

Cumulative Spatial Disadvantage and the Role of Human and Social Capital: A Spatial Analysis of Income and Poverty in the Multi-State Delta

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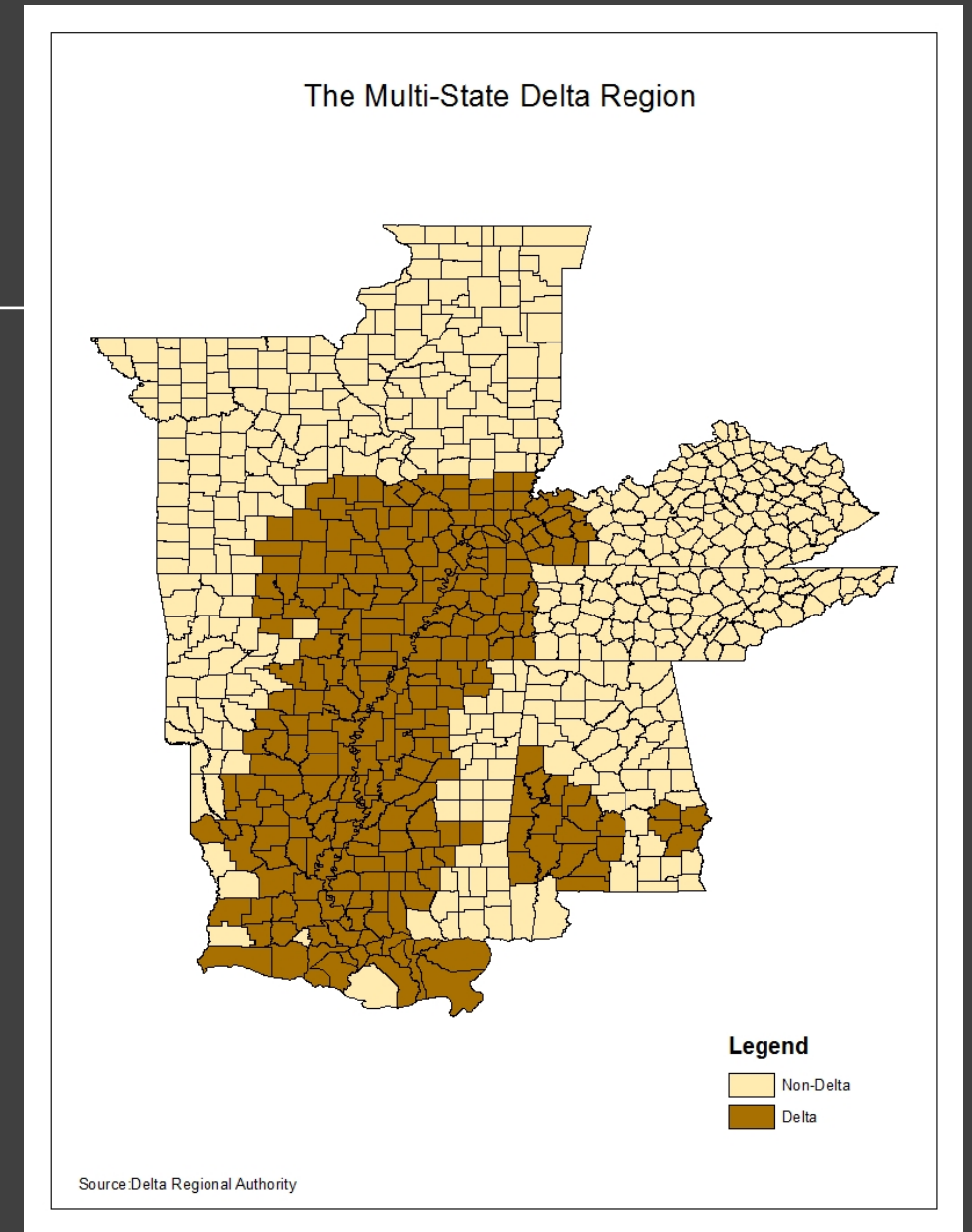
The Delta

*Common “cultural, social, demographic, and economic characteristics within a set of geographic and political boundaries”
(Green et al. 2015)*

Low educational attainments

Low household incomes

High poverty rates



The Research

South vs. North

Delta vs. Non-Delta

Non-Metropolitan vs. Metropolitan

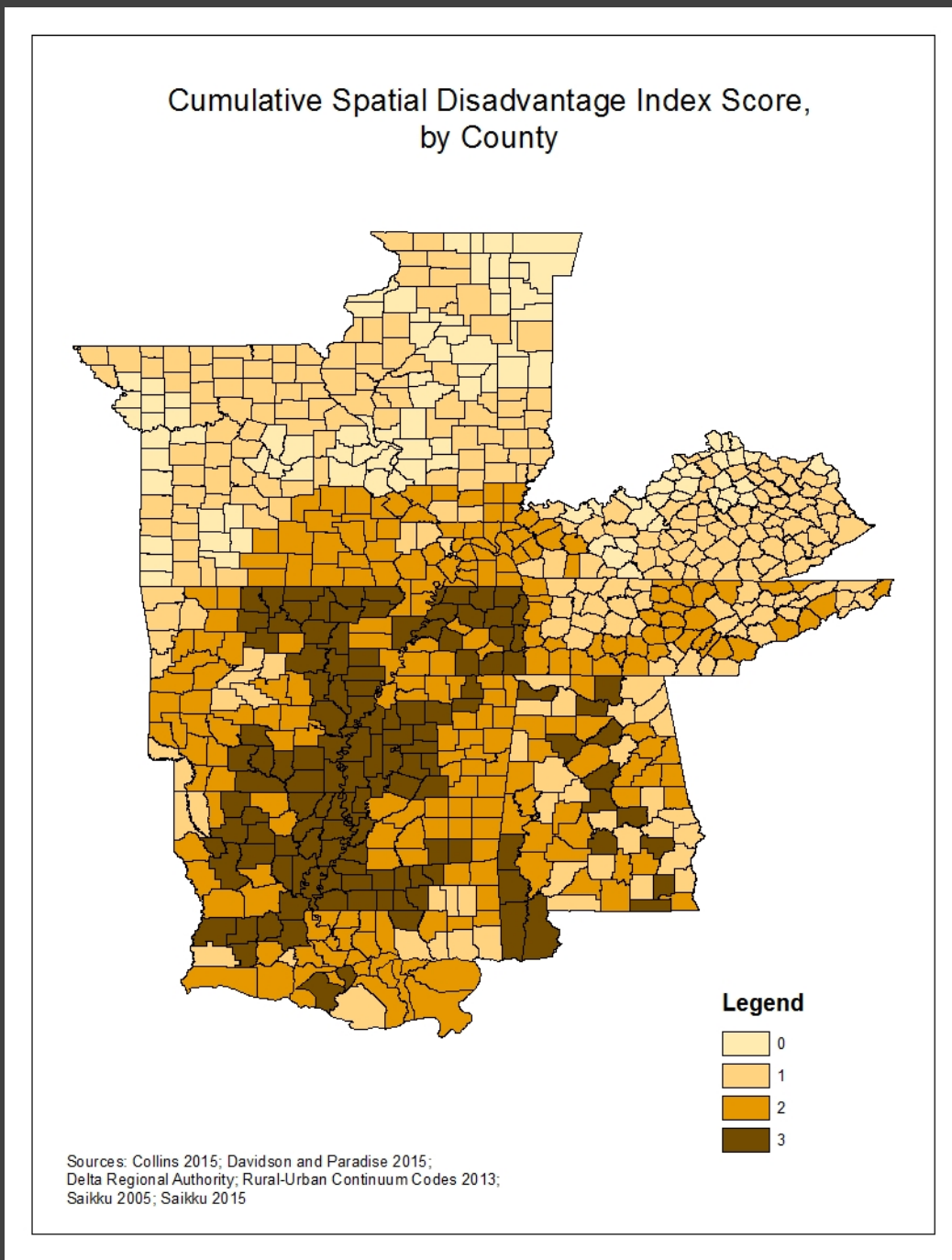
- *How does income and poverty differ in these areas?*
- *How does the stacking up of disadvantages further impact both income and poverty?*
- *How can we utilize/invest in community capitals to better the situations in our communities?*

Cumulative Spatial Disadvantage

North vs. South

Non-Delta vs. Delta

Metro vs. Non-Metro



Dependent Variables

Median Household Income

Percent of Families in Poverty

(American Community Survey, 2011-2015 five-year estimates)

Independent Variables

Geography

- North/South (History and literature)
- Non-Delta/Delta (Delta Regional Authority)
- Metro/Non-Metro (Rural-Urban Continuum Codes, 2013)

Cumulative Spatial Disadvantage

- South, Delta, and Non-Metro

Historical Context

- Persistent Poverty (Decennial Census, 1980, 1990, and 2000)

Human Capital

- Percent of a county (ages 25+) with an Associate's (ACS, 2006-2010)
- Percent of a county (ages 25+) with a Bachelor's or more (ACS, 2006-2010)
- Premature morbidity, County Health Rankings, 2014 (based on data from the National Center for Health Statistics, 2008-2010)
- Low birthweight, County Health Rankings, 2013 (based on data from the National Center for Health Statistics, 2004-2010)
- Poor/Fair health, County Health Rankings, 2012 (based on data from the Behavioral Risk Factor Surveillance System, 2004-2010)

Social Capital

- Social Capital Index (Rupasingha, Goetz, and Freshwater, 2009)

Operationalization and Measurement

Multi-State Database

- County-level data (N=624; 96 counties with missing data)

OLS Linear regression

Lagged-effects modeling

Spatial autocorrelation

The Regression Models

State Comparison Model



Disadvantaged Areas Model



CSD Index Model



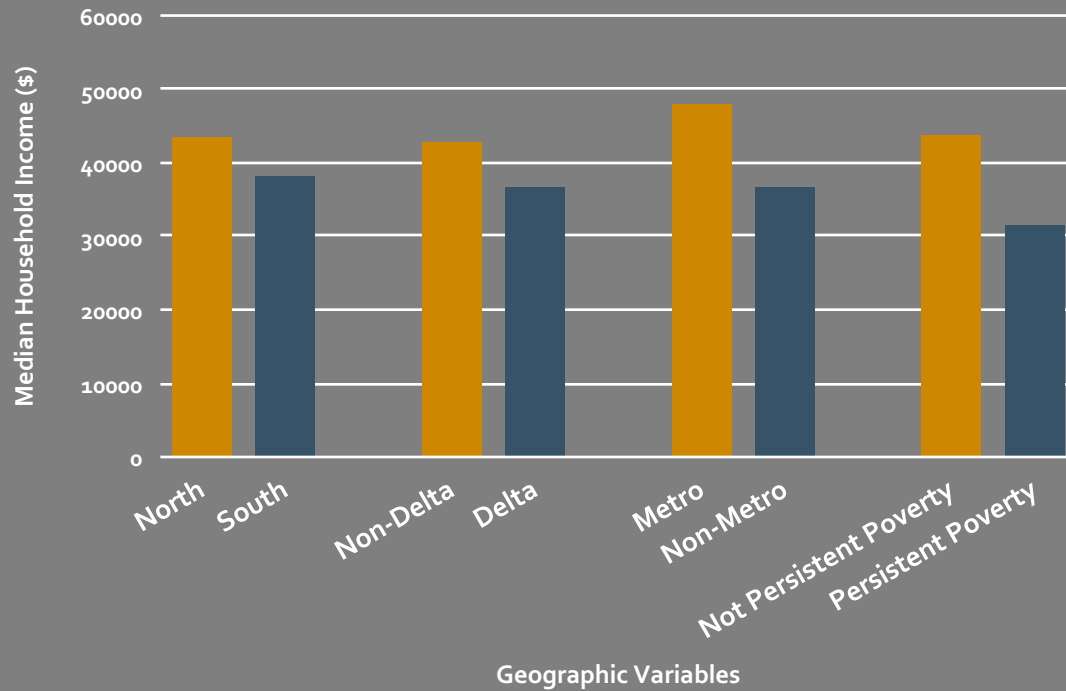
CSD Index Comparison Model



Spatial Autocorrelation Model

Average Median Household Income by Geographic Variables

American Community Survey, 2011-2015



Disadvantaged Areas Model Household Income

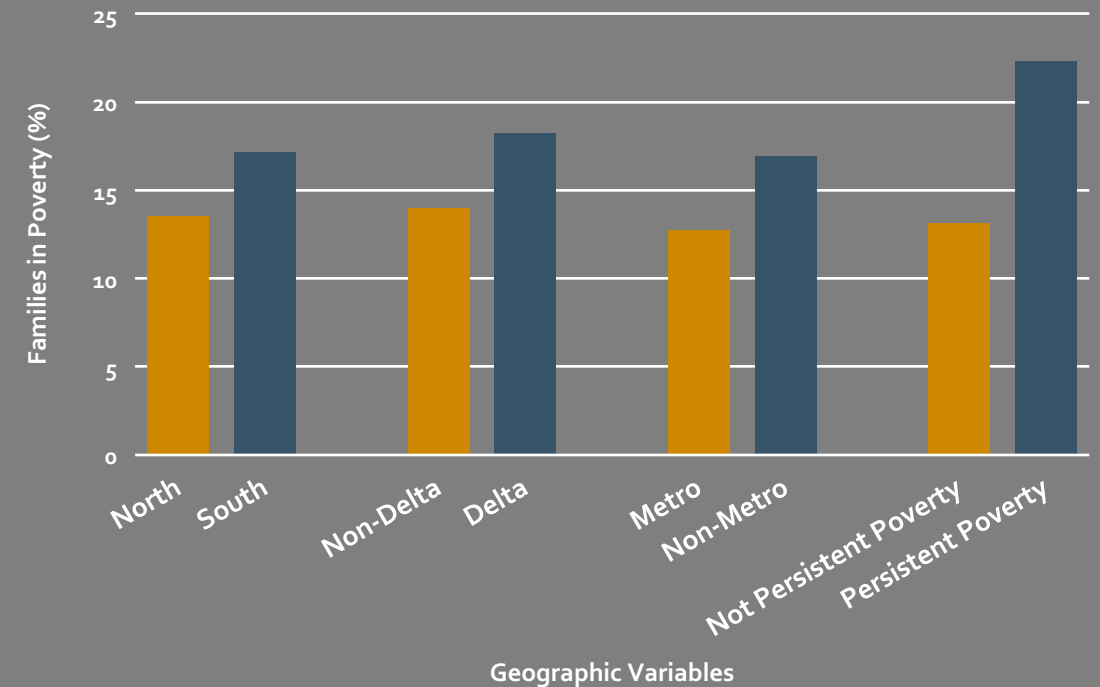
Counties that are **Southern, Delta, non-metro**, and **persistently poor**, on average, have lower median household incomes than their counterparts

Disadvantaged Areas Model Poverty

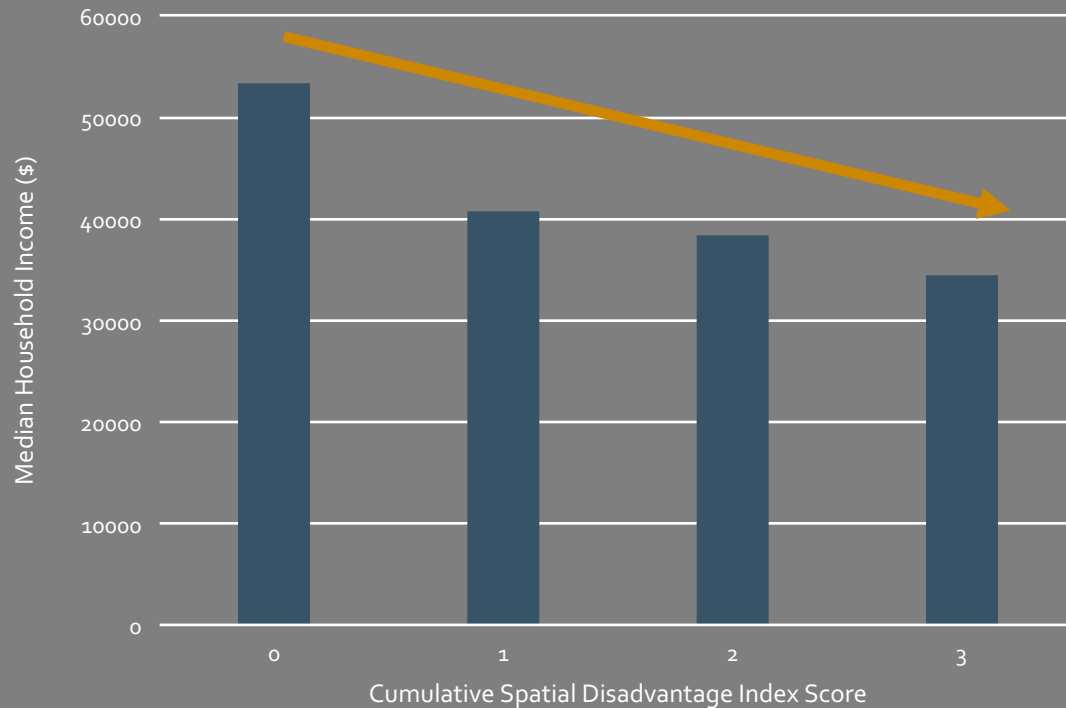
Counties that are **Southern, Delta, non-metro**, and **persistently poor**, on average, have higher percentages of families in poverty

Average Percent of Families in Poverty by Geographic Variables

American Community Survey, 2011-2015



Average Median Household Income
by Cumulative Spatial Disadvantage Index Score
American Community Survey, 2011-2015



CSD Index Model Household Income

Counties that have a higher accumulation of spatial disadvantage (**South, Delta, and non-metro**), on average, have lower median household incomes than counties with relative less disadvantages

CSD Index Model Poverty

Counties that have a higher accumulation of spatial disadvantage (**South, Delta, and non-metro**), on average, have higher percentages of families in poverty than counties with relative less disadvantages

Average Percent of Families in Poverty
by Cumulative Spatial Disadvantage Index Score
American Community Survey, 2011-2015

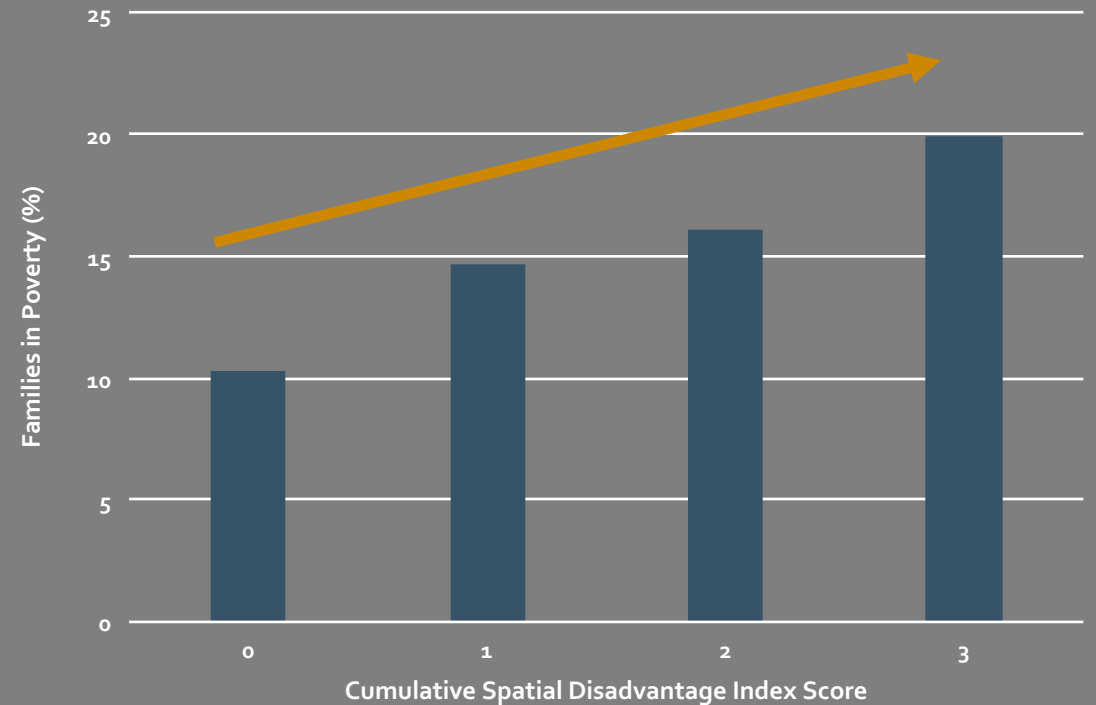


Table 8. Regression Model E, Median Household Income by Cumulative Spatial Disadvantage Index Score Comparison

<i>Cumulative Spatial Disadvantage Index</i>	<i>0</i>		<i>1</i>		<i>2</i>		<i>3</i>	
Variables	b	β	b	β	b	β	b	β
Historical Context								
Persistent Poverty	-	-	-6,701 [-8,710; -4471]	-.331 ($<.001$)	-4,596 [-6,457; -2,484]	-.267 ($<.001$)	-4,757 [-6,529; -2,767]	-.329 ($<.001$)
Human Capital								
Associate's degree	2,240 [1,430; 3,157]	.315 ($<.001$)	575 [259; 873]	.132 (.002)	-7.10 [-477; 465]	-.002 (.976)	114 [-332; 516]	.028 (.664)
Bachelor's degree or higher	655 [411; 876]	.541 ($<.001$)	507 [289; 763]	.385 ($<.001$)	320 [99; 582]	.233 ($<.001$)	350 [3; 611]	.273 ($<.001$)
Poor Health Index	-3,890 [-5,398; -2,340]	-.300 ($<.001$)	-2,019 [-3,027; -1,100]	-.233 ($<.001$)	-3,016 [-4,356; -1,824]	-.361 ($<.001$)	-2,799 [-3,865; -1,705]	-.393 ($<.001$)
Social Capital	-2,195 [-4,215; -48]	-.146 (.046)	-110 [-690; 514]	-.013 (.784)	174 [-1,486; 1,984]	.015 (.824)	-633 [-2,307; 865]	-.048 (.477)
Constant	19,581 [10,750; 27,060]		30,210 [26,418; 33,641]		35,795 [30,190; 41,139]		32,475 [28,473; 37,448]	
Adjusted R^2	.560		.638		.393		.558	
N	92		224		190		118	

All numbers are rounded to the nearest dollar.

Numbers in parentheses are p-values. Numbers in brackets are confidence intervals calculated at the 95% level using the bootstrap method (1000 samples).

Note: Analysis includes available data for counties in: AL, AR, IL, KY, LA, MS, MO, and TN.

Sources: American Community Survey 2011-2015 five-year estimate; Delta Regional Authority, 2016; Rural-Urban Continuum Codes, 2013; Decennial Census, 1980, 1990, and 2000; American Community Survey, 2006-2010; National Center for Health Statistics, 2008-2010; National Center for Health Statistics, 2004-2010; Behavioral Risk Factor Surveillance System 2004-2010; Social Capital Index, 2009 version from Rupasingha, Goetz, and Freshwater.

CSD Index
Comparison
Model
Income

CSD Index Comparison Model Poverty

Table 9. Regression Model F, Percent of Families in Poverty by Cumulative Spatial Disadvantage Index Score Comparison

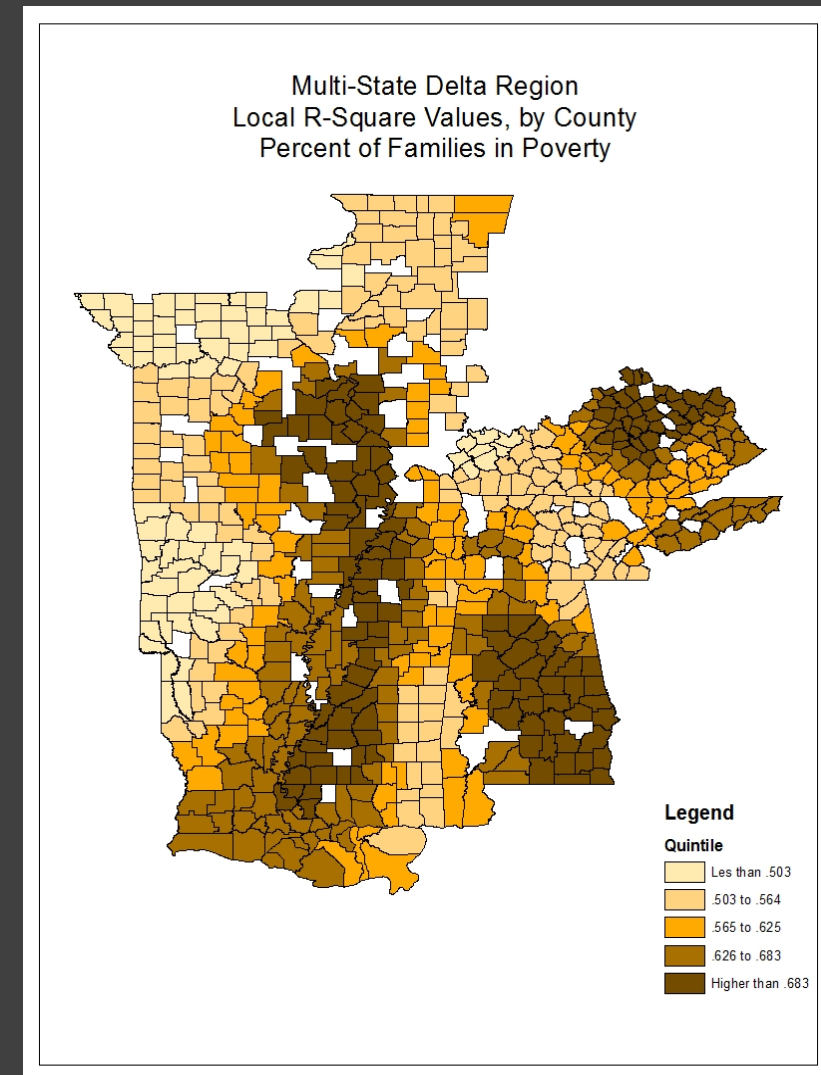
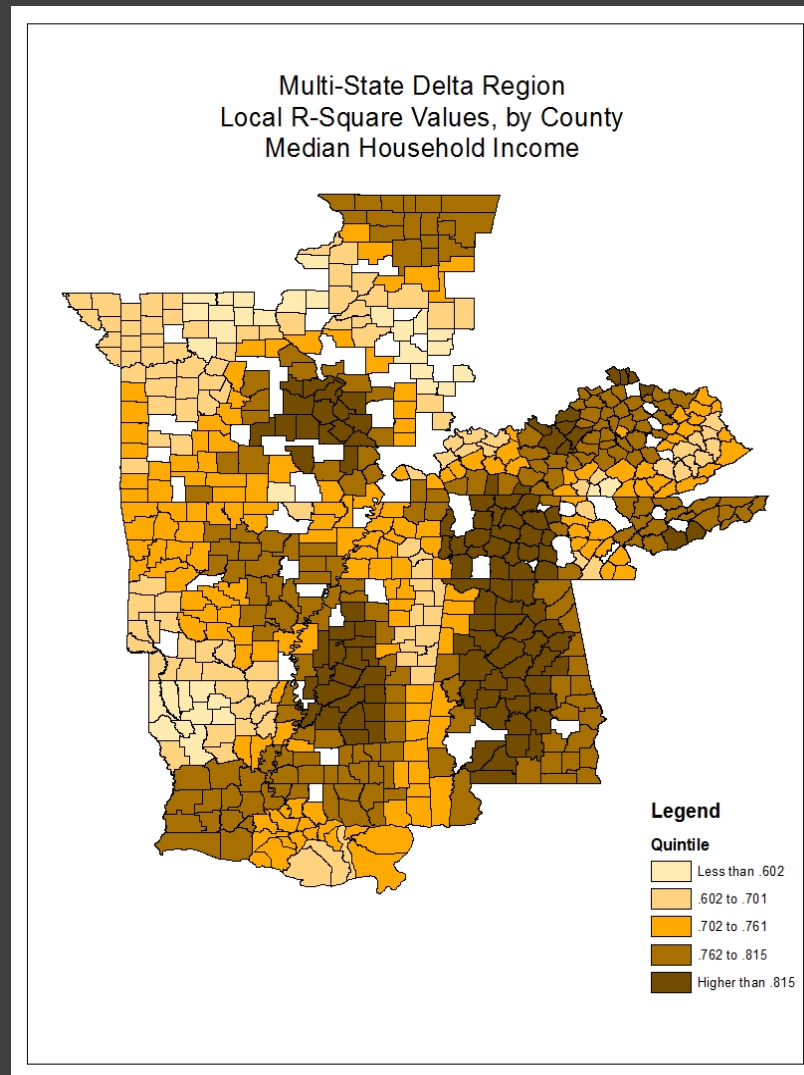
<i>Cumulative Spatial Disadvantage Index</i>	<i>0</i>		<i>1</i>		<i>2</i>		<i>3</i>	
Variables	b	β	b	β	b	β	b	β
Historical Context								
Persistent Poverty	-	-	5.19 [3.99; 6.57]	.396 ($<.001$)	4.89 [3.41; 6.42]	.472 ($<.001$)	5.64 [3.93; 7.72]	.422 ($<.001$)
Human Capital								
Associate's degree	-0.84 [-1.21; -0.52]	-.349 ($<.001$)	-0.44 [-0.65; -0.22]	-.156 (.002)	0.02 [-0.28; 0.30]	.009 (.884)	-0.23 [-0.74; 0.28]	-.062 (.382)
Bachelor's degree or higher	-0.11 [-0.18; -0.04]	-.277 (.001)	-0.09 [-0.17; -0.03]	-.110 (.030)	0.01 [-0.11; 0.10]	.014 (.833)	0.10 [-0.09; 0.39]	.082 (.301)
<u>Poor Health Index</u>	1.98 [1.14; 2.66]	.451 ($<.001$)	1.29 [0.71; 1.92]	.230 ($<.001$)	1.43 [0.71; 2.16]	.284 ($<.001$)	3.01 [1.67; 4.29]	.457 ($<.001$)
Social Capital	-0.42 [-1.13; 0.22]	-.081 (.361)	-1.19 [-1.66; -0.76]	-.215 ($<.001$)	-0.02 [-1.15; 1.09]	-.003 (.965)	-1.07 [-2.69; 0.53]	-.088 (.230)
Constant	19.91 [17.11; 22.97]		17.52 [15.56; 19.32]		14.35 [11.57; 17.21]		15.04 [10.56; 18.98]	
Adjusted R^2	.506		.634		.395		.485	
N	92		224		190		118	

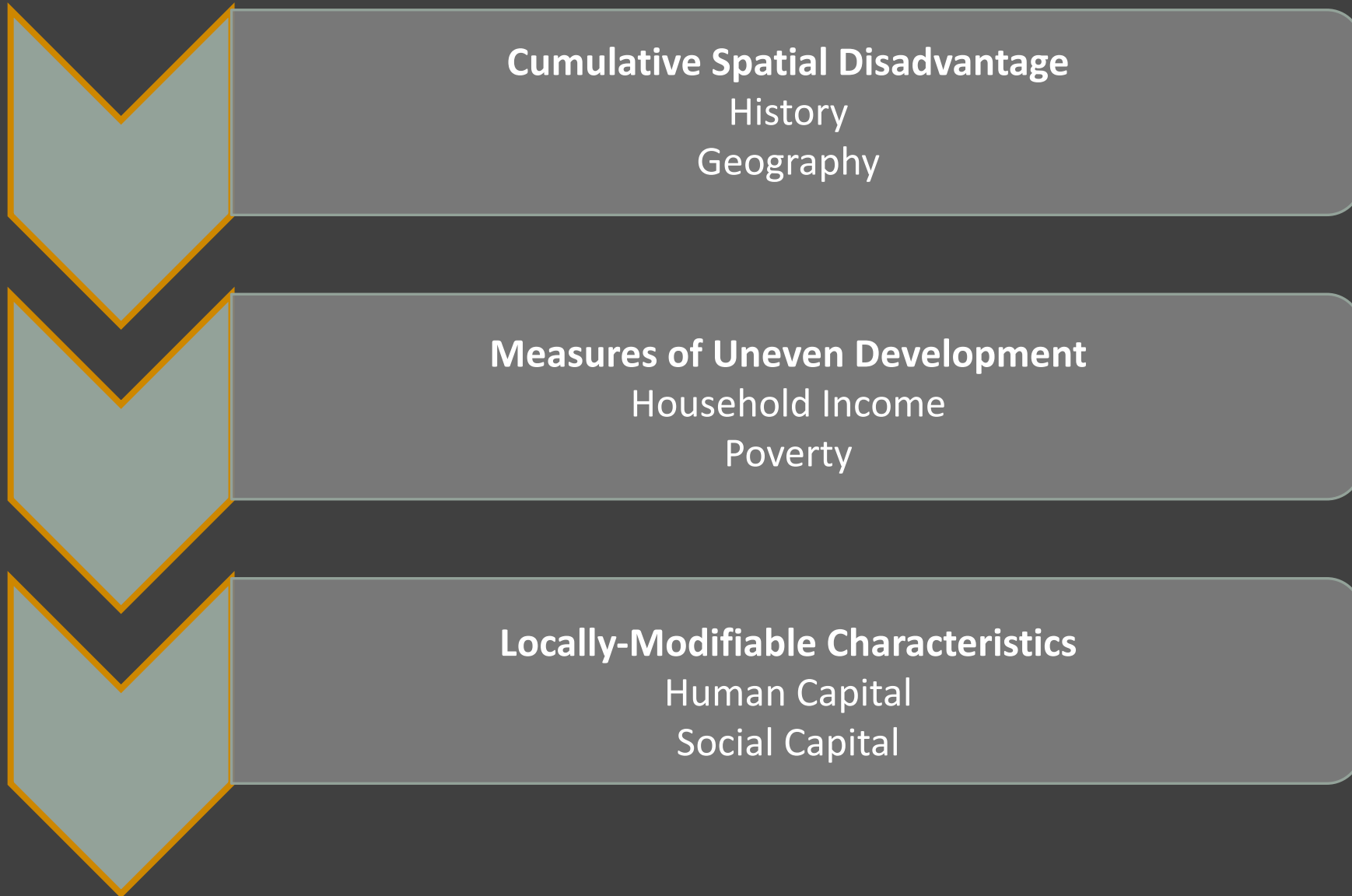
Numbers in parentheses are p-values. Numbers in brackets are confidence intervals calculated at the 95% level using the bootstrap method (1000 samples).

Note: Analysis includes available data for counties in: AL, AR, IL, KY, LA, MS, MO, and TN.

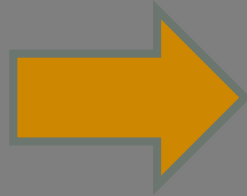
Sources: American Community Survey 2011-2015 five-year estimate; Delta Regional Authority, 2016; Rural-Urban Continuum Codes, 2013; Decennial Census, 1980, 1990, and 2000; American Community Survey, 2006-2010; National Center for Health Statistics, 2008-2010; National Center for Health Statistics, 2004-2010; Behavioral Risk Factor Surveillance System 2004-2010; Social Capital Index, 2009 version from Rupasingha, Goetz, and Freshwater.

Spatial Autocorrelation Model

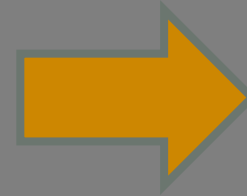




**Space
matters!**



**Investment in
human and
social capital**



**Better outcomes and
overall wellbeing in a
community**