Racial/Ethnic Test Score Gaps and the Urban Continuum

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Research is just beginning to describe with precision determinants of racial and ethnic achievement gaps. Work by Reardon, Kalogrides, and Shores found that factors such as parental income, parental education, and segregation are the strongest predictors of achievement gaps. In this study we expand this line of inquiry to examine the role of urbanicity. Given the considerable historical, cultural, economic, and educational differences between city and rural locales, there is reason to suspect that the forces which shape their achievement gaps are different as well. We examine White-Black and White-Hispanic test gaps across thousands of Local Education Agencies (LEAs), finding that rural LEAs have White-Black and White-Hispanic achievement gaps 16% and 22% smaller, respectively, than those found in city schools. Moreover, socioeconomic factors have a different relationship to gaps in more rural as opposed to more urban places.

Racial and ethnic achievement gaps are one of the most studied issues in education research, receiving perennial attention from media outlets and policy circles. Understandably, the dialogue around these achievement gaps usually resides in the practical realm: what causes them; how they affect the lives of students of color; and, most importantly, what can be done to shrink them. Given the confluence of factors that interact with racial and ethnic achievement gaps, answering these questions confidently proves exceedingly difficult. For this reason, an important, but underappreciated, thread of achievement gap research seeks to better describe achievement gaps—in terms of their magnitude and how important characteristics of schools and neighborhoods relate to them—in hopes that a clearer understanding will eventually lead to improved knowledge of causal mechanisms.

The Stanford Education Data Archive (SEDA), which was made publicly available in 2016, represents the most comprehensive source of information on the demographic and socioeconomic conditions that underpin achievement gaps in U.S. school districts (Reardon, Kalogrides, Ho, Shear, Shores, & Fahle, 2016). Several recent studies use SEDA to greatly expand our understanding of how factors such as income and segregation relate to achievement and racial/ethnic test disparities (Fahle & Reardon, 2016; Reardon, 2016a, 2016b; Reardon, Kalogrides, & Shores, 2016). This article furthers this literature by examining how the urbanicity of a school district—whether it resides in a city, suburban, town, or rural location—relates to its racial and/or ethnic achievement gaps, as well as how important predictors of such gaps might operate differently across these settings. Given that racial and ethnic achievement gaps are largely framed as an urban issue (with the bulk of research focusing on conditions in cities that lead to such poor outcomes for students of color), and because there is a relative dearth of research on the economic and social conditions of rural minorities in general (Crockett, Carlo, & Temmen, 2016; Gurley; 2016; Sáenz, 2012) and place-based examinations of student achievement specifically (Votruba-Drzal, Miller, & Coley, 2016), we examine this issue through the lens of urbanicity in an effort to expand the literature and offer potential insights that may be used to address the gaps in different types of places across the country. As the social and economic forces differentially impacting racial/ethnic groups in rural areas are quite different from those that shape the urban landscape, one might expect differences in achievement gaps as well.

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Literature Review

Correlates of Racial/Ethnic Achievement Gaps

Racial/ethnic achievement gaps—particularly the White-Black achievement gap—have been scrutinized for over half a century. Although there was some narrowing of achievement gaps in the 1970s and 1980s, and again after the turn of the century (Barton & Coley, 2010), they remain unacceptably large, with magnitudes of roughly 0.55 to 0.75 standard deviation (SD) among school districts and in metropolitan areas (Reardon, Kalogrides, & Shores, 2016). Ever since the Coleman Report (Coleman et al., 1966)—and despite its methodological shortcomings—there has been a strong consensus that family and neighborhood factors are important contributors to racial/ethnic achievement gaps. Researchers have long held general convictions about characteristics that contribute to achievement gaps, including disparities in resources at home, more dangerous neighborhood environments for students of color, highly segregated schools, and different levels of social capital and the opportunities it affords. However, researchers are just beginning to undertake more nuanced analyses of such relationships. Using SEDA, Reardon, Kalogrides, and Shores (2016) explain roughly three-quarters of the variation in district- and metropolitan-level racial/ethnic achievement gaps, with parental income, parental education, and segregation serving as the strongest predictors. Moreover, more affluent school districts tended to exhibit larger racial/ethnic achievement gaps. These findings echo a prior study on this topic, which found that racial gaps in achievement become especially pronounced in places where racial opportunity in the labor market is constricted and levels of racial inequality are correspondingly high (Roscigno, 1999).

Reardon, Kalogrides, and Shores (2016) did not find school quality factors to be robust predictors of achievement gaps, although, as the authors acknowledge, the school quality variables included in the study were limited. Moreover, the authors suggest that framing in-school and out-of-school causes of achievement gaps as distinct is to imply a false dichotomy. There are numerous ways in which these two categories interact, such as more affluent communities securing greater educational resources for students, or parents in such communities leveraging their social capital to provide better educational opportunities. Regardless, this research establishes that there remains a powerful connection between socioeconomic conditions and segregation on the one hand, and racial/ethnic achievement gaps on the other.

Achievement Gaps and Urbanicity

The existing literature that highlights achievement trends between more and less affluent students along lines of urbanicity suggests that differences do exist, and, given the link between race and class, such findings could relate to racial/ethnic achievement gaps. For instance, Graham and Teague (2011) find that, when controlling for SES, despite students' having similar overall reading achievement across urbanicity, rural students who were low achievers at the start of kindergarten made smaller gains than did their urban and suburban peers. This finding could suggest that rural schools have more trouble in helping their struggling students, and perhaps students of color, than do more metropolitan schools. However, other research might imply the opposite. For instance, some evidence suggests that the magnitude of the association between income and early reading and mathematics skills differs between urban and rural places: one study found that income increases are related to the greatest improvements in early academic skills in large urban areas, but only slight improvements in rural areas (Miller, Votruba-Drzal, & Setodji, 2013). Such income disparities could be correlated with differences along racial/ethnic lines. Furthermore, a report on the White-Black achievement gap found that schools with higher densities of Black students exhibited higher achievement gaps, and that rural schools generally had lower densities of Black students (Bohrnstedt, Kitmitto, Ogut, Sherman, & Chan, 2015)—a finding that could suggest lower racial/ethnic achievement gaps in rural places. Overall, the literature is mixed as to how racial/ethnic achievement gaps might differ by place.

Relevant Rural and Urban Differences

Might the findings of Reardon, Kalogrides, and Shores (2016) be different for rural school districts when compared to more urban locales? There are numerous reasons to believe so. Populations in rural areas differ from those in more urban locations in meaningful ways, not just in terms of racial and ethnic compositions but in terms of how such profiles were established and the current contexts that shape the lived experiences of rural as opposed to more urban children. In this section, we review differences across four domains: historical, cultural, economic, and educational.

Historical differences. The past century's Great Migration, in which Blacks from the rural south moved to major urban centers in the north in great numbers to avoid de jure discrimination and pursue economic opportunities, has left lasting social forces across these places. For instance, Blacks who moved were significantly more educated than those who stayed (Tolnay, 2003). However, countervailing forces were also at work. Walker's (1996) comprehensive case study of a segregated school in the rural south highlights the importance of community, care, and advocacy in sustaining such schools, providing a rebuff against the prevailing wisdom that the educational conditions of Blacks in desegregated northern (and often urban) schools was superior to that of southern Blacks. The Rosenwald Rural School Initiative, which facilitated the construction of

roughly 5,000 schoolhouses for southern Blacks between 1913 and 1931, was shown to have a tremendous impact on the educational outcomes of rural Blacks (Aaronson & Mazumder, 2011).

For Hispanics, immigration to rural destinations is a relatively recent phenomenon, and they have impacted the demographics and economics of small rural towns in ways dissimilar to long-established urban enclaves. Higher rates of fertility and poverty among rural Hispanics suggests that they may not be as well assimilated as those Hispanics who reside in more urban locales (Lichter, Sanders, & Johnson, 2015). Other research has shown that rural immigrants, most of whom are Hispanic, are poorer and have lower educational attainment than their urban counterparts (Schaefer & Mattingly, 2016). However, the migration of Hispanics to rural "boomtowns" is driven by the economic opportunities available there (e.g., meatpacking plants) (Johnson & Lichter, 2008), and there is reason to believe that the fate of many such places—including the lives of the Hispanic immigrants themselves—will ultimately improve thanks to Hispanic immigration (Carr, Lichter, & Kefalas, 2012). Relevant history and migration patterns differ temporally, geographically, and circumstantially between Blacks and Hispanics—not to mention within subgroups of these populations as well. Overall, peopling stories are rich with nuance and offer competing evidence regarding a rural advantage/disadvantage in reducing achievement gaps.

Cultural differences. Rural families continue to exhibit more traditional marriage patterns than do urban families (Smith & Mattingly, 2012), with a larger emphasis on men in families as breadwinners (Sherman, 2009). Interactions between racial and ethnic norms on the one hand, and rural characteristics on the other, may also be of note. Some evidence shows that racial identity might buffer against the stresses of racism for Black couples who move into more rural towns from larger urban locales (Cutrona, Clavél, & Johnson, 2016). Other scholars have noted that rural Hispanics often hold to traditional celebrations and customs from their country of origin, yet due to being in less-established communities, may lack the infrastructure that would foster fuller engagement in their communities (Stein, Gonzales, Coll, & Prandoni, 2016).

Economic differences. In general, the face of poverty, work, and opportunity is different in rural areas (Thiede, Lichter, & Slack, 2016; Tickamyer & Duncan, 1990), which undoubtedly affects the lives of all children who reside there. Many of the new opportunities created in rural areas are for relatively low-wage work (Johnson & Lichter, 2008), and scholars have found that talented and highly resourced rural adolescents may view leaving their home for more metropolitan locales as the best way to ensure their success (Carr & Kefalas, 2009). Due in part to the shifting nature of work over the past century, rural areas are more likely than metropolitan places to experience higher rates of poverty, concentrated poverty, and poverty that spans generations (Schaefer, Mattingly & Johnson, 2016). Of particular importance to this study is understanding how more proximal aspects of poverty affect achievement, as well as how such factors might differ across urbanicity. Brooks-Gunn and Duncan (1997) outline pathways through which poverty impacts child outcomes, including health and nutrition, the home environment, parental interactions with children, parental mental health, and neighborhood conditions. For instance, research has shown a relationship between various factors of environmental chaos and the physical and mental health of children (Coley, Lynch, & Kull, 2015). While this framework provides a useful heuristic for examining the underlying poverty-related mechanisms that impact achievement, and though a wide body of research examines the connections between various pathways and outcomes, we find no systematic study that examines (a) the relative impact of various pathways on achievement, and (b) how such pathways differ across urbanicity.

Educational differences. The characteristics of rural places also lead to differences in schooling between urban and rural schools. In larger, more metropolitan locations, White students from more affluent backgrounds can have wholly different lived experiences—in terms of peer interactions, neighborhood safety, and enrichment activities—compared to the experiences of poorer, minority students in the same district. It stands to reason that the more limited range of possibilities and conditions in many rural locations could serve to attenuate the differences in achievement along socioeconomic lines. Rural schools and districts themselves are also generally smaller, which could affect the level and tenor of racial and ethnic segregation.

Numerous studies have illustrated the importance of place in rural schools, and how community can foster educational goals (Barley & Beesley, 2007; Gruenewald, 2003; Tieken, 2014). Barley and Beesley (2007) review four cases of high-performing, high-need rural schools, detailing tightly interwoven places where communities connect with schools through formal partnerships, the use of school facilities, and investment in schools by local stakeholders. Tieken (2014) also highlights how schools often serve as a focal point in rural communities and subsequently can force a certain amount of interaction between different races and perhaps more of a shared identity. Of particular importance to this study, the primacy and interconnectedness of school and community in rural places may create a similarity of student experience across race and ethnicity that is less common in larger urban settings, which could have a bearing on racial/ethnic achievement gaps.

However, rural schools also have a host of magnified challenges when compared to more metropolitan schools, including higher per-pupil overhead costs, lower teacher

pay (Player, 2015), a greater share of out-of-subject-area teachers (Lazarus, 2003), fewer professional development opportunities (Graham & Teague, 2011), and many additional difficulties that may arise from being geographically isolated. Furthermore, rural schools may be at a disadvantage in finding solutions to these and other challenges, as numerous scholars have argued that the rural perspective often goes underappreciated by policy circles (Epply, 2009; Gagnon & Mattingly, 2015; Johnson & Howley, 2015). How these issues might differentially affect the achievement of White, Black, and Hispanic children, though, is unclear.

In this study, we examine how racial/ethnic achievement gaps differ across urbanicity in the United States, accounting for a wide range of socioeconomic conditions. Our review of historical, cultural, economic, and educational differences between rural and urban places is meant to motivate this deep investigation, in that it presents a brief survey of the types of factors that, though not necessarily captured in macro, district-level variables included in our study, might account for unexplained differences uncovered in our analyses. Ultimately it is exceedingly difficult to theorize a priori, and impossible to test using our empirical data at hand, how the aforementioned rural-urban differences might impact the landscape of racial/ethnic achievement disparities across place. Our goal here is to uncover relationships between racial/ethnic achievement gaps and place in a rigorous, quantitative manner. In doing so, we aim to provide a platform, and motivation, for future research to further investigate these trends. Our research questions are as follows.

1. How does the achievement in racially/ethnically diverse city and suburban school districts compare to that of racially/ethnically diverse town and rural school districts?
2. How do racial/ethnic achievement gaps in city and suburban districts compare to those of town and rural districts?
3. Is the relationship between racial/ethnic achievement gaps and average socioeconomic conditions or achievement of a district consistent across urban-centric locales?
4. Are differences in racial/ethnic achievement gaps along lines of urbanicity merely an artifact of socioeconomic and demographic differences?

Data

The primary source of data for this study comes from SEDA (Reardon, Kalogrides, Ho, Shear, Shores, & Fahle, 2016), which includes a range of data on measures of academic achievement; achievement gaps; and important demographic variables pertaining to school, neighborhood, and socioeconomic composition. Demographic variables in SEDA are constructed using data from sources such as the American Community Survey (ACS) and the National Center for Education Statistics' (NCES) Common Core of Data (CCD).[1] The achievement-related measures (i.e., means and racial/ethnic gaps) used in this study are pooled across years, grades, and subjects to create a single variable for each district. Achievement means in SEDA are constructed using approximately 215 million test scores in mathematics and ELA assessments for third through eighth graders in the 2008-09 through 2012-13 school years (simply referred to as 2009 and 2013 from here forward). Transformations are derived which allow state assessment results to be linked to the National Assessment of Educational Progress (NAEP), ultimately providing for valid national comparisons across time and place (Reardon, Kalogrides, & Ho, 2016). The outcome variables of interest in this study, district-level White-Black and White-Hispanic achievement gaps, are estimated for the 4,450 districts with at least 20 assessment outcomes in each group reported. For each district, a v-statistic is estimated, allowing for comparisons of standardized mean differences across different districts and/or states (Reardon & Ho, 2015). These achievement-related measures are reported in population SD units. Therefore, a district achievement mean of zero indicates that the average achievement in that district is equivalent to the national average, whereas a score of +/-1 suggests average achievement one SD above/below the national mean.[2] Similarly, a White-Black achievement gap of zero suggests no average racial differences in achievement for a district, whereas a score of +/-1 indicates that White students score one SD above/below Black students in that district, on average. While these data provide overall achievement and the White-Black and White-Hispanic achievement gaps for districts, we do not know the absolute achievement level by racial/ethnic group. Consequently, they do not allow for knowing precisely whether a high White-Black gap, for instance, is caused by high-achieving Whites or low-achieving Blacks, relatively speaking.

To these SEDA data, we merge urbanicity data taken from the CCD. School districts in this data set are

[1]For a more complete discussion of how the SEDA database is constructed, see Reardon, Kalogrides, & Shores (2016), Reardon & Ho, (2015), and the following technical documentation: https://cepa.stanford.edu/sites/default/files/SEDA%20Technical%20Documentation%20Version1_1.pdf

[2]Reardon, Kalogrides, Ho, Shear, Shores, and Fahle (2016) suggest that one SD in achievement may be very roughly equated to three grade equivalents of learning. However, this is considered an approximate heuristic, as any such estimate is highly dependent on contextual factors such as grade, location, etc.

categorized along urban locale using four major types: city, suburb, town, and rural according to population density and relationship to urbanized areas.[3] The final merged data set contains 4,439 districts that have information for a White-Black achievement gap and/or a White-Hispanic achievement gap, as well as an urban-locale designation. This collection represents roughly one-third of districts in the country. However, the districts included here educate roughly 90% of all Black and Hispanic students in the country (Reardon, Kalogrides, & Shores, 2016), as such students are concentrated in a proportionally small number of districts in the United States. Therefore, the sample of "racially/ethnically diverse" districts used here is a highly comprehensive sample from which to make generalizations about such districts. Strictly speaking, there are two separate analytic samples: one containing districts with White-Black achievement gap (n=2,872), and another containing districts with a White-Hispanic achievement gap (n=3,648), with the majority of districts in the former also appearing in the latter. All analyses in this study are conducted separately for each analytic sample.

Data in the study are at the district level, which is the geographic level at which data are made available through SEDA. Regardless, the school district is the appropriate unit of analysis for this study for several reasons. First, it is the most finite level from which to examine issues of urbanicity, since all schools within a district are given the same urban-locale designation. Second, school districts have a considerable amount of control over many factors that might influence achievement gaps—practices of tracking, teacher hiring, within-district school choice policies, etc.—and thus there is a substantive case to examine trends at this level. Third, Reardon, Kalogrides, and Shores (2016) show that substantial variation in achievement gaps exists at the district level, which supplies a necessary precondition for one to examine how such variability relates to district characteristics such as urbanicity.

Methods

We begin our analysis with a descriptive examination of the data. First, we present trends in central tendency and variation for measures used in this study, discussing important takeaways. Next, we examine averages along lines of urbanicity for the following prominent measures: district size (schools, enrollment), racial/ethnic composition, low-income composition, overall and racial/ethnic socioeconomic status (SES), achievement and racial/ethnic achievement gaps. We also descriptively examine the relationships between socioeconomic conditions, urbanicity, and district racial/ethnic achievement gaps.

After describing our data, we conduct multivariate regression analyses through the construction of a taxonomy of regression models. We are not interested in the causal relationship of urbanicity on achievement gaps per se, but rather in better understanding how the underlying characteristics of locales relate to achievement gaps. Instead of controlling for the full suite of variables available in SEDA, we focus on the variables found to have the strongest relationship to gaps as well as those of substantive interest (which are the same variables that are described descriptively). This approach allows us to examine the relationships that these predictors and a district's urbanicity have on its racial/ethnic achievement gaps without controlling away the essence of urbanicity. For instance, data on types of employment are correlated with urbanicity more than the outcome variables of interest, and ultimately may control away the variation one hopes to examine. Taken to an extreme, this is the same reason we do not control for population density (which is largely how urbanicity is defined): it is highly predictive of a district's urbanicity but lacks a strong theoretical connection to achievement gaps. Since the precision of achievement gap estimates varies systematically according to district size (larger districts generally have more precise estimates), we also repeat all OLS regressions while accounting for this heteroscedasticity. Specifically, we weight each observation equal to the inverse of the variance of its achievement gap. However, our preference remains in using unweighted estimates, as weighting ultimately gives more leverage to larger, often more urban, districts. Finally, to further illustrate the unique relationship between urbanicity and achievement gaps, we conduct a Blinder-Oaxaca decomposition analysis. This procedure partitions an achievement gap into the portion explained by urbanicity and that explained by all other determinants, as well as that portion explained by the interaction of the two. This decomposition analysis aims to further explore how urbanicity is related to achievement gaps, independently of district characteristics. While this procedure does not examine the impact of individual variables, it allows for a more complete examination of urbanicity's relationship to achievement gaps as the method accounts for all predictors and interactions of those predictors.

Results

Tables 1 and 2 shows descriptive trends for primary variables of interest in this study. We find mean White-Black and White-Hispanic achievement gaps of 0.62 and 0.48, respectively, with considerable variation (SDs = 0.24, 0.26, respectively). The district average difference in socioeconomic indices across race and ethnicity is striking: 1.95 SD lower for Blacks, and 1.12 SD lower for Hispanics, within their respective analytic samples. Measures of racial/ethnic segregation and low-income, income, and parental

[3]See https://nces.ed.gov/ccd/rural_locales.asp for complete definitions.

education gaps all show considerable variation across the analytic samples.

When examining key measures for cities, suburbs, towns, and rural districts separately, we again see striking trends (see Tables 3 and 4). In answering our first research question, we see that, on average, suburban districts outscore city, town, and rural districts by 0.19 constant population SD units or more—a considerable margin—across both samples, with non-suburban districts exhibiting nearly equivalent average achievement within samples. However, in regard to our second research question we find that town and rural districts exhibit lower racial/ethnic achievement gaps than do city districts, and to a lesser extent, even suburban districts. City districts are the most racially diverse, and they also exhibit the largest White-Black and White-Hispanic disparities in socioeconomic status. However, one should take notice of the relatively large racial/ethnic socioeconomic status (SES) differences in rural districts, even when compared to city districts.

Next, we examine racial/ethnic achievement gaps with respect to the average socioeconomic conditions within urban-centric locales. Table 5 shows average gaps for above sample-average SES and below sample-average SES within city, suburban, town, and rural districts. We see that within city and suburban districts, the White-Black achievement gap is considerably smaller in less affluent/advantaged districts than it is more affluent/advantaged city and suburban districts, with gaps of 0.09 SD and 0.15 SD, respectively. In other words, affluence has a meaningful relationship to the magnitude of the White-Black achievement gap of city and suburban districts. In contrast, the average White-Black achievement gap is actually *smaller* in more affluent/advantaged town districts than it is in less affluent/advantaged ones, while the difference across such rural districts is essentially negligible (0.01 SD). Thus, unlike in city and suburban districts, this table suggests that the level of affluence/advantage in rural and town districts has little bearing on the magnitude of its White-Black achievement gap.

Several different trends emerge when applying the same analytic lens to the White-Hispanic achievement gap sample. First, as earlier analyses illustrated, the average magnitude of the White-Hispanic achievement gap is smaller than that of White-Black achievement gap. Second, even though the White-Hispanic achievement gap is smaller, the difference in gaps between more and less affluence/advantaged districts is greater: there is a 0.08 SD difference in White-Black gaps for all districts, compared to a 0.10 SD difference for the White-Hispanic gap, when looking across affluence/advantagedness. Third, we see less of an interaction with SES and urbanicity for White-Hispanic achievement gaps. We do again see that more affluent/advantaged city and suburb school districts exhibit considerably higher ethnic achievement gaps than do less affluent/advantaged districts from the same locale, with differences of 0.16 SD across city districts and 0.14 SD across suburban ones. However, this trend also holds for town and rural districts, albeit to a lesser extent, with differences in gap size of 0.09 SD across town and rural districts.

To systematically untangle the complex relationships between socioeconomic conditions, urbanicity, and achievement gaps, we next fit a taxonomy of regression models.[4] First, we add binary variables for suburb, town,

[4]We repeat all regression and decomposition analyses using

Table 1

Descriptive Statistics, Districts in the United States with a Measure of White-Black Achievement Gap (n=2,872)

Variable	Mean	SD	Min	Max
White-Black Achievement Gap	0.62	0.24	-1.55	1.82
SES Composite Measure	-0.15	1.02	-3.62	2.37
White-Black SES Difference	1.95	1.45	-1.92	8.21
Poverty Rate	0.17	0.10	0	0.54
White-Black Poverty Difference	-0.19	0.19	-0.98	0.43
Average Achievement	-0.03	0.34	-1.48	1.27
Number of Schools in District	19.40	36.90	1	931
District Enrollment, grades 3-8	3971	9158	169	299519
Percent Black	21.5%	20.1%	0.5%	97.6%
Percent White	56.2%	24.4%	1.0%	97.1%
White-Black District Racial Segregation	0.07	0.09	0.00	0.75
White-Black FRPL Gap	0.05	0.07	-0.13	0.59
White-Black Income Gap	0.66	0.48	-1.38	2.96
White-Black Parental Education Gap	0.18	0.37	-1.21	1.98

Table 2

Descriptive Statistics, Districts in the United States with a Measure of White-Hispanic Achievement Gap (n=3,648)

Variable	Mean	SD	Min	Max
White-Hispanic Achievement Gap	0.48	0.26	-2.59	1.62
SES Composite Measure	0.10	0.94	-3.37	2.65
White-Hispanic SES Difference	1.12	1.06	-3.77	6.67
Poverty Rate	0.15	0.09	0.00	0.57
White-Hispanic Poverty Difference	-0.14	0.18	-0.95	0.91
Average Achievement	0.01	0.33	-1.46	1.27
Number of Schools in District	16.84	33.22	1	931
District Enrollment, grades 3-8	4531	10007	169	299519
Percent Hispanic	25.7%	22.5%	0.7%	98.7%
Percent White	57.8%	24.7%	0.9%	96.5%
White-Hispanic District Racial Segregation	0.05	0.07	0.00	0.53
White-Hispanic FRPL Gap	0.04	0.07	-0.13	0.48
White-Hispanic Income Gap	0.63	0.46	-2.18	2.48
White-Hispanic Parental Education Gap	0.71	0.42	-0.94	2.37

Table 3

Means, Key Measures of Demography and Achievement across Urbanicity, Districts in the United States with a Measure of White-Black Achievement Gap

	City	Suburb	Town	Rural
Number of Districts	588	1148	489	634
Schools per District	39.5	18.5	9.1	10.4
District Enrollment, grades 3-8	10015	5760	2009	2710
Percent White	45.2%	57.8%	57.3%	62.7%
Percent Black	22.6%	17.0%	25.6%	25.6%
Percent Free Reduced-Priced Lunch (FRPL)	49.3%	34.4%	54.0%	48.8%
SES Composite: All	-0.41	0.33	-0.69	-0.37
SES Composite: White	0.15	0.54	-0.12	0.08
SES Composite: Black	-2.05	-1.11	-2.45	-1.88
White-Black SES Difference	2.20	1.65	2.34	1.95
Average Achievement	-0.11	0.10	-0.15	-0.11
White-Black Achievement Gap	0.67	0.63	0.60	0.56

and rural districts (see Model 1, Tables 6 and 7). These coefficients must be interpreted with respect to the excluded binary variable: city school districts. For instance, we see in Model 1, Table 6, that rural school districts have an estimated White-Black achievement gap 0.116 SD smaller than that in city school districts. When controlling for overall SES of a district (Model 2, Table 6), we see that this estimate remains nearly constant (0.120 SD). Next, we allow the effects of SES to vary within urban-centric locales by adding interaction terms (Model 3, Table 6), interpreting the overall SES coefficient as the effect of SES on the White-Black achievement gap within the excluded category of city districts. We find that a one SD difference in SES status in city districts is associated with a White-Black achievement

weights equal to the inverse of the variance of the respective achievement gap, finding substantively similar results. In this article we present unweighted results; weighted analyses are available upon request.

Table 4

Means, Key Measures of Demography and Achievement across Urbanicity, Districts in the United States with a Measure of White-Hispanic Achievement Gap

	City	Suburb	Town	Rural
Number of Districts	619	1380	840	790
Schools per District	38.7	16.7	8.2	9.3
District Enrollment, grades 3-8	9886	5148	1681	2290
Percent White	44.6%	59.7%	58.8%	63.6%
Percent Hispanic	28.3%	22.4%	30.3%	24.7%
Percent Free Reduced-Priced Lunch (FRPL)	47.6%	30.2%	48.0%	43.1%
SES Composite: All	-0.32	0.54	-0.24	0.04
SES Composite: White	0.23	0.70	0.07	0.26
SES Composite: Hispanic	-1.13	-0.33	-1.15	-0.73
White-Hispanic SES Difference	1.36	1.03	1.23	0.99
Average Achievement	-0.09	0.15	-0.09	-0.04
White-Hispanic Achievement Gap	0.55	0.48	0.47	0.43

Table 5

Racial/Ethnic Achievement Gaps by Socioeconomic Status and Urbanicity

Urbanicity	Socioeconomic Status	White-Black Achievement Gap		White-Hispanic Achievement Gap	
		Mean	SD	Mean	SD
All	More Affluent/Advantaged	0.66	0.26	0.52	0.25
	Less Affluent/Advantaged	0.58	0.23	0.42	0.25
City	More Affluent/Advantaged	0.73	0.24	0.64	0.27
	Less Affluent/Advantaged	0.64	0.25	0.48	0.23
Suburb	More Affluent/Advantaged	0.68	0.26	0.51	0.27
	Less Affluent/Advantaged	0.53	0.21	0.37	0.23
Town	More Affluent/Advantaged	0.58	0.24	0.53	0.25
	Less Affluent/Advantaged	0.61	0.22	0.44	0.24
Rural	More Affluent/Advantaged	0.56	0.22	0.47	0.25
	Less Affluent/Advantaged	0.55	0.21	0.38	0.27

gap 0.065 SD greater. However, rural school districts exhibit only a 0.035 SD greater gap, which is significantly lower, and roughly half as large in magnitude, than in city districts. We then add control variables one vector at a time (Models 4 through 9), and then add state fixed effects as well (Model 10) to see if these effects of interest are robust to the inclusion of controls. We find that White-Black achievement gaps in city school districts are significantly higher than all other locales, even in the full model, which explains over half of all variability. In addition, the effect

of SES on achievement gaps within urban-centric locales is fairly robust to the inclusion of controls. We find that the relationship between SES and the White-Black achievement gap is roughly one-third as large in rural and town districts as it is in city and suburban ones when a full host of controls in included (Model 9). Only in town school districts does this effect remain significantly different from city school districts when state fixed effects are included.

A somewhat similar story emerges for White-Hispanic gaps (see Table 7). Again, we see that achievement gaps are significantly higher in city districts—and in fact are generally larger in magnitude than their corresponding estimates from Table 6—even when including controls. For instance, Model 9 suggests that rural districts have White-Hispanic achievement gaps roughly 0.08 SD smaller than those in city districts, controlling for SES indicators, overall achievement, district size, race composition, economic and racial/ethnic segregation, and racial ethnic differences in income and education. This estimate attenuates considerably when state fixed effects are included (Model 10), but it remains statistically significant. We also find that the relationship between SES and White-Hispanic achievement gaps is generally smaller for suburban and rural districts than it is in city districts—but not for towns. Overall, there is a less clear trend in this regard across the urban-rural continuum for the White-Hispanic achievement gap than was observed for the White-Black achievement gap.

What explains these gaps and how much can be attributed to urbanicity? To further illustrate the unique effect of place, we perform Blinder-Oaxaca decomposition analysis.[5] This procedure is used to estimate the difference in an outcome variable between two groups that is attributable to specific, measured characteristics, and how much of the gap remains unexplained by variables in the model. This technique estimates the change in one group's outcome if the second group (in a binary assignment) had the same characteristics, or endowments, as the first group. In our context, this means that we must compare one urban locale—for instance, city districts—to all other locales (i.e., suburban, town, and rural). Included in this decomposition are all independent variables used in the full model. This analysis is then repeated for each locale.

Table 8 shows the results of Blinder-Oaxaca decomposition of the White-Black achievement gap in our sample. We find that 0.051 SD of the gap between city and non-city districts may be attributed to endowment differences between locales. However, a 0.015 SD may be attributed to unmeasured aspects of city districts, which is 29% as large as the portion attributable to endowment differences between city and non-city districts. Another 0.006 SD may be attributed to interaction effects between a locale and its characteristics. In short, although the larger White-Black achievement gaps found in cities can mostly be attributed to important characteristics of locale—racial and ethnic segregation, socioeconomic conditions, and so on—a meaningful portion of this difference is not captured by these demographic variables. We see the same pattern emerge when comparing rural and non-rural districts: coefficients account for -0.026 SD of the White-Black achievement gap, which is about 36% as large as the portion that is explained by endowments (-0.076). Note that due to a positive interaction term, the endowment term, by itself, has a larger magnitude than the total difference in White-Black achievement gaps between rural and non-rural districts. Given the extensive set of covariates, which produce an even richer array of interactions, it is extremely difficult to interpret the meaning of this interaction term—a reality that has been previously noted (Fortin, Lemieux, & Firpo, 2011).

Next, we perform an identical Blinder-Oaxaca decomposition for the White-Hispanic achievement gap (see Table 9). Here we see an even larger proportional effect of coefficient terms versus endowment terms than was illustrated through decomposition analysis of the White-Black achievement gap. For instance, comparing city to non-city districts, we find that coefficients (-0.040) have nearly the same attribution towards the total difference as do endowments (-0.046). We find a similar proportion when looking at rural vs. non-rural districts. Results from the previous regression analyses may presage these findings: when including a full suite of variables, but without state fixed effects (Table 7, Model 9), we see that the size of the rural coefficient in the White-Hispanic equation (-0.083) is nearly double the corresponding estimate from the White-Black equation (0.042). Both suggest that the relative predictive power of locale versus other district characteristics appears to be larger in the case of White-Hispanic achievement gaps as opposed to White-Black achievement gaps.

Discussion

This study is the first in-depth examination into how racial/ethnic achievement gaps may look different across the urban-rural spectrum. We find that rural school districts have White-Black and White-Hispanic achievement gaps 16% and 22% smaller, respectively, than those found in city schools. These are not trivial amounts, as they correspond to more than a tenth of a SD, or very roughly a third of a school year worth of learning. Such a descriptive finding alone is noteworthy. More importantly, however, the differences in racial/ethnic achievement gaps between rural and city districts persist even when accounting for

[5]As with regression analyses, decomposition analyses are repeated using a weight equal to the inverse of the variance of the achievement gap estimate. We also find these analyses to be substantively similar, and again proceed with results from the unweighted analyses only.

Table 6

Predictors of the White-Black Achievement Gap in Racially/Ethnically Diverse United States School Districts (Ordinary Least Squares Regression)

	1	2	3	4	5	6	7	8	9	10
	no fixed effects (FE)									State FE
Intercept	.67 ***	.70 ***	.70 ***	.42 ***	.45 (.022) ***	.43 ***	.14	.08 (.16)	.18 (.15)	N/A
	(.010)	(.010)	(.010)	(.022)		(.022)	(.016)			
Urbanicity (City Excluded):										
Suburb	-0.047 ***	-0.091 ***	-0.108 ***	-0.065 ***	-0.069 ***	-0.054 ***	-0.066 ***	-0.039 **	-0.017 †	-0.021 **
	(.012)	(.012)	(.013)	(.012)	(.012)	(.012)	(.012)	(.012)	(.010)	(.008)
Town	-0.070 ***	-0.056 ***	-0.109 ***	-0.085 ***	-0.083 ***	-0.064 ***	-0.062 ***	-0.027 †	-0.047 **	-0.028 †
	(.015)	(.014)	(.013)	(.016)	(.015)	(.016)	(.016)	(.016)	(.015)	(.015)
Rural	-0.116 ***	-0.120 ***	-0.140 ***	-0.096 ***	-0.097 ***	-0.077 ***	-0.089 ***	-0.059 ***	-0.042 **	-0.035 **
	(.014)	(.013)	(.014)	(.013)	(.013)	(.013)	(.013)	(.013)	(.013)	(.011)
Overall Socioeconomic Status (SES)		0.056 ***	0.065 ***	0.139 ***	0.154 ***	0.096 ***	0.133 ***	0.122 ***	0.097 ***	0.116 ***
		(.005)	(.009)	(.014)	(.011)	(.015)	(.016)	(.016)	(.016)	(.022)
Suburb*SES			-0.014	-0.022 *	0.015	0.005	0.007	-0.006	-0.016	-0.010
			(.012)	(.011)	(.011)	(.011)	(.011)	(.011)	(.010)	(.010)
Town*SES			-0.005	-0.046 **	-0.039 *	-0.052 ***	-0.048 **	-0.045 **	-0.054 ***	-0.042 *
			(.015)	(.015)	(.015)	(.015)	(.015)	(.015)	(.015)	(.020)
Rural*SES			-0.030 *	-0.023 †	-0.023 †	-0.036 **	-0.040 **	-0.035 **	-0.026 *	-0.011
			(.015)	(.013)	(.013)	(.013)	(.013)	(.013)	(.013)	(.014)
R-squared	0.026	0.073	0.099	0.254	0.267	0.281	0.311	0.353	0.520	

Note: Standard errors in parentheses. †p<.10,*p<.05, **p<.01, ***p<.001.

Control Vectors Added:

Model 4: Socioeconomic Indicators (Overall Poverty, SES by race) Model 5: Vectors from Model 4 and Overall Achievement

Model 6: Vectors from Model 5 and District Size (number of schools, 3-8 enrollment) Model 7: Vectors from Model 6 and Racial Composition

Model 8: Vectors from Model 7 and Economic and Racial/Ethnic Segregation

Model 9: Vectors from Model 8 and Racial/Ethnic Differences in Income and Education Model 10: Vectors from Model 9 and State Fixed Effects

Table 7

Predictors of the White-Hispanic Achievement Gap in Racially/Ethnically Diverse United States School Districts (Ordinary Least Squares Regression)

	1	2	3	4	5	6	7	8	9	10
	no fixed effects (FE)									State FE
Intercept	0.55 ***	0.58 ***	0.58 ***	0.34 ***	0.33 ***	0.31 ***	0.55 ***	0.45 ***	0.23	N/A
	(.010)	(.010)	(.011)	(.024)	(.024)	(.024)	(.115)	(.109)	(.179)	
Urbanicity (City Excluded):										
Suburb	-0.071 ***	-0.142 ***	-0.145 ***	-0.108 ***	-0.108 ***	-0.092 ***	-0.093 ***	-0.047 ***	-0.031 *	-0.045 ***
	(.013)	(.013)	(.013)	(.013)	(.013)	(.013)	(.013)	(.013)	(.013)	(.008)
Town	-0.073 ***	-.083 ***	-0.085 ***	-0.072 ***	-0.073 ***	-0.054 ***	-0.040 **	0.021	-0.047 **	-0.013
	(.014)	(.013)	(.014)	(.014)	(.014)	(.045)	(.015)	(.015)	(.018)	(.017)
Rural	-0.119 ***	-0.151 ***	-0.155 ***	-0.149 ***	-0.149 ***	-0.129 ***	-0.107 ***	-0.052 ***	-0.083 ***	-0.055 **
	(.014)	(.014)	(.014)	(.014)	(.014)	(.014)	(.015)	(.015)	(.016)	(.019)
Overall Socioeconomic Status (SES)		0.078 ***	0.090 ***	0.174 ***	0.186 ***	0.198 ***	0.164 ***	0.138 ***	0.077 ***	0.104 ***
		(.005)	(.009)	(.015)	(.016)	(.004)	(.018)	(.017)	(.019)	(.022)
Suburb*SES			-0.014	-0.027 *	-0.025 *	-0.035 **	-0.029 *	-0.022 †	0.000	-0.006
			(.012)	(.012)	(0.12)	(.012)	(.012)	(.012)	(.012)	(.014)
Town*SES			-0.005	0.009	0.007	-0.007	-0.002	-0.000	-0.022	-0.022
			(.015)	(.016)	(.016)	(.016)	(.016)	(.016)	(.019)	(.017)
Rural*SES			-0.029 *	-0.028 †	-0.028 †	-0.040 **	-0.039 *	-0.029 **	0.013	0.013
			(.015)	(.015)	(.015)	(.015)	(.015)	(.015)	(.016)	(.019)
R-squared	0.019	0.087	0.088	0.186	0.187	0.197	0.212	0.292	0.424	

Note: Standard errors in parentheses. †p<.10,*p<.05, **p<.01, ***p<.001.

Control Vectors Added:

Model 4: Socioeconomic Indicators (Overall Poverty, SES by race) Model 5: Vectors from Model 4 and Overall Achievement

Model 6: Vectors from Model 5 and District Size (number of schools, 3-8 enrollment) Model 7: Vectors from Model 6 and Racial Composition

Model 8: Vectors from Model 7 and Economic and Racial/Ethnic Segregation

Model 9: Vectors from Model 8 and Racial/Ethnic Differences in Income and Education Model 10: Vectors from Model 9 and State Fixed Effects

Table 8

Decomposition Analysis, White-Black Achievement Gap, in Standard Deviation Units

	City vs. non-City	Suburban vs. non-Suburban	Town vs. non-Town	Rural vs. non-Rural
Total Difference	0.071	-0.020	-0.014	-0.055
Endowments	0.051	-0.028	0.029	-0.073
Coefficients	0.015	0.004	-0.005	-0.026
Interaction	0.006	0.003	-0.038	0.045

Table 9

Decomposition Analysis, White-Hispanic Achievement Gap, in Standard Deviation Units

	City vs. non-City	Suburban vs. non-Suburban	Town vs. non-Town	Rural vs. non-Rural
Total Difference	0.097	0.004	-0.047	-0.104
Endowments	-0.046	-0.005	-0.064	-0.076
Coefficients	-0.040	-0.001	-0.003	-0.061
Interaction	-0.011	0.010	0.020	0.033

socioeconomic factors, levels of segregation, and other important district characteristics. This was reaffirmed by decomposition analyses, which showed that for both White-Black and White-Hispanic achievement gaps, a substantial proportion of the difference between city and rural districts is left unexplained by the complete array of district characteristics. It is unclear whether this difference is a product of White students performing worse or students of color performing better, as we can only examine mean achievement and not racial/ethnic-specific achievement. One might be tempted to conclude from this that the trend is more a product of better performing Whites in high-gap districts than of better performing Blacks/Hispanics in low-gap districts. However, our data do not allow such a conclusion, and this area is worth further exploration. One limitation of this study is that data are only available at the district level, and not the school level. While we believe that district-level analyses are preferable to school-level analyses for reasons put forth earlier, it does preclude some interesting angles of investigation regarding within-district, between-school variation. For instance, larger districts allow for the movement of teachers between schools, with district policy permitting this to varying degrees. Given that teachers have been shown to leave high-minority schools at disproportionate rates (Hanushek, Kain, & Rivkin, 2004), urban schools with more permissive transfer policies likely experience more unequal distributions of teacher quality, which could have an influence on the racial/ethnic achievement gap findings presented in this study.

There are many directions in which future research could proceed from here, as findings may be viewed critically through historical, cultural, economic, and/or educational lenses. One possibility is an investigation into the role that rural community may play in buffering against racial/ethnic achievement gaps. Smaller achievement gaps could result from more cohesiveness in rural districts through such factors such as smaller class size, tighter community connections, and higher participation in interscholastic athletics (Gagnon & Mattingly, 2017)—all of which promote a more shared experience across race and ethnicity in a way that would not be adequately captured by an aggregate measure of segregation. Related to this is our finding that racial achievement gaps increase when one looks at more affluent/advantaged districts within city/suburban districts more so than they do while looking across these same conditions in town/rural districts. It

is possible that more affluent urban districts provide for especially advantageous environments for White students (e.g., through highly-developed, dense, and multifaceted social networks), especially disadvantageous environments for Blacks (e.g., through social-psychological factors), or a combination of both.

The intersection of poverty pathways, student achievement, and urbanicity represents another promising area of future inquiry. Bronfenbrenner and Morris (1998) outline a bioecological model of development whereby differences of macrosystem contexts, such as place, likely affects the ways in which proximal processes of poverty affect cognitive development. That is, poverty looks different in city and rural contexts, and therefore it is certainly possible that poverty affects achievement differently across place. Urban poverty is generally more closely associated with stressors such as overcrowding, less access to green space (Wells & Evans, 2003), and less stable housing (George & Holden, 2000), whereas the rural poor must more often face challenges as they relate to isolation and exposure to environmental toxins, for instance (Burton, Lichter, Baker, & Eason, 2013). These and other differences in proximal aspects of poverty may have differential effects on child cognitive development across place, and ultimately be related to the findings we present here. Unfortunately, the data used in this study simply cannot untangle such phenomena, although there are different pathways of possible interest, including environmental chaos, proximity and availability of services, pollution, and the organizational structures that attend to areas of high need in a community. We call for a greater understanding of how poverty manifests itself in rural as opposed to urban places, how such mechanisms of poverty affect learning, and how these processes might differentially affect children of different races and ethnicities.

Ultimately, this study cannot offer convincing explanations for its findings. The data we use here allow for a very nuanced description of this landscape, but the underlying mechanisms that lead to these findings remain hidden from view. Moreover, we hold that there does not exist a single unifying explanation, nor only one lens from which one can view and make sense of these findings. Brann-Barrett (2014) argues that rural communities, like their urban counterparts, are dynamic and diverse, and researchers who ignore this plurality do so to the detriment of constructing better and more accurate representations of rurality. Here we provide an important opportunity for researchers to examine how the structure of rural schools and communities might lead to less disparate outcomes for students along lines of race and ethnicity. Future research should examine the ways in which contextual, social, and environmental factors with respect to urban and rural places impact achievement disparities.

References

Aaronson, D., & Mazumder, B. (2011). The impact of Rosenwald schools on Black achievement. *Journal of Political Economy*, *119*, 821-888. doi:10.1086/662962

Barton, P. E., & Coley, R. J. (2010). *The Black-White achievement gap: When progress stopped*. Princeton, NJ: Educational Testing Service.

Bohrnstedt, G., Kitmitto, S., Ogut, B., Sherman, D., & Chan, D. (2015). *School composition and the Black–White achievement gap* (NCES 2015-018). Retrieved from National Center for Education Statistics website: https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2015018

Barley, Z. A., & Beesley, A. D. (2007). Rural school success: What can we learn? *Journal of Research in Rural Education*, *22*(1), 1-16. Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/22-1.pdf

Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children*, *7*(2), 55-71. doi:10.2307/1602387

Brann-Barrett, T. (2014). Understanding "the community" in rural community research. In S. White & M. Corbett (Eds.), *Doing educational research in rural settings: Methodological issues, international perspectives and practical solutions* (pp. 75-87). New York, NY: Routledge.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Theoretical models of human development* (5th ed., Vol. 1, pp. 993-1028). New York, NY: Wiley.

Burton, L. M., Lichter, D. T., Baker, R. S., & Eason, J. M. (2013). Inequality, family processes, and health in the "new" rural America. *American Behavioral Scientist*, *57*, 1128-1151. doi:10.1177/0002764213487348

Carr, P. J., & Kefalas, M. (2009). *Hollowing out the middle: The rural brain drain and what it means for America*. Boston, MA: Beacon Press.

Carr, P. J., Lichter, D. T., & Kefalas, M. J. (2012). Can immigration save small-town America? Hispanic boomtowns and the uneasy path to renewal. *Annals of the American Academy of Political and Social Science*, *641*(1), 38-57. doi:10.1177/0002716211433445

Coleman, J., Campbell, E., Hobson, C., McPartland, J., Mood, A., Weinfall, F., & York, R. (1966). *Equality of educational opportunity.* Washington, DC: Office of Education, Department of Health, Education, and Welfare.

Coley, R. L., Lynch, A. D., & Kull, M. (2015). Early exposure to environmental chaos and children's physical and mental health. *Early Childhood Research Quarterly*, *32*, 94-104. doi:10.1016/j.ecresq.2015.03.001

Crockett, L. J., Carlo, G., & Temmen, C. (2016). Ethnic and racial minority youth in the rural United States: An overview. In L. J. Crockett & G. Carlo (Eds.), *Rural ethnic minority youth and families in the United States: Theory, research, and applications* (pp. 1-12). Cham, Switzerland: Springer International.

Cutrona, C. E., Clavél, F. D., & Johnson, M. A. (2016). African American couples in rural contexts. In L. J. Crockett & G. Carlo, (Eds.), *Rural ethnic minority youth and families in the United States: Theory, research, and applications* (pp. 37-56). Cham, Switzerland: Springer International.

Eppley, K. (2009). Rural schools and the highly qualified teacher provision of No Child Left Behind: A critical policy analysis. *Journal of Research in Rural Education*, *24*(4). Retrieved from http://jrre.vmhost.psu.edu/wp-content/uploads/2014/02/24-4.pdf

Fahle, E. M., & Reardon, S.F. (2016). *How much do test scores vary among school districts? New estimates using population data, 2009-2013* (CEPA Working Paper No. 17-2). Retrieved from https://cepa.stanford.edu/sites/default/files/wp17-02-v201701.pdf

Fortin, N., Lemieux, T., & Firpo, S. (2011). Decomposition methods in economics. *Handbook of Labor Economics*, *4*, 1-102. doi:10.1016/S0169-7218(11)00407-2

Gagnon, D. J., & Mattingly, M. J. (2015). State policy responses to ensuring excellent educators in rural schools. *Journal of Research in Rural Education 30*(13), 1-13. Retrieved from jrre.psu.edu/wp-content/uploads/2016/01/30-13.pdf

Gagnon, D. J. & Mattingly, M. J. (2017). *Constructing an index of educational opportunity: Examining access across poverty and place.* Paper presented at the annual meeting of the American Educational Research Association, San Antonio, TX, April 29, 2017.

Gruenewald, D. A. (2003). Foundations of place: A multidisciplinary framework for place-conscious education. *American Educational Research Journal*, *40*, 619-654. doi:10.3102/00028312040003619

George, L., & Holden, C. (2000). *Why housing matters: HAC's 2000 report on the state of the nation's rural housing.* Washington, DC: Housing Assistance Council.

Gurley, L. (2016). Who's afraid of rural poverty? The story behind America's invisible poor. *American Journal of Economics and Sociology*, *75*, 589-604. doi:10.1111/ajes.12149

Graham, S. E., & Teague, C. (2011). *Reading levels of rural and urban third graders lag behind their suburban peers* (Issue Brief No. 28). Durham, NH: Carsey Institute.

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004). Why public schools lose teachers. *Journal of Human Resources*, *39*, 326-354. doi:10.2307/3559017

Johnson, J., & Howley, C. B. (2015). Contemporary federal

education policy and rural schools: A critical policy analysis. *Peabody Journal of Education*, *90*, 224-241. doi:10.1080/0161956X.2015.1022112

Johnson, K. M., & Lichter, D. T. (2008). Natural increase: A new source of population growth in emerging Hispanic destinations in the United States. *Population and Development Review*, *34*, 327-346. doi:10.1111/j.1728-4457.2008.00222.x

Lazarus, S. S. (2003). *Preparing rural educators to teach students in an era of standards-based reform and accountability.* Paper presented at the Promoting the Economic and Social Vitality of Rural America: The Role of Education national research workshop, New Orleans, LA, April 14-15, 2003. Retrieved from ERIC database: http://files.eric.ed.gov/fulltext/ED481281.pdf

Lichter, D. T., Sanders, S. R., & Johnson, K. M. (2015). Hispanics at the starting line: poverty among newborn infants in established gateways and new destinations. *Social Forces*, *94*, 209-235. doi:10.1093/sf/sov043

Miller, P., Votruba-Drzal, E., & Setodji, C. M. (2013). Family income and early achievement across the urban-rural continuum. *Developmental Psychology*, *49*, 1452-1465. doi:10.1037/a0030244

Player, D. (2015). *The supply and demand for rural teachers*. Retrieved from Rural Opportunities Consortium of Idaho website: http://www.rociidaho.org/the-supply-and-demand-for-rural-teachers/

Reardon, S. F. (2016a). *School district socioeconomic status, race, and academic achievement*. Retrieved from Stanford Center for Educational Policy Analysis website: https://cepa.stanford.edu/sites/default/files/reardon%20district%20ses%20and%20achievement%20discussion%20draft%20april2016.pdf

Reardon, S. F. (2016b). School segregation and racial academic achievement gaps. *The Russell Sage Foundation Journal of the Social Sciences*, *2*(5), 34-57. doi:10.7758/rsf.2016.2.5.03

Reardon, S. F., & Ho, A. D. (2015). Practical issues in estimating achievement gaps from coarsened data. *Journal of Educational and Behavioral Statistics*, *40*, 158-189. doi:10.3102/1076998615570944

Reardon, S. F., Kalogrides, D., & Ho, A. D. (2016). *Linking U.S. school district test score distributions to a common scale, 2009-2013* (CEPA Working Paper No. 16-9). Retrieved from Stanford Center for Educational Policy Analysis website: https://cepa.stanford.edu/sites/default/files/wp16-09-v201604.pdf

Reardon, S. F., Kalogrides, D., Ho, A. D., Shear, B., Shores, K., & Fahle, E. (2016). *Stanford education data archive*. Retrieved from Stanford University website: http://purl.stanford.edu/db586ns4974

Reardon, S. F., Kalogrides, D., & Shores, K. (2016). *The geography of racial/ethnic test score gaps* (CEPA Working Paper No. 16-10). Retrieved from Stanford Center for Education Policy Analysis website: http://cepa.stanford.edu/sites/default/files/wp16-10-v201604.pdf

Roscigno, V. J. (1999). The Black White achievement gap, family school links, and the importance of place. *Sociological Inquiry*, *69*, 159-186. doi:10.1111/j.1475-682X.1999.tb00498.x

Sáenz, R. (2012). Rural race and ethnicity. In L. J. Kulcsar & K. J. Curtis White (Eds.), *International Handbook of Rural Demography* (pp. 207-223). Dordrecht, Netherlands: Springer.

Schaefer, A., & Mattingly, M. J. (2016). *Demographic and economic characteristics of immigrant and native-born populations in rural and urban places* (National Issue Brief No. 106). Retrieved from the Carsey School of Public Policy website: https://carsey.unh.edu/publication/rural-immigrant-demographics

Schaefer, A., Mattingly, M. J., & Johnson, K. M. (2016). *Child poverty higher and more persistent in rural America* (National Issue Brief No. 97). Retrieved from the Carsey School of Public Policy website: https://carsey.unh.edu/publication/rural-child-poverty-higher

Sherman, J. (2009). Bend to avoid breaking: Job loss, gender norms, and family stability in rural America. *Social Problems*, *56*, 599-620. doi:10.1525/sp.2009.56.4.599

Smith, K. E., & Mattingly, M. J. (2012). Rural families in transition. In L. J. Kulcsar & K. J. Curtis White (Eds.), *International handbook of rural demography* (pp. 239-253). Dordrecht, Netherlands: Springer.

Stein, G. L., Gonzales, R. G., Coll, C. G., & Prandoni, J. I. (2016). Latinos in rural, new immigrant destinations: A modification of the integrative model of child development. In L. J. Crockett & G. Carlo (Eds.), *Rural ethnic minority youth and families in the United States: Theory, research, and applications* (pp. 37-56). Cham, Switzerland: Springer International.

Thiede, B. C., Lichter, D. T., & Slack, T. (2016). Working, but poor: The good life in rural America? *Journal of Rural Studies*. Advance online publication. doi:10.1016/j.jrurstud.2016.02.007

Tickamyer, A. R., & Duncan, C. M. (1990). Poverty and opportunity structure in rural America. *Annual Review of Sociology*, *16*, 67-86. doi:10.1146/annurev.so.16.080190.000435

Tieken, M. C. (2014). *Why rural schools matter*. Chapel Hill: University of North Carolina Press.

Tolnay, S. E. (2003). The African American "great migration" and beyond. *Annual Review of Sociology*, *29*, 209-232. doi:10.1146/annurev.soc.29.010202.100009

Votruba-Drzal, E., Miller, P., & Coley, R. L. (2016).

Poverty, urbanicity, and children's development of early academic skills. *Child Development Perspectives*, *10*, 3-9. doi:10.1111/cdep.12152

Walker, V. S. (1996). *Their highest potential: An African American school community in the segregated south*. Chapel Hill: University of North Carolina Press.

Wells, N. M., & Evans, G. W. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and behavior*, *35*, 311-330. doi:10.1177/0013916503035003001