest groups (the National Committee for an Effective Congress and the Center for Voting and Democracy). The fact that these groups monitor the redistricting process in the United States leads us to have faith in the information they provide, however, we hope to validate a small sample of the data.[11]

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[10] This hypothetical situation assumes an increase in black constituents by only 0.10%, which is the average increase of all the states in Figure 2b. It also makes an assumption that blacks vote disproportionately for Democrats. Based upon data from the 2000 National Election Studies survey, blacks voted for Democratic House candidates over Republicans by a 91.5% to 8.5% margin. If we take the 0.10% average increase in black constituents and assume that 91.5% of them would have voted for the Democratic candidate, then three elections all decided by 650 votes or fewer would have tipped to the Democrats (Florida's 20th District, Michigan's 8th District, and Minnesota's 2nd District). This conclusion holds even if we assume less than perfect turnout.

[11] For now, we compared the CVD figures for all 43 states with publicly available data produced by Minnesota State Legislature (http://www.senate.leg.state.mn.us/departments/ scr/redist/redprof/profiles.htm). This comparison revealed three clear discrepancies on the Voting Rights Act requirement. Re-running our analyses with the Minnesota data does not change our results.

The fact that states may choose different ways to implement standards such as compactness also gives us pause. According to some estimates, there are over 20 unique measures of compactness (Niemi et al. 1990) and more will surely be developed (e.g., Enstrom and Alford 2002). And yet, our analysis only considers the requirement, not the manner in which—or even *whether*—it was implemented. If both parties agree not to follow a guideline and the plan is not challenged in the courts, it is possible to evade redistricting rules. This sort of chicanery is unlikely when it comes to obtaining pre-clearance with Section 5 of the Voting Rights Act, however, we have no sense of how many states actually comply with the other formal guidelines. Nevertheless, given the importance recent Supreme Court rulings have placed on "traditional redistricting requirements" such as compactness, the time for an empirical examination of their effects is long overdue.

Conclusion

According to many scholars, compactness standards permit an objective assessment of district boundaries (e.g., Engstrom and Alford 2002; Pildes and Niemi 1993). McDonald (1996) argues that compactness standards, especially in conjunction with contiguity requirements, are an important safeguard in a system where the line-drawers are government officials (also see Stern 1974; Wells 1982; Polsby and Popper 1991). Recent court rulings suggest that compact districts are a sort of gold standard in the messy world of mapmaking.

We examined the impact of compactness rules on the change in the average percentage of blacks in state congressional districts in the 43 states that underwent redistricting after the 2000 Census. After controlling for the number of seats lost or gained and migration into and out of a state, we found that the impact of compactness is not uniform. In states with a relatively even

distribution of African-Americans, compactness standards led to a decrease in the average percent black. States with highly concentrated black populations experienced an increase in the average percent black. This pattern runs contrary to the one imagined by Lowenstein and Steinberg who charge that the combination of urban ghettos and compactness requirements amount to a Republican "Trojan Horse." At the same time, our findings illustrates that the impact of an ostensibly race neutral standard can have dramatically different effects depending on the distribution of blacks within a state.

Appendix

The Index of Dissimilarity is the summation of vertical deviations between the Lorenz curve and the line of perfect equality. The closer the ID is to 1, the more dissimilar the distribution is to the line of perfect equality.

The formula for creating the ID is:

$$ID = .5\sum_{i=1}^{N} | X_i - Y_i |$$

Consider the following example from the state of New Hampshire:

County	Total	Black	% Black of County (Y)	% Black if equal distribution (X)	|X-Y|
Belknap	56325	151	0.02	0.10	0.08
Carroll	43666	69	0.01	0.10	0.09
Cheshire	73825	250	0.03	0.10	0.07
Coos	33111	36	0.00	0.10	0.10
Grafton	81743	419	0.05	0.10	0.05
Hillsborough	380841	4493	0.54	0.10	0.44
Merrimack	136225	688	0.08	0.10	0.02
Rockingham	277359	1497	0.18	0.10	0.08
Strafford	112233	658	0.08	0.10	0.02
Sullivan	40458	93	0.01	0.10	0.09
					1.03

Index of Dissimilarity = (1.03*.5) = .52

In this example there is an unequal distribution of African-Americans with Hillsborough County accounting for 54% of the state's blacks. As result, the index of dissimilarity is a moderately high .52.

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Table 1. Redistricting Requirements in the United States

State	Contiguity	Communities of Interest	Political Subdivisions	Protect Incumbents	VRA §5	District Core	Compactness
AL	X	X	X		X	X	X
AZ	X				X		X
AR			X	X		X	
CA	X				X		
CO							
CT							
FL				X	X		
GA	X		X	X	X	X	
HI					X		
ID	X	X	X				X
IL							
IN							
IA	X		X	X			X
KS	X	X	X			X	X
KY		X	X			X	X
LA					X		
ME							
MD	X	X	X			X	X
MA							
MI							
MN	X	X	X				X
MS	X		X		X		X
MO	X	X	X			X	X
NE	X	X	X				X
NV			X		X		X
NH	X		X				X
NJ					X		
NM							
NY					X		
NC	X		X	X	X	X	
OH							
OK							
OR	X	X	X	X	X		
PA							
RI							
SC	X	X	X	X	X	X	X
TN							
TX					X		
UT	X	X	X				X
VA	X						X
WA	X		X				X
WV	X		X				X
WI							
Total	20	11	20	7	15	9	18

Note: A "X" means that the state is governed by a requirement. Information was obtained from the webpages of the Center for Voting and Democracy and the National Committee for an Effective Congress.

Table 2. Regression Analysis of Changes in Average Black Congressional District Composition

	Coefficient	T-ratio
Contiguity	-0.05	-0.26
	(0.20)	
Communities of interest	0.20	1.09
	(0.20)	
Political subdivisions	-0.10	0.69
	(0.26)	
Incumbent protection	0.09	0.37
	(0.23)	
Voting Rights Act §5	-0.01	-0.06
	(0.15)	
Preservation of district core	-0.53	-2.65 *
	(0.20)	
Compactness	-1.46	-2.45 *
	(0.60)	
Black segregation	-1.44	-2.30 *
	(0.63)	
Black segregation X compactness	2.65	3.04 **
	(0.87)	
Black migration to state	-0.44	-4.96 **
	(0.09)	
Change in number of districts	-0.07	-0.84
	(0.08)	
Constant	0.72	1.62
	(0.45)	
R-squared	0.62	
Adj. R-squared	0.48	
Root MSE	0.37	
N	43	

Note : The dependent variable is the statewide change in the average percent black for the states which engaged in redistricting at the congressional level after the 2000 Census. The standard errors are in parentheses. See text for variable coding.
** $p < .01$; * $p < .05$ (two-tailed).

Figure 1. Estimated Change in Percent Black for States with Compactness Rule and Varying Levels of Segregation

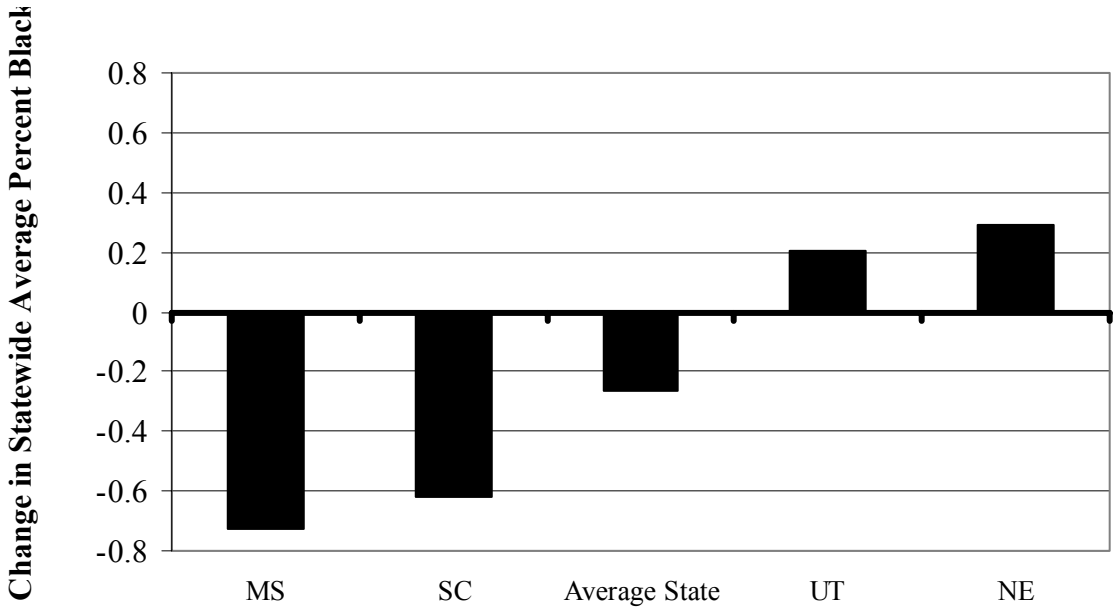

Figure 2a. Hypothetical Changes in Percent Black under Conditions of Low Segregation and a Compactness Rule

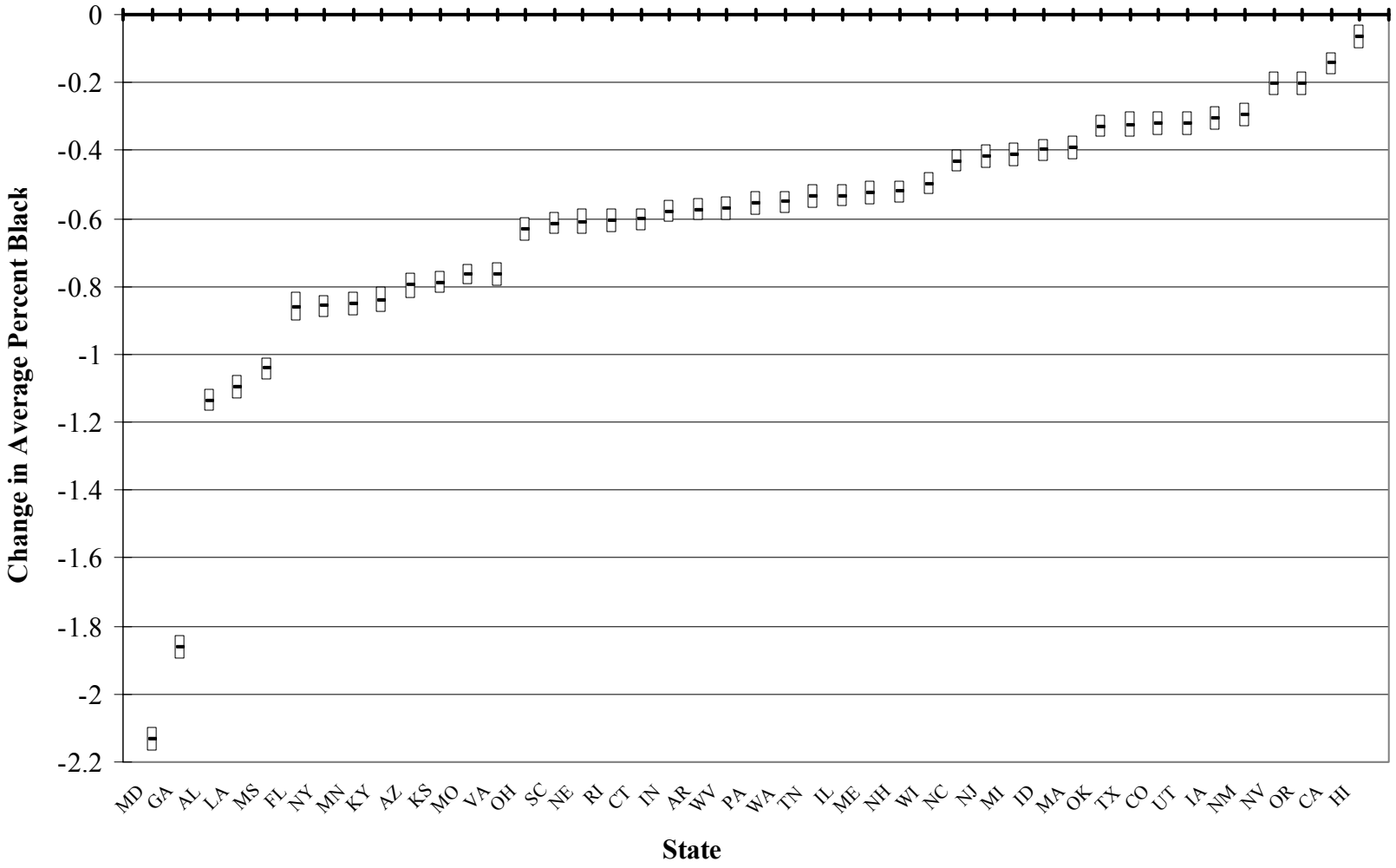

Figure 2b. Hypothetical Changes in Percent Black under Conditions of High Segregation and a Compactness Rule