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Natural Population Decrease Differentials in Mississippi : An Indicator of Rural Development¹

Introduction

THE subject of natural decrease of population has received no direct investigation in the South. This phenomenon involves the excess of deaths over births in a county in a year.

Natural population decrease has been examined on a national basis by Dorn (1939) and Beale (1969). The incidences of natural decrease found by Dorn in the years 1935 and 1936 were related to low current fertility levels in these areas. Beale studied the period 1950 to 1966 and found a total of 324 counties affected. However, in this case natural decrease stemmed from the distortion of the age structure of the county. These distortions were the result of high rates of age-selective net out-migration. Where counties of moderate fertility had experienced a prolonged or severe net out-movement of successive cohorts of young adults, the age-structure had often become so altered that there were not enough births to couples of childbearing age to offset the deaths that occurred to less depleted older cohorts.

Beale noted a number of factors which were associated with the incidence of natural decrease. These counties were concentrated mainly in agricultural or mining regions. These populations were "older", had a smaller proportion of

1. The research on which this paper is based is part of MAFES Population Project No. 4004.

women in the childbearing ages, a history of population decline, a predominantly rural population and a loss of employment in agriculture.

Beale found an unusual pattern in the Southern counties of the United States. A number of counties were characterized by a natural increase of population in the total population while the white population experienced a natural decrease of population. Beale noted that different fertility patterns and age-specific migration rates between white and nonwhite populations had produced increasingly divergent age distributions and ratios of births to deaths in these Southern counties.

More recently, Chang (1974) examined differences between Iowa counties with natural increase and those with a natural decrease of population for the period 1965 to 1970. In this study, Chang found the same factors to be associated with the incidence of natural decrease as had Beale. In addition, natural decrease counties had lower unemployment rates, a higher percentage of families below a \$5000 annual income, and spent more on highways and public welfare and less on education.

These three studies have demonstrated natural decrease of population as an indicator of a demographic as well as a social problem for a county. The problem has not been treated in a systematic sense. However, there is still a need for further investigation in this area. As pointed out by Beale, the South's population offers an area open to examination.

Natural population decrease is conceptualized as an "imbalanced" state. An imbalance in a county's vital processes reflects other conditions in the demographic, economic and social spheres of that community.

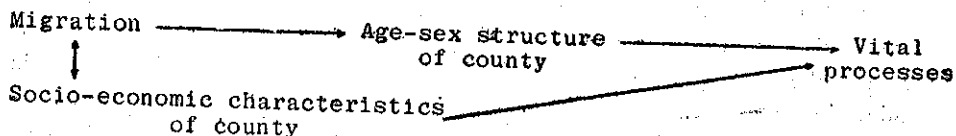
Every society tends to keep its vital processes in a state of balance such that population will replenish losses from death and grow to an extent deemed desirable by collective norms. These norms are flexible and readjust rather promptly to changes in the ability of the economy to support population. . . (Bogue, 1969 : 51)

In this analysis of natural population decrease, it is hypothesized that migration acts through the age-sex structure of county populations to alter the vital processes. Migration is basically a response by persons to economic, social and demographic forces in the environment. In turn, migration may indirectly affect social and economic characteristics of counties. Forces influencing a community's birth rate are primarily social and economic in origin.

Natural decrease has been found to stem from a large net out-migration of young adult cohorts from a population. These are the age groups most responsible for the maintenance of reproduction. An age structure so altered may have

a greater concentration of people in older age groups. A county's mortality rate may be distorted by such a pattern as this in the age structure.

The interrelationship of variables may be diagrammed as under :



Purpose

The purpose of this paper is to investigate the incidence of natural decrease of population in Mississippi counties. Specifically, this paper attempts to test the composite hypothesis that natural decrease in Mississippi is a phenomenon among white population and is related to an imbalance in the socio-economic and demographic indicators in the affected counties. In order to test the hypothesis, natural decrease counties will be identified in the period 1950 to 1970. Demographic and socio-economic variables associated with this phenomenon will be analyzed. Since natural decrease may occur in the white population, only, data will be classified by race whenever possible.

Data and Analysis

Data used in this study are obtained from U.S. population censuses, U.S. Vital Statistics and county net migration estimates from : *Net Migration of the Population by Age, Sex and Color, 1950-60* and . . . *1960-70* by Bowles, Tarver and Lee.

Hypotheses

The hypotheses to be tested in this study are : (1) natural decrease occurs in the white population of counties; counties experiencing natural decrease: (2) are grouped geographically; (3) are smaller and more rural; (4) have "older" populations; (5) have higher mortality rates; (6) have lower fertility levels; (7) have larger rates of net out-migration; (8) have a smaller proportion of women in the childbearing-ages; and (9) have a lower proportion of the adult population employed and unemployed, and a lower average of median number of school years completed by the population over 25 years of age.

Results

1. *White Population.* Inspection of Table 1 indicates that natural decrease occurred in the white populations in 27 (out of 82) counties in the period 1950

to 1970. These counties make up the "natural decrease county group." Table 1 presents a list of counties affected with natural decrease and their occurrence in each year of the period under study.

TABLE 1—COUNTIES AFFECTED BY NATURAL DECREASE OF POPULATION, 1950-1970

	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70				
Amite																x			x	x					
Attala																						x			
Benton															x					x					
Carroll							x				x	x	x												
Choctaw																				x	x	x			
Claiborne													x	x			x								
Clarke																				x					
Copiah																			x		x				
Franklin																			x	x	x	x	x		
Holmes													x						x	x	x	x	x		
Issaquena								x			x									x					
Jefferson								x	x				x	x			x	x	x	x	x	x			
Kemper								x				x		x	x	x	x	x	x	x		x			
Leake																			x	x					
Marshall																				x					
Montgomery																				x	x				
Newton																				x	x				
Noxubee															x				x	x					
Stone																				x					
Sunflower																						x			
Tallahatchie																					x	x	x		
Tunica																				x					
Walthall																					x				
Webster																					x	x			
Wilkinson																					x	x			
Winston														x							x				
Yalobusha												x									x	x	x	x	x
									2	3		3	3	5	2	3	5	11	14	14	3	10			

2. *Geographic Proximity.* The counties experiencing natural population decrease are located in two areas of Mississippi—the southwest corner and across the north central section of the State. These areas have been characterized by a large proportion of the labour force being in forest and small scale farming industries (Bogue and Beale, 1961).

3. *Population Size and Type of Residence.* Table 2 indicates that population size of natural decrease counties is substantially smaller than natural increase counties in all three census years. Moreover, the average population size of counties experiencing natural decrease is declining while that of the State is increasing.

TABLE 2—AVERAGE POPULATION SIZE OF COUNTY GROUPS AND POPULATION OF COUNTY GROUPS OF BY TYPE RESIDENCE, 1950, 1960 AND 1970

County group and type of residence	Year		
	1950	1960	1970
Natural Increase	15,113	15,832	16,612
<i>Urban</i>			
Number	562,096	767,197	912,102
Percentage	33.81	44.05	49.91
<i>Rural</i>			
Number	1,100,368	982,099	922,752
Percentage	66.19	55.95	50.09
Natural Decrease	9,564	8,085	7,214
<i>Urban</i>			
Number	45,066	53,608	74,540
Percentage	8.73	12.28	19.13
<i>Rural</i>			
Number	471,384	375,237	307,518
Percentage	91.27	87.72	80.87

SOURCES : U.S. Bureau of the Census. *U.S. Census of Population 1960*. Number of Inhabitants, Table 6. Washington, D. C. : USGPO, 1963. *U. S. Census of Population : 1970*, Number of Inhabitants, Table 9. Washington, D. C. : USGPO, 1971.

The natural decrease county group exhibits a much higher degree of rurality than other counties. The rural-urban differential between the two county groups

has remained large throughout the period studied; natural decrease counties were generally 25, 32, and 30 percent more rural than natural increase counties in 1950, 1960 and 1970, respectively.

4. *Index of Aging.* Three indices of aging were used to examine the age structures of Mississippi Counties. These are the index of aging, the aged and the youth dependency ratios.

It is clear from Table 3 that there has been a trend in the State toward aging between 1950 and 1970. The white population of the natural decrease county

TABLE 3—MEASURES OF AGING FOR COUNTY GROUPS BY RACE, 1950, 1960 AND 1970

Measure, county group and race	Year		
	1950	1960	1970
Index of Aging			
Natural Increase			
White	23.45	27.89	35.59
Nonwhite	17.87	18.86	24.23
Natural Decrease			
White	27.97	44.01	58.23
Nonwhite	15.88	18.34	26.32
Youth Dependency Ratio			
Natural Increase			
White	47.24	51.14	43.93
Nonwhite	67.83	86.41	75.53
Natural Decrease			
White	51.11	47.68	39.68
Nonwhite	78.07	93.22	79.33
Aged Dependency Ratio			
Natural Increase			
White	11.08	14.26	15.63
Nonwhite	12.12	16.30	18.30
Natural Decrease			
White	14.29	20.98	23.11
Nonwhite	12.40	17.09	20.88

SOURCES: U.S. Bureau of the Census. *U.S. Census of Population: 1950. General Population Characteristics, Table 41.* Washington, D.C.: USGPO, 1952. *U.S. Census of Population: 1960. General Population Characteristics, Table 27.* Washington, D.C.: USGPO, 1961. *U.S. Census of Population: 1970. General Population Characteristics, Table 35.* Washington, D.C.: USGPO, 1971.

group exhibited a higher index of aging in each year than the natural increase group. Moreover, the gap between the two is widening.

The white population of the natural decrease group also has a lower youth dependency ratio in 1960 and 1970; and a higher proportion in the older age groups in each census year than in the natural increase group.

The nonwhite population of the State generally shows a slower trend toward aging than that for whites. Nonwhites in natural decrease counties exhibit a higher youth dependency ratio as well as a higher aged dependency ratio than natural increase counties. However, the index of aging in natural decrease counties is not substantially higher than in natural increase counties. This is due to the interaction of several factors. Natural decrease counties are more rural and fertility among non-whites is generally higher than for whites. This would inflate the 0-14 years age group.

5. *Mortality* The crude death rate is used as the measure of mortality. The data in Table 4 shows that a marked difference has existed between the white population of the natural decrease and increase county group since 1960, and between the nonwhite population of the natural decrease and increase county group in 1970. The mortality rates are generally consistent with the index of aging ratios—those population groups with higher death rates also had a higher proportion of their population in older age groups.

TABLE 4—MORTALITY RATES FOR COUNTY GROUPS BY COLOR, 1950, 1960 AND 1970

County group	Year		
	1950	1960	1970
Natural Increase			
White	.077	.089	.098
Nonwhite	.103	.109	.113
Natural Decrease			
White	.089	.111	.127
Nonwhite	.108	.108	.124

SOURCES : U.S. Public Health Service. *U.S. Vital Statistics, 1950-70, Volume 2. "Mortality."* Rockville, Maryland : National Center for Health Statistics. U.S. Bureau of the Census. *U.S. Census of Population : 1950. General Population Characteristics, Table 41.* Washington, D.C. : USGPO, 1952. *U.S. Census of Population : 1960. General Population Characteristics, Table 27.* Washington, D.C. : USGPO, 1961. *U.S. Census of Population : 1970. General Population Characteristics, Table 35.* Washington, D.C. : USGPO, 1971.

6. *Fertility.* In this study, three fertility measures were used to analyze fertility differentials; namely, the child-woman ratio, the general fertility rate and the crude birth rate.

TABLE 5—MEASURES OF FERTILITY FOR COUNTY GROUPS BY RACE, 1950, 1960 AND 1970

<i>Measure, county group and race</i>	<i>Year</i>		
	<i>1950</i>	<i>1960</i>	<i>1970</i>
Child-Woman Ratio			
Natural Increase			
White	523	526	397
Non-white	692	879	622
Natural Decrease			
White	525	484	371
Nonwhite	763	919	650
General Fertility Rate			
Natural Increase			
White	103	102	86
Nonwhite	181	184	144
Natural Decrease			
White	102	93	83
Nonwhite	169	192	143
Crude Birth Rate			
Natural Increase			
White	22.7	20.0	17.5
Nonwhite	36.1	32.7	27.1
Natural Decrease			
White	21.2	16.7	15.5
Nonwhite	36.6	32.6	26.0

SOURCES : U.S. Public Health Service. *U.S. Vital Statistics, 1950-1970*, Volume 1. "Natality." Rockville, Maryland : National Center for Health Statistics. U. S. Bureau of the Census, *U.S. Census of Population : 1950*. General Population Characteristics, Table 41, Washington, D.C. : USGPO, 1952. *U.S. Census of Population : 1960*. General Population Characteristics. Table 27, Washington, D.C. : USGPO, 1960. *U.S. Census of Population : 1970*. General Population Characteristics, Table 35, Washington, D.C. : USGPO, 1971.

With one exception, the white population of natural decrease counties exhibited lower child-woman ratios, general fertility rates and crude birth rates than natural increase counties in all three census years. The child-woman ratio is higher for whites in natural decrease counties in 1950 only. However, the first incidences of natural decrease did not occur until 1957.

The nonwhite population in the natural decrease county group experienced higher child-woman ratios than nonwhites in natural increase counties. This may stem from the rurality of these counties and higher levels of fertility among nonwhites. The general fertility rate fluctuated widely between the two county groups in the three census years studied : it was lower in the natural decrease group in 1950, higher in 1960 and almost equal in 1970. Like whites, nonwhites exhibit a declining birth rate. However, there is little difference in the nonwhite population between each county group.

7. *Net Migration* County net migration estimates classified by age, race and sex were not available for each county during the period 1950 to 1960 (Bowles and Tarver, 1965). Accordingly, migration analysis was limited to total net migration rates for this period. Natural increase counties averaged a net out-migration rate of -16.32 percent for the period 1950 to 1960 while the natural decrease county group averaged -27.44 percent.

As shown in Table 6, from 1960 to 1970 the natural decrease county group (including both races) had a larger rate of net out-migration; while natural increase counties averaged a total net *in*-migration. The nonwhite population had a lower ("lower" connotes a negative direction) rate of net migration in all age groups in the natural decrease county group (as compared to the natural increase group). The white population of natural decrease counties had lower net migration rates than in natural increase counties in all age categories except 0-9 years and 35-39 years of age.

The 20-29 year age groups show a substantial net *out-migration* in all categories for the period 1960 to 1970. There were significant differences between the natural increase and decrease county groups in the ages 20-29 years and still marked differences through 39 years of age. Rates of net out-migration for the white population in the natural decrease counties were 32 percent less for the 20-24 year age group and 23 percent less for the 25-29 year age group than in natural increase counties. This differential was so substantial to effect a decline in fertility in natural decrease. Differences in migration rates between natural increase and decrease counties were not as marked for nonwhites as for whites. Nonwhites have a more consistent pattern of net migration. That is, large rates of net out-migration were not concentrated in only a few age groups; they were

TABLE 6 - AVERAGE NET MIGRATION RATES FOR MISSISSIPPI COUNTIES,
1960-1970, BY AGE AND RACE

Age Groups	County groups					
	Mississippi		Natural increase		Natural decrease	
	White	Nonwhite	White	Nonwhite	White	Nonwhite
0-4	2.66	-7.00	1.45	-6.88	5.12	-7.24
5-9	6.05	-19.82	5.79	-18.53	6.59	-22.45
10-14	7.26	-20.49	7.58	-18.57	6.63	-24.40
15-19	2.51	-24.42	4.28	-21.99	-1.10	-29.38
20-24	-18.79	-51.82	-8.24	-48.03	-40.27	-59.54
25-29	-18.20	-57.60	-10.59	-53.62	-33.69	-65.72
30-34	13.47	-38.00	15.99	-34.07	8.33	-45.99
35-39	11.46	-21.52	11.03	-19.39	12.35	-25.86
40-44	7.99	-12.66	8.49	-10.68	6.97	-16.68
45-49	5.06	-10.19	5.88	-8.87	3.40	-12.89
50-54	3.57	-7.09	3.81	-6.04	3.07	-9.22
55-59	3.55	-7.57	4.34	-6.86	1.92	-9.00
60-64	5.58	-1.23	6.14	0.55	4.46	-4.84
65-69	6.20	2.95	6.80	4.00	4.99	0.82
70-74	3.66	-0.45	3.82	0.02	3.32	-1.40
75 +	-2.81	-10.81	-1.05	-10.76	-6.41	-10.92
All ages	-0.23	-24.02	1.66	-21.68	-4.08	-28.79

SOURCES : Bowles, Gladys K., and Everett S. Lee. *Net Migration of the Population, 1960-70 by Age, Sex and Color*. Washington, D. C. : USGPO, 1975. Vol. 1, Part 4, Preliminary report.

distributed more evenly throughout the older age groups. Their age structures were less distorted through this process.

8. *Proportion of Women, 15-44 Years*. It goes without saying that the proportion of women in the childbearing ages in a given population is not per se an indicator of the level of fertility of that population. Rather, it indicates "potential" or the proportion of women "available" for reproduction. For the

State as a whole, 21.4 percent of the population was made up of women in the child-bearing ages in 1950, 18.4 percent in 1960, and 19.3 percent in 1970. As shown in Table 7, there were significant differences between the white population in natural increase and decrease county groups with regard to the proportion of these women. Whites in the natural decrease county groups consistently

TABLE 7—PROPORTION OF POPULATION MADE UP BY WOMEN IN
 CHILDBEARING AGES, BY COUNTY GROUP AND RACE,
 1950, 1960 AND 1970

County group and race	Year		
	1950	1960	1970
Natural Increase			
White	.221	.196	.205
Nonwhite	.215	.178	.189
Natural Decrease			
White	.207	.180	.186
Nonwhite	.202	.171	.183

SOURCES : U.S. Bureau of the Census. *U.S. Census of Population : 1950*. Characteristics of the Population, Table 41. Washington, D.C. : USGPO, 1952. *U.S. Census of Population : 1960*. Characteristics of the Population, Table 27. Washington, D.C. : USGPO, 1961. *U.S. Census of Population : 1970*. Characteristics of the Population, Table 27. Washington, D.C. : USGPO, 1961. *U.S. Census of Population : 1970*. Characteristics of the Population, Table 35. Washington, D.C. : USGPO, 1971.

averaged a lower percentage in each year : 1.4, 1.6 and 1.9 in 1950, 1960 and 1970, respectively. The gap in this variable is widening. Nonwhites had a consistently lower proportion of women 15-44 years of age in the natural decrease county group in each year.

9. *Socio-Economic Characteristics*. In regard to employment, the percentages in Table 8 indicate the prevalence of differences between county groups for whites and nonwhites. The white population in natural increase counties recorded an increasing proportion of employment whereas that of the natural decrease group scored a decrease in the proportion of its employment since 1960. Nonwhites in the natural decrease and increase groups experienced lower employment than whites in 1970, and a lower rate in 1960 in the natural increase county group.

TABLE 8—SOCIO-ECONOMIC CHARACTERISTICS OF COUNTY GROUPS,
1950, 1960, AND 1970

Measure, county group and race	Year		
	1950	1960	1970
Percentage Employed			
Natural Increase			
White	38.70	47.10	52.30
Nonwhite	50.10	49.90	45.00
Natural Decrease			
White	36.40	55.00	50.00
Nonwhite	50.80	37.10	37.80
Percentage Unemployed			
Natural Increase			
White	1.12	2.15	1.83
Nonwhite	2.94	4.03	4.00
Natural Decrease			
White	0.71	2.86	1.88
Nonwhite	1.00	2.32	4.42
Median Years of School			
Natural Increase	8.15	8.85	10.31
Natural Decrease	6.99	8.10	9.26

Nonwhites have a higher proportion of the adult population unemployed than whites in both county groups during the twenty year period. They also have an increasing proportion of unemployed, with a slight decline in 1970 for the natural increase county group.

For whites in both county groups, unemployment rose between 1950 and 1960, then fell to approximately the same level in 1970. Rates were higher in the natural decrease county group than in the natural increase group. This differs from Chang's findings in Iowa in which natural decrease counties had lower unemployment. Rather, it tends to support the inverse relationship usually found between net migration and unemployment (El Attar, 1974; Anderson, 1965).

Data on the median number of school years completed for those 25 years of age and older indicated a rising educational level for the State as a

whole. However, the natural decrease county group had a consistently lower average than the natural increase county group. This indicates a lower "educational pool" in natural decrease counties; in this sense, out-migration seems to be selective of the better educated.

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