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Local Lines: A Simulation Analysis of Majority-Minority Districts in U.S. City Councils

Cities offer a unique context for the study of redistricting because the national partisan divide is often less relevant and because most U.S. cities feature large minority populations. The latter characteristic is important because minorities regularly lobby for majority-minority districts in their cities. Despite their perception as an important tool for minority empowerment, it is unclear what conditions facilitate the creation of majority-minority districts. In this paper, we have taken geospatial data of over 100 city council district maps, merged them with census demographic information, and used an MCMC-based redistricting simulator to draw a representative sample of the underlying distribution of plausible maps within each city. We demonstrate that when majority-minority districts are viable, cities tend to implement more of them than are drawn in the average race-neutral simulation. This is true of both Black-majority and Latine-majority districts. We also find that citizenship and segregation rates are fundamental determinants of the number of Latine-majority and Black-majority districts than can be drawn, as well as the number implemented.

Introduction

City council redistricting is a major focus of local interest groups during each decennial cycle. These cycles often produce political battles and scandals that are regularly the subject of local news stories, and sometimes significant litigation. In 2022 alone, cities across the country experienced redistricting controversy, from some of the largest like Los Angeles and Houston to medium-sized cities like Buffalo and Chattanooga.[1] [2] [3] During the redistricting process, interest groups lobby extensively for their desired outcomes. In addition to organizing protests, they also attend open meetings at council or commission meetings and decry developments they see as unjust or simply counterproductive to their political agenda (Cain and Hopkins 2002). If the council or appointed commission puts forth a map seen as unfair, leaders of neighborhood organizations, minority associations, and even ordinary residents, respond with litigation—sometimes resulting in court orders to restart the redrawing process altogether.

Political scientists, on the other hand, have paid relatively little attention to local redistricting. While many case studies of single city redistricting processes exist, inter-city analyses are few and far between. The few works that do exist offer key insights. Behr (2004) found that cities tend to adopt many fewer majority-minority districts than what was algebraically feasible. Behr also found differential rates of majority-minority adoption: cities in which segregation rates were higher adopted more majority-minority districts, and cities tended to adopt more majority-Black districts than majority-Latine districts. More recently, Hankinson and Magazinnik (forthcoming) leveraged the California Voting Rights Act (CVRA) to analyze cities that switched from at-large elections to district representation in California. They found that cities generally maximize the number of Latine-majority districts when possible. They also found that the optimal Latine proportion for achieving minimal descriptive representation in majority-minority districts is well over 50%.

While foundational, these initial findings leave some unanswered questions. Do cities continue to implement more Black-majority districts than Latine-majority districts? To what extent were these results specific to California or specific to a clean-slate switch to districts, rather than a decennial redistricting process? And what roles do segregation and citizenship play in district viability and implementation? In order to resolve these lingering questions, we applied an redistricting simulation algorithm to over 100 cities across the U.S. We found that across the U.S., cities tend to implement majority-minority districts when viable for both Black and Latine-majority districts. The minority concentration of these districts is about equal, at roughly 65%. Finally, we demonstrate that citizenship rates are a major determinant in the number of majority-minority districts that are viable, and that segregation is not only important for viability, but also for implementation.

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[1] Ura, A. (2022, December 5). *Houston's at-large City Council districts deprive Latinos of fair representation, lawsuit alleges*. The Texas Tribune. https://www.texastribune.org/2022/12/05/houston-city-council-elections-lawsuit/

[2] *Lawsuit questioning Chattanooga redistricting process to continue | Chattanooga Times Free Press*. (2023, February 27). https://www.timesfreepress.com/news/2023/feb/27/subtext-lawsuit-questioning-chattanooga/

[3] Williams, D. (2022, December 18). *Court fight over Buffalo's redistricting draws sharp exchanges from rival experts*. Buffalo News. https://buffalonews.com/news/local/court-fight-over-buffalos-redistricting-draws-sharp-exchanges-from-rival-experts/article_58dc7c5e-77e3-11ed-a820-2bcb00de7c5d.html

Racial Redistricting and Majority-Minority Districts

In addition to partisanship, much of the existing redistricting literature has centered on racial bias at the state and federal levels. This was a direct consequence of the Supreme Court's unanimous decision in *Thornburg v. Gingles (1986)*[4], and the standardization of the *Gingles Test*, which created a legal framework for assessing claims under Section 2 of the VRA. Under the *Gingles test*, plaintiffs can make claims of disenfranchisement if they can demonstrate that a minority group is: (1) sufficiently large and compact to form a majority-minority district, (2) that it is politically cohesive, and (3) that the majority votes in a bloc such that it would normally defeat the minority group's preferred candidate.

Majority-minority districts proliferated under this framework, leading scholars to debate their desirability and efficacy. Specifically, scholars argued whether they produced a tradeoff between increased descriptive representation and decreased substantive representation (Cameron et al. 1996; Lublin 1999; Lublin and Voss 2000). For example, Epstein and O'Halloran (1999) argued that such a tradeoff does exist and found that Black descriptive representation was optimized by the creation of districts with roughly 45% Black VAP (voting-age population). The debate over the efficacy of majority-minority districts in advancing minority interests in state and federal legislatures continues to this day. On the one hand, some scholars continue to argue that majority-minority districts are detrimental to minority policy interests (e.g., Canon 2022), but others point to benefits outside of policy outcomes. For example, Gay (2002) found that constituents were more likely to engage with co-racial representatives, and Pantoja and Segura (2003) found a link between co-ethnic representation at the state and federal level decreased feelings of political alienation among Latine constituents. Similarly, Barreto et al. (2004) found that co-ethnic representation in Congress led to higher voter turnout among Latine constituents, while Fraga (2016) found that co-racial representation in Congress led to higher turnout among voters, but co-ethnic representation did not lead to higher turnout among Latine voters.

Local Redistricting

The attention that interest groups and individual activists and at least some city councilmembers pay to this process suggests that these actors believe that local redistricting is a high-stakes process. One of the main reasons behind the significance attributed to the results of the process is the belief that majority-minority districts are necessary to empower the political power of minority residents in cities. The key benefit attributed to majority-minority districts is the ability for a minority group to select their ideal candidate.

Scholars have also studied racial representation at the local level, but this work has largely revolved around comparing outcomes between single-member district and at-large councils. Across several decades, the literature has reached a broad consensus that districts benefit minorities relative to at-large systems (e.g., Mundt and Helig 1982; Bullock and Macmanus 1990; Leal et al. 2004). Trounstine and Valdini (2008) added nuance to this consensus by emphasizing that the benefits of district representation only apply when a minority group is large and highly concentrated within a city. More recently, scholars have leveraged the California Voting Rights Act (CVRA), which made it easier for residents to sue their city and

[4] 478 US 30 (1986)

demand district-based representation. These analyses were able to directly compare descriptive representation before and after the implementation of districts, and found clear evidence that districts increase Latine descriptive representation (Collingwood and Long 2019; Abbott and Magazinnik 2020).

However, to date there has been very little attention paid to the redistricting process itself, and what maps cities implement relative to the range of viable alternatives. This is concerning because, relative to even the most gerrymandered federal congressional districts, city council districts can be significantly more homogenous as they are smaller and more densely populated than their congressional counterparts. Perhaps this relative neglect is due to the perception that political polarization and party membership is simply less relevant in urban contexts. After all, U.S. cities tend to be overwhelmingly inhabited by Democrats, and many cities are governed by nonpartisan offices. In this context of limited partisan competition, race has been argued to be "the dominant factor in the local electoral arena" (Hajnal and Trounstine 2014). Because redistricting literally defines the local electoral arena, then race also should be a major determinant of redistricting decisions as well.

High levels of ethnic-racial and class segregation are characteristic of virtually all large U.S. cities with white, Black, and Latine residents consistently living in distinct neighborhoods (Lichter et al. 2015). These factors provide a unique opportunity for mapmakers at the local level to create electoral districts with highly specific demographics within homogenous "communities of interest" (Grofman and Handley 1989). This is because densely packed and politically cohesive neighborhoods are the ideal targets for mapmakers to either empower minority groups by creating majority-minority districts, or to disempower them by creating super majority-districts or "cracking" minority residents into as many districts as possible in order to dilute their overall influence on city politics. Thus, the highly segregated, ethnically and racially diverse context of American cities offers the potential for both fostering minority political power and engagement, as well as its suppression.

As in the literature at the state and federal level, there is also some evidence of direct, material consequences to local descriptive representation. Sances and You (2017) find that city fines and court fees are disproportionately targeted at Black residents in U.S. cities, but the disparity is mitigated when the city's council has Black representation. Similarly, Christiani et al. (2021) find that the number of traffic stops that lead to searches is lower in cities with higher rates of Black descriptive representation in city council. Sociologists have even asserted that local governments can use redistricting as a tool for "racially and economically motivated social control", based on historical analyses of redistricting in three midwestern cities (Vargas et al. 2021). Local activists and interest groups seem to share the belief that city governments routinely engage in racial gerrymandering, as plans implemented by city councils are often the subject of litigation alleging racial discrimination.[5] Nonetheless, like local-level redistricting more generally, there is little research on racial redistricting within American Politics.

[5] E.g., Ayanna Alexander, "Florida City Highlights Conflicts over Local Gerrymandering," AP NEWS (Associated Press, February 2, 2023), https://apnews.com/article/politics-fraud-jacksonville-0dea0c7bca4aa034d99c952201283687.

One of the of only works in this area is that of Behr (2004), who analyzed the 2000 redistricting cycle for a set of large U.S. cities. Using the proportion of Black and Latine residents in these cities, Behr compared the theoretical maximum number of majority-minority districts in each city, finding that cities with large Black populations had more majority-Black districts than cities with large Latine populations had majority-Latine districts. He attributes this difference to higher rates of segregation among Blacks in the U.S.—finding that representation within city council maps was more proportional for both groups when cities were highly segregated. As one of the only analyses of this kind, this remains an important contribution to this literature. However, it lacks analysis of spatial data. Any nonspatial analysis of demographic composition in a geographic space will suffer from the checkerboard problem (Lieberson and Carter 1982)[6] and may overestimate the possibility of creating particular districts within the constraints usually imposed on redistricting (i.e., compactness and equipopulous districts). Varying distances between population clusters, as well as clusters of varying population density are accounted for when redistricting simulation is used to sample the underlying distribution of possible maps (Chen and Rodden 2013; Katz et al. 2020).

Most recently, Hankinson and Magazinnik (forthcoming) leveraged the CVRA to conduct a spatial analysis of Latine representation in California using a redistricting simulation algorithm. They find that cities in California generally draw Latine districts when possible, and that Latine residents are most likely to be descriptively represented in more highly concentrated districts, rather than in slight majority or plurality-Latine districts.

Automated Redistricting and the Median Simulated Plan

Recent work in the literature has begun to implement cutting-edge redistricting algorithms to develop a point of comparison against which to compare implemented plans (McCartan et al. 2022; Hankinson and Magazinnik forthcoming), but redistricting algorithms have a surprisingly long history. As early as the 1960s, scholars foresaw how regular redistricting could quickly become the partisan tool that today's public recognizes as gerrymandering. To prevent this development, automated redistricting was proposed as a solution to take the politics out of the drawing process. By using an agreed upon algorithm and selecting only among those maps produced by the algorithm, the entire process could be safeguarded from partisan influence. In essence, the promise of this technology was the opportunity to "push all decision-making to the beginning of the redistricting process" (Vickrey 1961). Engaging in public debate over what considerations to prioritize would at least make any bias in terms of metrics used explicit and publicly available.

However, for almost a half-century, these algorithms had little impact outside of academic discourse. The computationally intensive nature of simulating district maps while optimizing under several typical constraints (contiguity, population equality, compactness, VRA requirements, and more), excluded the technology from political relevancy. Only recently has

[6] The 'checkerboard problem' describes the erroneous equating of all spaces in which two groups of equal population are clustered independently of one another, regardless of the distance between the clusters. For example, a space in which all members of group A are on one side of the space and all members of group B are on the other side are equated to a 'checkerboard' distribution in which individuals from each group reside in alternating clusters as in a checkerboard.

personal computing become sufficiently cheap and powerful for this tool to begin to serve its practical purpose in the public realm.

Today, the state of the art in automated redistricting simulation is implemented in the Redist R package (Fifield et al. 2020b; Kenny 2021). In some respects, its methodology is similar to other recent work in that it uses a Monte Carlo simulation algorithm (e.g., Mattingly and Vaughn 2014; Chikina, Frieze, and Pegden 2017; Herschlag, Ravier, and Mattingly 2017; DeFord, Duchin, and Solomon 2019). However, Fifield et al. (2020b) critique these earlier methods for lacking theoretical bases and for scaling poorly in larger contexts. To improve on these earlier attempts, the authors proposed a new automated redistricting simulator based on partitioning partition a graph (or map) into several connected subgraphs, treating redistricting as a graph-cutting problem (see also Magleby and Mosesson 2018), and then applying a custom Markov chain simulation algorithm.

The geography and population density of cities may present unique challenges for district mapping. Because redistricting at this level is understudied, an outlier analysis using simulations is especially well suited for revealing obstacles to unbiased map-drawing, as well as for revealing structural bias. Past work has already revealed that heterogeneity in population density makes it more difficult to draw fair districts, particularly when it is correlated with group identities, partisan or ethno-racial (Chen and Rodden 2013; Chen and Rodden 2015). Performing an outlier analysis via simulation therefore has distinct advantages over other measures of bias (e.g., efficiency gap, partisan bias, etc.) because it takes the structural challenges of a particular geopolitical area into account, producing relative rather than absolute comparisons (Burden and Smidt 2020). Using the latest in simulation, the extent of bias present in current district designs can be plotted against a representative set of legally viable maps.

Data and Methods

In order to analyze the makeup of existing districts and simulate new ones, we merged several datasets. First, we obtained a large set of city council shapefiles of over 100 cities, many of which had not been previously digitized (Warshaw et al. forthcoming). We then added population and voting-age population (VAP) demographic data at the census-block to these city council maps using the Census's Current Population Survey. Because many city council maps are not drawn in consideration of census blocks, the relevant demographic data often needed to be spatially weighted to estimate total populations at the city council district level. Neither citizenship rates or counts are available at the census-block level. In order to estimate CVAP-level (citizen voting-age population) demographic data, citizenship rates were assumed to be consistent for all blocks within a particular block group—the smallest unit at which citizenship rates are available from the census (Kenny 2023).

Following previous work (Behr 2004; Hankinson and Magazinnik forthcoming), segregation rates were estimated using the dissimilarity index (Duncan and Duncan 1955a; Duncan and Duncan 1955b) at the census block level. Finally, in order to prepare the city shapefiles for simulation, geographic contiguity had to be ensured in each city. U.S. city limits are often highly irregular, with large sections separated from the city's core, and only connected by roads, bridges, or even waterways.[7] Geographic data was minimally edited to accomplish this, with geographic features added to mimic the roads and waterways that exist in reality but are often not technically part of a city's limits.

[7] The districts of San Ysidro and Otay Mesa in San Diego, for example, are only contiguous via a small sliver of waterway across the San Diego Bay, which had to be manually drawn with GIS software.

In total, data collection described above was completed for 101 cities from 35 different states. Every city in the dataset is represented by district-based councilmembers, although many also have at-large representatives. The set contains most of the largest cities in the U.S. by population (mean=414,325; median=304,641), but also has 20 cities with a population below 150,000 and 9 cities below 100,000 (see **Table A1** in the appendix for a complete list). The number of single-member districts in these cities also vary widely from three (Kennewick, WA) to 35 (Nashville, TN). Within each city, segregation was calculated for each major ethnic or racial group using the dissimilarity index (Duncan and Duncan 1955a; Duncan and Duncan 1955b)

Using the Redist R package, we simulated at least 20,000 novel district plans for each city using 2010 demographic data and 2016 partisan data (the most recent presidential election for which geospatial data is available at the precinct level).[8] The number of districts within each simulation is equivalent to the number of single-member districts within each city. For each city, we simulated a minimum of 20,000 maps using sequential Monte Carlo (SMC) sampling (McCartan and Imai 2020) under only minimal constraints: (1) generally compact districts as measured by edge-cut compactness (Dube and Clark, 2016; DeFord et al., 2019)[9], (2) population equity between districts, with a deviation between districts of no more than 10% in total population, and (3) fully contiguous districts. For illustrative purposes, a few dozen simulated maps are displayed in **Figure 2.**

For particularly large cities, are those with a large number of city council districts, sometimes more simulations (as many as 60,000) were needed to ensure the MCMC chains were well-mixed. This was determined by using the updated R-hat convergence diagnostic after rank normalization and folding, following (Vehtari et al., 2021). Simulations were run until R-hat was under 1.02 for all demographic measures across chains.

The creation of majority-minority districts was never implemented as a constraint, although the package does allow for it. One reason for the absence of a majority-minority constraint is to avoid redistricting primarily on the basis of race, which the Supreme Court held unconstitutional in *Miller v. Johnson (1995)* (Canon 2022). Another reason is to simulate plans that do not prioritize the representation of minority groups. Instead, the simulations produced serve as a conservative estimate of what is both viable and plausible via random sampling given each city's demographic and geographic context.

Results

Of the 101 cities analyzed, 71 had at least one viable majority-minority district across thousands of simulations. 36 cities had at least one viable Latine-majority district, 36 had at least one viable Black-majority district, and just three had at least one Asian-majority district. Among

[8] For select cities with a large number of city council districts, a larger number of districts were simulated in order to achieve a higher probability of chain convergence and to ensure reliable samples of the underlying distribution of possible maps.

[9] While there is no legal consensus over how exactly to determine compactness, there is legal precedent for "general compactness" to be expected of fairly drawn districts. States have different requirements for compactness in redistricting, some with formal definitions, and others with a more general expectation. From McDonald (2019), see for example: No. 4FA-11-02209CI (Alaska Super. Ct. 2011); League of Women Voters of Fla. v. Detzner, 172 So. 3d 363 (Fla. 2015); League of Women Voters of Pa. v. Commonwealth, No. 159 MM 2017 (Pa. Feb. 19, 2018); Jamerson v. Womack, 423 S.E.2d 180 (Va. 1992).

these, eight had viable majority-minority districts for two different minority groups—seven had both Black and Latine-majority districts and one had both Latine and Asian-majority districts. Overall, implemented maps were very similar to the mean of race-neutral map simulations in terms of majority-minority districts. Among cities with at least one Black-majority district, the average city had 3.37 implemented Black-majority districts compared to 2.84 simulated Black-majority districts. Among cities with at least one Latine-majority district, the average city had 2.89 implemented Latine-majority districts compared to 2.64 simulated Latine-majority district. The sum of the average simulated map of each city featured about 166 majority-minority districts, compared to 171 majority-minority districts actually implemented during the 2010 cycle. The overall similarity between average simulations and implemented maps can be seen in **Figure 3** and **Figure 4.**

However, cities were not found to maximize the number of districts implemented either. The 171 implemented districts were made up of 112 Black-majority districts, 54 Latine-majority districts, and 5 Asian-majority districts. On the other hand, the maps at the extreme of each set of simulations summed to 174 Black-majority districts, 77 Latine-majority districts, and seven Asian-majority districts. This contrasts the findings of Hankinson and Magazinnik (forthcoming), suggesting that the results of redistricting may be distinct from the results of districting for the first time.

Considerations of VAP vs CVAP

Also highlighted in **Figure 3** and **Figure 4** is the significant gap between the number of majority-minority districts that are produced when CVAP is used relative to when VAP is used, across both actual and simulated maps. This gap is driven largely by Latine districts: across actual maps, 91 majority-Latine districts exist when measured by VAP (86 simulated), but only 54 when measured by CVAP (51 simulated). In contrast, Black-majority districts are lost when using CVAP: 120 districts were implemented by CVAP vs. 112 by VAP; 112 majority-Black districts by CVAP were simulated vs 100 simulated by VAP.

Within the political realm of redistricting, the principal issue around measures of population has centered on whether to use a count of the total population or the electorally relevant population. In *Evenwel v Abbott*[10], the court left open the possibility that states could use a count of eligible voters (either VAP or CVAP) instead of the overall population to determine whether districts are equally populous and satisfy the one person one vote requirement. However, this is also variation in the metric used to assess majority-minority districts and their Section 2 compliance. Most recently, in *Grace Inc. v. City of Miami*, the city of Miami's district plan was thrown out by a U.S. district court[11]. One of the plaintiffs' experts, explicitly cited the city's use of VAP rather than CVAP in order to understate the extent to which Black residents were packed into a single district.

Effects of Segregation

Behr (2004) found that high levels of segregation were associated with both the number of districts algebraically viable and the number implemented for the 2000 cycle. The results from

[10] 578 US _ (2016)
[11] Case No. 1:22-cv-24066-KMM

this analysis corroborate this previous finding—the more segregated a group is within a city, the more majority-minority districts can be simulated, even after adjusting for the overall size of the group (see **Table 1**). It is unsurprising that it is easier to draw districts around demographic groups that are geographically concentrated.

On the other hand, it does not necessarily follow that implementation should depend on segregation as closely, given other goals of mapmakers, such as the creation of equally populous districts and the preservation of incumbent districts. To test the relationship between segregation and the number of implemented majority-minority districts, models were fitted with segregation rates and a number of related predictors. Predictors were also rescaled to make model coefficients more easily interpretable. Across all specifications, going from one standard deviation below the mean level of Black segregation to one segregation above the mean was estimated to be between 7% and 15%. Latine segregation meanwhile was found to be slightly less relevant and estimated to be between 5% and 13% (See model results in **Table 2** and **Table 3**).

There are two avenues through which segregation likely affects the adoption of majority-minority districts. The first is what Behr (2004) called "viability," or the ease with which compact districts can be drawn. Districts that are irregularly shaped or "look gerrymandered" are more likely to draw public attention and be challenged in the courts. A second avenue is through the concentration of political organization. In highly segregated cities, power may fall more directly along ethnic and racial lines, making it easier for minority groups to demand district representation.

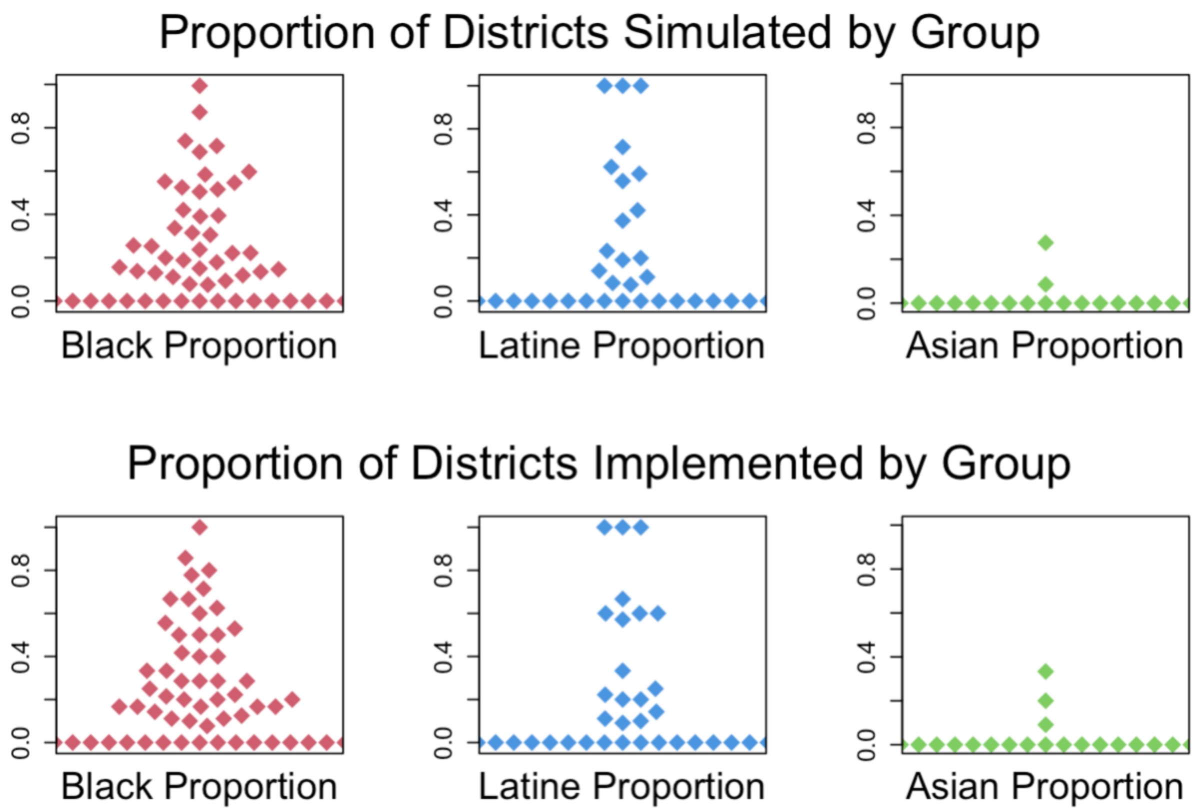

Figure 1: In each of the figures above, the proportion of the districts that are majority-minority by CVAP are plotted. The top row plots simulated data, while the bottom row plots the implemented proportions.

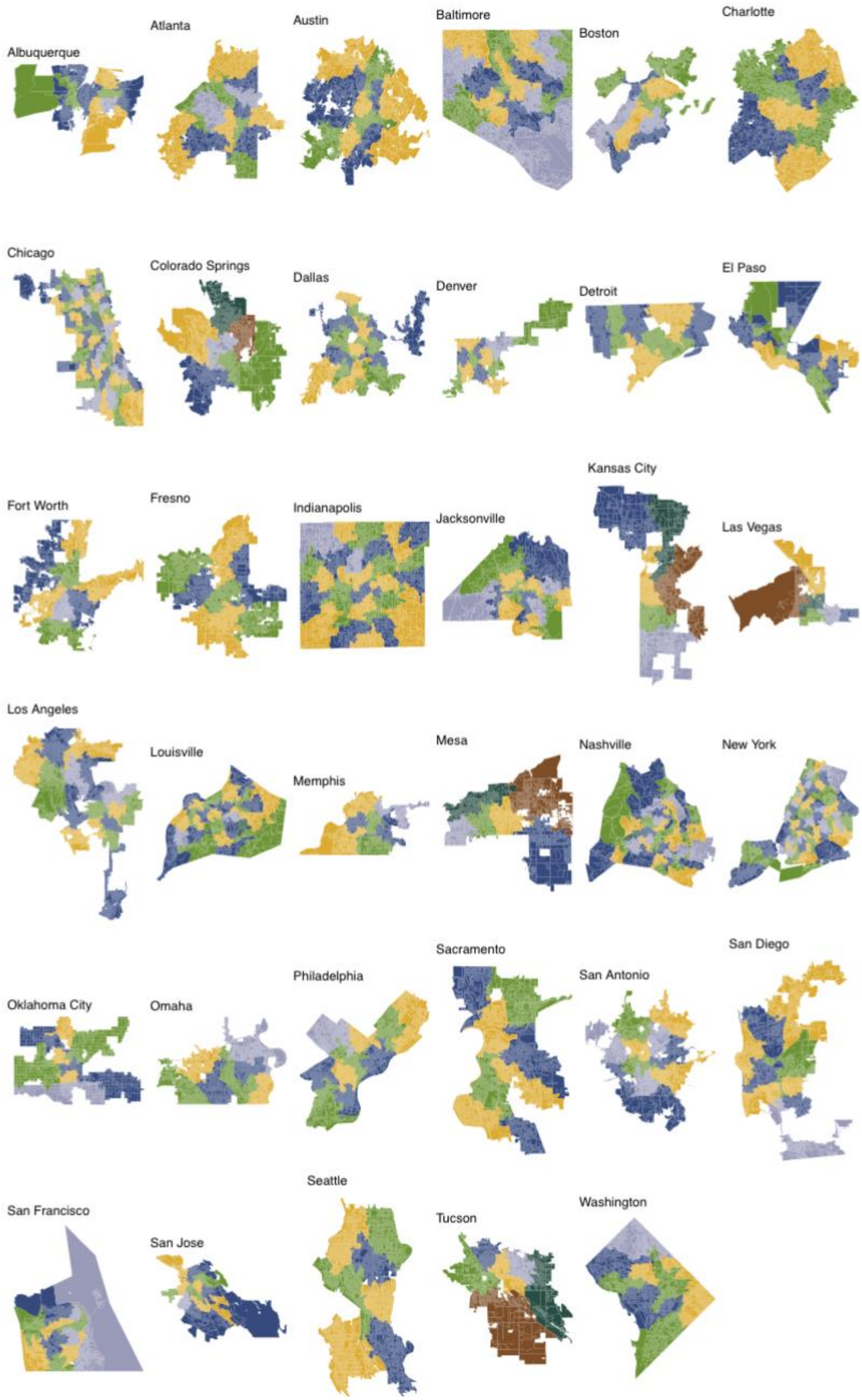

Figure 2: Each city's 500th simulation under only compactness and equal population constraints. Each plan features the respective number of districts in each city's council.

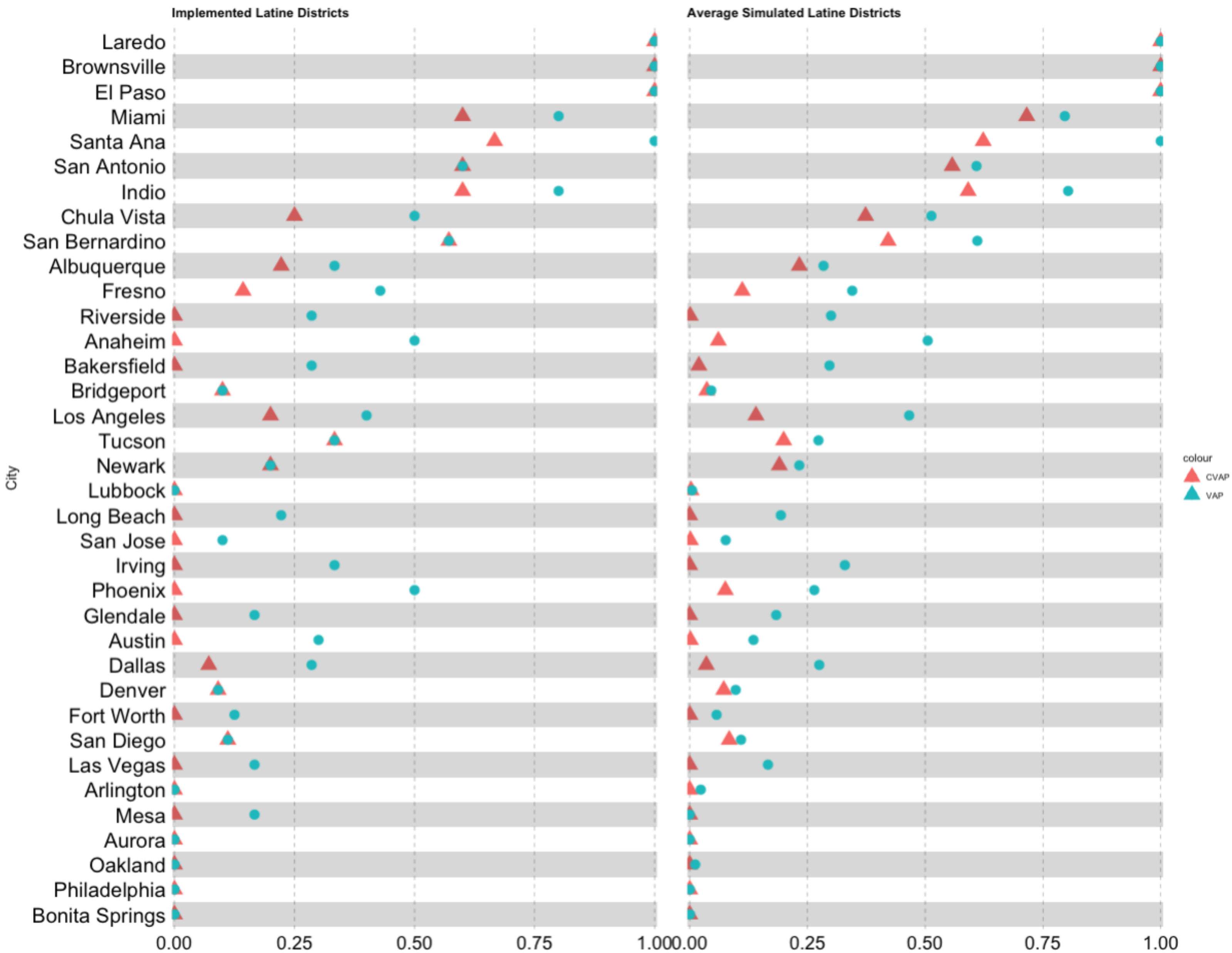

Figure 3: The left figure plots the proportion of Latine-majority districts that were actually implemented. The red triangles represent CVAP districts and the blue dots represent VAP districts. The right figure is similar, but plots the mean Latine-majority districts across all simulated maps.

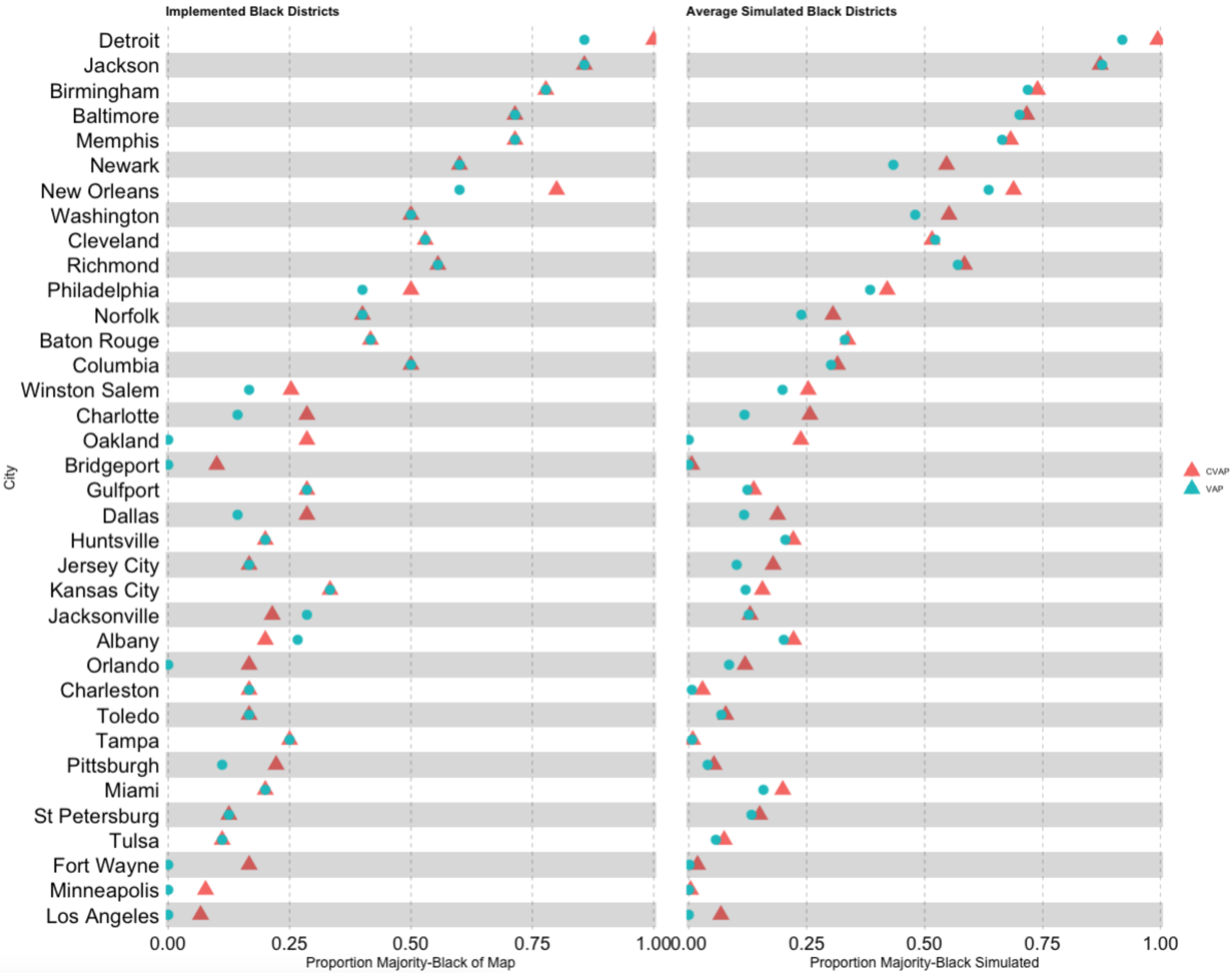

Figure 4: The left figure plots the proportion of Black-majority districts that were actually implemented. The red triangles represent CVAP districts and the blue dots represent VAP districts. The right figure is similar, but plots the mean Black-majority districts across all simulated maps.

Predicting Simulated Districts

Predictors	**Proportion Black Simulated** *Estimates*	**Proportion Black Simulated** *Estimates*	**Proportion Black Simulated** *Estimates*	**Proportion Latine Simulated** *Estimates*	**Proportion Latine Simulated** *Estimates*	**Proportion Latine Simulated** *Estimates*
Intercept	0.13 (0.11:0.15)	0.13 (0.11:0.15)	0.12 (0.11:0.14)	0.07 (0.05:0.10)	0.07 (0.05:0.10)	0.06 (0.04:0.08)
Black Segregation	0.09 (0.05:0.13)	0.04 (-0.01:0.09)	0.07 (0.02:0.12)		0.07 (0.01:0.14)	0.09 (0.03:0.15)
Black Proportion	0.39 (0.35:0.43)	0.41 (0.34:0.49)	0.39 (0.32:0.46)		0.03 (-0.06:0.13)	0.02 (-0.07:0.11)
Latine Segregation		0.08 (0.02:0.15)	0.08 (0.02:0.14)	0.08 (0.03:0.13)	0.02 (-0.07:0.11)	0.02 (-0.05:0.11)
Latine Proportion		0.07 (0.03:0.11)	0.09 (0.05:0.13)	0.39 (0.34:0.44)	0.37 (0.31:0.42)	0.38 (0.33:0.43)
Partisan Segrergation		-0.04 (-0.11:0.03)	-0.07 (-0.14:-0.01)		-0.02 (-0.11:0.07)	-0.04 (-0.12:0.04)
Black Segregation:Black Proportion			0.23 (0.12:0.32)			
Latine Segregation:Latine Proportion						-0.20 (-0.30:-0.10)
Observations	90	90	90	90	90	90
R^2 Bayes	0.837	0.857	0.884	0.743	0.753	0.787

Table 1: This table features three models predicting the proportion of simulated Black-majority districts and three models predicting the number of simulated Latine-majority districts. All predictors have been rescaled to make them more easily interpretable: the regression coefficient is the degree to which the proportion would increase given a shift from one standard deviation below the mean of the measure, to one standard deviation above the mean. Within each set of three, the first model is the most basic, with only group proportion and the dissimilarity index as predictors. The second model adds these same values, but from the opposite group. The third model interacts the group dissimilarity and the group proportion. Partisan segregation is measured by the dissimilarity index of Democrats and Republicans in the city.

Black Districts by CVAP

	Proportion Black Districts Implemented	Proportion Black Districts Implemented	Proportion Black Districts Implemented	Proportion Black Districts Implemented	Proportion Black Districts Implemented	Proportion Black Districts Implemented
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*
Intercept	0.15 (0.13:0.16)	0.15 (0.13:0.16)	0.15 (0.13:0.16)	0.14 (0.13:0.16)	0.14 (0.13:0.16)	0.14 (0.13:0.16)
Black Segregation	0.07 (0.04:0.11)	0.11 (0.06:0.16)	0.11 (0.06:0.16)	0.09 (0.05:0.13)	0.15 (0.09:0.20)	0.15 (0.10:0.20)
Proportion Black	0.43 (0.40:0.47)	0.52 (0.45:0.60)	0.52 (0.45:0.59)	0.41 (0.36:0.45)	0.52 (0.46:0.58)	0.53 (0.45:0.60)
Latine Segregation		-0.02 (-0.09:0.04)	-0.02 (-0.08:0.04)		-0.03 (-0.09:0.03)	-0.02 (-0.08:0.03)
Latine Proportion		-0.00 (-0.04:0.04)	-0.00 (-0.04:0.04)		0.01 (-0.03:0.05)	0.01 (-0.03:0.05)
Ideology		-0.01 (-0.04:0.03)			-0.00 (-0.03:0.03)	
Avg. Black Districts Simulated		-0.11 (-0.17:-0.05)	-0.11 (-0.17:-0.05)		-0.16 (-0.22:-0.10)	-0.16 (-0.22:-0.09)
Partisan Segregation		0.01 (-0.05:0.06)				-0.01 (-0.06:0.04)
Percent Dem			0.01 (-0.03:0.05)			0.01 (-0.03:0.04)
Black Segregation:Black Proportion				0.08 (-0.02:0.18)	0.19 (0.09:0.28)	0.19 (0.09:0.29)
Observations	91	90	90	91	90	90
R^2 Bayes	0.880	0.899	0.901	0.882	0.915	0.914

Table 2: This table features six models predicting Black-majority districts, across a number of different predictors. All predictors except for the average districts simulated have been rescaled to make them more easily interpretable: the regression coefficient is the degree to which the proportion would increase given a shift from one standard deviation below the mean of the measure, to one standard deviation above the mean. Ideology is measured using MRP (Warshaw 2023). The average number of districts simulated is the mean number of majority-Black districts across all simulated maps for the respective city.

Latine Districts by CVAP

	Proportion Latine Districts Implemented	Proportion Latine Districts Implemented	Proportion Latine Districts Implemented	Proportion Latine Districts Implemented	Proportion Latine Districts Implemented	Proportion Latine Districts Implemented
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*	*Estimates*
Intercept	0.09 (0.07:0.10)	0.09 (0.07:0.10)	0.09 (0.07:0.10)	0.09 (0.07:0.11)	0.09 (0.07:0.10)	0.09 (0.07:0.10)
Latine Segregation	0.12 (0.09:0.16)	0.05 (-0.00:0.11)	0.05 (-0.00:0.10)	0.13 (0.09:0.17)	0.05 (-0.01:0.11)	0.06 (0.00:0.11)
Proportion Latine	0.45 (0.41:0.49)	0.18 (0.12:0.25)	0.18 (0.11:0.24)	0.45 (0.41:0.48)	0.18 (0.12:0.24)	0.18 (0.12:0.24)
Black Segregation		0.01 (-0.03:0.04)	0.00 (-0.03:0.04)		0.00 (-0.04:0.04)	0.00 (-0.04:0.04)
Black Proportion		0.01 (-0.04:0.06)	-0.01 (-0.05:0.03)		-0.00 (-0.04:0.03)	0.00 (-0.05:0.06)
Ideology		0.00 (-0.02:0.03)			0.00 (-0.02:0.03)	
Avg. Latine Districts Simulated		0.28 (0.22:0.33)	0.28 (0.22:0.33)		0.28 (0.22:0.33)	0.28 (0.22:0.33)
Partisan Segregation		-0.02 (-0.06:0.02)				-0.02 (-0.06:0.03)
Percent Dem			0.01 (-0.02:0.04)			0.01 (-0.02:0.04)
Latine Segregation:Latine Proportion				0.04 (-0.05:0.13)	0.01 (-0.07:0.08)	0.01 (-0.07:0.08)
Observations	91	90	90	91	90	90
R^2 Bayes	0.859	0.934	0.934	0.859	0.934	0.934

Table 3: This table features six models predicting Latine-majority districts by CVAP, across a number of different predictors. Ideology is measured using MRP (Warshaw 2023). All predictors except for the average districts simulated have been rescaled to make them more easily interpretable: the regression coefficient is the degree to which the proportion would increase given a shift from one standard deviation below the mean of the measure, to one standard deviation above the mean. The average number of districts simulated is the mean number of majority-Latine districts across all simulated maps for the respective city.

Appendix

City	State	Population	Total Districts	City	State	Population	Total Districts
Akron	OH	206634	10	Jackson	MS	175085	7
Albany	NY	93576	15	Jacksonville	FL	809874	14
Albuquerque	NM	494962	9	Jersey City	NJ	237125	6
Anaheim	CA	334909	6	Kansas City	MO	441833	6
Ann Arbor	MI	113716	5	Kennewick	WA	63593	3
Antioch	CA	109485	4	Laredo	TX	218041	8
Arlington	TX	374729	6	Las Vegas	NV	553807	6
Atlanta	GA	424096	12	Lexington	KY	274245	12
Aurora	CO	304641	6	Lincoln	NE	245301	4
Austin	TX	683404	10	Long Beach	CA	486571	9
Bakersfield	CA	301775	7	Los Angeles	CA	3911500	15
Baltimore	MD	602658	14	Louisville	KY	241072	26
Baton Rouge	LA	222217	12	Lubbock	TX	213587	6
Birmingham	AL	229300	9	Memphis	TN	639736	7
Bonita Springs	FL	43842	6	Mesa	AZ	461167	6
Boston	MA	567759	9	Miami	FL	386740	5
Bremerton	WA	45306	7	Milwaukee	WI	575250	15
Bridgeport	CT	138901	10	Minneapolis	MN	364726	13
Brownsville	TX	174135	4	Nashville	TN	523547	35
Charleston	SC	106372	12	New Orleans	LA	454207	5
Charlotte	NC	607111	7	Newark	NJ	281378	5
Chula Vista	CA	221736	4	Norfolk	VA	248182	5
Cleveland	OH	443949	17	Oakland	CA	393632	7
Colorado Springs	CO	375744	6	Oklahoma City	OK	538141	8
Columbia	SC	118020	4	Omaha	NE	417809	7
Concord	CA	126360	5	Orlando	FL	211226	6
Concord	NC	61640	7	Philadelphia	PA	1439814	10
Dallas	TX	1216543	14	Phoenix	AZ	1450884	8
Davenport	IA	96595	8	Pittsburgh	PA	316272	9
Denton	TX	105431	4	Plano	TX	260415	4
Denver	CO	556575	11	Reno	NV	206626	5
Des Moines	IA	192050	4	Richmond	VA	189498	9
Detroit	MI	871789	7	Riverside	CA	306351	7
El Paso	TX	603545	8	Sacramento	CA	480392	8
Eugene	OR	146483	8	Saint Louis	MO	315546	10
Evansville	IN	114237	6	Saint Petersburg	FL	245804	7
Fayetteville	AR	66288	4	San Antonio	TX	1278171	9
Flint	MI	115691	9	San Bernardino	CA	205743	11
Fort Collins	CO	131505	6	San Diego	CA	1299352	10
Fort Wayne	IN	231147	6	San Francisco	CA	723724	6
Fort Worth	TX	633849	8	San Jose	CA	897883	7
Fremont	CA	202574	6	Santa Ana	CA	344086	3
Fresno	CA	472517	7	Seattle	WA	570430	28
Glendale	CA	204747	6	Spokane	WA	197513	8
Grand Rapids	MI	193006	3	Tampa	FL	328578	4
Gulfport	MS	71400	7	Toledo	OH	305292	6
Huntsville	AL	169155	5	Tucson	AZ	525268	6
Indianapolis	IN	771725	25	Tulsa	OK	379833	9
Indio	CA	69736	5	Virginia Beach	VA	453884	7
Irving	TX	194407	6	Winston-Salem	NC	194826	8
				Washington	DC	605282	12

Appendix Table 1

Expert Interviews

In order to develop better-informed hypotheses, over a dozen interviews were conducted with former city council members, city-contracted demographers, redistricting attorneys, journalists, and nonprofit analysts. Interviewees were asked about the political considerations that motivate redistricting decisions, the role of residents' partisanship and race, the role of local party organizations, and finally, the influence of incumbent council members. The overwhelming theme of the responses received in these interviews can be summarized by one quote in particular from the chief of staff of one New York City council member, "The primary focus of local redistricting is to protect incumbents. What new gerrymandering is done is to protect minorities—only after they've made enough noise." When asking another NYC council member directly about redistricting, he explained that it was an uncontentious process that involved little politicking—"the only change we made was adding an Asian [American] district."

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