정책학 석사학위논문

SPATIAL REPRESENTATION OF REGIONAL POVERTY IN ARKANSAS:

A COMPARATIVE ANALYSIS OF DIFFERENCES BY FAMILY TYPE

지역 빈곤의 공간적 상징으로서의 미 아칸소 주:

가족구조별 비교분석

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행정학과 정책학전공

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이 논문을 정책학 석사학위논문으로 제출함

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본 연구는 미국의 가장 빈곤한 두 지역 – 아칸소 주 델타(Delta), 오자크 (Ozarks) – 에 대한 군(county) 단위의 빈곤을 가족 구조에 따른 차이를 중심으로 비교분석을 진행했다.

미 인구 조사국의 군 단위 자료 (2009 년 – 2013 년) 를 통해 두 지역에서 가족 형태에 따른 빈곤을 살펴 보고, 다양한 방식의 통계 해석 - 고용 구조, 인구 구성, 인적 자본, 비(非)수도권 거주 등 – 이 편부모 가족 빈곤율과 기혼 가족 빈곤율 각각에 미치는 영향을 살펴봤다.

본 연구의 결과는 지역에 따른 빈곤의 분포나 가족 구조에 따른 빈곤율을 드러내는데 OLS 회귀 모델을 적용해 찾은 세 가지 핵심 사실은 다음과 같다. 1) 아칸소 주 델타와 오자크는 가족 구조별,

지역별 확연한 빈곤 수준 격차가 있다. 2) 오자크는 델타에 비해 기혼 가족 빈곤율이 높고, 반면 델타는 기혼 가족보다 편모 가족의 빈곤율이 높았다. 3) 편모 가족 빈곤과 기혼 가족 빈곤의 구조적 요인은 고용률 외에는 서로 큰 차이를 보인다.

이러한 가족 구조를 중심의 비교분석적 접근을 통해 본 연구는 아칸소 주의 빈곤을 결정하는 여러 요인을 시각화하고 그 관계를 명확하게 드러내고자 한다.

Keywords: 빈곤, 가족구조, 미시시피 델타, GIS

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CHAPTER 1: INTRODUCTION

1.1 Background of Research Problem

Ever since President Lyndon B. Johnson declared the "war on poverty" in 1964, the geographic distribution of poverty and the socioeconomic characteristics of American families living in poverty have shifted: poverty has decreased dramatically and is more evenly distributed across the nation, though still heaviest in the South (Gans, 2002; Gieryn, 2000; Lobao, 2004; Lobao and Saenz, 2002; Lobao, Hooks, and Tickamyer, 2007; Tickamyer, 2000), and families today are structured differently than they were then (Bianchi, 1999; Lichter and Jayakody, 2002; DeNavasWalt, Proctor, and Smith, 2007). More than five decades after the Lower Mississippi Delta[1] region was identified as one of the primary battlegrounds for the "war on poverty", the region remains to this day the quintessential example of persistent poverty and underdevelopment in the United States.

Geography plays a significant role in these areas with long-term higher-than-average poverty rates, and each geographic setting provides place-specific opportunities and challenges when analyzing

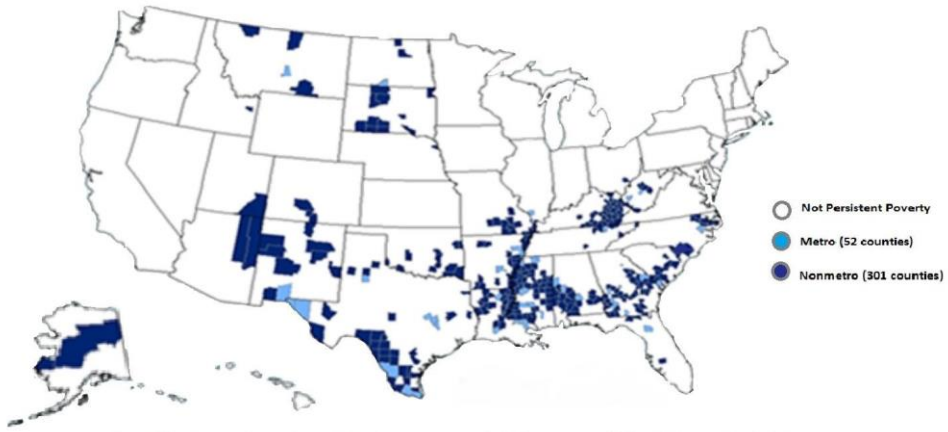
[1] The eight-state Delta region consists of 252 counties and parishes across Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee; the population is roughly 10 million in this region.

socioeconomic mobility for its low-income families. To shed light on the geography of poverty in America, the U.S. Department of Agriculture's Economic Research

Service (ERS) has defined counties as being "persistently poor" if 20 percent or more of their populations were living in poverty over the last 30 years. By using this definition for place-specific poverty as a benchmark for identifying persistently impoverished areas, ERS found that between 2009 and 2013 there were 353 counties (roughly 11.2 percent) that were persistently poor throughout the United States and nearly 84 percent of those persistently impoverished counties were located in the South (Figure 1), specifically clustered in the Lower Mississippi Delta region.[2] Therefore, poverty analysis should not only adopt a spatial approach when analyzing the differences and similarities in the distribution of poverty but should also keep in mind spatial representations of socioeconomic characteristics of families living in poverty, especially with regard to the American South.

[2] American Community Survey 5-Year Summary Files, 2013

Figure 1: Persistent Poverty Counties in the United States, 2007-2011



Source: USDA, Economic Research Service. Persistent poverty counties had poverty rates of at least 20 percent in each U.S. Census 1980, 1990, and 2000, and American Community Survey 5-year estimates, 2007–2011.
http://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/geography-of-poverty.aspx

Family structure is, of course, a focal point of the national dialogue on poverty in the United States, particularly since the early 1980s when Tickamyer (1981) published a study on the "feminization of poverty" in Central Appalachia that garnered widespread national attention on the rising phenomena of women and children being disproportionately represented in poor populations. In particular, much concern has become centered on the disproportionate economic hardship faced by single female-headed families' relative to those living in other family and household arrangements (Bianchi, 1999; Lichter and Jayakody, 2002; Tickamyer and Tickamyer, 1981). In 2013, for example, the U.S. Census Bureau's American Community Survey (ACS) 5Year Summary Report revealed that the poverty rate

stood at 40.0 percent nationally for single female-headed families compared to only 8.30 percent for families headed by married couples. The State of Arkansas experienced similar disproportions in its poverty rates but even worse. The percentage of poor Arkansan married couple-headed families stood at 11.1 percent, which was higher than the national average that year of 8. 3 percent, and poor Arkansas single female-headed families had a poverty rate reaching nearly 50 percent at 48.4 percent on average. Therefore, despite regional poverty rates declining across the board at both the national and state-levels as illustrated in Table 1, it appears the "feminization" of poverty among American families is on the rise.

Table 1: Regional Poverty Rates Based on Census Year

	1960	*1970*	*1980*	*1990*	*2000*	*2010*
Unites States	22.10%	13.70%	12.40%	13.10%	12.40%	15.30%
Arkansas	47.51%	27.80%	18.95%	19.10%	15.80%	18.70%

Source: https://www.census.gov/hhes/www/poverty/data/census/1960/; http://www.census.gov/did/www/saipe/data/statecounty/data/2010.html

Because aggregated, national-level and state-level poverty data typically masks sub- regional variations, mapping poverty that is

specifically tailored to county-level conditions is essential in order to accurately depict strong regional patterns of families living in poverty and the heterogeneous characteristics of poverty that affect those families, such as gender and family structure. As stated earlier, the geographic distribution of poverty and the socioeconomic characteristics of American families living in poverty as a whole have shifted since the declaration of the "war on poverty" in the 1960s, so in what ways have these shifts affected poverty within "persistently poor" areas in the Lower Mississippi Delta region in particular? The State of Arkansas serves as an interesting starting point to this topic, especially in regards to the Arkansas Delta and the Arkansas Ozarks regions in the state, because poverty research to date has typically focused on the legacy of slavery and the institutional mechanisms used to facilitate racial inequalities in the region rather than looking at poverty through the lenses of family type and household structures. The following section will outline key points to the overall research problem.

1.2 Statement of the Research Problem

While a significant body of literature has examined economic hardship found within African American single, female-headed families across American as well as within the Lower Mississippi Delta region as a

whole (Tickamyer, 1981; Pearce and McAdoo, 1981; Bianchi, 1999; Lichter and Jayakody, 2002; DeNavas-Walt, Proctor, and Smith, 2007), little research to date has taken an explicitly comparative approach to the ways family structure relates to poverty within specific "persistently poor" regions of the Lower Mississippi Delta; for example, the Arkansas Delta and the Arkansas Ozarks. Research has either focused on the experience of the Lower Mississippi Delta Region (Slack et. al., 2011), the experiences of the Appalachian and Ozarks regions (Tickamyer, 1981; Kamerman, 1984), but it has not been structured to actually compare the poverty situation regarding family structures of two persistently poor regions within the same state.

I provide such a comparative analysis here, with the aim of parsing out similarities and differences in the patterns and aggregate mechanisms that influence poverty in the Arkansas Delta and the Ozarks across major family types. I also provide visual representations of poverty that bring to light various heterogeneous characteristics of poverty across these two regions by utilizing GIS-based *choropleth* mapping tools. By isolating these two regions at the county-level and then focusing on specific variables correlated to poverty, this comparative analysis will provide visual data in a disaggregated form that highlights place-specific poverty more accurately. The following

section will go in to more detail regarding this study's particular research objectives.

1.3 Research Objectives

This study seeks to determine how the prevalence of county-level poverty differs in the Arkansas Delta and the Arkansas Ozarks across major family types. The aim of this research is twofold: to generate spatially representative area data of county-level poverty in the Arkansas Delta (17 counties) and the Arkansas Ozarks (18 counties) vis-à-vis GIS *choropleth*[3] mapping; and to disentangle differences in the mechanisms that influence county-level family poverty in these two regions, specifically by examining how aggregate correlates of poverty levels differ by family type relative to four key dimensions of county-level characteristics: employment structure, population structure, human capital, and nonmetropolitan residence.

This research looks at how the socioeconomic structure of the region differentially influences poverty rates for different segments of the population with special attention given to married couple-headed families and single female-headed families. In particular, this study

[3] The *Choropleth* map is probably the most commonly used tool in area data visualization techniques. Appropriate use of class intervals and colors to represent values in a *choropleth* map is essential.

combines the insights from theories of uneven development with those from the "feminization" of poverty to examine how place-based poverty and family structure contribute to our understanding of family poverty in the State of Arkansas, specifically between the Arkansas Delta and the Arkansas Ozarks. As stated earlier in the previous section, this research will provide a comparative descriptive analysis at the county-level between the Arkansas Delta and the Arkansas Ozarks with a special focus on the differences by family type in order to provide more spatially representative data and visual data for future studies in the geography of family poverty in the State of Arkansas and to better understand the heterogeneous characteristics with family poverty in this region.

Research has clearly demonstrated enduring relationships between geographic location and poverty, but what is the relationship between family structure and poverty in "persistently poor" areas? For example, have persistently poor regions in the State of Arkansas—the Arkansas Delta and the Arkansas Ozarks—experienced similar trends to the national-level with decreases in overall poverty but a rise in poverty for female-headed families? Are there differences and/or similarities between poverty rates within these two regions of the State of Arkansas when it comes to married couple-headed families versus

single female-headed families? The following section will provide a roadmap for the data that will be collected and analyzed for this study as well as outline the research methodology.

1.4 Research Methodology

This research draws on county-level data from the 2009 and 2013 U.S. Census Summary Files and the American Community Survey (ACS).[4] The ACS is used here to examine various family types and poverty rates at the national-level, state-level (the State of Arkansas), and at the county-level (17 counties in the Arkansas Delta and 18 counties in the Arkansas Ozarks). The methods and data utilized in this study are twofold: to first examine family type-specific poverty in relation to various heterogeneous characteristics of factors affecting poverty at county-levels between the Arkansas Delta and the Arkansas Ozarks, and then to provide spatially representative data at the county level by creating place-specific choropleth maps for both the State of Arkansas and for the two areas of study.

This research will approach the analysis by first examining descriptive statistics to compare the contours of county-level poverty

[4] The ACS uses a rolling sample of U.S. housing units (250,000 monthly) to provide basic population characteristics annually for areas with populations of at least 65,000 people. ACS

by family type by modeling similar techniques used in Slack's (2011) comparative analysis study between the Texas Borderland and the entire Mississippi Delta region. However, I chose to modify the scope and scale of my study by focusing on one state and two persistently poor areas within the region. Similarly, in Slack's (2011) comparative analysis study, I first estimate ordinary least squares (OLS) regression models using a lagged panel design to ascertain the manner in which family type-specific poverty is related to county-level employment structure, population structure, human capital, and nonmetropolitan residence across the two regions. As stated earlier, the regression analysis is restricted to families (with related children present) headed by married couples and single mothers (single male-headed families were excluded due to low numbers).

I chose to use a lagged panel design, a modeling technique in which independent variables are measured at an earlier point in time compared to the dependent variable. As outlined above, the independent variables are county-level measures drawn from 2009 data, while my dependent accumulates samples over 3- and 5-year intervals to produce estimates for areas with smaller populations; only the 5-year average ACS provides coverage for all counties in the United States; variables are based on 2013 data. Lagged panel designs are

more rigorous than simple cross sectional analysis because they are able to address problems associated with endogeneity and simultaneity bias. Also, it is worth mentioning that when using geographically defined units of analysis, it is often the case that variables associated with the units are not fully independent from one another. Significant levels of spatial clustering can potentially result in inaccurate statistical inferences when using standard linear regression techniques.

After analyzing the descriptive statistics extracted from the OLS regression models of the two regions, I chose to then provide visual data of my findings by utilizing GIS-based choropleth mapping. A choropleth map is a thematic map in which areas are shaded or patterned in proportion to the measurement of the statistical variable being displayed. Choropleth maps provide an easier way to visualize how a measurement varies across a geographic area and they can also show the level of variability within a particular region. I chose to highlight the variations and similarities between these two regions vis-à-vis choropleth mapping by focusing on the following themes: employment structure, population structure, human capital, and nonmetropolitan residence. The following section will go in to more detail the significance of this type of study.

1.5 Significance of the Study

The aim of this comparative study is to reveal important regional variations in both the prevalence of poverty and the composition of the poor population across major family types. By mapping regional poverty and spatially identifying specific family structures in these historically impoverished areas of Arkansas, regionally targeted and demographically tailored anti-poverty policies can properly be implemented across the state of Arkansas.

While a significant body of literature has examined economic hardship in these two regions, little research to date has taken an explicitly comparative approach. Research is either focused on the experience of the Delta region or the experience of the Ozarks region but it has not been structured to actually compare the poverty situation in these two regions. This research will provide a comparative descriptive analysis with the aim of parsing out similarities and differences in the patterns and aggregate mechanisms that influence poverty in the Arkansas Delta and the Ozarks across major family types. The purpose of this research is to provide a comparative analysis of county-level poverty in two of the poorest regions of the United States—the Arkansas Delta and the Ozarks—with a special focus on differences by family type. By mapping regional poverty and spatially

identifying specific family structures in these impoverished areas of Arkansas, researchers and policymakers alike can begin to better understand the changing geographic distribution of poverty and family type-specific structures within these two persistently poor regions of the state.

1.6 Thesis Structure

The thesis is divided into five (5) chapters.

Chapter 1 outlines the research problem, objectives of this study, the research methodology, the significance of this particular approach of research, the scope and limitations of the study, and an overall logic structure.

Chapter 2 reviews related literature on the theories and definitions of poverty within the American context with special attention given to the Lower Mississippi Delta. This chapter also explores the various spatial dimensions of poverty in relation to the geography of welfare in the South and how family structure relates to poverty, and, subsequently, provides background information for specific aggregate correlates of poverty, such as: employment structure, population structure, human capital, and nonmetropolitan residence. It will also go in to more detail of the case study areas within the State of Arkansas—the Arkansas

Delta and the Arkansas Ozarks—and will provide descriptive statistics on topics related to family structure and poverty in the state. A conceptual framework will then serve as an overarching guide in exploring spatial representation of regional poverty in the Arkansas Delta and Ozarks Regions.

Chapter 3 discusses in full detail the methodologies employed in analyzing and mapping the spatial patterns of poverty. An analytic strategy will also be provided in order to shed light on the various spatial analysis that was executed to derive the different spatial variables that could possibly affect poverty condition in the selected study areas.

Chapter 4 provides a thorough discussion and analysis of the spatial patterns and determinants of poverty in the selected study sites based from the results of the regression analysis. Each identified spatial and non-spatial variables and their influence to the incidence of poverty is discussed in this chapter. Additional secondary data in relation to every variable is also presented to enrich the analysis vis-à-vis GIS-based choropleth maps.

Finally, **Chapter 5** summarizes the findings of the study and thereafter draws concluding remarks from the empirical findings and suggests implications for further research.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Theories and Definitions of Poverty

According to Sen (1999), Bradshaw (2006), and Slack (2011) the definition of poverty and theories that explain it are deeply rooted in strongly held research traditions and political values, reinforced by encompassing social, political and economic institutions that have a stake in the issue. Poverty, however, in its most general sense is the lack of basic essential necessities—food, clean water, shelter, and access to decent work. Valentine (1968) says that "the essence of poverty is inequality… in slightly different words, the basic meaning of poverty is relative deprivation." A social (relative) definition of poverty allows community flexibility in addressing pressing local concerns, while objective definitions allow tracking progress and comparing one area to another (Valentine, 1968).

Therefore, the most common "objective" definition of poverty is the statistical measure established by the federal government as the annual income needed for a family to survive. The

"federal poverty line" was initially created in 1963 by Mollie Orshansky at the U.S. Department of Agriculture based on three times her estimate of what a family would have to spend to maintain a decent, well-balanced diet, and this categorization of poverty has remained the same in America ever since. Most poverty scholars identify numerous problems with this particular definition of poverty when taking in to consideration the diverse concepts of family, cash income, treatment of taxes, special work related expenses, or regional differences in the cost of living (Blank, 1997; Quigley, 2003). Regardless of how we look at the political motives of poverty discussions (Darby, 1997) or when identifying the "knowledge of poverty" (O'Conner, 2001) in particular areas of the county, it is essential to retain focus on the fact that the definition of poverty and the policies addressing it are all shaped by families of all shapes, sizes, and types.

2.2 Persistent Regional Poverty

Indeed, recognition of the acute economic distress faced by historically persistently poor regions is not new. The persistence of poverty in the United States has been perceived as both a social problem and a political issue ever since the declaration of the "war on poverty" in the early 1960s. In the 1960s through the 1970s, poverty was conceptualized by scholars largely in terms of region, race, and age

(Tickamyer, 1981) that typically revolved around one or more of the following topics: urban ghettos (Tenda, 1990; Wilson, 2011; Vergara, 1995), the elderly (Easterlin, 1987; Engelhardt and Gruber, 2004), Native American populations (Kodras, 1997; Hotez, 2008; Vinje, 1996), and the Deep South (Tickamyer and Duncan, 1990; Davis and Gardner, 2009; Slack et. al., 2011). In the 1980s gender and family structure were added to the list of factors recognized as important sources of poverty, especially after Tickamyer (1981) published a critically reviewed study on the "feminization" of poverty in Central Appalachia. Given particular areas of the United States that have historically been impoverished—Central Appalachia, the Mississippi/Arkansas Delta, the Arkansas Ozarks, and the Texas Borderland—researchers are increasingly recognizing the importance of geographic space and place (Lobao, Hooks, and Tickamyer, 2007; Tickamyer, 1981; Lobao, 2004), and connecting studies of spatial inequality and persistently poor regions in attempts to provide pivotal linkages between questions regarding place-based poverty and heterogeneous characteristics of poverty.

Neil Smith (2008) has contributed abundantly to the discussion of the underdevelopment and uneven geographical development among advanced capitalist economics, such as the United States. The concept in itself has become an important tool for understanding pockets of

regional and sub-regional poverty that remain endemic within persistently poor areas of the United States as illustrated earlier in Figure 1 (Malizia, 1978; Hansen, 1979; Tickamyer and Tickamyer, 1981). Perhaps more to the point, it has become clearer over the decades that even in places of large scale economic growth, regional imbalances remain. The State of Arkansas serves as a great example of regional imbalances of wealth despite large scale economic growth in the region from multinational corporations launching in the region such as Walmart and Tyson Foods, which are two of the largest food and retail conglomerates in the United States. Traditional socioeconomic theories of development would assume that expanded growth in the region from businesses like Walmart and Tyson Foods in the State of Arkansas would result in increased benefits for the areas and populations involved, however, regional imbalances remain.

A large body of research has shown that place-based poverty is strongly linked to the local employment structure. Much of the literature on poverty, however, now suggests that the economic system is structured in such a way that poor people fall behind regardless of how competent they may be (Jencks, 1996), and that the problem is the fact that minimum wages do not allow single mothers or their families to be economically self-sufficient (Tickamyer, 2008; Jencks, 1996). Tobin (1994) speculates that the problem of the working poor is

increasingly seen as a wage problem linked to structural barriers that prevent poor families from getting better jobs that are further complicated due to the limited number of jobs for low skilled workers in the first place. For the case of states making up region of the Mississippi Delta, such as the State of Arkansas, these areas have historically been linked to agriculture and farming that only yield high returns for a few and not the many. A final broad category of system flaws related to employment structure and place-based poverty are social stigmas that form the undercurrent for discrimination based on racial or ethnic backgrounds that lead groups of people to have limited opportunities regardless of their personal capabilities.

Literature has also demonstrated that the population structure of a region is strongly related to prevailing poverty levels as well as significant linkages between aggregate-level human capital and poverty. As Niles Hansen (1970) points out, rural areas are often the last stop of technologies, and low wages and competitive pricing dominate production. The lack of infrastructure that allows development of human resources limits economic activity that might use these resources, therefore, stifling not only the overall population structure but hindering appropriate resources to contribute to the overall human capital of the region. The higher residence of poverty in rural compared to urban areas has been studied extensively both

qualitatively and empirically based on numerous national surveys and censuses (Jensen, McLaughlin, and Slack 2003). During the latter years of the "war on poverty", the President's National Advisory Commission on Rural Poverty issued a report entitled *The People Left Behind* (1967) initially highlighted disparities between rural and urban regions of the country but gave special recognition to the deep South that has been and continues to be characterized by high concentrations of poor racial/ethnic minorities.

2.3 Family Structure and Poverty

Family structure is, of course, another focal point of the national dialogue on poverty in the United States that serves as a cross-cutting topic whether it be about employment and population structures to human capital and educational attainment. Although there are numerous household living arrangements and types recognized by the government when it comes to conducting household surveys and censuses, this study will focus on three main categorizations of family structure: all families, married couple-headed families, and single female-headed families. By focusing specifically on married couple-headed households and single female-headed households, descriptive statistics will better highlight trends in household and family composition in the following sections of this study.

Researchers and policymakers' attention has been devoted to the rise of single female headed families in American since the 1980s, and the disproportionate risk of poverty faced by unmarried women and their children (Bianchi 1999; Lichter and Jayakody 2002). Bianchi (1999) outlines one key trend that has contributed to the "feminization" and "juvenilization" of poverty in recent decades thanks to the many studies catalyzed by Tickamyer's 1981 report of poverty in Central Appalachia. First, the increasing rates of unmarried and out-of-wedlock childbearing that has increased the proportion of families headed by young, never-married mothers. This group experiences extensive economic disadvantages due to unstable flows of income from nonresident fathers and fiscal instabilities from obtaining child support (Bianchi, 1999). Secondly, this trend has served to disproportionately concentrate poverty among single female-headed families and their children. Among children in particular the inequalities by family type are stark, which has created a very real "juvenilization" of poverty throughout the nation. For example, in 2006 the child poverty rate was 42.1 percent for those living in single female-headed families compared to 8.1 percent for those living in families headed by married couples (DeNavas-Walt, Proctor, and Smith (2007).

The relationship between family structure and poverty and the various impacts this relationship has on a community is very important to keep in mind when analyzing persistently poor regions across the United States. In particular, much concern has specifically centered on the disproportionate economic hardship faced by single female-headed families' relative to those living in other family and household arrangements (Bianchi 1999; Lichter and Jayakody 2002). In 2006, for example, the poverty rate stood at 28.3 percent for single female-headed families compared to only 4.9 percent for families headed by married couples (DeNavas-Walt, Proctor, and Smith 2007). In recognition of the important relationship between family structure and poverty, welfare reform expressly sought to reduce poverty and welfare dependency in the late 1990s by promoting marriage and encouraging "the formation and maintenance of two-parent families" (H.R. 3734). Research has noted the economic benefits of marriage, especially for women from disadvantaged backgrounds (Bianchi, 1999), but other studies have been cautious to this type of family policy promotion as it does not always lead to increased economic status (Slack et al., 2009). Regardless, the point here is that the centrality of the issue of family structure in the poverty research and policy discourse makes understanding the different aggregate mechanisms that influence poverty across major family types an important endeavor.

2.4 The Case Study: The State of Arkansas

The State of Arkansas is a financially poor state with an average poverty rate that reached almost half of the state's entire population in 1960. (See Table 1) Whether we are talking about sustainable economies or cultural concepts, this fact forms the undercurrent of much of what has solidified the Lower Mississippi Delta's reputation as a whole both past and present. Indeed, the high and persistent poverty suffered by residents in this region has much to do with the unique social position of African American minorities in the rural U.S. (Harris and Worthen, 2003; Saenz and Torres, 2003; Snipp 1996; Slack et al., 2009). Not only is the state predominately rural with one in three jobs connected to agriculture (Delta Regional Authority, 2013) but it is also characterized by high shares of racial minorities, specifically within the Arkansas Delta region to the east along the Mississippi River, that have experienced intergenerational poverty for decades. Figure 2 shows the six regional breakdowns within the State of Arkansas, and the areas of study are the two highlighted regions—the Arkansas Delta to the east and the Arkansas Ozarks to the north

Figure 2: Map of Regions of Arkansas

However, historical census data indicates that poverty has dramatically decreased in the state since the 1960s, from a high poverty rate of 47.51 percent reported in the 1960 census to 18.70 percent in the 2010 census as illustrated in Table 1. In comparison, the U.S. official poverty rate in 1960 was 22.10 percent and 15.30 percent in 2010. Although the poverty averages in both the U.S. and the State of Arkansas have dropped significantly over the years, poverty rates still vary considerably across specific regions of the state, especially regarding the Arkansas Delta and the Arkansas Ozarks regions. Both are predominately rural and characterized by high shares of racial/ethnic minorities consisting mainly of African Americans. (See Figure 6) Indeed, the high and persistent poverty suffered by the residents of these regions in Arkansas has much to do with the unique

social position of racial and ethnic minorities in the rural U.S. in general (Harris and Worthen 2003; Snipp 1996), populations who share the enduring legacy of living in the shadows of "the historical remnants of institutions explicitly created to conquer, oppress, and maintain their subordinate position in society…through slavery, Jim Crow, sharecropping, and the plantation agriculture" (Snipp 1996).

Despite these similarities, however, the Arkansas Delta and the Arkansas Ozarks also differ in many notable respects. One such example is the structure of families in the two regions. In 2009, for example, 42.3 percent of Arkansas Delta families were headed by married couples compared to 65.8 percent of families in the Ozarks. In that same year, 44 percent of Arkansas Delta families were headed by single mothers, while this was true of 34 percent of families in the Ozarks. These differences are even more pronounced when race and ethnicity are considered. Whereas the family structure of non-Hispanic whites[5] is very similar between the two regions, there are significant differences in the family structure of African Americans in the Arkansas Delta and the Arkansas Ozarks. In 2000, 73.6 percent of non-

[5] Non-Hispanic whites or whites not of Hispanic or Latino origin are people in the United States, as defined by the Census Bureau, who are of the white race and are not of Hispanic or Latino origin/ethnicity. Non-Hispanic whites are a subcategory of white Americans, the other being white Hispanic and Latino Americans. That means there are black, white, even Asian Hispanics. The label "Hispanic" -- meaning, "with origins or heritage in Spanish-speaking countries" -- was intended by the census to be a category of linguistic and ethnic heritage, not an official "race" of its own.

Hispanic families in the Arkansas Delta were headed by married couples, compared to only 42.3 percent of African American families in the Arkansas Delta. And while 26 percent of non-Hispanic families in the Arkansas Delta were headed by single mothers, this family type characterized more than half (53%) of African American families in the Arkansas Delta. Thus, the substantial differences in family structure observed in the Arkansas Delta versus the Arkansas Ozarks raise the prospect of important variation in the dynamics of how family structure relates to regional poverty within two regions in the State of Arkansas.

2.4.1 The Arkansas Delta

The Arkansas Delta economy is still dominated by agriculture. The main cash crop is cotton and other crops include rice and soybeans. Catfish farming continues to generate major revenue for Arkansas Delta farmers along with poultry production. The Arkansas Delta has some of the lowest population densities in the American South, sometimes less than 1 person per square mile. Despite the migration of many African Americans from the area, the region still has a large African American population. Eastern Arkansas has the highest percentage of cities in the state with predominately African-American populations. Urbanization and the shift to mechanization of farm

technology during the past 60 years has sharply reduced jobs in the Delta. People have followed jobs out of the region, leading to a declining tax base, which hampers efforts to support education, infrastructure development, community health and other vital aspects of growth. The region's people suffer from unemployment, extreme poverty, and illiteracy.

The conditions in the Arkansas Delta are strongly linked to the legacy of slavery and the institutional mechanisms used to facilitate black labor exploitation after its abolition (Hyland and Timberlake 1993; Snipp 1996). The Arkansas Delta is home to the exceptionally fertile soil of the Mississippi River floodplain—a resource accessed through considerable human effort to channel the river, drain the swamps and wetlands, and control flooding—and has long been characterized by intensive plantation agriculture, rice and cotton production in particular. Historically, landowners imported African slaves to work their plantations. After the abolition of slavery, the power elite in this region devised other forms of institutional racism and economic servitude (i.e. Jim Crow laws; sharecropping; tenant farming) to maintain rigid class and racial caste boundaries.

Further, the Arkansas Delta's natural ecology and the absence of rail and road systems served to isolate the region and allowed plantation owners and county governments to wield nearly absolute

power. This power was used to limit local educational and economic opportunities in order to perpetuate an economically dependent agricultural workforce. As noted by Hyland and Timberlake (1993), "The Jim Crow South provided a potent system for keeping African Americans economically oppressed and socially separate. Coupled with effective elite opposition to industrial development in the Delta, this system assured planters that there would be continued access to cheap labor for chopping cotton in the spring and harvesting in the fall." Today, the Arkansas Delta continues to be characterized by out-migration, underdevelopment, and racial inequality.

2.4.2 The Arkansas Ozarks

Currently, areas in the Arkansas Ozarks region have a much lower poverty rate than areas of the Arkansas Delta. During the 1960s and into the 1970s, however, parts of the Arkansas Ozarks had very high poverty rates but was greatly reduced starting in the mid-1980s. Just as the topography of the Arkansas Ozarks and Delta are extremely different, so too are their histories related to poverty. While both areas had extremely high rates of poverty compared to national averages in the 1960s and both saw declines over the past decades, the current poverty average (16.36 percent) of northwest Arkansas' Ozarks region is much more in line with the national average (15.3 percent),

exemplifying that even areas perceived as historically impoverished can change, decrease poverty rates and improve their economic status.

In sum, the high and persistent poverty found in the Arkansas Delta and the Ozarks is rooted in the historical legacies and contemporary consequences of systematic racism, oppression, subordination, exploitation, and underdevelopment. Beyond being home to high concentrations of racial/ethnic minority populations and being the very poorest places in American society, another characteristic the regions share in common is that they are spatially and socially isolated from the American mainstream. One the other hand, the Arkansas Delta and the Arkansas Ozarks are also unique in many respects. Not only are the cultural histories of these regions quite different, so are their experiences with demographic and economic change. Further, as noted in the introduction, the Arkansas Delta and the Arkansas Ozarks are characterized by quite different family structures. Taken together, these similarities and differences help motivate a need for comparative analysis.

2.5 Conceptual Framework

The literature on place-based poverty suggests the importance of a variety of aggregate-level relationships. While not an exhaustive account, the aggregate mechanisms that influence poverty can be

roughly categorized along four key dimensions: employment structure, population structure, human capital, and nonmetropolitan (nonmetro) residence. The following section will elaborate on these four dimensions and their applicability to the case study area.

2.5.1 Aggregate Correlates of Poverty: Employment Structure, Population Structure, Human Capital, and Nonmetropolitan (Nonmetro) Residence

Employment Structure

A large body of research has shown that place-based poverty is strongly linked to the local employment structure. Studies have shown that the percentage of total employment in agriculture tends to be positively related to poverty (Albrecht 2000; Levernier, Patridge, and Rickman 2000) whereas the percentages of total employment in the manufacturing sector (Cotter 2001; Rupasingha and Goetz 2007) and the finance, insurance, and real estate (FIRE) sectors (Parisi et al. 2003; Singelmann 1978) are negatively associated with aggregate poverty levels. In sum, the literature makes clear that the local employment structure—both in terms of overall employment and the industrial mix—is an important consideration for understanding place-based poverty.

Population Structure

The literature has also demonstrated that the population structure of places is strongly related to prevailing poverty levels. For example, places characterized by higher minority concentrations tend to be characterized by higher poverty rates (Friedman and Lichter 1998; Rupasingha and Goetz 2007; Saenz 1997; Voss et al. 2006) reflecting the myriad social disadvantages faced by such groups. Population density is another part of a growing body of theory on spatial variables in social science using the tools of GIS to track spatial dynamics of opportunity and poverty

(Bradshaw and Muller, 2003).

Human Capital

A large body of literature has demonstrated significant linkages between aggregate-level human capital and poverty. Areas characterized by lower levels of educational attainment have consistently been shown to be home to higher poverty rates (Friedman and Lichter, 1998; Rupasingha and Goetz, 2007; Voss et al., 2006). These variables point to a labor market disadvantages faced by populations with less marketable skills.

Nonmetropolitan Residence

Finally, an extensive literature has examined the higher residence of poverty in rural compared to urban areas (Jensen, McLaughlin, and Slack 2003; Rural Sociological Society Task Force on Persistent Rural Poverty 1993). This research has shown that the poor living in areas where poverty is prevalent face impediments beyond those of their individual circumstances. Concentrated poverty contributes to poor housing and health conditions, higher crime and school dropout rates, as well as employment dislocations. As a result, economic conditions in very poor areas can create limited opportunities for poor residents that become self-perpetuating.

CHAPTER 3: DATA AND METHODOLOGY

This study seeks to determine how the prevalence of county-level poverty differs in the Arkansas Delta and the Arkansas Ozarks across major family types. Figure 3 shows the county-level breakdown of the two regions along with each county's name. The aim of this research is twofold: to generate spatially representative area data of county-level poverty in the Arkansas Delta (17 counties) and the Arkansas Ozarks (18 counties) vis-à-vis GIS *choropleth*[6] mapping; and to disentangle differences in the mechanisms that influence county-level family poverty in these two regions, specifically by examining how aggregate correlates of poverty levels differ by family type relative to four key dimensions of county-level characteristics: employment structure, population structure, human capital, and nonmetropolitan residence. The methods for accomplishing these objectives are outlined below:

3.1 Data and Regional Definitions

My research draws on state-level and county-level data from the 2009 and 2013 U.S. Census Bureau's Summary Files and Small Area

[6] The *Choropleth* map is probably the most commonly used tool in area data visualization techniques. Appropriate use of class intervals and colors to represent values in a *choropleth* map is essential.

Income and Poverty Estimates (SAIPE) data sets as well as the 2009 to 2013 American Community Survey (ACS) 5-year Summary Files. Following the Delta Regional Authority (DRA), I define the Arkansas Delta by starting with the geography delineated by the DRA, but further restrict my analysis to the core 17 Arkansas Delta counties along the eastern border of the state. The Arkansas Ozarks is defined by the 18 counties along the northern border of the state that make up the core counties of the Arkansas Ozarks region.

Illustrated in Figure 3, the Arkansas Delta stretches along the Mississippi River from Chicot County to Clay County and includes a total of 17 counties. In 2013, African Americans represented 30.92 percent of the total population in this region. This is almost double the average amount of African Americans living in both the United States and Arkansas at 13.20 percent and 15.60 percent respectively. (See Appendix) In fact, African Americans were the numerical majority in 6 of the 17 Arkansas Delta counties, reaching levels as high as 61.60 percent of the population. Figure 3 also demonstrates the area that makes up the Arkansas Ozarks region. The Arkansas Ozarks region stretches along the northern border of the state along the Ozark Mountains from Benton County to Lawrence County and includes a total of 18 counties. In 2013, African Americans represented only 0.96%

of the total population with White, non-Hispanics making up the numerical majority in all 18 counties.

Illustrated in Figure 4 is the extent to which poverty afflicts the residents of these two regions. Between 2009 and 2013, 34 of the 35 counties in the Arkansas Delta and the Ozarks had poverty rates that exceeded the national average (i.e., poverty rates in excess of 14.50%); 6 of the 17 counties in the Arkansas Delta actually were more than double the national poverty rate with Mississippi County experiencing a poverty rate of 41.10 percent in 2013. (See Appendix) Further, the majority of counties in the Arkansas Delta are designated as "persistently poor" by the Economic Research Service of the U.S. Department of Agriculture, a designation applied to counties in which 20 percent or more of the residents have been living in poverty in each of the last four decennial censuses (1970, 1980, 1990, and 2000). Clearly, these two regions are plagued by high and deeply entrenched poverty, making them important regions to study further in the pursuit of understanding spatial representation of poverty in the State of Arkansas.

When defining 'land area' when collecting data, it is defined as the size in square units (metric and nonmetric) of all areas designated as land in the Census Bureau's national geographic (TIGER) database. Identification of land is for statistical purposes and does not necessarily

reflect legal definitions. The Census Bureau developed the Topologically Integrated Geographic Encoding and Referencing (TIGER) System to automate the geographic support processes needed to meet the major geographic needs of the 1990 census. Land area was calculated from the specific set of boundaries recorded for the entity (in this case, counties, which were then aggregated to metropolitan totals) in the Census Bureau's geographic database. Land area measurements are originally recorded as whole square meters (to convert square meters to square kilometers, divide by 1,000,000; to convert square kilometers to square miles, divide by 2.58999; to convert square meters to square miles, divide by 2,589,988). Land area measurements may disagree with the information displayed on U.S. Census Bureau maps and in the TIGER database because, for area measurement purposes, features identified as "intermittent water" and "glacier" are reported as land area. The accuracy of any area measurement data is limited by the accuracy inherent in (1) the location and shape of the various boundary information in the TIGER database and (2) rounding affecting the last digit in all operations that compute and/or sum the area measurements.

Persons per square mile is the average number of inhabitants per square mile of land area. These figures are derived by dividing the total number of residents by the number of square miles of land area in

the specified geographic area. The land area measurement is from the Census 2010. To determine population per square kilometer, multiply the population per square mile by .3861.

Poverty status is defined by the U.S. Census Bureau by family—either everyone in the family is in poverty or no one in the family is in poverty. The characteristics of the family used to determine the poverty threshold are: number of people, number of related children under 18, and whether or not the primary householder is over age 65. Family income is then compared to the poverty threshold and, if that family's income is below that threshold, the family is in poverty. The federal government has two ways to define poverty for Arkansas families. The first is the federal poverty threshold, the original poverty measure designed in 1963. It is updated every year by the U.S. Census Bureau using the Consumer Price Index. This measure was based on the cost a minimum diet of a family of four.8 In 2009 the federal poverty threshold for a family of four with two children was $21,756 while the threshold for a family of three with one child was $17,268.9 The second is the federal poverty guidelines, which are calculated by the U.S. Department of Health and Human Services and are a simplified version of the federal poverty threshold. The poverty guidelines are used to determine financial eligibility for certain federal programs. In 2009, the federal poverty guideline for a family of four was $22,050

and $18,310 for a family of three. Families living in deep poverty earn less than 50 percent of the poverty threshold. This means a family of four would earn less than $10,917 under the 2008 federal poverty threshold.

The ACS is an ongoing statistical survey by the U.S. Census Bureau and it is also the largest survey the Census Bureau administers other than the decennial census. The ACS has an initial sample of approximately 3.5 million housing unit addresses and group quarters throughout the United States with samples selected from all counties and county-equivalents that aggregate individual ACS responses into estimates at many geographic summary levels. These data sets exemplify the tools necessary to analyze spatial representation of regional poverty due to its emphasis on place-specific data. The ACS is the framework by which the Census Bureau collects and publishes demographic, social, housing, and economic data. Geography contributes to, and is involved in, ACS sampling, data collection, weighting, and data tabulation activities.

SAIPE provides annual estimates of income and poverty statistics for all school districts, counties, and states across the country with the main objective being to provide estimates of income and poverty for the government. The U.S. Census Bureau, with support from other Federal agencies, originally created the SAIPE program to

provide more current estimates of selected income and poverty statistics than the most recent decennial census. Single-year direct survey ACS estimates are annually available for counties and other areas with population size of 65,000 or more. Three-year ACS estimates are annually available for areas with population size of 20,000 or more. Five-year ACS estimates are annually available for all counties and school districts, as well as for other small geographic areas (e.g., census tracts). Since modeling produces estimates with reduced sampling error, the SAIPE program continues to annually produce single-year model based estimates for all school districts, counties, and states.

3.2 Measures

The units of analysis in this research are counties. The dependent variable, drawn from the 2009 U.S. Census Summary Files, is the percentage of families with related children whose total family income in the year preceding the 2009 Census fell below the official poverty thresholds.[7] This research will further disaggregate family poverty by family type, specifically those headed by the following main three family types: married couples, single females, and single males. The multivariate analysis will then be restricted to the circumstances of

[7] See U.S. Census Bureau (2008) for further information on the official definition of the poverty thresholds.

married couple and single female-headed families, due to the low number of families with children headed by unmarried males.

The independent variables will be drawn from the 2009 U.S. Census Summary Files and are based on the four dimensions of aggregate-level poverty predictors outlined previously: employment structure, population structure, human capital, and nonmetropolitan residence. More specifically, because overall employment and the industrial mix in an area have been shown to be important considerations in understanding place-based poverty (Cotter, 2001; Rupasingha and Goetz, 2007; Parisi et al., 2003; Singelmann, 1978), this research will examine the following four variables related to county-level employment structure: the percentage of the working age population that is employed, and the percentages employed in the agricultural, manufacturing, and FIRE sectors. Since research has also shown the population structure of places to be significantly linked to local poverty rates, this study will also examine four variables related to county-level population structure: net migration, the percentage of the population under 15 years of age, the percentage that is foreign-born, and the percentage that are members of the predominate racial/ethnic minority group in the area (Friedman and Lichter, 1998; Rupasingha and Goetz, 2007; Saenz, 1997; Voss et al., 2006). Because aggregate human capital levels have been shown to be important

predictors of county-level poverty, this study will assess two variables related to county level human capital: the percentage of the population aged 25 years and older with less than a high school degree or equivalent, and the percentage that does not speak English well or at all. Last, since a large literature has revealed economic disadvantages associated with living in rural areas, this study will consider nonmetropolitan residence as a predictor of county-level poverty. Descriptive statistics for each of these variables will be presented in order to demonstrate similarities and differences in the structural characteristics of these two regions in Arkansas.

Table 2: Distribution of Independent Variables, 2009

	DELTA				OZARKS			
Variables	**Mean**	**S.D.**	**Min**	**Max**	**Mean**	**S.D.**	**Min**	**Max**
Percent employed	60.7	6.7	34.2	79.3	64.5	6.4	39.9	76.7
Percent agriculture	10.1	6.0	0.7	39.8	13.4	7.2	5.0	34.3
Percent manufacturing	30.6	8.6	9.5	55.9	18.6	4.0	1.2	20.5
Percent FIRE	3.9	1.5	0.5	10.2	4.1	1.3	2.1	7.6
Percent under age 15	26.1	3.2	17.2	33.5	28.0	3.3	18.1	34.5
Percent foreign-born	0.6	0.8	0.0	5.9	1.4	0.0	0.8	3.0
Percent minority	42.5	29.4	0.8	86.0	19.8	17.7	0.4	36.2
Percent less than H.S.	44.1	7.6	19.5	56.3	37.1	5.9	14.4	53.4
Nonmetro	78.9	--	--	--	81.0	--	--	--

Source: 2009 U.S. Census Summary Files.

Notes: S.D. = standard deviation. Percent minority measures the percentage of the population that is black in the Arkansas Delta and the Arkansas Ozarks. Nonmetro is a dummy variable, expressed here as a percentage of the counties in a region that are nonmetro. Delta N=17. Ozarks N=18.

3.3 Analytic Strategy

This research will approach the analysis by first examining descriptive statistics to compare the contours of county-level poverty by family type in the Arkansas Delta and the Arkansas Ozarks regions. This study seeks to determine how the prevalence of county-level poverty

differs in the Arkansas Delta and the Arkansas Ozarks across major family types. The aim of this research is twofold: to generate spatially representative area data of county-level poverty in the Arkansas Delta (17 counties) and the Arkansas Ozarks (18 counties) vis-à-vis GIS *choropleth*[8] mapping; and to disentangle differences in the mechanisms that influence county-level family poverty in these two regions, specifically by examining how aggregate correlates of poverty levels differ by family type relative to four key dimensions of county-level characteristics: employment structure, population structure, human capital, and nonmetropolitan residence.

I will first estimate ordinary least squares (OLS) regression models using a lagged panel design to ascertain the manner in which family type-specific poverty is related to county-level employment structure, population structure, human capital, and nonmetropolitan residence across the two regions. As stated earlier, the regression analysis is restricted to families (with related children present) headed by married couples and single mothers (single male-headed families were excluded due to low numbers). I chose to use a lagged panel design—a modeling technique in which independent variables are measured at an earlier point in time compared to the dependent

[8] The *Choropleth* map is probably the most commonly used tool in area data visualization techniques. Appropriate use of class intervals and colors to represent values in a *choropleth* map is essential.

variable—in order to highlight trends in household and family composition, describe characteristics of each family type vis-à-vis descriptive statistics, and to show spatially representative data throughout the two regions in Arkansas.

As outlined above, the independent variables are county-level measures drawn from 2009 data, while my dependent variables are based on 2013 data. Lagged panel designs are more rigorous than simple cross-sectional analysis because they are able to address problems associated with endogeneity and simultaneity bias. Also, it is worth mentioning that when using geographically defined units of analysis, it is often the case that variables associated with the units are not fully independent from one another. Significant levels of spatial clustering can potentially result in inaccurate statistical inferences when using standard linear regression techniques.

CHAPTER 4: RESULTS

4.1 Prevalence of Poverty by Family Type

I will begin with a descriptive account of poverty by family type in the Arkansas Delta and the Arkansas Ozarks with comparisons to both state and national averages. Table 3 shows the percentage poor by family type for the two regions in Arkansas, for the State of Arkansas and the United States as a whole. Overall, family poverty is roughly twice the national average (17.80%) in the Arkansas Delta (31.70%) and nearly 10 percent more in the Arkansas Ozarks (26.08%). The results show that single female-headed families suffer similarly high rates of poverty in the Arkansas Delta (58.61%) and the Arkansas Ozarks (49.92%) when compared to both the nation's average and the State of Arkansas' average (40.00% and 48.40%, respectively). While nationally about four in ten single female-headed families are in poverty, the Arkansas Delta and Arkansas Ozarks both have much higher percentages of poor single female-headed families (58.60% and 49.92%, respectively).

In comparison, poverty rates among married couple-headed families are slightly lower, though in both regions married-couple family poverty is still well above both the national and state averages

(8.30% and 11.10%, respectively). The poverty rate for families headed by married couples in the Arkansas Delta (13.44%) is slightly above the state average (11.10%), while the poverty rate for married couple-headed families in the Arkansas Ozarks (17.74%) is more than twice the national average (8.30%). Clearly, family poverty in much more severe in the Arkansas Delta and the Arkansas Ozarks than it is at the national and state levels. Single female-headed families face extremely high poverty rates—in excess of 50 percent in both regions. However, the results also show slightly higher poverty rates for married-couple families in the Arkansas Ozarks compared to the Arkansas Delta. These results suggest that marriage provides Arkansas Ozarks residents less protection from poverty than is the case among their Arkansas Delta counterparts. Stated another way, Arkansas Ozarks residents appear to reap fewer economic benefits from marriage than is true elsewhere.

Table 3: Percent Poor by Family Type in Arkansas, 2013

Family Type	USA	Arkansas	Delta	Ozarks
All families	17.8	23.3	31.7	26.08
Married couple headed	8.3	11.1	13.4	17.74
Single female headed	40.0	48.4	58.61	49.92

Source: 2013 U.S. Census Summary Files
Notes: Analysis restricted to families with related children under age 18. Delta =17. Ozarks=18.

4.2 Proportion of Poverty by Family Type

Table 4 shows the proportion of the poor population by family type nationally for the Arkansas Delta, for the Arkansas Ozarks, and nationally. These data demonstrate that the proportion of the poor population differs greatly by family type across the two regions. In the Arkansas Ozarks, the proportion of the poor by family type largely mirrors the national numbers, though there are slight differences. The proportion of the poor population represented by families headed by single mothers is slightly lower in the Arkansas Ozarks compared to the nation (55.4% versus 57.3%, respectively), while the proportion of married couple-headed families is slightly higher (37.2% versus 33.6%, respectively). In the Arkansas Delta, however, the distribution of the

poor population by family type differs substantially from the distributions in the Arkansas Ozarks and the nation. Among poor Arkansas Delta families, the majority (58.61%) live in families headed by single females, with comparatively fewer living in families headed by married couples (13.4%). In terms of regional comparisons, the key point is straightforward: In the Arkansas Delta, poverty is more concentrated among single female-headed families, while in the Arkansas Ozarks it is married couple-headed families that represent the greatest share of the poor.

Table 4: Proportion Poor by family type, 2013

Family Type	United States	Delta	Ozarks
All families	100.0	100.0	100.0
Married couple-headed	33.6	30.8	37.2
Single female-headed	57.3	67.5	55.4
Single male-headed	9.1	1.7	7.4

Source: 2013 U.S. Census Summary Files
Notes: Analysis restricted to families with related children under age 18. Delta N=17. Ozarks N=18.

4.3 Multivariate Models of Poverty Levels by Family Type

Table 5 shows standardized OLS regression coefficients from regionally pooled lagged panel models of county-level poverty by family type in 2013. Each model includes a regional dummy variable measuring whether or not a given county is part of the Arkansas Delta (1=yes) versus the Arkansas Ozarks, as well as structural variables tapping the local employment structure, population structure, human capital, and nonmetro status. The aim of these models is to assess the aggregate mechanisms that influence poverty by family type in these two regions, as well as determine whether regional differences hold net of these factors. The models yield a number of important results. A key finding, given the aim of this analysis, is that, net of other factors, there are no significant regional differences in the poverty levels for either of the two major family types. That is, the regional differences in family type specific poverty that do exist are explained by the differences between the two regions in the structural variables that are included in the models.

Among married couple-headed families, the percentage of the working-age population that was employed in 2009 is shown to exert significant downward pressure on poverty five years later to where greater proportions of working-age people are employed, poverty rates will be lower. At the same time, the results also indicate an important

influence of employment in particular economic sectors. Specifically, a higher percentage of agricultural employment in 2009 is shown to be associated with significantly higher married couple-family poverty in 2013. This relationship is likely indicative of the agricultural labor exploitation and systematic underdevelopment outlined earlier in the paper, as well as the particularly high rates of underdevelopment that plague agricultural workers compared to those employed in other sectors (Slack and Jensen, 2004). These results also suggest that issues related to low educational attainment are special concerns for the economic well-being of families headed by married couples.

Not surprisingly, higher local employment rates are also shown to be associated with lower poverty levels among single female-headed families five years later. Notably, however, this is the only significant variable the models for married couple and single female-headed families have in common. Poverty rates among single female-headed families are also shown to be higher where a greater proportion of the population is under 15 years of age and for nonmetro areas. The first finding point to the linkages between the "feminization" and "juvenilization" of poverty (Bianchi, 1999), while the latter is suggestive of the fact that rural women receive lower labor market returns, or earnings, for their human capital and occupation compared to their urban counterparts (McLaughlin and Perman, 1991; Slack et.

al., 2011) and face more restricted employment opportunities. Last, these models tested two-way interactions between the Arkansas Delta dummy variable and each of the other independent variables, but found no significant interaction effects associated with poverty among single female-headed families.

Table 5: OLS lagged panel regression models of county-level poverty by family type, 2013

Independent variables	Married couple-headed		Single female-headed
Delta (yes=1)	0.039	0.032	-0.005
Percent employed	-0.151**	-0.137*	-0.245**
Percent agriculture	0.238***	0.235***	0.061
Percent manufacturing	-0.059	-0.072	-0.183
Percent FIRE	-0.005	-0.013	-0.073
Percent under age 15	0.065	0.062	0.231*
Percent foreign-born	0.228***	0.335***	0.058
Percent minority	0.248	0.219	-0.075
Percent less than H.S.	0.272***	0.291***	0.249
Nonmetro (yes=1)	0.054	0.053	0.2119**
Adjusted R-square	0.810	0.805	0.551

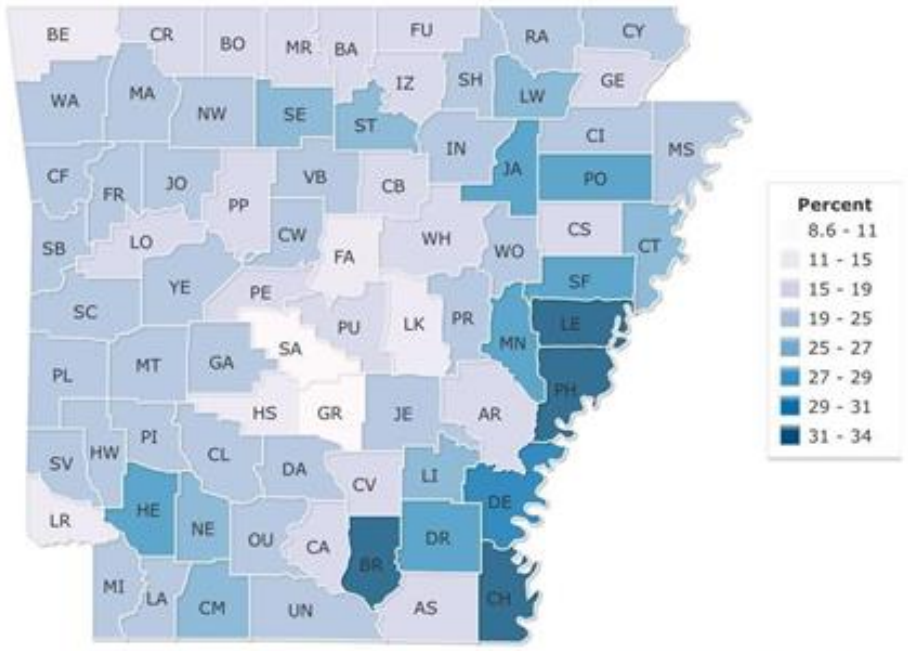
Source: 2009 and 2013 U.S. Census Summary Files.
Notes: Cell entries are standardized OLS coefficients. Percent minority equals percent black in the Arkansas Delta and in the Ozarks. N=35.
*p < .05; ** p < .01; *** p < .001

4.4 Descriptive Statistics for Spatial Analyses

The choropleth map is probably the most commonly used tool in area data visualization techniques. This section analyzes the various spatially generated maps from the 2009-2013 ACS that highlight representative poverty and poverty correlates of area data of county-level poverty in the Arkansas Delta (17 counties) and the Arkansas Ozarks (18 counties).

Figure 4 shows the breakdown of persons below the federal poverty level between 2009 to 2013 with the average being 19.2 percent for the entire state. However, as you can see from the map poverty is mainly concentrated in the east along the Mississippi River within the Arkansas Delta region. For example, Phillips County initialed PH had an average poverty rate of 33.5 percent consistently throughout that five-year period, and Lee County followed close behind at an average poverty level of 31. 5 percent throughout the same time period.

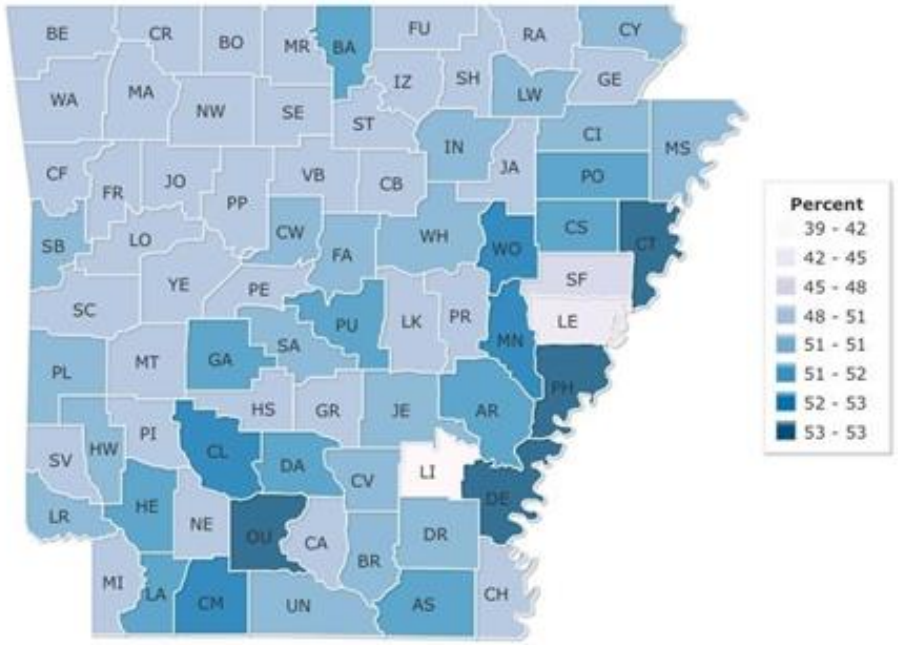
Figure 4: Persons below poverty level in Arkansas, 2009-2013



Source: U. S. Census Bureau, American Community Survey, 5-Year Estimates. http://factfinder2.census.gov

Figure 5 shows the county-level breakdown of female persons throughout the state between 2009 to 2013. Notice that counties with higher percentages of females, such as Phillips County and Lee County—both were in concentrated areas of poverty similar to Figure 4. However, it appears the counties with female concentrated populations seem to be not only consolidated within the Arkansas Delta counties but also span areas to the southwest in the Timblerlands region, to the east in the Ouachitas region, and in the Central Arkansas region as well. (Refer to Figure 1).

Figure 5: Female Persons in Arkansas, Percent, 2013

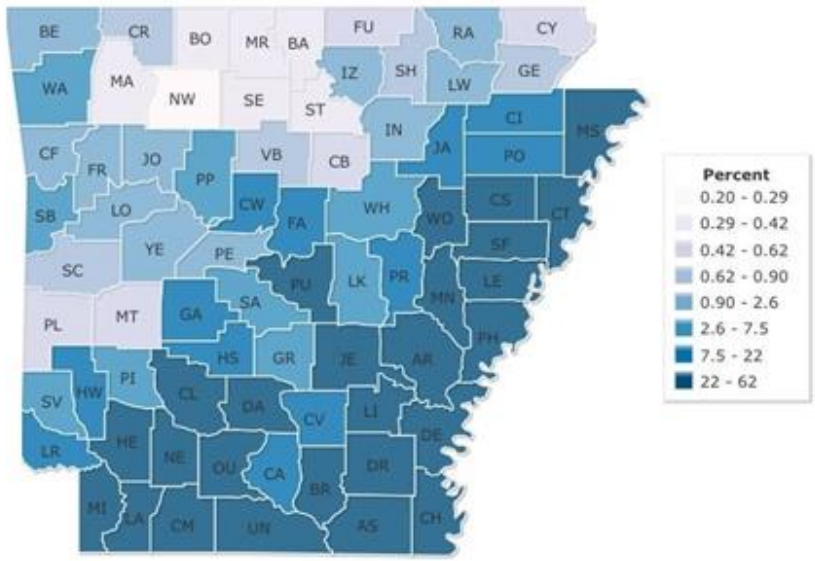


Source: U.S. Bureau of the Census, Population Estimates Program (PEP).

Figure 6 is the most visually telling map of all the maps due to its stark split between the racially divided regions of Arkansas between non-Hispanic whites and African Americans. Counties within the Arkansas Delta—Phillips County, Lee County, and Washington County— have African American populations that reach as high as 62 percent of the population. The areas to the north, specifically in the Arkansas Ozarks region, have significantly less African American residents with a low of 0.20 percent in a handful of counties and a maximum of 7 percent. The Arkansas Delta and the Timberlands

regions are also historically impoverished, rural, and have a higher population of females as discussed earlier. (Refer to Figure 5).

Figure 6: Black or African American Alone in Arkansas, Percent, 2013

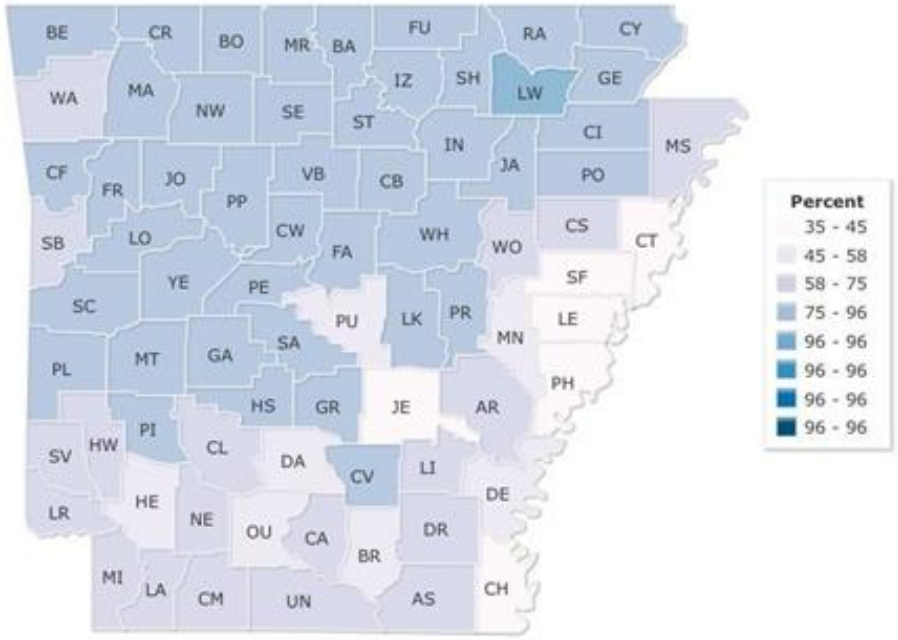


Source: U.S. Bureau of the Census, Population Estimates Program (PEP).

Figure 7 shows a majority white population concentrated to the north in the Arkansas Ozarks as well as throughout the central and western most regions. Lawrence County has the highest concentration of white Arkansans with an average of 96.5 between 2009 to 2013. The lowest concentrations of white Arkansans would be in the highly concentrated African American areas within the Arkansas Delta, especially the counties directly beside the Mississippi River. Also, the poorest counties in the Arkansas Delta—Phillips County, Lee County,

and Chicot County— all have extremely low percentages of white Arkansans. Pulaski County also has a high percent of African Americans, which is not surprising since the capitol city of Little Rock is located in this county. It is not unusual to have high percentages of racial/ethnic minorities located in the areas with the biggest cities since more job opportunities are available.

Figure 7: White alone, Non-Hispanic or Latino in Arkansas, Percent, 2013

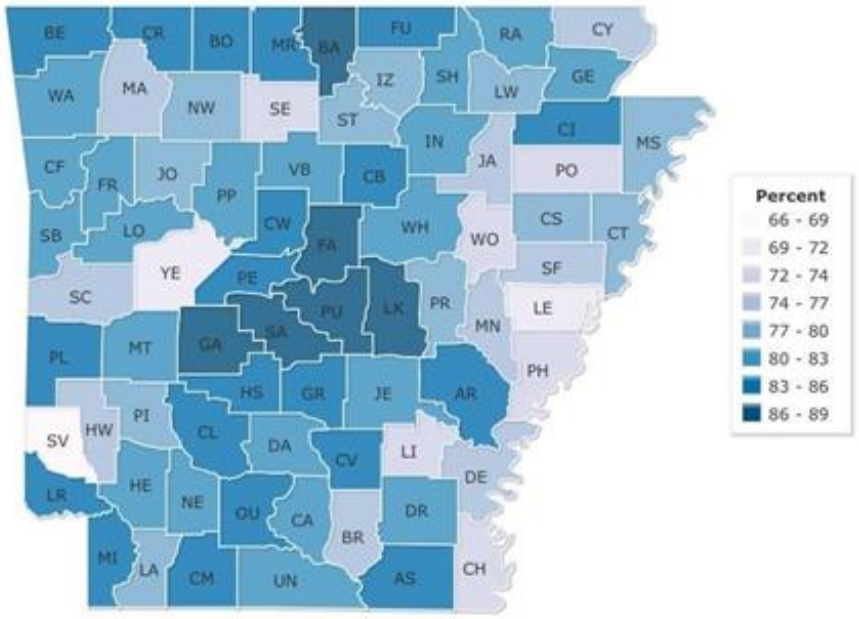


Source: U.S. Bureau of the Census, Population Estimates Program (PEP).

The next map shows the concentration of persons with a high school degree or higher above the age of 25 years old. (See Figure 8). The areas with the highest percentages are naturally located in and

around the capitol of the state, Little Rock, which is located in the Central region of the state. The areas to the north in the Arkansas Delta also have higher concentrations of high educational attainment and are also located in counties with higher populations. The most rural counties in the state have lower levels of educational attainment and also happen to be where the highest levels of concentrated poverty are located, especially within the Arkansas Delta region to the east. Pulaski County located in the very middle region of the state has a high of 89 percent of the population with higher levels of education. The county with the lowest education levels is also the county with the most poverty, which is Lee County located to the east in the Arkansas Delta, and it is one of the counties with the highest concentrations of both women and single female headed families.

Figure 8: High School Graduate or Higher, Percent of Persons age 25+, 2009-2013

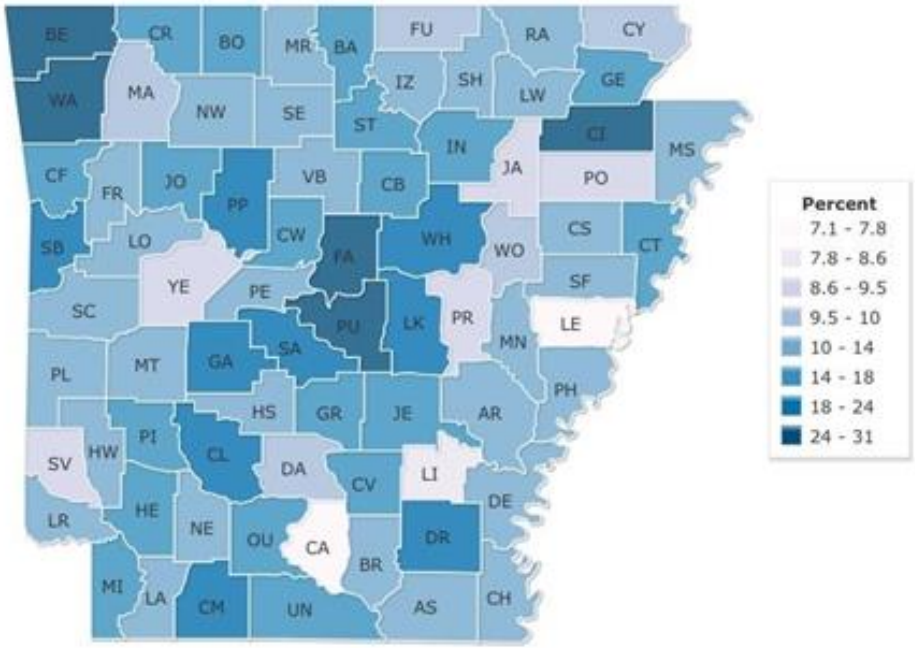


Source: U. S. Census Bureau, American Community Survey, 5-Year Estimates.

Figure 9 shows the spatial distribution of persons with a bachelor's degree or higher above the age of 25 years old between 2009 and 2013. The counties with the highest concentrations of educated Arkansans are Pulaski County located in the Central region, Benton County located in the very northwest corner that also happens to be where the international headquarters of Walmart is located, and Madison County right below Benton County that is also home to multiple multinational companies such as Tyson Foods and Lockhead Martin. The counties with the lowest percentages of persons with a bachelor's degree and higher are the same counties from the previous

section (Figure 8) that also happen to be rural, agriculturally dependent areas within the state. Figure 9 also shares similarities to the spatial distribution of poverty around the state and shows the poorest areas that are below the federal poverty level the past five years in a row—Phillips County and Lee County—to also be the areas with low education levels and high concentrations of females. Academic clusters remain in the state's city and urban centers throughout the central and northwest regions of the state as well as to the east, which is in close proximity of another city center in Memphis, Tennessee.

Figure 9: Bachelor's Degree or Higher, Percent of Persons age 25+, 2009-2013



Source: U. S. Census Bureau, American Community Survey, 5-Year Estimates.

CHAPTER 5: DISCUSSION AND CONCLUSIONS

Using county-level data from the 2009 and 2013 U.S. Census Summary Files, this study presents a comparative analysis of poverty in two regions of the State of Arkansas—the Arkansas Delta and the Arkansas Ozarks—with a special focus on differences by family type. The goal was to examine the contours of family type-specific poverty in these two regions and to ascertain the manner in which a variety of aggregate mechanisms—employment structure, population structure, human capital, and nonmetro residence—influence poverty levels for families headed by married couples versus single mothers. The results showed that single female-headed families suffer similarly high rates of poverty in the Arkansas Ozarks (49.92%) and the Arkansas Delta (58.61%), though significantly higher in the Arkansas Delta. Married couple-headed families are comparatively more disadvantaged in the Arkansas Ozarks (17.74%) than in the Arkansas Delta (13.4%). The results also demonstrated that the proportion of the poor population differs greatly by family type across the two regions. In the Arkansas Delta, the majority of the poor live in families headed by single females (67.5%), while in the Arkansas Ozarks the majority of the poor reside in married-couple families (37.2%).

Finally, the regression models demonstrated three key findings: 1) There are significant regional differences in poverty levels by both family type and the distribution of the poor between the Arkansas Delta and the Arkansas Ozarks; 2); the Arkansas Ozarks has higher percentages of poor married couples than in the Arkansas Delta, whereas the Arkansas Delta has higher percentages of poor single female-headed families than poor married couple families, and 3) with the exception of the employment rate, the structural factors associated with poverty among married couple and single female-headed families are quite different.

The findings from this study represent an important contribution to the scholarship on stratification in the Lower Mississippi Delta region. Both the Arkansas Delta and the Arkansas Ozarks are home to significant populations of people who have been especially marginalized from the social and economic mainstream (Slack et. al., 2009; Rural Sociological Society Task Force on Persistent Rural Poverty, 1993). Indeed, people in these two regions live in direct spatial proximity to the historical institutions that manufactured that reality (Snipp, 1996). This research speaks to the importance of the consideration of geographic space and place (Gans, 2002; Gieryn, 2000; Slack et. al., 2011; Tickamyer, 2000; Lobao, 2004) and family type (Bianchi, 1999; Lichter and Jayakody, 2002) as key axes of

inequality. While regional differences in poverty by family type certainly exist between the Arkansas Delta and the Arkansas Ozarks, this study shows these differences are explained differentials in the structural factors at play in this region. Further, this study shows that the aggregate mechanisms associated with poverty in these two regions of the State of Arkansas differ considerably by family type.

These results suggest a need for regionally targeted and demographically tailors antipoverty policies. The high and persistent poverty that characterizes both the Arkansas Delta and the Arkansas Ozarks, and the sordid historical legacies that have contributed to the Lower Mississippi Delta region as whole, make focusing on improving the economic conditions faces by the residents of these two regions a just policy objective. Such policies should be crafted with recognition that facilitating different types of aggregate changes in communities will have varying impacts on the economic well-being of different types of families. Investing in job growth and employment opportunity will benefit families headed by married couples and single mothers alike. But beyond that, tending to the circumstances of different types of families calls for different policy prescriptions.

In sum, the Arkansas Delta and the Arkansas Ozarks have long been historically poor regions within both the State of Arkansas and in the United States. It is time that research and policy attention be

devoted to understanding and changing the reality. By taking a comparative approach and focusing on the critical issue of family structure, this analysis provides a step in that direction while also providing visual data that more clearly depict spatial representations of poverty and poverty related factors within the State of Arkansas.

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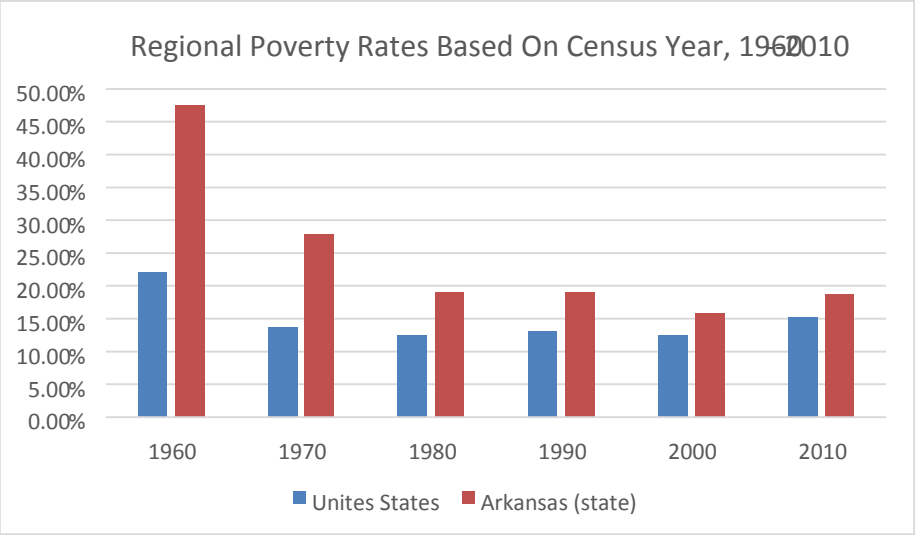
APPENDIX

REGIONAL POVERTY RATES BASED ON CENSUS YEARS, 1960—2010

	1960	*1970*	*1980*	*1990*	*2000*	*2010*
Unites States	22.10%	13.70%	12.40%	13.10%	12.40%	15.30%
Arkansas	47.51%	27.80%	18.95%	19.10%	15.80%	18.70%



Source: The U.S. Census Bureau's American Community Survey 5-Year Estimates, 2009—2013

REGIONAL POVERTY RATES BASED ON CENSUS YEAR - POVERTY PERCENT ALL AGES

	2009	*2010*	*2011*	*2012*	*2013*
UNITED STATES	**14.30%**	**15.30%**	**15.90%**	**15.90%**	**15.80%**
ARKANSAS (STATE)	**18.50%**	**18.70%**	**19.30%**	**19.60%**	**19.40%**
ARKANSAS DELTA	**25.64%**	**25.79%**	**25.91%**	**26.66%**	**25.78%**
Arkansas County	17.20%	18.60%	18.50%	18.40%	19.80%
Chicot County	32.80%	30.70%	33.40%	37.00%	32.40%
Clay County	20.30%	18.30%	20.10%	22.40%	20.00%
Craighead County	17.90%	21.10%	20.60%	17.60%	20.00%
Crittenden County	28.30%	30.30%	26.60%	24.00%	23.60%
Cross County	18.20%	19.60%	19.20%	19.90%	20.60%
Desha County	25.80%	28.00%	27.60%	27.40%	34.00%
Greene County	14.40%	17.00%	17.40%	19.40%	17.70%
Jackson County	28.40%	25.80%	23.90%	26.70%	17.70%
Lee County	42.60%	37.50%	35.20%	38.60%	27.50%
Mississippi County	23.40%	25.00%	25.40%	25.60%	41.10%
Monroe County	27.50%	26.60%	31.60%	27.30%	25.60%
Phillips County	34.70%	36.00%	34.00%	39.00%	28.70%
Poinsett County	26.30%	27.10%	25.00%	27.90%	24.70%
Prairie County	18.80%	18.30%	21.70%	21.60%	19.60%
St. Francis County	31.80%	32.70%	32.90%	32.30%	37.30%
Woodruff County	27.40%	25.90%	27.30%	28.10%	28.00%
ARKANSAS OZARKS	**20.36%**	**19.33%**	**20.72%**	**21.63%**	**20.68%**
Baxter County	16.50%	15.70%	16.80%	17.70%	15.60%
Benton County	13.10%	10.20%	12.10%	13.50%	11.70%
Boone County	16.30%	16.00%	16.90%	21.20%	17.20%
Carroll County	17.30%	16.40%	18.70%	20.00%	22.20%
Cleburne County	17.50%	18.60%	16.20%	16.90%	16.30%
Fulton County	23.00%	18.90%	21.40%	23.50%	22.90%
Independence County	20.80%	18.20%	21.40%	19.50%	18.40%
Izard County	24.20%	18.60%	20.50%	24.60%	27.50%
Lawrence County	23.50%	22.40%	23.00%	25.00%	20.40%

Madison County	18.70%	19.30%	22.60%	21.20%	20.20%
Marion County	20.40%	19.50%	20.50%	21.40%	19.00%
Newton County	25.50%	23.30%	21.30%	27.10%	23.50%
Randolph County	20.00%	19.20%	23.40%	21.60%	22.60%
Searcy County	27.00%	23.70%	28.60%	28.40%	25.90%
Sharp County	21.90%	25.10%	24.50%	24.40%	22.80%
Stone County	23.30%	22.40%	22.90%	24.30%	26.20%
Van Buren County	18.70%	20.90%	22.10%	19.80%	18.90%
Washington County	18.70%	19.60%	20.10%	19.30%	20.90%

Source: The U.S. Census Bureau's American Community Survey 5-Year Estimates, 2009—2013

RACE DEMOGRAPHICS BASED ON AMERICAN COMMUNITY SURVEY 5-YEAR SUMMARY

	White, Non-Hispanic Alone	*Black or African American Alone*
UNITED STATES	**62.10%**	**13.20%**
ARKANSAS (STATE)	**73.40%**	**15.60%**
ARKANSAS DELTA REGION	**64.33%**	**30.92%**
Arkansas County	70.20%	24.50%
Chicot County	39.20%	54.60%
Clay County	95.70%	0.60%
Craighead County	78.00%	14.50%
Crittenden County	44.10%	51.80%
Cross County	73.30%	22.90%
Desha County	46.60%	47.90%
Greene County	94.50%	0.90%
Jackson County	77.10%	17.60%
Lee County	41.00%	54.20%
Mississippi County	59.40%	34.90%
Monroe County	55.10%	40.30%

Phillips County	35.60%	61.60%
Poinsett County	87.50%	8.00%
Prairie County	85.70%	11.78%
St. Francis County	41.10%	52.70%
Woodruff County	69.50%	26.90%
ARKANSAS OZARKS REGION	**90.99%**	**0.96%**
Baxter County	95.20%	0.40%
Benton County	74.90%	1.90%
Boone County	94.30%	0.40%
Carroll County	81.10%	0.80%
Cleburne County	94.80%	0.50%
Fulton County	95.80%	0.60%
Independence County	89.30%	2.30%
Izard County	93.80%	1.80%
Lawrence County	96.00%	1.00%
Madison County	90.40%	0.40%
Marion County	94.60%	0.40%
Newton County	94.00%	0.30%
Randolph County	95.20%	0.90%
Searcy County	93.70%	0.30%
Sharp County	94.00%	0.80%
Stone County	95.00%	0.40%
Van Buren County	93.50%	0.50%
Washington County	72.20%	3.50%

Source: The U.S. Census Bureau's American Community Survey 5-Year Estimates, 2009—2013

ABSTRACT

SPATIAL REPRESENTATION OF REGIONAL POVERTY IN ARKANSAS: A COMPARATIVE ANALYSIS OF DIFFERENCES BY FAMILY TYPE

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This research provides a comparative analysis of county-level poverty in two of the poorest regions of the United States—the Arkansas Delta and the Ozarks—with a special focus on differences by family type. Using county-level data from the 2009 and 2013 U.S. Census Summary Files, the goal was to examine the contours of family type-specific poverty in these two regions and to ascertain the manner in which a variety of aggregate mechanisms—employment structure, population structure, human capital, and nonmetro residence—influence poverty levels for families headed by married couples versus single mothers.

The results of this analysis reveals important regional variations in both the prevalence of poverty and the composition of the poor population across major family types. Using OLS regression models of family type-specific poverty three key findings are made: 1) There are significant regional differences in poverty levels by both family type and the distribution of the poor between the Arkansas Delta and the Arkansas Ozarks; 2); the Arkansas Ozarks has higher percentages of poor married couples than in the Arkansas Delta, whereas the Arkansas Delta has higher percentages of poor single female-headed families than poor married couple families, and 3) with the exception of the employment rate, the structural factors associated with poverty among married couple and single female-headed families are quite different.

The results showed that single female-headed families suffer similarly high rates of poverty in the Arkansas Ozarks (49.92%) and the Arkansas Delta (58.61%), though significantly higher in the Arkansas Delta. Married couple-headed families are comparatively more disadvantaged in the Arkansas Ozarks (17.74%) than in the Arkansas Delta (13.4%). The results also demonstrated that the proportion of the poor population differs greatly by family type across the two regions. In the Arkansas Delta, the majority of the poor live in families headed by single females (67.5%), while in the Arkansas

Ozarks the majority of the poor reside in married-couple families (37.2%).

These results suggest a need for regionally targeted and demographically tailors antipoverty policies. The high and persistent poverty that characterizes both the Arkansas Delta and the Arkansas Ozarks, and the sordid historical legacies that have contributed to the Lower Mississippi Delta region as whole, make focusing on improving the economic conditions faces by the residents of these two regions a just policy objective. By taking a comparative approach and focusing on the critical issues of family structure, this analysis provides a step in that direction while also providing visual data that more clearly depicts spatial representation of poverty and poverty related factors within the State of Arkansas.

Keywords: Poverty, Family Type, Mississippi Delta, GIS
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