Chapter 2

Growing up in Rural vs. Urban Poverty: Contextual, Academic, and Cognitive Differences

Michele Tine

Additional information is available at the end of the chapter

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Abstract

This chapter aims synthesize current literature and research from a variety of fields to highlight what we know about the (1) contextual, (2) academic, and (3) cognitive differences between children growing up in urban versus rural poverty. The goal is to understand the unique needs of children growing up in urban and rural poverty to, in turn, place us in a better position to effectively remediate through targeted interventions and policy change.

Keywords: poverty, education, cognitive development, children, rural, urban

1. Introduction

More than 16 million of children in the United States live below the current federal poverty line [1]. A breadth of research has been dedicated to understanding how poverty affects these children, especially in terms of academic success and cognitive development. For example, research has consistently shown students from higher-income communities outperform those from lower-income communities across many academic domains, including reading, math, and science [2]. Moreover, the gaps in standardized test scores in many of these academic domains are reported to be the largest they have been in 50 years [3]. Income related differences are found on other measures of academic success show, as well. Those growing up in poverty have lower high school graduation rates, higher participation in special education, and greater grade retention than those living above the poverty line [4–6].

In an effort to understand what may underlie this income related differences, recent research has explored if domain general cognitive processes vary between those growing up below

and above the poverty line [7]. Results from this line of work suggest income level disparities exist in cognitive processing related to working memory, language, incidental memory, and inhibition, again with lower income students not performing as well as their higher income counterparts [7–11].

Importantly, the work exploring these academic and cognitive differences has been limited in an important way: 'poverty' samples have been drawn from almost exclusively from urban environments. Yet, poverty exists in both urban and rural contexts. The literature has not been upfront in addressing this distinction and has inadvertently generalized urban poverty findings to both urban and rural populations.

Even though far less is known about the academic and cognitive profiles of children growing up in rural poverty, the need to understand this populations needs is more important now than ever before. Trends show the number of children living in rural poverty is increasing at a faster rate than the number of children living in urban poverty [12, 13]. Currently one-fourth (25%) of children in rural areas live below the poverty line, compared to about one-fifth (21%) of children in urban areas [1]. Moreover, the 4% difference in the gap between these groups has grown significantly in the last decade; it 1998 it was only a 2% difference [1, 14]. When considering those children living just *above* the poverty line, the difference between the percentages of children living in urban vs. rural poverty is even larger. Approximately half of rural children live in families with incomes below 200% of the federal poverty line, compared with only 37% of urban children [15]. The persistence of poverty in rural counties is also higher than that of urban counties. The Economic Research Service of the United States Department of Agriculture defines "persistently poor counties" as those in which the poverty rate has exceeded 20% at every decennial census since 1970. Since 1970, 730 U.S. counties have experienced persistent child poverty and 82% of them are located in rural America [16]. This is of particular importance when considering how poverty affects cognitive processing and academic achievement, as research suggests that the longer the periods of childhood poverty, the greater the reductions in cognitive development [17], which is in turn associated with academic success [8].

2. Theoretical framework

This chapter benefits from the frameworks of three different, but complementary theories. First, the Family Stress Model is helpful when considering the challenges associated with growing up in any type of poverty, as it focuses the relationships and interactions between parents and children, how those relationships may be adversely affected by family financial difficulties, and may, in turn, hinder the development of children [18, 19]. Second, the Family Investment Model proposes that economic resources determine the extent to which families can provide learning materials at home, such as books and computers, as well as provide access to resources outside the home as children get older, such as sports activities and afterschool activities. According to the Family Investment Model, these things work together to impact the development of a child [20, 21]. Not surprisingly, the Family Stress Model and

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Family Investment Model are often utilized when studying poverty. While both are useful, either fully or explicitly addresses the nuances between rural and urban poverty or highlights how such nuances may differentially impact development. For this reason, this chapter may be most closely aligned with Bronfenbrenner's Ecological Systems Theory, which posits that development is influenced by experiences arising from the iterative processes between children and the specific settings in which they grow up [22]. Certainly, rural and urban poverty are distinct specific settings and, in turn, may be associated with distinct patterns of development.

3. Contextual differences between rural and urban poverty

All three of the aforementioned models emphasize how developmental context bears influence on children as they develop. In an effort to highlight how rural and urban poverty are distinct developmental contexts, this section reviews some of the known contextual differences between rural and urban poverty at the neighborhood, school, and home levels. At times when researchers have not made direct comparisons between rural poverty and urban poverty, we rely on more general comparisons of rural versus urban.

Before reviewing the differences between these different contexts, it is essential to note that the definition of "rural" is often debated and rarely agreed upon. According to the National Center for Education Statistics definition, there are three categorizations of rural: fringe, distant, and remote that are determined based on proximity to an urban area [23]. The determination of "rural" for an area is achieved based by a town's latitude and longitude, and thus distance from an urban center, along with population thresholds [1]. Despite this ambiguous definition of rural, Coladarci argues that a precise definition of rural is not what the research community is lacking, as much as clear contextual description detailing the specific rural context under study, as this will allow researchers and practitioners to determine for themselves whether or not two rural contexts are similar enough to generalize the results for quantitative studies [24]. Keeping that in mind, the following overview is not subdivided by rural category, but it is encouraged that readers appreciate that there are different types of rural context and locate the original sources to more specifically determine the rural context of any study mentioned before generalizing the findings to other rural contexts.

3.1. Neighborhood level differences

At the neighborhood level, research shows that those living in urban poverty often cluster in inner-city neighborhoods with substandard and crowded housing, high crime rates, excessive noise levels, and inadequate services [25]. Psychological disorders, divorce, and other social pathologies are higher among those living in low-income urban neighborhoods than rural ones [26, 27]. But, rural poverty brings a host of its own stressors. Rural poverty is associated with higher infant mortality, lower quality housing and health care, and fewer formal support services than urban poverty [16, 28, 29]. Also, rates of unemployment and underemployment are higher in low-income rural neighborhoods than in low-income urban ones [30], as are jobs

offering the opportunity for upward mobility [31]. And in direct contrast to the overcrowding and excessive noise levels of low-income city neighborhoods, individuals living in rural areas face great isolation—from people, technology, and institutions [5]. Importantly, research suggests this isolation often prevents the rural poor from utilizing social support networks [32, 33]. Indeed, rural families receive, give, and expect significantly less help from others in their "town" than do urban families [33]. This is relevant because social support is thought to buffer individuals from stress [34]. Such social support may protect those living in impoverished urban neighborhoods from some of the negative consequences of urban poverty.

3.2. School level differences

3.2.1. Class size

One of the greatest advantages of low-income rural schools compared to low-income urban schools is the tendency for smaller classes in the former, a variable that has been linked to achievement. Specifically, when looking at pupil/teacher ratio, achievement is greater in smaller schools with smaller classes [35]. Research has investigated the mechanisms explaining why smaller classes are associated with academic gains [36]. First, teachers' enthusiasm and satisfaction is often enhanced when there are fewer students in their class. This enthusiasm and satisfaction is often perceived by the students and, in turn, influences their motivation for learning [36]. Second, class size directly impacts teacher-student interactions, with smaller classes allowing for more individual attention and allowing for more thorough and continuous student evaluation [36]. Finally, from an administrative standpoint, smaller classes reduce teachers' responsibilities for paperwork and record keeping, allowing them to allocate more of their time to instructionally relevant activities [36].

3.2.2. Teachers

However, there are also disadvantages associated with low-income rural schools. Rural schools in general have a particularly difficult time recruiting and retaining qualified teachers [37]. A portion of this may be due to salary and teaching conditions in these areas; suburban teachers are paid an average of $7500 more than rural teachers per year and $3700 more than urban teachers [37]. Furthermore, rural teachers are less likely to receive health insurance and other fringe benefits. Some of the pay discrepancy may be explained by rural teachers having lower overall levels of education than urban teachers; thirty-seven of rural K-12 teachers hold master's degrees versus 44% of urban teachers and 47% of teachers in urban-fringed schools [37].

3.2.3. Funding

Low-income rural schools also wrestle with state funding formulas that can favor larger districts. In many states, the dependence on local property tax revenues to finance education fuels funding disparities between urban, suburban, and rural districts [38, 39]. In addition, numerous policies and programs include funding formulas that set a minimum number of

students as a prerequisite for funding, or tie such funding to growth in the student population [40]. Also, some formulas allocate funds on a per-pupil basis, meaning small districts and schools receive relatively small amounts of money [38].

3.2.4. Technology

A lack of technology in rural areas is another often-cited concern among policy makers. However, research shows that the number of computers in low-income urban, suburban, and rural classrooms does not differ [41]. The software, technical support, and condition of the equipment does differ across context, but in a somewhat counterintuitive manner. The software, technical support and condition are more likely to be inadequate in urban schools than in suburban and/or rural schools [41]. Furthermore, educators in low-income urban schools are less likely than other educators to have used any type of technology recently in school [41].

3.3. Home level differences

It has been suggested rural families may play a greater role in children's development than urban families because of the greater isolation of families in rural areas [42] and also because social networks in rural areas are more likely to be kin-based than those in urban areas [43]. In turn, rural children may have less access to influences outside the family. Unfortunately, there are some stressors associated with the home life of those living rural poverty.

3.3.1. Parental employment

Rural parents work more hours and earn less than their urban counterparts [44], which may increase the stress on the families and lead to adverse consequences for families and children [45]. Moreover, trends show that among rural families there is an increase in non-standard work hours [44]. Importantly, these irregular work hours by mothers early in the child's life have been linked to poorer language and cognitive skills at 36 months of age. Further, rural families commute longer distances to work, school, and services, with only 40% of rural areas having access to public transportation [46]. These factors leave parents with fewer hours to devote to interacting with their children.

3.3.2. Parental education

There are also differences in the parental education levels of rural and urban areas. Recent estimates found that approximately 27% of rural children were living with a parent without a high school education, compared to 21% in urban areas [2]. And only 21% of young adults in rural areas had a bachelor's degree, compared with 34% of young adults in urban areas [47]. Parental education is an important factor to consider when thinking about child development, as research shows it is associated with better language, cognitive and academic skills in children in preschool, elementary school, middle school, and high school [48–51]. Moreover, a welfare experiment to increase maternal education in poor families has established a causal link between maternal increases in education and children's academic school readiness [52].

3.3.3. Family structure

Family structure in rural areas seems to be changing. In the 1970s, approximately 77% of rural children lived in married-couple households compared to 72% of urban children. But in 2007, 66% of rural children compared to 70% of urban children lived in married couple families [14]. This decline in married-couple families in rural areas has had implications for child poverty because two-parent married couples have been shown to be less likely to live in poverty than other family structures. Although overall poverty rates declined for female-headed households after the new welfare reform in 1996, single rural mothers have continued to experience higher rates of poverty than similar urban mothers [53]. These higher rates of poverty by rural single mothers have existed despite the fact that these rural mothers have been working more than their urban counterparts, reflecting the lower education of rural mothers and the absence of high wage jobs in rural areas [53].

3.3.4. Parenting practices

Research investigating measurable parenting behaviors of rural versus urban parents has found that rural parents tend to be less emotionally supportive, more intrusive, and harsher than urban parents [54, 55]. There are also differences in how rural versus urban parents beliefs and behaviors about their children's academic achievement. First, compared to urban parents rural parents place less emphasis on their children's academic achievement [56, 57] and hold lower expectations for their children's educational attainment [58]. Rural parents invest less financially in educational materials and cultural experiences and invest less time in their children's academic experience than urban parents [59]. Urban and suburban parents also have more general knowledge about child development and childrearing than rural parents, which may be associated to overall differences in parental education levels, as noted earlier in the chapter [56, 60].

The aforementioned differences at the neighborhood, school, and home levels highlight how the life lived for a child in rural poverty is very different from the life lived for a child in urban poverty.

4. Academic differences between Rural and Urban poverty

There is little existing data that directly compares the academic achievement of children growing up in rural poverty compared with urban poverty, so we are left relying on the more general known academic differences of children growing up in rural versus urban areas who attend public schools. The differences outlined below can be used (1) as a guide for future researchers interested in examining if more exaggerated differences exist among low-income rural and urban populations and (2) to serve as an impetus for future intervention and curriculum development that is accurately based on local needs.

One way to measure academic achievement is to look at how students perform on recent National Assessment of Educational Progress (NAEP) exams. In general, public school students in rural areas outperform students in urban districts on these exams, though achievement in

both groups consistently falls below that of their suburban peers. The NAEP exams disparities between rural and urban students are present across grade levels and across subjects including reading, math and science [47].

More specifically, 34% of 4th grade students attending public schools scored at or above the proficient level on the NAEP reading assessment. Thirty-one percent of rural students achieved this level, compared to 24% of urban students. In 8th grade, 30% of rural students and 23% of urban students scored at or above the proficient level (29% nationwide). And in 12th grade, 33% of rural students and 30% of urban students scored at or above proficient (34% nationwide). However, this difference in 12th grade reading scores was not statistically significant due to large standard errors [47].

For math, a larger proportion of students living in rural areas achieved a score at or above the proficient level in 4th, 8th and 12th grade on the NAEP mathematics assessment. The percentage of 4th graders at this achievement level was 36% while that in urban areas was 29% (35% nationwide). In 8th grade, 29% of rural and 23% of urban students achieved this level, as compared with 29% nationwide. By 12th grade scores across both district types had fallen, with 21% of rural students and 18% of urban students scoring at or above the proficient level (21% nationwide) [47].

Finally, the NAEP science assessment shows similar results for rural to urban public achievement disparities. Thirty two percent of rural students and 19% of urban students achieved a score at or above the proficient level on the science assessment in 4th grade. This gap narrowed slightly in 8th grade with 30% of rural and 19% of urban students reaching this level of proficiency (27% nationwide). The percentage of students reaching the proficient level drops across geographic divisions by 12th grade, as 18% of rural students, 13% of urban students, and 17% of students nationwide achieving the proficiency [47].

An alternative measure of academic achievement is high school dropout rates. The nationwide public high school dropout rate for 16- to 24-year-olds in 2004 was 11%, but that decreased to 6.5% by 2014 [23]. The dropout rate was higher in cities (13%) than in rural areas (11%) and within both geographic categories, the dropout rate for students living below the poverty line was greater than for students living at or above the poverty line. Despite the overall greater dropout rates for urban students, the dropout rate for students living below the poverty line in rural areas (23%) was actually greater than that of students living below the poverty line in urban areas (18%) [47]. This is one of the only known statistics to show lower academic achievement among rural compared to urban students; it is also one of the only a few to directly compare students of rural poverty with students of urban poverty.

Two other studies that compare urban and rural poverty are state specific. For example, a study compared the percentage of students who reached a state-determined level of proficiency on a state created standardized test given to 10th grade students in Ohio living in urban and urban poverty [61]. Math achievement was nearly identical for the two groups; 80.6% of students in urban poverty districts were proficient in math and 80.2% of students in the rural poverty districts were proficient. Reading achievement was similar between the two groups, as well. Both low-income rural and urban districts had 90% at the proficient level for reading. Finally, there were no apparent difference in science achievement between the two

groups, with a 71.4% proficiency rate in the low-income rural districts and 71.7% proficiency rate in the low-income urban districts [61].

A comparable study looking at academic achievement differences between low-income urban and rural school districts in Tennessee found slightly different results [62]. Tennessee Comprehensive Assessment Program (TCAP) standardized testing results were analyzed and no significant difference was found between the math achievement of students of rural versus urban poverty, but a significant difference was found for language arts scores, with 75.9% of the disadvantaged urban students reaching a proficient level in reading compared to 82.7% of disadvantaged rural students [62].

5. Cognitive differences between rural and urban poverty

While overall academic performance between those growing up in rural and urban poverty does not seem to dramatically vary, research suggests there are notable differences in the underlying cognitive processing abilities of the two groups. The hypotheses that drove these studies were that the distinct developmental contexts of rural and urban poverty could have distinct influences on cognitive processes like working memory, as there is evidence that working memory is negatively impacted by chronic stress [17] and the chronic stresses associated with the two types of poverty are different, as reviewed earlier in this chapter.

Therefore, to determine if cognitive differences between the two groups exist, verbal and visuospatial working memory tasks were administered to sixth grade students living in low-income rural, low-income urban, high-income rural, and high-income urban developmental contexts [63]. Both low-income rural and low-income urban children showed working memory deficits compared to their high-income counterparts, but their deficits were indeed distinct from one another [63]. Low-income urban children exhibited symmetrical verbal and visuospatial working memory deficits compared to their high-income urban counterparts [63]. Meanwhile, low-income rural children exhibited asymmetrical deficits when compared to their high-income rural counterparts, with more extreme visuospatial working memory deficits than verbal working memory deficits [63]. These results suggest that different types of poverty are associated with different working memory abilities.

To determine if other cognitive processes varied between the groups, a follow-up study measured incidental memory, language, and inhibition among students from low-income rural, low-income urban, high-income rural, and high-income urban developmental contexts. Expected income-related differences were found on all three cognitive processing measures among the urban samples. That is, the low-income urban group scored significantly lower than the high-income urban group on the language, incidental memory, and inhibition tasks [64]. These results mirror the previous work that documents an income-processing gap in urban communities [7–11]. The income-processing gap was also present in the rural samples; the low-income rural group scored significantly lower on the language, incidental memory, and inhibition tasks compared to their high-income rural counterparts. Importantly, low-income rural students exhibited distinct patterns from low-income urban students. Specifically, the

low-income rural students had lower inhibition scores, showing again that the two types of poverty are associated with cognitive processing differences [63, 64].

The study also found that relationship *between* cognitive processing (i.e., language, incidental memory, and inhibition) and academic achievement varied for individuals who grew up in different developmental contexts, specifically for the students who grew up in rural poverty. In the other three contexts, each individual cognitive process itself accounted for a significant amount of the variance in academic achievement [64]. However, inhibition did not account for a significant portion of the variance in the low-income rural sample [64]. The results suggest that inhibition may be less related to academic performance for students from rural poverty compared to students growing up in other areas.

Policy makers and educators should take the aforementioned research into consideration when creating research-based interventions to target specific cognitive processes as a way of improving academic outcomes. To point, interventions and/or remediation plans should be tailored for students in rural poverty in ways that are slightly different for students from other contexts. For example, some interventions may want to focus on improving inhibition among low-income rural students, but for the sake of improving inhibition itself, not necessarily for the sake of improving academic achievement. With that said, it is important to understand that interventions aimed at improving cognitive processes have been ineffective in producing long-term and/or transferable gains thus far [65]. Thus, educators may want to focus instead on decreasing the inhibitory demands placed on students in rural poverty (without lowering the learning objectives) and/or capitalizing on other, stronger cognitive processes that are more related to their academic achievement in this population.

6. Conclusion

In summary, there is a growing population of children growing up in rural poverty, and the population has been grossly underrepresented in research. The work that does exist suggests that there are notable differences in contextual variables and cognitive processes associated with rural versus urban poverty, but fewer differences in academic achievement. Yet, extant literature is hardly robust. It is strongly encouraged that researchers continue to document the nuanced differences between urban and rural poverty, especially in the ways that the two developmental contexts affect children. To best serve underprivileged urban and rural populations, we must establish their unique needs. Once these needs are accurately established, we will be able to provide efficacious support for the two populations.

Author details

Michele Tine

Address all correspondence to: michele.tine@dartmouth.edu

Dartmouth College, United States

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