Social Capital, Structural Conditions, and Mortality: A Study of Nonmetropolitan Counties in Mississippi

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ABSTRACT   In this study, we examine the extent to which
structural conditions that favor investment in social capital affect
mortality across nonmetro counties in Mississippi. To this end,
we focus on four county structural conditions: (1) place of resi-
dence within county boundaries, (2) civic infrastructure, (3) eco-
nomic conditions, and (4) county regional location. The results
clearly indicate that structural conditions that favor investment in
social capital lead to lower mortality. Specifically, concentration
of disadvantage conditions has an independent effect on mortality.
That is, its effect operates independently of other structural condi-
tions. In contrast, the effects of place of residence and civic infra-
structure do not operate independently from county economic
conditions. The results also indicate that county regional location
has no effect on mortality across nonmetro counties in Missis-
sippi.

Although residents in metropolitan (metro) counties have greater
access to economic and health resources than those in nonmetropoli-
tan (nonmetro) counties, mortality rates adjusted by age, race, and
gender tend to be lower in nonmetro than metro counies (Miller,
Stokes and Clifford 1987). According to McLaughlin, Stokes, and
Nonoyama (2001:594), potentially greater social cohesion in non-
metro counties might account for this paradox. The argument is that
embedded in a socially-cohesive environment are resources, such as

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social support and social capital (Coleman 1988; Lin 2001;Putnam 1993). Access to such resources is viewed as central to reducing the risk of mortality (Hayward, Pienta, and McLaughlin 1997). In this respect, nonmetro counties are said to have lower mortality rates because they provide the conditions for the emergence of a socially-cohesive environment fostering investment in social resources relevant to one's chances of survival (McLaughlin et al. 2001).

Across nonmetro counties, however, there are differences in structural conditions such as place of residence, industry size, community-based organizations, and amenities that promote or thwart investment in social resources (Flora and Flora 1993; Tolbert et al. 2002; Wilkinson 2000). The extent to which differences in such structural conditions might account for differences in mortality rates across nonmetro counties has rarely been carefully explored. Thus, the objective of this study is to examine the effects of these structural conditions on mortality across nonmetro counties in Mississippi.

Although in the current literature one can find several forms of social resources relevant for promoting individual and collective well-being, in this study we limit our attention to county structural conditions that favor investment in social capital. The link between social capital and the risk of mortality is perhaps one of the most consistent findings in the literature (Link and Phelan 1995; Rogers, Hummer and Nam 2000). Putnam (2000), for instance, indicates that access to social capital is a necessary condition for an individual to enjoy a healthy life. Others have also indicated that the risk of mortality increases when an individual has limited access to social resources (Berkman and Syme 1979; House, Landis and Umberson 1988; Kawachi et al. 1997).

Social Capital, Structural Conditions, and Mortality

In the sections that follow, we first provide a definition of social capital. Second, we describe four structural conditions that might influence the ability of nonmetro counties to invest in social capital. Third, we present the conceptual link between these structural conditions and mortality.

Social Capital

Social capital is a social resource emerging from processes of interaction within and between social groups (Lin 2001), and it is understood to mean norms, trust, and reciprocity that facilitate coordination and cooperation for mutual benefit (Putnam 1993). Thus, this social resource is embedded in the social relations between and among "actors," such as individuals, organizations, and institutions (Bourdieu 1986; Coleman 1988; Flora 1998; Flora and Flora 1993; Putnam 2000; Portes and Sensenbrenner 1993). Because social capital can be accessed only through social connections that bond and bridge actors into a socially-cohesive environment, the extent to which actors can benefit from it is contingent upon the quantity and the quality of social connections. Quantity refers to the number of actors involved in social relations (Bourdieu 1986), and quality refers to types of social relations (Coleman 1988, 1990). That is, networks of associations can be formed through primary and secondary relations. Primary relations are central to fulfilling personal psychological needs. Secondary relations are instrumental to mobilize social and economic resources necessary to achieve a collective interest in a local population. In this respect, social capital can be clustered in two general types: psychological and material. The balance between these two types of social capital determines the form of social capital available in a given local population.

Some have indicated that the ability of a local population to invest in social capital rests on structural conditions that influence the likelihood of a local population to come together and interact on a daily basis (Tolbert et al. 2002; Wilkinson 2000). Identifying structural conditions that promote or thwart processes of social interaction and relations can help to understand differences in quality and quantity of social relations, and thus, to assess the differential ability of local populations to invest in different forms of social capital. In the literature, one can find several structural conditions that can be related to the emergence of different forms of social capital. In this study, we focus our attention on four structural conditions: (1) place of residence within county boundaries (2) civic infrastructure, (3) economic conditions, and (4) county regional location.

Place of Residence Within County Boundaries

Within nonmetro county boundaries, people can reside in different types of incorporated places, such as villages, towns, or small cities. According to Tolbert et al. (2002), these areas are the spatial backbone of communities in rural America. They delineate the locality where people develop their common identity (Gieryn 2000; Wilkinson 2000), and are the areas within which people can come together, interact, and meet their daily needs (Parisi et al. 2002; Taquino, Parisi, and Gill 2002; Wilkinson 2000). Furthermore, the locality is the site for social, economic, and political action (Lobao 1990) and the backdrop for the local society and local agency. The local society refers to formal and informal social, economic, and political organizations and institutions relevant to promote interactions among local residents (Wilkinson 2000), and to comprehensive networks of association necessary to generate horizontal and vertical channels of communication (Warren 1978). The local society is also instrumental for the emergence of local agency - the ability of a local population to act on its own toward locally-oriented issues (Luloff and Swanson 1995). The key point is that local society and local agency are the "social means" by which local populations invest in social capital (Flora 1998).

The extent to which local society and local agency can influence the ability of a local population to invest in social capital is a function of the size and economic conditions of the place in which people reside (Wilkinson 2000). According to the U.S. Census Bureau, places within county boundaries are defined as rural if their local populations are less than 2,500, and urban if their local populations are greater than 2,500 (Whitener, Weber, and Duncan 2002). Generally, rural places are associated with Gemeinschaft-type of social organization, and urban places with Gesellschaft-type. Although they are ideal types, the distinction between Gemeinschaft and Gesellschaft society provides a conceptual tool to understand the mechanism by which social relations might impact the well-being of an individual in a local population. For example, in a Gemeinschaft-type of local society, people tend to develop networks of association through primary ties. Such networks provide access to resources to meet psychological needs. In contrast, in a Gesellschaft-type of local society, people are more likely to develop networks of association through secondary ties. These networks

provide access to resources that are instrumental to meet material needs, such as finding employment and achieving collective interest (Lin 2001). As Wilkinson (2000) argues, the presence of secondary ties in a local society is instrumental for the emergence of locally-oriented collective actions toward achieving a generalized interest of the community. In this respect, Wilkinson (2000) argues that, because rural communities tend to have a shortage of secondary ties, they should become more urban. This, however, can be misleading because having more people in a given place does not necessarily mean that people develop secondary relations. For example, Luloff and Swanson (1995) indicate that structural barriers, such as high concentration of poverty, can compromise the development of secondary relations. We argue that primary ties and, therefore, rural communities, provide necessary support to overcome stressful psychological conditions imposed by structural barriers.

Civic Infrastructure

Civic infrastructure refers to local economic and civic organizations that facilitate the likelihood of people to engage in processes of social interaction and relations (Parisi et al. 2002). Thus, it facilitates investment in social capital. The civic infrastructure, as defined here, rests on three general local structural characteristics: (1) local capitalism (Tolbert et al. 2002); (2) third places (Oldenburg 1999), and (3) community faith-based organizations (Putnam 2000).

Local capitalism refers to the presence of locally-owned, medium sized firms. Such businesses facilitate the investment in social capital in three ways. The first is that owners, managers, and workers interact in a more informal and friendly manner. The second is that the hiring process often occurs through word of mouth. The third is that the businesses are called upon to actively participate in decision-making processes for local development (Tolbert et al. 2002:93). Thus, counties with higher levels of local capitalism might have higher potential for investment in material social capital, which is central for the economic viability of a local population.

Third places refer to places where people can meet and discuss local issues. These places can be planned or unplanned (Gieryn 2000). Planned places include malls, squares, and city parks, while unplanned places include barbershops, coffee shops,

convenience stores, and the like (Oldenburg 1999). In addition to these places, faith-based organizations are also important places for people to come together (Green and Haines 2002; Putnam 2000). The distinction between third places and faith-based organizations rests on the fact that the former might be more relevant for the creation of material social capital, and the latter for the creation of psychological social capital. This implies that the higher the pro-portion of meeting places in a county the higher the potential for investment in material and psychological social capital.

Economic Conditions

Under macro economic and political forces of the last two decades, nonmetro counties have been polarized into "thriving" and "strug-gling" economies (Beaulieu, Barfield, and Stone 2001; Drabenstott 2001; Duncan 1999; Galston 2000; Johnson 2001; Lichter and McLaughlin 1995; Wilkinson 2000). The labor market conditions of struggling economies are characterized by high concentration of disadvantage conditions. These conditions include unemployment rates, employment in low-wage service jobs, part-time and tempo-rary jobs, poverty, welfare dependency, minority groups, income inequality, and underinvestment in human capital (Beaulieu et al. 2000; Lichter and Jensen 2002).

A high concentration of disadvantage conditions has three important social implications. First, it polarizes a local population into "haves" and "have-nots" and it divides a local population across racial and political lines (Duncan 1999). Second, it increases social disorganization by weakening the norms that control socially acceptable behavior (Sampson, Morenoff and Earls 1999). Third, it thwarts the processes of social interaction by impeding the devel-opment of channels of communication within and between social groups of a local population (Wilkinson 2000). Thus, residents in counties with poor economic conditions are faced with structural barriers that limit their ability to invest in both material and psycho-logical social capital.

Regional Location

Nonmetro counties are situated into various functional economic regions (Killian and Tolbert 1993). Counties in these regions are

interdependent parts of the social, economic, and political whole, impinging upon the economic and social performance of a local population (Barnes and Ledebur 1998). For example, Duncan (1999) describes how the socially and economically disadvantaged conditions in the Delta and Appalachian regions compromise the emergence of social capital across their local populations to a greater extent than those regions not facing such conditions.

In rural Mississippi, for instance, the Mississippi State Extension Service divides the state into four major functional economic regions: (1) The Northwest or Delta, (2) Northeast, (3) Southeast, and (4) Southwest. The Delta is the most underdeveloped region in Mississippi for several reasons: the polarization of its political, social, and economic system into *haves* and *have nots* (Duncan and Lamborgini 1994), high concentrations of poverty (Lyson and Falk 1993), limited public transportation systems (Beaulieu et al. 2000), absence of viable full-time employment (Parisi et al. 2002), and geographic, social, and economic isolation (Duncan 1999). Local residents in the Delta also have limited access to health insurance and receive less preventive healthcare (Wiseman, Moeller-Kato, and Menifeld 1993).

Structural Conditions and Mortality

The link between structural conditions and mortality can best be understood when placed within a contextual framework (Clifford and Brannon 1985; Link and Phelan 1995; Rogers et al. 2000). In such a framework, the assumption is that differences in structural conditions determine the extent to which local residents can invest in material and psychological social capital, both of which are key resources to increase one's chance of survival.

Our general hypothesis is that nonmetro counties better endowed with structural conditions promoting investment in psychological and material social capital are expected to experience lower mortality rates. In this study, the structural conditions that promote investment in psychological social capital are rural places and church capacity, and those that promote investment in material social capital are local capitalism and third places. In contrast, the structural conditions that thwart investment in both forms of social capital are concentration of disadvantage conditions and the location

of counties in socially and economically disadvantaged regions. Within this framework, we developed four major hypotheses:

Hypothesis 1: The higher the proportion of rural places and the higher the level of church capacity in a given county, the lower its mortality rate.

Hypothesis 2: The higher the level of local capitalism and the higher the presence of third places in a given county, the lower its mortality rate.

Hypothesis 3: The higher the concentration of disadvantage conditions in a county, the higher its mortality rate.

Hypothesis 4: Counties situated in the Mississippi Delta region are expected to have higher mortality rates than their counterparts.

Methods: Data, Measurement, and Analytical Strategy

Data

Data to measure mortality and structural conditions across nonmetro counties in Mississippi came from multiple sources.[1] Mortality data came from the 1996 Center for Disease Control and Prevention (CDC), and data for economic conditions came from the 1990 U.S. Decennial Census (U.S. Bureau of the Census 1992). Information on regional location came from the Mississippi Extension Service (2002). Data on place of residence within county boundaries came from the 1990 Decennial Census, and was compiled by the Unit for Community and Environmental Studies (2000).

Data to measure civic infrastructure were drawn from two sources: (1) 1998 American Business Directory data, and (2) 1997 U.S. Department of Commerce data. Both data sets provided single-record latitude and longitude data points. A three-step procedure was developed to generate county aggregate-level data. In the first step, each record was geocoded by latitude and longitude coordinates. The records were then mapped and overlaid on county

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[1] In Mississippi, there are 82 counties, 73 of which are classified as nonmetro.

boundaries so that a geographic identification code (county-id) could be assigned to records falling within the county boundaries. Finally, single records were summed by county-ids.

Measurement

Mortality. This measure was computed as numbers of deaths per 1000 population. Since age is a key factor affecting the level of mortality, this rate was adjusted by age. The statistics revealed that, in 1996, approximately 10 people per 1,000 died across nonmetro counties in Mississippi (See Table 1).

Place of Residence within County Boundaries. This variable was defined as the percentage of rural places in a given non-metro county. On average, approximately 54 percent of the places within county boundaries in Mississippi were classified as rural. For analytical purposes, this variable was recoded into four dummy variables, and their construction was based on the following coding scheme: (1) 100 percent of a county's places were rural, (2) at least 50 percent of a county's places were rural, (3) less than 50 percent of a county's places were rural, and (4) 100 percent of a county's places were urban. Of the four categories, the first was used as the reference group because it represents the counties with the highest potential for investment in psychological social capital.

Civic Infrastructure. Three variables were used to gauge a nonmetro county's civic infrastructure: (1) local capitalism, (2) third places, and (3) church capacity. Following the procedure set forth by Tolbert, Lyson, and Irwin (1998), local capitalism was defined as the percentage of manufacturing businesses employing less than 20 individuals. Similarly, third places were defined as the percentage of service-based businesses with fewer than 20 employees.[2] This variable includes coffee shops, barbershops, restaurants, convenience stores, and other service-based meeting places. Church capacity was defined as the number of churches per 1000 population in a county. In Mississippi, on average, 2.47 percent of a nonmetro county's businesses are small manufacturing, and 33.68 percent are small service businesses. On average, there are 5.19 churches per 1000 population.

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[2] This measure is not meant to be an indicator of the psychological meaning that people attach to third places, as discussed by Oldenburg (1999).

Table 1: Descriptive Statistics for Mortality and Structural Conditions Variables, Nonmetro Mississippi Counties, (N = 73).

Variable	Mean	SD*	Source
Age-Adjusted Mortality: Number of Deaths per 1000 Population	9.98	1.01	CDC[1]
Place of Residence in County Boundaries: Percentage of Rural Places	54.03	32.41	UCES[2]
Civic Infrastructure			
Local Capitalism: Percent Small Manufacturing	2.47	0.93	ABD[3]
Third Places: Percent Small Service	33.68	4.31	ABD[3]
Church Capacity: Number of Churches per 1000 Population	5.19	2.08	USDC[4]
Disadvantage Conditions			
Percent African-American	39.98	18.76	Census[5]
Percent Less than High School	43.11	6.39	Census[5]
Percent Unemployed	9.78	3.71	Census[5]
Percent in Poverty	30.26	9.31	Census[5]
Percent Female Headed Households	16.12	4.90	Census[5]

*SD= Standard Deviation
Sources: (1) 1996 Center for Disease Control; (2) 2000 Unit for Community and Environmental Studies; (3) 1998 American Business Directory; (4) 1997 U.S. Department of Commerce; (5) 1992 U.S. Census Bureau .

Table 2: Factor Scores for Nonmetro County Index of Disadvantage Conditions, in Percent.

Variable	Factor Score (in percent)
African-American	.949
Less than High School	.571
Unemployed	.822
In Poverty	.945
Female Headed Households	.914

Eigenvalue: 3.63; Percent variance explained: 72.65; Cronbach's Alpha: 0.80

Concentration of Disadvantaged Conditions. Following Sampson et al. (1999), this variable was defined by five indicators: (1) percentage of African-Americans, (2) percentage with less than high school education, (3) unemployment rate, (4) poverty rate, and (5) percentage of households headed by females. A principal component factor analysis showed that the five indicators formed one factor that accounted for 72.65 percent of the variance, with an Eigenvalue of 3.63 (see Table 2). The Cronbach's Alpha for this scale was 0.8, indicating that items are highly inter-correlated. The factor score was used to determine the level of disadvantage conditions. The higher the value of the factor score, the greater the level of disadvantage.

Regional Location. This variable was defined by a dummy variable to compare nonmetro counties situated in the Delta versus those situated in other nonmetro areas. For operational purposes, Delta was coded "1."

Analytical Strategy

Our modeling strategy involved estimating ordinary least squares regression models of mortality rates across nonmetro counties in Mississippi. An examination of the distribution of the dependent variable indicated that there were no outliers. Consequently, the analysis was based on all 73 nonmetro counties. We used variance inflation factors (VIF) to diagnose potential for multicollinearity among the independent variables. As a rule of thumb for standard-

ized data, a VIF greater than ten indicates harmful collinearity (Kennedy 1992: 183). Upon completion of this analysis, the statistics did not show any value greater than ten. We added the independent variables in theoretically meaningful groups as one means to assess their possible interrelationships. We then estimated the full model to assess how each set of variables accounts for differences in mortality rates.

Results

The results of this analysis are reported in Table 3. The zero-order correlation coefficients reveal that mortality rates are lower in nonmetro counties with higher proportions of rural places. The coefficients also reveal that, of the three civic infrastructure variables, only percent local capitalism is significant and in the expected direction. As expected, a high concentration of disadvantage conditions is significantly and positively related to mortality. Regional location is also statistically significant and in the expected direction. That is, nonmetro counties situated in the Delta region, on average, experience higher mortality rates than those situated in non-Delta regions.

The results of the multivariate analysis of nonmetro county mortality rates are based on four separate regression models. Model 1 includes only the place of residence dummy variables. Of the three variable included in the model, only counties with 100 percent urban places are statistically significantly different from counties with 100 percent rural places. The average mortality rate in counties with 100 percent urban places is 0.88 units higher than those with 100 percent rural places. The coefficients of the remaining two dummy variables also indicate that counties with higher proportions of urban places experience higher mortality. Specifically, the presence of rural places in a nonmetro county reduces the mortality rate by a factor of two. This model explains 6.7 percent of the total variance in mortality rates.

Model 2 adds the three civic infrastructure variables. Although each variable is in the expected direction, church capacity is not statistically significant. It is important to note that, in this model, the coefficient for third places changes sign from positive in the bivariate analysis to negative in the multivariate analysis. This suggests that third places might function as a means to invest in

Table 3: OLS[1] Regression Analysis of Mortality for Nonmetro Counties in Mississippi, 1996 (N = 73).

Variable	Zero-Order Correlation	Model 1	Model 2	Model 3	Model 4
Constant	-	9.52***	13.07***	12.34***	12.22***
Place of Residence (100% Rural = Reference)					
Greater than 50 Percent Rural	0.02	0.48	0.37	0.30	0.28
Less than 50 Percent Rural	0.01	0.47	0.55	0.41	0.40
100 Percent Urban	0.19*	0.88**	0.80**	0.51*	0.51*
Civic Infrastructure					
Local Capitalism	-0.25**	-	-0.29**	0.08	0.09
Third Places	0.12	-	-0.08*	-0.05	-0.05
Church Capacity	-0.14	-	-0.02	-0.22***	-0.21***
Index of Disadvantage Conditions	0.55***	-	-	0.77***	0.75***
Region (Delta = 1)	0.32***	-	-	-	0.11
R^2	-	6.7	14.8	52.3	52.4

***$p<.01$; **$p<.05$; *$p<.10$
[1]OLS=Ordinary Least Squares

material social capital only when situated in rural places. Thus, the effect of third places on mortality does not operate independently from the size of the places in which they are situated. In fact, in rural places, small service businesses are more than just places where people can meet and discuss local issues. They have a sub-jective social meaning in the daily life of the local population (Oldenburg 1999). This model increases the explained variance from 6.7 to 14.8 percent.

Model 3 adds the index of county disadvantage conditions. The coefficient reveals that higher disadvantage conditions lead to higher mortality rates. Specifically, for each unit increase in the index, mortality rates increase by 0.77 units. The addition of this index reduces substantially the effect of place of residence within county boundaries on mortality rates, but it remains statistically significant. Furthermore, local capitalism and third places become insignificant with the addition of this index. In contrast, the effect of church capacity increases substantially and becomes statistically significant. Specifically, for each unit increase in churches capacity, mortality rates decrease by 0.22 units. A plausible explanation for these findings is that factors that promote investment in social capital operate differently based on county economic conditions. Specifically, place of residence, local capitalism, and third places might facilitate investment in material social capital in counties with thriving economies. In contrast, church capacity might facilitate investment in psychological social capital in economically disad-vantaged conditions. The addition of the index of disadvantage conditions increases the explained variance from 14.8 to 52.3 per-cent.

Model 4 adds the variable defining county regional location. The coefficient indicates that this variable is not statistically signifi-cant. The addition of this variable does not substantively increase the explained variance in mortality rates. This finding suggests that what really matters is the local conditions; not the conditions of the region in which the county is situated.

Discussion and Conclusion

These findings clearly indicate that structural conditions that favor the investment in social capital lead to lower mortality. Our analy-sis indicates that concentration of disadvantage conditions has an

independent effect on mortality. That is, its effect operates independently of other structural conditions. In contrast, the effects of place of residence and civic infrastructure are contingent upon county economic conditions.

Although rural places provide limited conditions for the development of economies of scale in a given county, and thus limited access to physical and economic resources, they do provide an ideal environment for the emergence of processes of social interaction and relations, as well as for the development of a civic infrastructure based on local capitalism and third places. These facilities lead to the development of material social capital in two important ways. First, they tend to have longer tenure, which results in small business owners and their employees having greater self-interest in their place of residence. Second, they provide physical space for reciprocal exchange; that is, the place where local residents can come together and discuss common local issues. The key point is that self-interest and reciprocal exchange are at the core of the mechanism though which material social capital can emerge in a local population (Coleman 1988). Consequently, local capitalism and third places can be viewed as key civic structural conditions that lead to low levels of mortality because they contribute to the economic viability of a local population that provides access to economic resources relevant to increase one's chance of survival.

Our findings, however, indicate that the effects of local capitalism and third places on mortality disappear when disadvantage conditions are controlled (see Table 2, Model 3). This suggests that, when a county has high concentrations of disadvantage conditions, low mortality rates might be related to structural conditions that favor investment in psychological social capital. In fact, our results indicate that in poor county economic conditions, the higher the proportion of places with a population less than 10,000, and the higher the level of church capacity, the lower the levels of mortality.

In conclusion, the empirical results of this study are consistent with the general hypothesis that lower levels of mortality are typical of those counties with structural conditions that favor investment in social capital. Although this finding is in line with a growing body of literature indicating that structural conditions that favor investment in social capital are key predictors of individual and collective well-being (Putnam 2000; Tolbert et al. 1998; Tolbert et al. 2002; Young 1999; Wilkinson 2000), its contribution rests on

the distinction between structural conditions that favor the creation of psychological social capital and those that favor the creation of material social capital. This suggests that future health policies should include development strategies aimed at increasing the ability of local populations to invest in both psychological and material social capital.

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