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## Who Will Help Children? Building Brain Regimes

By William F. Tate IV

EDITOR'S NOTE: *Who Will Help Children? Building Brain Regimes* is based in part on "Beyond Education Triage: Building Brain Regimes in Metropolitan America," in [Facing Segregation: Housing Policy Solutions for a Stronger Society](#). This Perspective is adapted from an address given during Facing Segregation: Building Strategies in Every Neighborhood, the 2019 annual conference of the Metropolitan St. Louis Equal Housing and Opportunity Council, on April 12, 2019, at Central Baptist Church, St. Louis, Missouri. The Perspective is presented through a partnership between the Center for Social Development and the council.

Thank you for the opportunity to speak with you briefly. I will not repeat what is in the book. Instead, I will begin by defining a term. Usually we hear the term *regime* and we think of something negative. But regimes vary. Positive and negative regimes exist. Here in St. Louis, we experience an example of a negative regime. We call it a segregation regime. A regime equates with a public-private arrangement organized to make and execute governing decisions.<sup>1</sup> In my opinion, this city and many other urban cities put together public-private partnerships arranged and orchestrated in such a way that they are elite and effective. They influenced the community in a negative fashion, but in light of their goals proved effective. It's possible to harm, yet produce the desired result. That's extremely important to understand.

We also have here a great sports regime; in fact, we have public-private partnerships that support the

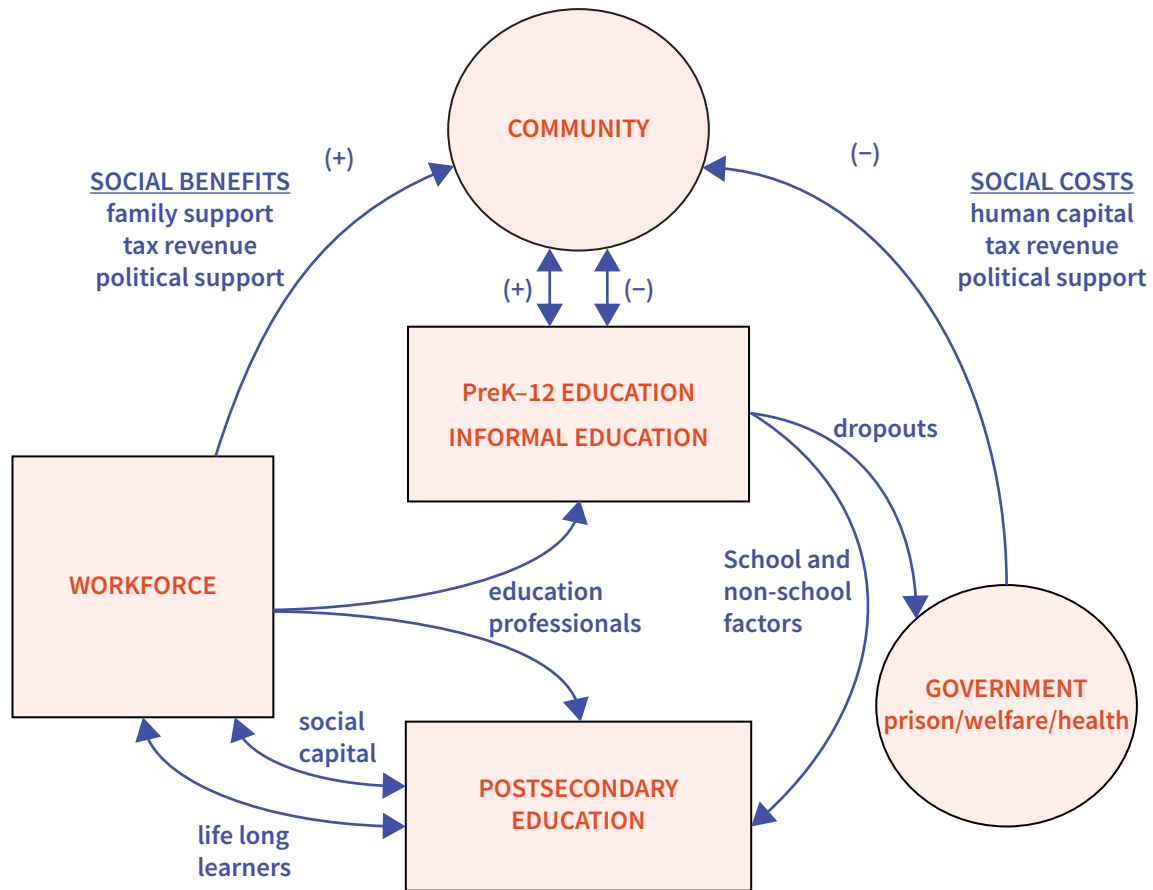
advancement of our teams. Recognized across the United States and the globe, the Cardinals offer an example of an exemplary sports franchise. It's an amazing sports regime. We even had a football team here called the Rams. And if you recall, we organized a public-private partnership to generate close to \$500 million to keep a losing football team in St. Louis. They were losing then, and it amazed me how quickly that financial package was done—how well it was done. To create what? A giant house. We organized a public-private partnership, a sports regime, to create a giant house to keep a sport associated with brain injury.<sup>2</sup>

Brain injuries result from more than physical contact. Our environment harms and protects the brain. Ultimately, I raise this question for every city across this country: Why can't we organize public-private partnerships to protect and to nurture the brains of our children? It should be easy. We do it for sports. We are elite at segregation regime building. Why can't we do it to protect the babies and children?

I come from Washington University, and in the academic world, theoretical presentation matters. I'm going to illustrate my guiding theory in quick fashion: Basically, communities matter. They interact with schools, and there's a symbiotic relationship between schools and communities. High-performing and functional schools exist in "good" communities and low-performing schools in less desirable communities.



Washington University in St. Louis



**Figure 1. Communities matter for outcomes**

Everybody knows it; the real estate agents preach it; and that’s the way it goes, right? And if they’re not in a good community, there’s a residual product. They end up where? School dropout, prison, unemployment, poor health, and other less-positive outcomes result. These factors increase the likelihood of ending up subsidized by the government’s social welfare or criminal justice programs. This pathway operates in circular fashion, feeding back into the community. That’s the negative pattern of Figure 1.

In contrast, the other pathway generates a net positive result. And these communities stay intact over time. In the communities where the institutions work well, the schools work well, the kids end up in postsecondary education or network into jobs, they become politically active, they generate positive tax revenue, and the residents with this experience return to live and to maintain the same kind of communities. This pattern replicates itself over and over. These two—communities and schools—are

married. Rarely does the pattern change without massive intervention.

From my perspective, this matter involves geography. I’m interested in how geography works and whether or not the first law of geography captures how opportunity organizes in our lives. Some of you might say, What is the first law of geography? It’s very simple.

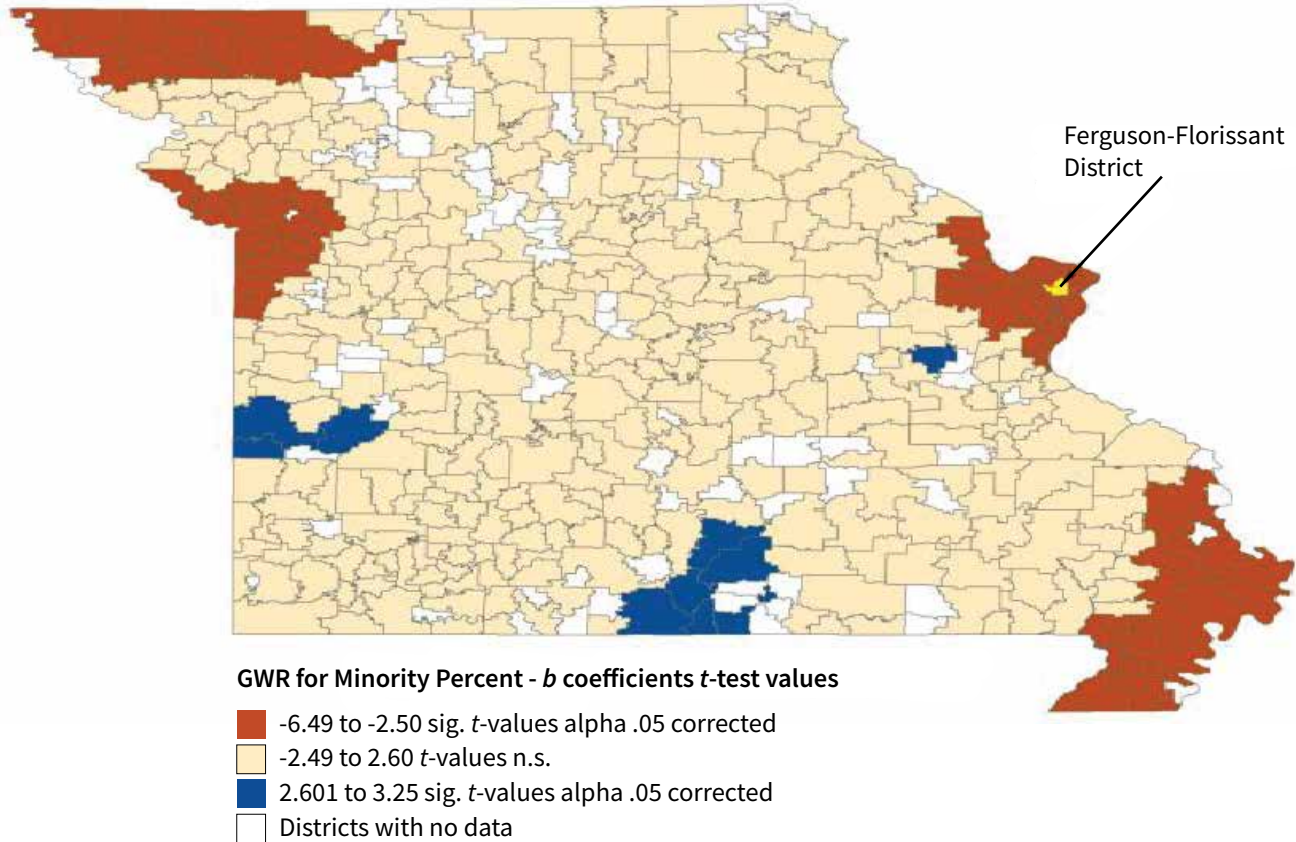
The first law of geography is that near things are more similar than distant things.<sup>3</sup> Things that are close together are very much alike. It’s a very, very clean conceptual idea. What does that mean for residents in Missouri and St. Louis?

Figure 2 is a map with an equation at the top:

$$y_1 = B_o(u_1, v_1) + B_1(u_1, v_1)x_{i1} + B_k(u_1, v_1)x_{ik} + \epsilon_i \quad (1).$$

To understand the idea behind the equation, we need Siri. Has anyone here asked Siri what the weather is in Missouri? You can do it right now.

$$y_i = B_0(u_1, v_1) + B_1(u_1, v_1)x_{i1} + B_k(u_1, v_1)x_{ik} + \varepsilon_i$$



**Figure 2. Minority percentages and Algebra I scores**

GWR = geographically weighted regression. Adapted from “Place, Poverty, and Algebra: A Statewide Comparative Spatial Analysis of Variable Relationships,” by M. C. Hoglebe and W. F. Tate IV, 2012, *Journal of Mathematics Education at Teachers College*, 3, p. 18. Copyright 2012 by the Program in Mathematics and Education, Teachers College, Columbia University in the City of New York. Adapted under Creative Commons [Attribution 4.0 International Public License](https://creativecommons.org/licenses/by/4.0/).

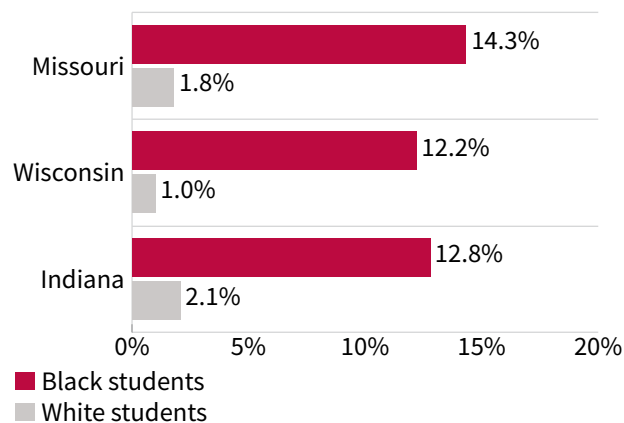
What did she say? Did she tell you the weather in Jefferson City, in Kansas City, or in another metro region? I have never heard Siri give a weather report for the state of Missouri. You know why? State weather reports are less useful for most decisions. And Siri operates just like my equation; it gives you a local report on conditions.

I want to know how my neighbor is doing. My equation tells us how we’re doing in our neighborhood. I examine a couple of variables. My interests include mathematics attainment. I investigated the relationship between the percentage of minority students in schools and algebra scores, and I modeled the relationship using my equation to get the local report in the context of the state of Missouri. And I discovered that the first law of geography captures the relationship—similar relationships cluster. The map

illustrates that in the St. Louis metro region. There is a negative relationship between the percentages of minority students in schools and algebra performance: the more minorities, the lower the score.

Notice that, across the state, Kansas City looks the same way. And strikingly, so does the Bootheel. I don’t have time to talk about the Bootheel, but I want to point out that the Bootheel and many of our urban communities have many similarities. We just haven’t figured out politically how to operate together. The urban and rural divide represents a political shortcoming in light of the empirical evidence.

I’m very interested also in how students experience school discipline. Research demonstrates a relationship between school discipline and



**Figure 3. States' elementary suspension rates, top three in the U.S. by the Black/White gap, 2011–12**

mathematics achievement.<sup>4</sup> I sought to determine the relationship between school discipline and mathematics attainment in Missouri. Does clustering exist? Do these things happen in tandem? We have to think about youth in terms of layers: They're in our schools; they're in residential housing; they're in communities; and so on. And here in the state of Missouri, we have one of the largest gaps between Blacks and Whites in suspensions. In fact, as Figure 3 shows, our state experienced many of the largest racial disparities in the country.

Of the six highest suspending districts in the United States of America, three are in metropolitan St. Louis (Figure 4). That's interesting because it's totally geographically based. It's clustered. Are you following the pattern? The first law of geography applies. Near things appear more similar.

Now remember that my question of interest focuses on mathematics attainment, so I want to know whether a relationship exists between learning algebra and discipline. As Figure 5 illustrates, there is a negative relationship in Missouri between discipline in schools and algebra performance, and it clusters in metropolitan St. Louis. The higher the discipline rates, the lower the algebra scores in the school.

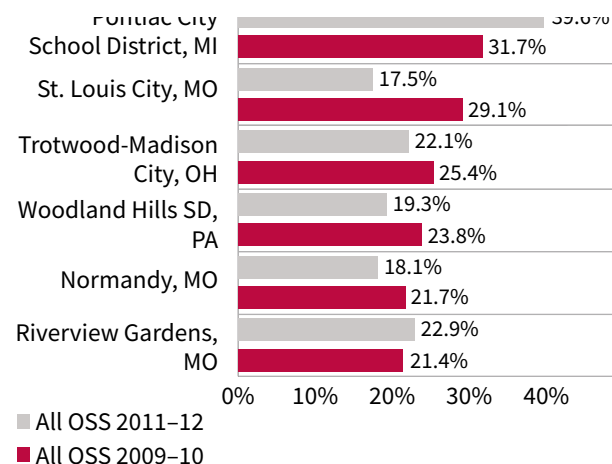
This relationship requires intervention. The For Sake of All Project described solutions consistent with sound developmental science.<sup>5</sup> I don't have time to review the recommendations here today. My point is that we have a challenge. Housing is

related to our challenge. Geography captures our challenge. And based on my initial model, if this continues, those young people won't learn algebra; the region's workforce and their academic opportunity pathways require an understanding of fundamental algebraic concepts. Our research indicates that algebraic understanding is clustered geographically, and without intervention, the clustering will cause these young people and their communities to continue to experience economic stress.

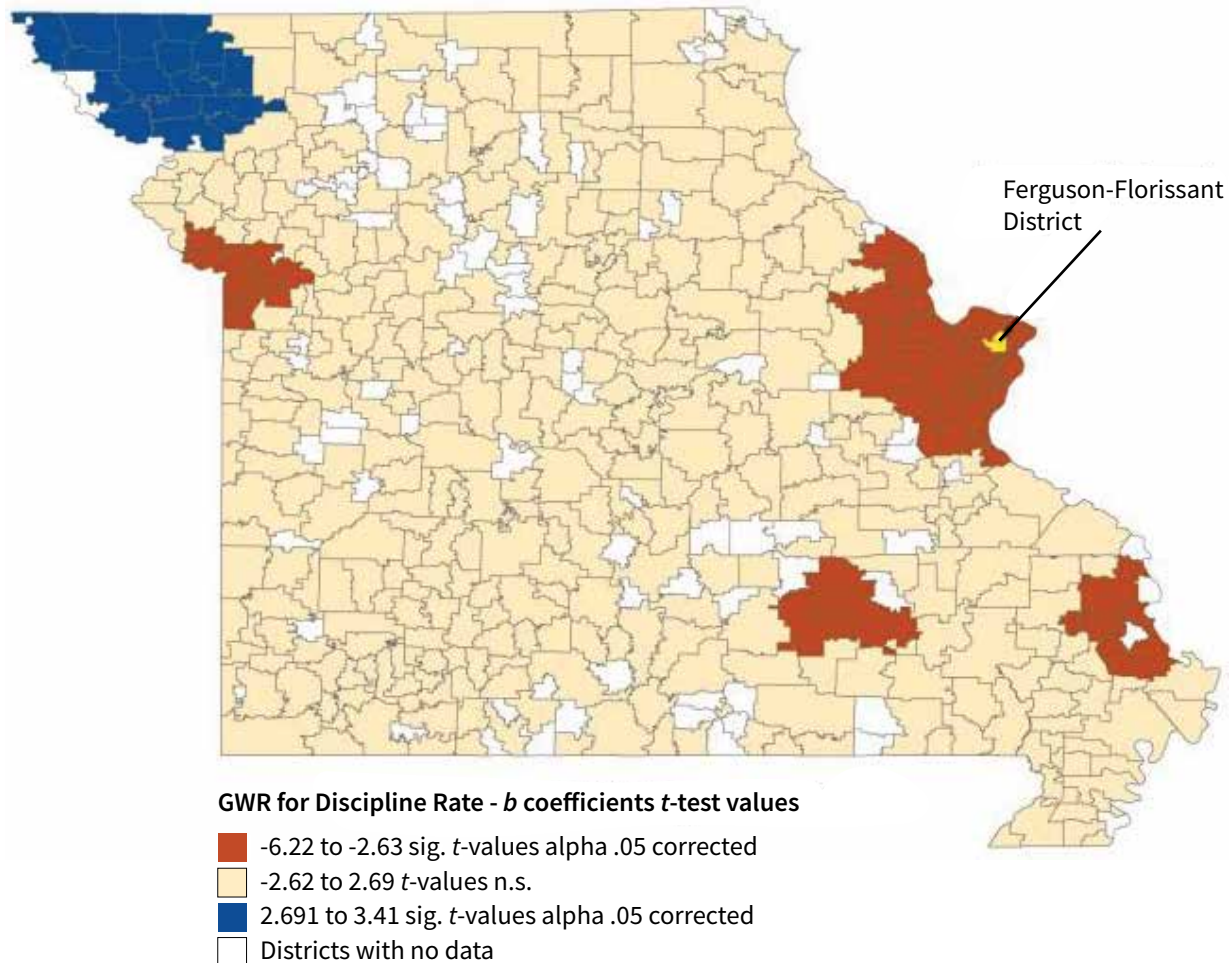
So let's think about it further. What happens when we think about the share of students receiving free- and reduced-price lunches—whether receipt is related to graduation rates? The relationship clusters. The higher the share of students who receive free and reduced lunch, in terms of distribution within the school, the lower the graduation rate. Metropolitan St. Louis and metropolitan Kansas City are the only places in the state of Missouri where that relationship is statistically significant.<sup>6</sup> Be clear: We should attend to all students throughout the state; however, the two metro regions offer an opportunity for targeted policy.

My colleagues and I sought to understand better the relationship between socioeconomic status and dropout rates. We examined the association

**Figure 4. Six highest-suspending districts for all elementary school students**



OSS = out of school suspensions. Adapted from "Ferguson and Beyond: A Descriptive Epidemiological Study Using Geospatial Analysis," by B. D. Jones, K. M. Harris, and W. F. Tate IV, 2015, *Journal of Negro Education*, 84, no. 3, p. 235. Copyright 2015 by the *Journal of Negro Education*.



**Figure 5. Discipline rate and Algebra I scores**

Adapted from “Place, Poverty, and Algebra: A Statewide Comparative Spatial Analysis of Variable Relationships,” by M. C. Hogrebe and W. F. Tate IV, 2012, *Journal of Mathematics Education at Teachers College*, 3, p. 19. Copyright 2012 by the Program in Mathematics and Education, Teachers College, Columbia University in the City of New York. Adapted under Creative Commons Attribution 4.0 International Public License.

between free and reduced lunch and dropout rates. Again we found that similar pattern in metropolitan St. Louis, Kansas City, and the Bootheel: a positive relationship between free and reduced lunch and the dropout rate. The higher the share of students with free and reduced lunch, the higher the dropout rate—those three areas represent the only places where that relationship is statistically significant in the state.<sup>7</sup>

I offer my recommendations in succinct fashion. First, we need prenatal care at scale in St. Louis. We know differentiation by race exists. It’s extremely important to intervene. Second, we need a consumer report on preschool quality. Financial resources and tax incentives support access to

preschool; yet tax credits don’t help consumers distinguish good preschools from less robust learning environments. Finding a good preschool proves especially difficult if the child’s caregiver lacks the benefit of the right social networks. Third, we need to expand health insurance to families. Health insurance for children supports the care that fosters brain development and positive cognitive outcomes.<sup>8</sup> I don’t understand why the economic calculus is so misunderstood. The cost-benefit on this investment offers clarity. We know that if we give insurance to children only, it falls short of the robust effect associated with family coverage. These recommendations offer evidence-based practices to guide a positive regime change. We don’t have to speculate.

# BUILDING A BRAIN REGIME:

*Evidence-based recommendations for positive change*



## DELIVER PRENATAL CARE AT SCALE

To nurture children, ensure that all mothers—regardless of race—have access to prenatal care.



## REPORT ON PRESCHOOL QUALITY

Help families distinguish good preschools from less robust learning environments.



## EXTEND HEALTH INSURANCE TO FAMILIES

Insurance supports the care that fosters brain development, and the benefits of covering families surpass the costs.



## BUILD THE TEACHER WORKFORCE

Stark disparities in teacher quality shape outcomes and require intervention.



## STRENGTHEN K-12 SCIENCE AND MATH

Science and math education enables engagement on the ways algorithms guide policy and distributions of opportunity.



## RECLAIM THOSE PUSHED OUT OF SCHOOL

Millions of people have been pushed out of school in the United States, and the resulting pathways can lead to a number of adverse outcomes.



## BUILD OASES IN FOOD DESERTS

Nutrition is the foundation for cognition, development, and health; food and social outcomes are linked.

Fourth, we need to build our teacher workforce. I work in education, and the shameful state of education saddens me. In some places, permanent substitute teachers teach students. And the students are being assessed with high stakes accountability. We know that teacher disparities abound and teacher effects are greater than school effects. If I showed you the distribution of teacher quality

across the region, you would see that the disparities are stark and geographically cluster in a fashion consistent with the first law of geography.<sup>9</sup> We need to intervene.

Fifth, we need to attend to the role of artificial intelligence and the distribution of health and human services. I wrote about this topic for the *St. Louis*

American,<sup>10</sup> and I expanded on it in *Diverse Issues in Higher Education*,<sup>11</sup> noting that the emerging area of algorithmic justice represents the new frontier of civil rights. Housing and residential patterns loom large in computational models informing the distribution and access to social benefits and economic opportunity. We need robust K–12 science and math education to develop stronger citizen scholars. People need to be prepared to understand how algorithms guide policy and to be taught to engage in thoughtful debate. Bob Moses called math and science the new civil rights.<sup>12</sup> He was correct. The massive funding disparities in education must be dealt with, and it’s not just what the government distributes. We know that affluent families invest more money into their children than do less wealthy families, and that their resource hoarding represents a foundational challenge to the democratic project.<sup>13</sup>

Sixth, we need to reclaim all the people who have been pushed out of school. We have pushed millions of people out of school in the United States, and we just ignore them.

And finally, the food deserts. My colleagues at For the Sake of All made some extremely important contributions.<sup>14</sup> I was happy to be on that team. They recognized the importance of food and nutrition as foundational to cognition, development, and human health. So if we don’t deal with food deserts, the cycle of negative social outcomes articulated in my theory continues.

All of this leads me back to the point that we need a brain regime. And it’s fitting that we’re in a church because it’s going to take effort of biblical proportions to make that happen. We’re going to have to cross over to Canaan. Kick-starting the process is going to take something miraculous.

Fannie Lou Hamer is my hero. In *Beyond the Big House*, my colleague Gloria Ladson-Billings characterized various people, including Hamer, and how they challenged the segregation regime of our society.<sup>15</sup> I will end by saying all of us need to get a little bit of the Fannie Lou. Thank you.

## Notes

- <sup>1</sup> Stone (1989).
- <sup>2</sup> Mez et al. (2017).
- <sup>3</sup> Tobler (1970).
- <sup>4</sup> Lacoë and Steinberg (2019).
- <sup>5</sup> Purnell, Camberos, and Fields (2015).
- <sup>6</sup> Tate and Hoglebe (2015).
- <sup>7</sup> Tate and Hoglebe (2015).
- <sup>8</sup> Cohodes, Grossman, Kleiner, and Lovenheim (2016).
- <sup>9</sup> Schultz (2014).
- <sup>10</sup> Tate (2019a).
- <sup>11</sup> Tate (2019b).
- <sup>12</sup> Moses and Cobb (2001).
- <sup>13</sup> Reeves (2017).
- <sup>14</sup> See, e.g., Cambria, Fehler, Purnell, and Schmidt (2018); Purnell, Camberos, and Fields (2015).
- <sup>15</sup> Ladson-Billings (2005).

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The council is the only private, not-for-profit fair housing enforcement agency working to end illegal housing discrimination in the Metropolitan St. Louis area. Operating throughout Missouri and Illinois, EHOC fights illegal housing discrimination through:

- » Education on fair housing laws for housing providers (lenders, landlords, real estate agents and insurance agents), local governmental bodies (those who should be concerned about the affects of discrimination on their communities) and the general public (especially those who are most likely to experience illegal discrimination); and
- » Enforcement actions against those who we find, through our investigations, discriminate illegally; and
- » Community outreach, by participating in grass-roots and community-based projects; working with academics, civil rights leaders, and the housing industry; and spreading the word about our services and message through public service announcements, press releases, distribution of material, and the website.

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