Journal of Critical Thought and Praxis

ISSN: 2325-1204. Journal homepage: https://www.iastatedigitalpress.com/jctp/

Volume 9, Issue 1, 2020, Article 6, https://doi.org/10.31274/jctp.11013

Metro and Non-Metro Variation in Postsecondary Enrollment: The Role of Race, Ethnicity, and Residential Location in Texas

Vanessa A. Sansone, *The University of Texas at San Antonio*

Corey S. Sparks, The University of Texas at San Antonio

Paulina Cano McCutcheon, The University of Texas at San Antonio

Abstract

This study used a spatial approach to explore metropolitan and nonmetropolitan variation of college enrollment at the interplay of place and race within the state of Texas. Analyzing Integrated Public Use Microdata Series (IPUMS-USA) data and using population proportions as well as regression methods, we pay particular attention to the racial/ethnic diversity in non-metro areas and its relationship with college enrollment. We find geography is a factor in the college enrollment racial/ethnic gaps in non-metropolitan areas of Texas, but considerable regional disparities exist. These disparities show diverse trends based on residential location. This indicates a need for more research to explore geographic differences in postsecondary opportunities and college access practices and policies with the racial/ethnic diversity of place in mind.

Recommended Citation

Sansone, V.A., Sparks, C.S., & Cano McCutcheon, P. (2020). Metro and non-metro variation in postsecondary enrollment: The role of race, ethnicity, and residential location in Texas. *Journal of Critical Thought and Praxis* 9(1), Article 6. https://doi.org/10.31274/jctp.11013.

The *Journal of Critical Thought and Praxis* is published by the Iowa State University Digital Press (https://press.lib.iastate.edu) and the Iowa State University School of Education (https://www.education.iastate.edu)

Journal of Critical Thought and Praxis
2020, Vol. 9, No. 1, 1-16

Metro and Non-Metro Variation in Postsecondary Enrollment: The Role of Race, Ethnicity, and Residential Location in Texas

Vanessa A. Sansone
The University of Texas at San Antonio
Corey S. Sparks
The University of Texas at San Antonio
Paulina Cano McCutcheon
The University of Texas at San Antonio

This study used a spatial approach to explore metropolitan and nonmetropolitan variation of college enrollment at the interplay of place and race within the state of Texas. Analyzing Integrated Public Use Microdata Series (IPUMS-USA) data and using population proportions as well as regression methods, we pay particular attention to the racial/ethnic diversity in non-metro areas and its relationship with college enrollment. We find geography is a factor in the college enrollment racial/ethnic gaps in non-metropolitan areas of Texas, but considerable regional disparities exist. These disparities show diverse trends based on residential location. This indicates a need for more research to explore geographic differences in postsecondary opportunities and college access practices and policies with the racial/ethnic diversity of place in mind.

Keywords: College access | nonmetropolitan | spatial equity | geography | race/ethnicity

It is well-established that being from a rural area has serious implications in a person's ability to access postsecondary opportunities (Adelman, 2006; Hillman, 2016). However, under this assumption, (dis)advantages in access and enrollment in higher education are thought to be equal across all rural areas, including those with large rural racial/ethnic populations. In this process, rurality becomes conflated with whiteness and disregards the experiences and outcomes for rural communities of Color. This is problematic given that research has shown that Native Americans, Blacks, and Latinx rural residents lag behind their White counterparts in terms of their levels of postsecondary attainment (U.S. Department of Agriculture [USDA], 2017). At the same time, parts of rural America are racially and ethnically diverse. For example, in states like Iowa and Georgia, rural Latinxs are a growing demographic and represent a large proportion of new rural population growth (Housing Assistance Council, 2012; Tickamyer et al., 2017). Given these populations shifts, rural researchers have pointed to a need to not only understand rural college access, *writ large*, but also address the realistic profile of what is going on for rural racial/ethnic communities in terms of access to educational opportunities (Watson, 2019).

Despite patterns of rural racial/ethnic minorities having the lowest levels of educational attainment in the U.S. today (USDA, 2017), research studies have approached understanding the role of geography on rural racial/ethnic access and opportunity in various ways. For one, there have been a handful of quantitative studies using national datasets, either using outdated or contemporary data, that operationalize rural geography as a measure associated with the student (i.e., student attended a rural school; Byun et al., 2012; Koricich et al., 2018; O'Connor et al., 2010; Wells et al., 2019). Another small group of qualitative studies addressed rurality in the

form of rural racial/ethnic people's perceptions about their encounters with a particular rural area (Freeman, 2016; Means et al., 2016). A study by Hillman (2016) measured geography using a geographic unit and looked at contextual levels, like the White, Latinx, Black, and Asian populations of counties and commuting zones that were classified as rural. In his study, the geography of the county and commuting zone was the unit of analysis, not individual-level characteristics.

From these studies, the evidence implies that rural residence uniquely disadvantages students because they are far more likely to live in an area that has less opportunity to access institutions and college-going resources, such as financial aid. However, these results are limited in their ability to understand the influence geography may exert on rural racial/ethnic postsecondary enrollment outcomes. This is because most of these studies have focused on the characteristics of students that are associated with enrolling in college at the individual-level. The few previous studies investigating the context of rural geography on individual college access outcomes have focused on only one racial/ethnic group, limited geographic location (e.g., a specific state or rural area) (e.g., Freeman, 2016; Means et al., 2016), or measured race/ethnicity and rural geography as independent factors on postsecondary enrollment outcomes (e.g., Hillman, 2016). Interestingly, little to no studies have empirically assessed the interplay of race and rural residence on college access and opportunity disparities for racial/ethnic groups, and none have considered how this intersection could operate differently across rural regions.

This study intends to fill this gap in the literature by taking an exploratory spatial analysis approach. Specifically, we will examine the spatial pattern of college enrollment outcomes by residence and race/ethnicity across metropolitan and nonmetropolitan settings within the state of Texas. Doing so allows us to identify *whether* and *where* regional disparities exist across rural areas, especially in the regions where large proportions of communities of Color live. Because prior education research has not studied rural students by race/ethnicity using a spatially contextualized approach, we examine the correlates of enrollment in college at the individual level and test how these factors vary across place in determining college enrollment. We specifically focus on the interplay between rural places and race/ethnicity in an effort to provide more insights about whether college enrollment opportunities spatially differ from place to place for underrepresented rural racial/ethnic groups (Hillman, 2017; Turley, 2009). We also intend to use our results to gain more of an understanding about the college enrollment of historically minoritized populations in geographically isolated areas, specifically rural, as well as the (in)equities of educational opportunity by place (Dache-Gerbino, 2018; Soja, 2010).

To understand the interplay of race and rural residence on educational access and opportunity disparities, we focus on the state of Texas. With a spatially and racially diverse rural population, Texas is in the position to begin to unravel the puzzle of increasing postsecondary enrollment for racial/ethnic rural residents (Housing Assistance Council, 2012). Texas is home to the largest number of rural youth with 900,000 in K–12 education, where approximately 45% of which identify as a member of a racial/ethnic group and 53% are considered low-income (Dick, 2017; Showalter et al., 2017). In this study, our geographic unit of analysis follows the US Census Bureau's metro/non-metro definitions. Non-metro is inclusive of rural and small-town geographies, but it does not solely represent areas that are defined by the US Census Bureau as strictly rural (i.e., population thresholds and proximity to metro area; USDA, 2019). For the purposes of this study, we use the term non-metro throughout this paper to represent and explore spatial and racial postsecondary opportunity and enrollment variation. The lessons learned from this exploratory study of Texas serve as a good starting point toward better understanding the

spatial and racial educational attainment gap in rural America at large. We asked the following research questions:

1. Does living in a rural area affect access to postsecondary opportunity for differing races/ethnicities?
2. How do race/ethnicity and residential location interact to influence college enrollment patterns in the state of Texas?

Conceptual Framework

Two conceptual frameworks guided this study. First, we drew on Perna's (2006) college choice theory. This work stipulates that a student's college decisions and behaviors are situated within multiple layers and a complex enrollment process. Perna's work suggests that these layers are interrelated and represent factors associated with the four main levels of: (a) individual, (b) school and community context, (c) higher education context, and (d) social, economic, and policy context. We use this model of college enrollment because it is designed to study the multiple levels of influence a student faces in their decision to enroll in college. Specifically, we employ this model to examine the various student-level and community-level factors that influence college enrollment.

Second, we applied Hillman's (2016) conceptualization of geography of college opportunity. Hillman's work is derived from critical geographic scholars who have centered the role of place to understand educational inequity for communities of Color in urban areas (De Oliver, 1998; Tate, 2008; Turley, 2009). Based on a study that measured the number and type of institution that racial/ethnic minorities have access to, Hillman (2016) argued that a student's college-going abilities are not determined solely by gaining better information or following an admissions process. Rather, Hillman suggested that these decisions are shaped by the advantages and disadvantages of *where* such processes occur. His findings suggest that traditional college access frameworks do not account for the varying nature of educational opportunities that are structured by place. We use Hillman's (2016) work with Perna's (2006) dominant college access framework to gain a better understanding of how geography influences college enrollment, and use it as a lens to examine implications of opportunity for racial/ethnic communities across areas. In addition to research related to Perna's (2006) and Hillman's (2016) conceptual frameworks, we reviewed studies that identified key demographic and geographic predictors of college enrollment that also appeared to be working in different ways across race/ethnicity.

Literature Review

Research has shown that the demographic characteristics of sex, age, and race/ethnicity are associated with college enrollment (Perna & Thomas, 2008). Being a woman has a stronger association with graduating high school and enrolling in college (Heckman & LaFontaine, 2010; Kleven et al., 2016). Age can also influence a student's likelihood of enrollment, with younger students more likely to enroll than older students (Adelman, 2006). Students from Latinx and Black racial and ethnic backgrounds have different enrollment patterns when compared to their White peers (Hurtado et al., 1997; Musu-Gillette, 2016). Evidence demonstrates that geography has a meaningful influence on college enrollment. Specifically, studies have shown that a student's place of residence may serve as a barrier to enrolling in college (Hillman, 2017; Turley, 2009). Students living in non-metro areas (i.e., rural) were found to be statistically less likely to

enroll in college compared to those living in metro areas (i.e., urban or non-rural; Adelman, 2006; Bowen et al., 2009; Byun et al., 2012; Koricich et al., 2018). Additionally, past research on this topic demonstrated that students' living closer to a university had a higher likelihood of applying to college (Turley, 2009).

Variations by Geography and Race/Ethnicity

There is some evidence to suggest that place of residence influences college enrollment for students from different racial/ethnic backgrounds in unique ways (Dache-Gerbino, 2018; De Oliver, 1998; Hillman, 2016; O'Connor et al., 2010; Tate, 2008; Turley, 2009). Dache-Gerbino (2018) employed a critical geographic lens to study the spatial proximity of communities of Color in relation to their access to institutions of higher education within the city of Rochester, New York. Her findings showed that access was limited for communities with high concentrations of Latinx and Black residents as opposed to communities with high concentrations of White residents. Research also revealed that commuting zones with high populations of Latinx and Black residents were found to have a negative effect on accessing four-year universities and highly-selective institutions of higher education (Hillman, 2016). Another study indicated that Latinxs living in rural areas were less likely to enroll in college (O'Connor et al., 2010). Although we see that minoritized communities are showing less access and enrollment in college, it must be noted that most of these studies were focused on urban places.

Methodology

Data Source and Variables

For this analysis we used data from the Integrated Public Use Microdata Series (IPUMS-USA) from the University of Minnesota Population Center (Ruggles et al., 2018). Data from IPUMS was collected from U.S. Census survey responses. Reponses to these data were randomly collected each year. Each respondent to the survey was new every year, with a slightly random chance that the same person would be sampled in multiple years. Because IPUMS-USA does not have panels within the data, we did not address issues of a participant being retained across the data. Although this is the case, we felt strongly that as an exploratory study, IPUMS-USA provided us with a starting point toward a critical understanding of race/ethnicity and metro/non-metro variation on college enrollment outcomes. We specifically used single-year American Community Survey microdata for the years 2014–2016. We restricted our analysis to the state of Texas and to individuals between the ages of 16 and 25. We restricted to these ages to focus on the college enrollment behavior within this group. The sample size for our analysis was 25,965 respondents.

Our outcome was college enrollment status and was coded as 1=enrolled in any college courses, and 0=not enrolled in college. For the outcome variable, we used the variable "GRADEATT" in the IPUMS-USA. This reported the grade or level of recent schooling for people who attended college at least three months prior to the survey. If the respondent of the survey answered they were in college or graduate school, we coded them as enrolled; otherwise, they were coded as not enrolled. We were primarily interested in how college enrollment status differs by residential location and race/ethnicity. We further restricted the data to those who were

identified in the IPUMS-USA to live in either a non-metro area, a central city, or a non-central city (i.e., suburban) of a metro area. Although non-metropolitan residence is not the same as rural residence, based on official designations, purely rural areas were contained within the nonmetropolitan geographic areas in the data. Non-metropolitan location could also include smaller urban areas outside of central cities. We considered five racial/ethnic groups by combining race with Latinx ethnicity. These groups were: Latinx, White, Black, Asian, and Other/Multiracial. We also included sex 1=male, 0=female and age as continuous variables.

Data Analysis Procedures

We followed two methodologies for this analysis. The first descriptive analysis used the IPUMS-USA data to produce small area estimates of enrollment by race/ethnicity for Public Use Microdata Areas (PUMAs) within Texas. A total of 212 PUMAs existed within the state. Within each of these PUMAs we estimated the proportion enrolled in college by race/ethnicity over this period. We also produced estimates of the proportion enrolled by metropolitan residence. These estimates included full survey design information and were estimated using the *svyby* function in the *survey* package for R version 3.5.1. All mapping was done using *ggplot2* (Wickham, 2016) and *sf* (Pebsema, 2018) libraries using TIGER line files accessed by the *tigris* (Walker, 2018) package. The mapping also used jenks breaks, which is a standard way to highlight natural breaks in a continuous variable (Jenks, 1977).

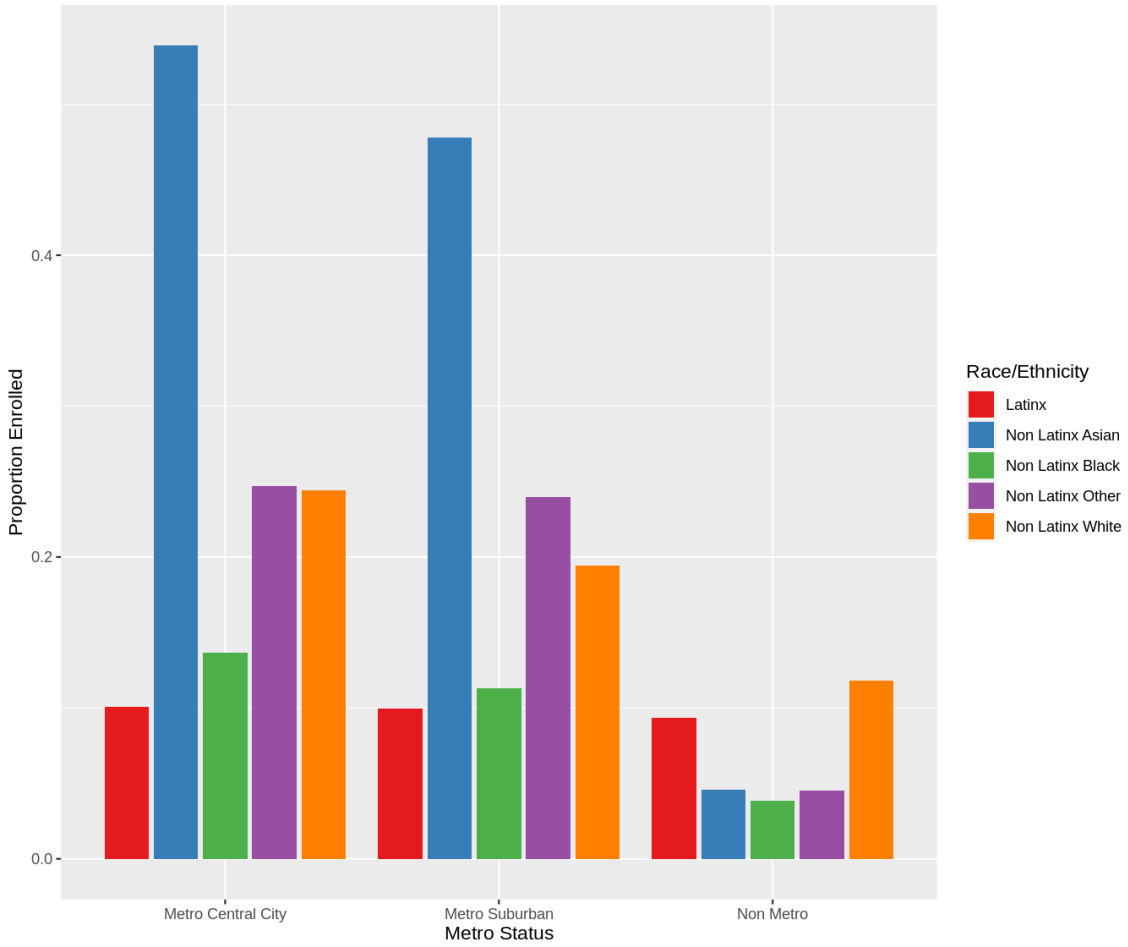
The second methodology used a multilevel logistic regression model to test for equality across PUMAs in enrollment status, as well as to test for differences by the demographic groups identified above. Our higher-level units in the models were PUMAs. As an initial test prior to running the multilevel model, we tested for equality of our outcome across all PUMAs using a likelihood ratio test. Results from the test showed significant variation between PUMAs. These models were estimated using the *lme4* library (Bates et al., 2014) in R. Scaled person weights were included in the analysis to make the analysis representative of the population of the state of Texas between the ages of 16 and 25. Although not a focus of this study, our model included controls for age and sex that had been identified in the literature as factors that influence college enrollment. We controlled for these factors in our regression analyses to check our spatial results and assist us with the interpretation of our spatial findings.

Results

Figure 1 showed the proportion of 16–25-year-olds enrolled in college by residence type. Overall, Asians had the highest levels of college enrollment in this age group, although only in cities, followed by Others and Whites. Latinxs and Blacks had the overall lowest levels of college enrollment, although Latinxs had slightly higher levels of enrollment in non-metro areas. To compare this distribution, we presented the overall population composition by race/ethnicity in Figure 2. We did this to highlight the inequality in the two distributions. If enrollments mimicked population composition, then the two figures would have showed the same patterns.

Figure 1

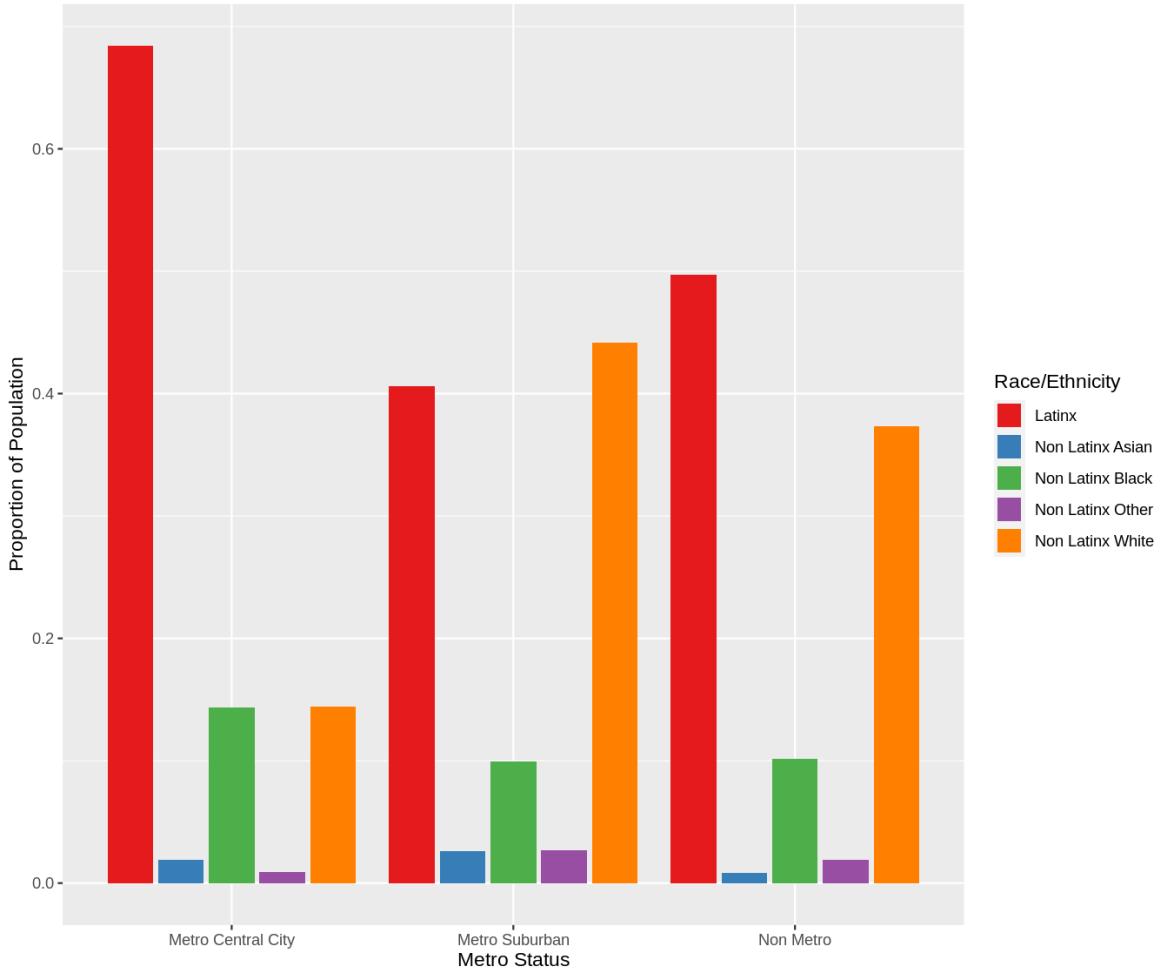
Distribution of College Enrollment by Race/Ethnicity and Metropolitan Residence Type, 2014-2016 ACS PUMS



Note. The data represents the proportion of 16-25-year-old's enrolled in college by metro residence type. ACS = American Community Survey. PUMS = Public Use Microdata Sample.

Figure 2

Distribution of Total Population Age 16 to 25 by Race/Ethnicity and Metropolitan Residence Type, 2014-2016 ACS PUMS



Note. ACS = American Community Survey. PUMS = Public Use Microdata Sample.

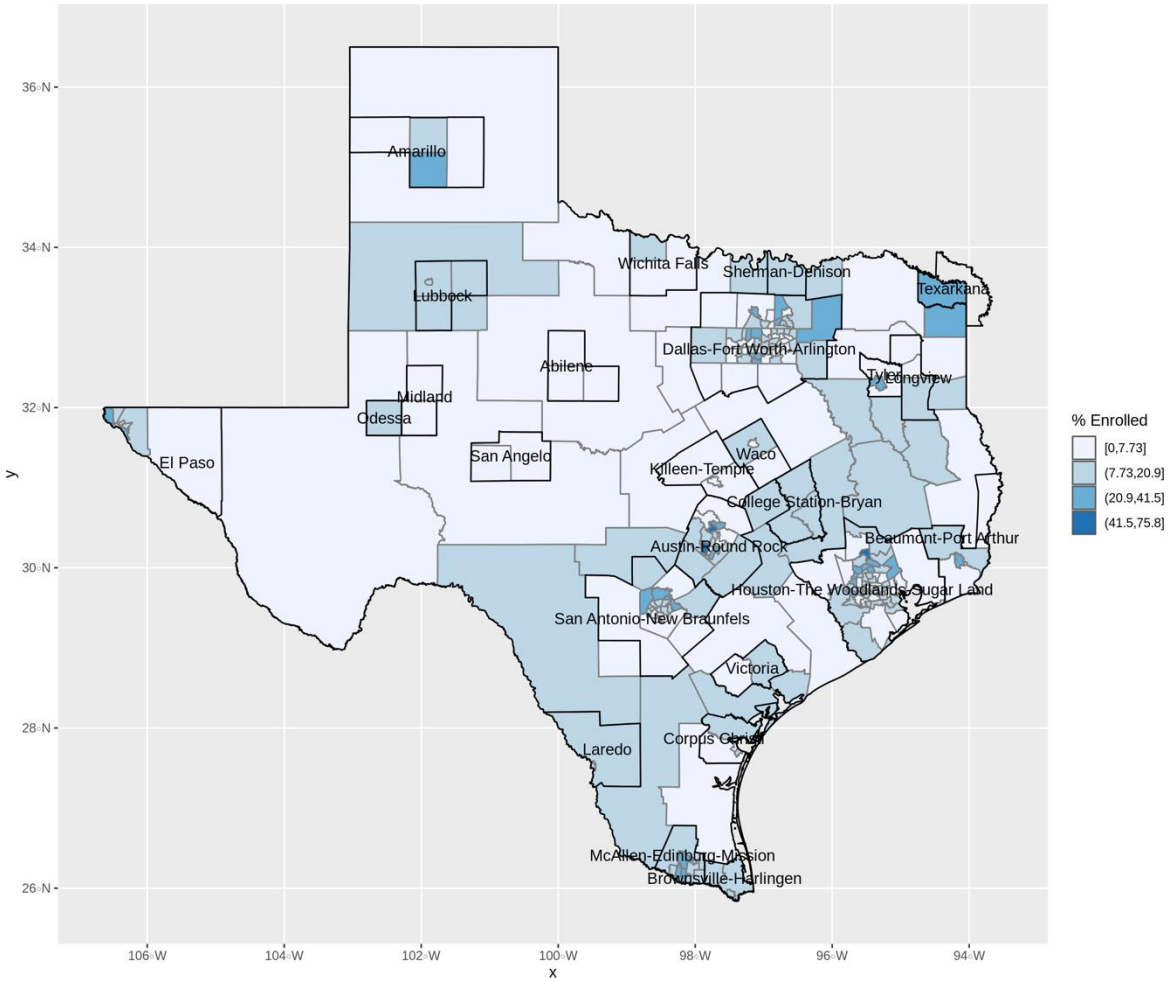
Of course, the two figures showed very different pictures. Asians had higher levels of enrollment than they make up in the population, for instance. Latinxs, having some of the lowest levels of enrollment, had nearly the largest shares of the population in all residence types. When looking at non-metro areas, the results showed that 16–25-year-old non-metro Latinxs were found to face a major disadvantage in their college enrollment rate. Specifically, the data showed that the college enrollment rates for non-metro Latinxs were much smaller than the demographic proportion that they represented in non-metro areas in Texas. This is significant because it means that in non-metro areas, Latinxs made up a large share of the population, but their low levels of college enrollment did not come anywhere close to the demographic proportion they represented.

Figures 3 through 5 illustrated the spatial distribution of college enrollment among the three largest racial/ethnic groups across the state. These maps suggested that the pattern of college enrollment is strongly patterned by being in a metropolitan area, with areas within the core based statistical areas (black lines) having higher fractions of high school graduates enrolled in college.

The black lines represented designated metro areas, as defined by the US Census Bureau. This is consistent with the literature on spatial inequality in higher education (e.g., Dache-Gerbino, 2018; De Oliver, 1998). Although this result is true overall and matches what was presented in Figure 1 above, the data also showed spatial variation within metro areas and non-metro areas by race/ethnicity. These findings, in general, matched the underlying spatial distribution of racial/ethnic groups within the state, with some exceptions noticed. For example, in Figure 3, north Bexar county Texas, which includes the city of San Antonio, indicated a large proportion of Latinxs with high rates of college enrollment.

Figure 3

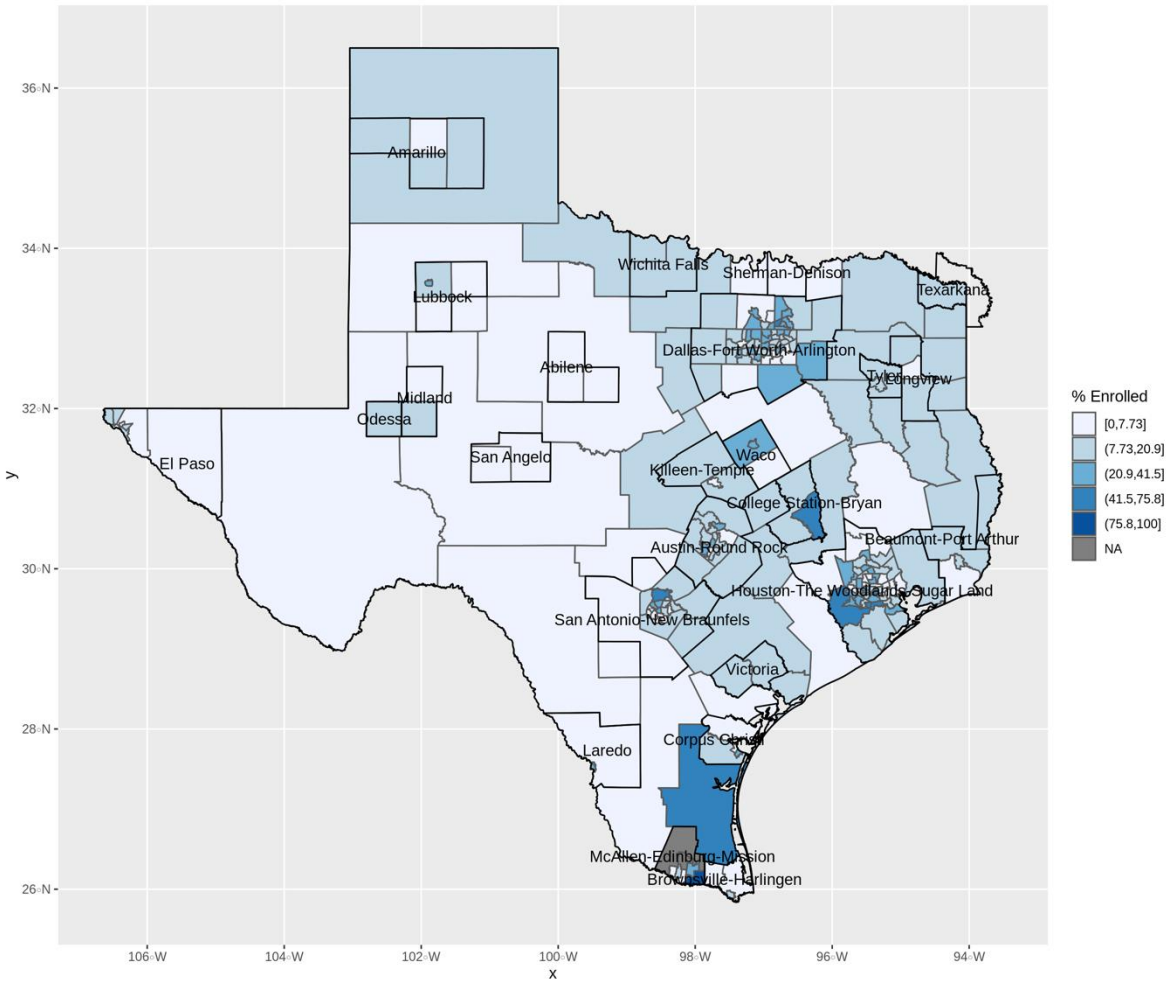
Proportion of Latinx High School Graduates Enrolled in College by PUMA-ACS, 2014-2016



Note. Natural map groupings in the data were calculated using jenk natural breaks. PUMA= Public Use Microdata Area. ACS = American Community Survey.

Figure 4

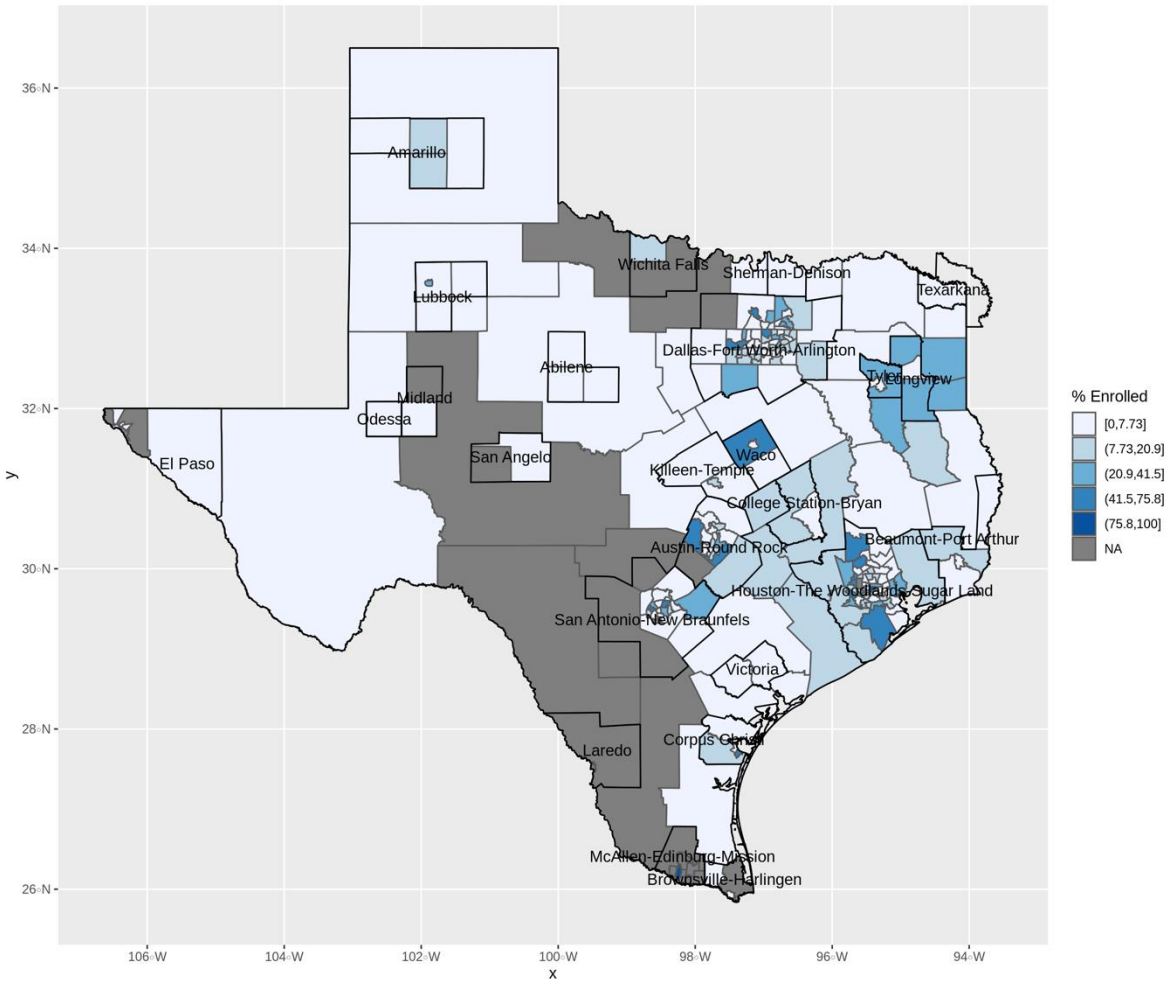
Proportion of White High School Graduates Enrolled in College by PUMA-ACS, 2014-2016



Note. Natural map groupings in the data were calculated using jenk natural breaks. PUMA= Public Use Microdata Area. ACS = American Community Survey.

Figure 5

Proportion of Black High School Graduates Enrolled in College by PUMA-ACS, 2014-2016



Note. Natural map groupings in the data were calculated using jenk natural breaks. PUMA= Public Use Microdata Area. ACS = American Community Survey.

Table 1 showed the results of the multilevel logistic regression model. We calculated a multi-level logistic regression model in an effort to test the results from our spatial analyses. Collectively, the results mimicked those of the descriptive analyses, where Asians ($e^B = 2.270$) were more likely than Whites (i.e., the reference group) to be enrolled, while Blacks ($e^B = 0.506$) and Latinxs ($e^B = 0.392$) were less likely to be enrolled in college. Residential location also showed significant variation in the model, with respondents in both metro locations (Central City $e^B = 1.834$; Suburban $e^B = 1.651$) showing higher likelihood of being enrolled, when compared to non-metro residences.

Table 1

Results of Multilevel Logistic Regression Model for College Enrollment

Variable	Odds Ratio	95% CI
White (reference)	1.00	
Latinx	0.40**	(0.150, 0.633)
Asian	2.27**	(1.742, 2.799)
Black	0.51**	(0.179, 0.834)
Other	1.00	(0.391, 1.609)
Non-Metro Residence (reference)	1.00	
Central City	1.83**	(1.405, 2.264)
Suburban	1.65*	(1.209, 2.093)
Age_z	0.43**	(0.314, 0.541)
Male (Female reference)	0.65**	(0.463, 0.838)
Year = 2014 (reference)	1.00	
2015	1.09	(0.860, 1.328)
2016	1.27*	(1.034, 1.498)
Intercept variance	0.16	

Note. Scaled person weights are include in the model to make the analysis representative of the population of the state of Texas between the ages of 16 and 25. CI = confidence interval. ^{z} Reflects a variable scaled into z-scores.
*p<.05. **p<.01. ***p<.001.

Discussion

This study used a spatially contextualized approach to examine college enrollment of 16–25-year-olds by race/ethnicity across metropolitan and nonmetropolitan settings within the state of Texas. We used these methods to specifically explore college enrollment for racial and ethnic minorities living in non-metro residences, as well as for those living in metro areas. The findings

showed patterns of college enrollment and opportunity regionally differing by race/ethnicity across Texas. We also found considerable regional disparities in non-metro areas. More specifically, our results identified that apart from Latinxs, the college enrollment rates across all race/ethnicities were lowest in non-metro areas. When we considered population composition of racial/ethnic residence in our analyses, the results from our graphics showed variation between all racial/ethnic groups. Findings from our multilevel approach further supported the findings from our descriptive statistics, which showed that higher rates of college enrollment were highly related to being White, Asian, older, female, and living in a city. Collectively, these findings imply a contradiction with past research, which assumed that the influence of rural place of residence was equal across all rural regions and/or among all rural races/ethnicities who wanted to access and enroll in college (e.g., Koricich et al., 2018). Rather, the results from this exploratory study provides empirical evidence that strongly suggests there are non-metro areas in Texas where spatial and racial postsecondary opportunity and equity are working collectively, not independently, to disadvantage.

This is a salient finding of this study and supports the argument that geography is a factor influencing college enrollment gaps, especially among racial/ethnic groups (Dache-Gerbino, 2018; Hillman, 2017; Turley, 2009). We built upon previous literature investigating geography and race/ethnicity by moving beyond the typical approaches that either focused on individual-level factors, or measured race/ethnicity and rural area independently. Specifically, we focused our exploration on the intersection of race/ethnicity and place of residence. We also considered population proportions of race/ethnicity in non-metro regions in an effort to better understand populations and refrain from diluting concentration issues.

Despite our focus on non-metro areas that included rural and small towns in Texas, our findings emphasize that there are disparities in accessing postsecondary opportunities for racial/ethnic minorities in rural America, particularly among college-aged Latinxs in Texas. This should be a critical concern in addressing spatial and racial college access equity gaps, especially because Latinxs are establishing a major presence in rural areas across the United States (Sáenz, 2012; Sáenz & Torres, 2004). Our findings accentuate the importance of addressing opportunity structures for racial/ethnic rural communities, like rural Latinxs, using spatial and racial/ethnic lenses. Without this approach, we run the risk of focusing on only rurality when looking to overcome college opportunity stratifications that can privilege certain residential locations over others (Hillman, 2017). The findings from this study point to the importance of recognizing how the geography of college opportunity (i.e., enrollment) can vary and intersect across races/ethnicities and rural residences. Beyond recognizing variation, as this study found, there will be a need to understand how and why rural geography contributes to disparities for racial/ethnic groups, like rural Latinxs in Texas.

Although understanding what specific geospatial factors are associated with Latinx rural variations is beyond the scope of this exploratory study, a potential explanation exists. The racial histories and demographic characteristics of rural Latinx communities suggest aspects of anti-Latinx policies and discrimination that are grounded in the foundation of these racialized rural places (Martinez, 2018). For example, United States labor and immigration policies initiated by meat packing and chicken farm industries in the 1940s actively recruited Latinxs and relied on them for low-wage labor (Sáenz, 2012). Such histories have contributed to Latinx migration and the creation of settlements across rural areas of Texas. One example of Latinx settlements are *colonias,* which are unincorporated rural lands where Latinx farmworkers and their families live and are located primarily along the Texas/Mexico border (Sáenz & Torres, 2004). In a *colonia,*

residents struggle with accessing basic necessities like potable water, broadband, and transportation resources (Barton et al., 2015). As of 2015, an estimated 500,000 people lived in *colonias* in Texas (Barton et al., 2015).

Our findings offer several implications for future research. For one, our results stress the importance of considering population proportions in work that is interested in measuring college enrollment outcomes using geospatial approaches. Not accounting for population proportions can lead to overlooking spatial inequities, stratification, and misspecifiying outcomes (Lobao & Sáenz, 2002). Using an exploratory approach, our study was limited in understanding how geospatial factors, like broadband, transportation, and health care access, could be influencing the rural spatial and racial variation results. Future studies should aim to uncover which geographic factors are associated with the results from this study. Future work may also consider exploring dual enrollment, early college high school, or other rural student outreach programs in an effort to build on our findings. We also acknowledge that our work explores rural areas using a non-metro measurement, suggesting that further research could examine rural areas using different geographic units of analysis (e.g., US Census Bureau continuum codes) that our study was not able to measure.

This study's conclusion of interest about non-metro and racial disparities in college enrollment outcomes, calls for more research that moves beyond independent variable analysis. Instead, there is a need for more studies that investigate how these variations are influenced by the interaction between rural residencies and race/ethnicity. This is important because rural residents have been identified to have unique social histories and geographies that could influence opportunity structures, including postsecondary (Tickamyer et al., 2017). Thus, future work can build upon the findings in this study by using intersectional qualitative, quantitative, and spatial research designs that address current limitations in accounting for the histories and power structures on college access for all rural communities of Color, like Native Americans, Blacks, Latinxs, and Asians (Means et al., 2016; Núñez, 2014; Reyes & Shotton, 2018). Doing so will help us to better understand the experiences and decision-making of racial/ethnic persons living in rural residencies who might be exposed to higher levels of geographic discrimination and inequity.

These findings also have important implications for higher education practice. The disparities emphasize a need for higher education practitioners and administrators to develop strategies that address the limited educational opportunities of rural racial/ethnic students who want to go to college. These practices must attend to the unique characteristics and needs of the area. In these discussions, practitioners and administrators should aim to develop institutional policies and practices that not only focus on historically marginalized groups and rural areas, but also send college admissions personnel to recruit and outreach to rural areas. These students must be a focus and offered the same opportunities and attention that urban centers and White students have traditionally been offered by student affairs and P-20 college access practitioners. Additionally, these practices must also be designed with the realistic profile of rural communities of Color in mind.

In this effort, rural K–12 schools, college admissions, and P-20 offices should work together (Núñez & Oliva, 2009). The established approaches that tend to keep K–12 and higher education working in silos will more than likely not work. Furthermore, because geography matters, learning about the geography from racialized rural residents will likely be a key for college admissions officers to achieve successful recruitment outcomes that close enrollment equity gaps (Jacquette & Salazar, 2018). Most importantly, the results here suggest that special attention and

partnerships should be given to rural communities of Color. Without this investment, rural areas and the communities of Color that live in them will likely continue to face limited postsecondary opportunity structures and enrollment disparities.

Author Notes

Vanessa A. Sansone is an assistant professor in the Department of Educational Leadership and Policy Studies at The University of Texas at San Antonio. She is an expert on racial, spatial and class disparities related to higher education outcomes, especially for students from Latinx, military-affiliated and rural backgrounds. Her research interests are college affordability, Hispanic-Serving Institutions and power structures and governance.

Corey S. Sparks is an associate professor in the Department of Demography at the The University of Texas at San Antonio. He is a statistical demographer with interests in Bayesian modeling, population health and spatial demography.

Paulina Cano McCutcheon is a research coordinator at Community Information Now, UT Health Science at Houston School of Public Health. Her research interests are spatial demography, higher education and Latinx communities.

Acknowledgements

The authors would like to thank the two anonymous reviewers for their feedback on this study. We also extend our gratitude to the JCTP editorial team members and copyeditor who provided constant support throughout the publication process. Last, we thank Paul Hengesteg for his unwavering support, and review of an early draft of this piece.

Correspondence concerning this article should be addressed to Vanessa A. Sansone.

References

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. U.S. Department of Education, Office of Vocational and Adult Education. https://www2.ed.gov/rschstat/research/pubs/toolboxrevisit/toolbox.pdf

Barton, J., Perlmeter, E. R., Blum, E. S., & Maquez, R. R. (2015). *Las colonias in the 21st century: Progress along the Texas-Mexico border*. Federal Reserve Bank of Dallas. https://www.dallasfed.org/~/media/documents/cd/pubs/lascolonias.pdf

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2014). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1-48. https://doi.org/10.18637/jss.v067.i01

Bowen, W. G., Chingos, M. M., & McPherson, M. S. (2009). *Crossing the finish line: Completing college at America's public universities*. Princeton University Press.

Byun, S., Meece, J. L., & Irvin, M. J. (2012). Rural-nonrural disparities in postsecondary educational attainment revisited. *American Educational Research Journal*, *49*(3), 412-437. https://doi.org/10.3102/0002831211416344

Dache-Gerbino, A. (2018). College desert and oasis: A critical geographic analysis of local college access. *Journal of Diversity in Higher Education, 11*(2), 97-116. https://doi.org/10.1037/dhe0000050

De Oliver, M. (1998). Geography, race, and class: A case study of the role of geography at an urban public university. *American Journal of Education*, *106*(2), 273-301. https://doi.org/10.1086/444183

Dick, A. (2017). *Rural students* [Issue Brief]. Greater Texas Foundation. https://www.greatertexasfoundation.org/wp-content/uploads/2017/12/Brief-Rural.pdf

Freeman, E. (2017). Diversion or democratization: Do rural, Hispanic, community college students show signs of academic undermatch? *Journal of Hispanic Higher Education, 16*(1), 77-97. https://doi.org/10.1177/1538192716628604

Heckman, J. J., & LaFontaine, P. A. (2010). The American high school graduation rate: Trends and levels. *The Review of Economics and Statistics, 92*(2), 244-262. https://doi.org/10.1162/rest.2010.12366

Hillman, N. W. (2016). Geography of college opportunity: The case of education deserts. *American Educational Research Journal, 53*(4), 987-1021. https://doi.org/10.3102/0002831216653204

Hillman, N. W. (2017). Geospatial analysis in higher education research. In *Higher education: Handbook of theory and research* (pp. 529-575). Springer International Publishing.

Housing Assistance Council (2012). *Race and ethnicity in rural American*. http://www.ruralhome.org

Hurtado, S., Inkelas, K. K., Briggs, C., & Rhee, B. S. (1997). Differences in college access and choice among racial/ethnic groups: Identifying continuing barriers. *Research in Higher Education, 38*(1), 43-75. https://doi.org/10.1023/a:1024948728792

Jacquette, O., & Salazar, K. (2018, April 13). Colleges recruit at richer, Whiter high schools. *The New York Times.* https://www.nytimes.com/interactive/2018/04/13/opinion/college-recruitment-rich-white.html

Jenks, G. F. (1977). *Optimal data classification for choropleth maps*. Department of Geography Occasional Paper no. 2. University of Kansas.

Klevan, S., Weinberg, S. L., & Middleton, J. A. (2016). Why the boys are missing: Using social capital to explain gender differences in college enrollment for public high school students. *Research in Higher Education, 57*(2), 223-257. https://doi.org/10.1007/s11162-015-9384-9

Koricich, A., Chen, X., & Hughes, R. P. (2018). Understanding the effects of rurality and socioeconomic status on college attendance and institutional choice in the United States. *The Review of Higher Education, 41*(2), 281-305. https://doi.org/10.1353/rhe.2018.0004

Lobao, L., & Sáenz, R. (2002). Spatial inequality and diversity as an emerging research area. *Rural Sociology, 67*(4), 497-511. https://doi.org/10.1111/j.1549-0831.2002.tb00116.x

Martinez, M. M. (2018). *Injustice never leaves you: Anti-Mexican violence in Texas*. Harvard University Press.

Means, D. R., Clayton, A. B., Conzelmann, J. G., Baynes, P., & Umbach, P. D. (2016). Bounded aspirations: Rural, African American high school students and college access. *The Review of Higher Education, 39*(4), 543-569. https://doi.org/10.1353/rhe.2016.0035

Musu-Gillette, L., Robinson, J., McFarland, J., Kewal Ramani, A., Zhang, A., & Wilkinson-Flicker, S. (2016). *Status and trends in the education of racial and ethnic groups 2016* (NCES 2016-007). Center for Education Statistics, U.S. Department of Education. https://nces.ed.gov/pubs2016/2016007.pdf

Núñez, A. M. (2014). Advancing an intersectionality framework in higher education: Power and Latino postsecondary opportunity. In M.B. Paulson (Ed.), *Higher education: Handbook of theory and research* (pp. 33-92). Springer.

Núñez, A. M., & Oliva, M. (2009). Organizational collaboration to promote college access: A P-20 framework. *Journal of Hispanic Higher Education, 8*(4), 322-339. https://doi.org/10.1177/1538192709347844

O'Connor, N., Hammack, F. M., & Scott, M. A. (2010). Social capital, financial knowledge, and Hispanic student college choices. *Research in Higher Education, 51*(3), 195-219. https://doi.org/10.1007/s11162-009-9153-8

Pebesma, E. (2018). sf: Simple Features for R. https://cran.r-project.org/package=sf

Perna, L. W. (2006). Studying college access and choice: A proposed conceptual model. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 21, pp. 99–157). Springer.

Perna, L. W., & Thomas, S. L. (2008). Theoretical perspectives on student success: Understanding the contributions of the disciplines. *ASHE/ERIC Higher Education Report, 34*(1). 1-87. Jossey-Bass.

Reyes, N. A. S., & Shotton, H. J. (2018). *Bringing visibility to the needs and interests of Indigenous students: Implications for research, policy, and practice* (ASHE-NITE Paper Series). Association for the Study of Higher Education and National Institute for Transformation and Equity. https://cece.sitehost.iu.edu/wordpress/wp-content/uploads/2017/02/Bringing-Visibility-to-the-Needs-and-Interests-of-Indigenous-Students-FINAL-2.pdf

Ruggles, S., Flood, S., Goeken, R., Grover, J., Meyer, E., Pacas, J., & Sobek, M. (2018). Integrated Public Use Microdata Series: Version 8.0 [machine-readable database]. *University of Minnesota*. https://doi.org/10.18128/D010.V8.0

Sáenz, R. (2012). Rural race and ethnicity. In L.J. Kulcsár, K.J Curtis. (Eds.). *International Handbook of Rural Demography* (pp. 207-224). Springer. https://doi.org/10.1007/978-94-007-1842-5_15

Sáenz, R., & Torres, C.C. (2003). Latinos in rural America. In D.L. Brown & L.E. Swanson (Eds.), *Challenges to rural America in the twenty-first century* (pp. 57-72). Penn State University Press.

Showalter, D., Klein, R., Johnson, J., & Hartman, S. L. (2017). *Why rural matters 2015–2016: Understanding the changing landscape.* http://www.ruraledu.org/user_uploads/file/WRM-2015-16.pdf

Soja, E. W. (2010). *Seeking spatial justice*. University of Minnesota Press.

Tate IV, W. F. (2008). "Geography of opportunity": Poverty, place, and educational outcomes. *Educational Researcher*, *37*(7), 397-411. https://doi.org/10.3102/0013189x08326409

Tickamyer, A., Sherman, J., & Warlick, J. (Eds.). (2017). *Rural poverty in the United States*. Columbia University Press.

Turley, R. N. L. (2009). College proximity: Mapping access to opportunity. *Sociology of Education*, *82*(2), 126-146. https://doi.org/10.1177/003804070908200202

U.S. Department of Agriculture. (2017, April). *Rural education at a glance, 2017 edition*. Economic Research Service. https://www.ers.usda.gov

Walker, K. (2018). tigris: Load Census TIGER/Line Shapefiles. Retrieved from https://cran.r-project.org/package=tigris

Watson, J. (2019, November 18). ASHE conference centers the stories of marginalized groups. *Diverse: Issue in Higher Education*. https://diverseeducation.com/article/160179/

Wells, R. S., Manly, C. A., Kommers, S., & Kimball, E. (2019). Narrowed gaps and persistent challenges: Examining rural-nonrural disparities in postsecondary outcomes over time. *American Journal of Education*, *126*(1), 1-31. https://doi.org/10.1086/705498

Wickham, H. (2016). *ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag. http://ggplot2.org