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ABSTRACT

In replication of other studies, the natural decrease of Texas population was examined in terms of the effect of migration and fertility. Utilizing Texas and U.S. vital statistics and the 1970 U.S. Census of Population, Texas population trends were analyzed for the 1968-72 period by dividing the 254 Texas counties into: (1) 65 natural decrease counties (those registering more deaths than births); (2) 132 low natural increase counties (those below the state average); (3) 57 high natural increase counties (those above the state average). Findings indicated natural decrease counties: (1) were smaller; (2) consituted less than 6% of the population; (3) were primarily rural; (4) experienced net-in-migration gains in 18 of the 65 counties; (5) had a population with an average median age of 41.1 years; (6) had a low proportion of Spanish-speaking population; (7) had a lower fertility level than the increase counties, but had a level above replacement levels. It was concluded that: (1) the presence of Spanish-speaking populations influenced fertility differentials, since counties with large Spanish populations experienced high levels of natural increase in spite of high levels of out-migration because of high fertility; and (2) migration trends for longer time intervals and by age should be examined to determine the effect of migration on age structure and natural decrease. (JC)

NATURAL DECREASE IN TEXAS COUNTIES*

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INTRODUCTION

The phenomenon of natural population decrease in a number of U.S. counties is rather recent, occuring first during the 1930's. Dorn (1939) who conducted the first study of natural decrease, identified 255 places which experienced the phenomenon during 1935-36, the first years during which the number of births and deaths were published by place of residence. Of these places, 145 were counties with a total population in 1930 of 8,267,000. Dorn explained natural decrease in the counties and communities identified as a result of a national trend of declining fertility which reached substantially low levels during the Great Depression.

According to Beale (1969), shortly after Dorn's publication, natural population decrease disappeared almost completely due to higher fertility during and after World War II. Beale observed that the phenomenon reappeared during the early 1950's in a number of counties and has accelerated throughout the period from 1950 to 1966, the last year his study has covered. During this period, natural decrease had affected a total of 324 counties, with 271 counties being affected in 1966. Beale's explanation of the phenomenon was quite different from Dorn's. He argued that the reappearance of natural decrease in the early 1950's could not have been the result of a national trend of declining fertility, since this was generally a period during which national fertility was rising. Rather it was mainly the outcome of "distorted age-structure" in certain counties which experienced "a high rate of age-selective net out-migration" (Beale, 1969, p. 93). Beale recognized that low and moderate fertility in some counties probably aided natural decrease, but in general fertility levels in these counties were high enough for population replacement. The major cause of natural decrease since the early 1950's has been, he argued, the heavy out-migration of young adults from these counties. In a few cases, such as a number of counties in Florida and other "retirement counties" scattered throughout the country, natural decrease occured from high rates of net-in-migration of older persons. But in both cases the phenomenon was due to age-selective migration and not inadequate fertility.

Beale observed that the occurrence of natural decrease during 1950-1966 was not random, but was concentrated in certain areas. The main natural decrease areas were identified as the "marginal Corn Belt country of northern Missouri and Southern Iowa" (Beale, 1969, p. 95), a group of counties in southwestern Kansas and southwestern Missouri, central Texas, and in southern Illinois with a few counties in western Kentucky. In central Florida, a few counties experienced natural decrease from in-migration of older people. The rest of the natural decrease counties were generally scattered throughout the United States.

The most recent study of natural decrease was carried out by Chang (1974) who concentrated on one of the above-mentioned areas, southern Iowa. Chang's concentration on Iowa counties only, allowed him to engage in a more detailed investigation of the characteristics of the Iowa natural decrease counties. He focused on those which registered an excess number of deaths over births in at least three years out of the five-year period 1960-1970 (Chang, 1974, p. 659). By this definition, 17 out of Iowa's 99 counties were designated as natural decrease counties. Of these, 14 were located along the state's southern border. Chang's analysis consisted of mainly comparing these natural decrease counties with the rest of the Iowa counties which were divided into low and high natural increase counties. Such comparisons of several characteristics of the three groups of counties led him to conclude that the major cause of natural decrease in Iowa counties was high rates of net-out-migration of young adults. Fertility was found to be of secondary

importance, but not to be underestimated, since "prolonged net out-migration was more likely to trigger natural decrease in counties of comparatively low fertility than in those with higher fertility" (Chang, 1974, p. 670).

This paper, as a follow-up on Chang's study, focuses on another major area of natural population decrease, Texas. Our data show that the phenomenon is more widespread in Texas, although perhaps not as concentrated as in the case in Iowa. According to our definition of natural decrease (see below) there were 65 natural decrease counties in Texas during 1968-72, a higher proportion of the total number of counties than in Iowa. While most of these counties are found in central Texas, a few are scattered in the northern and eastern part of the state. In describing the natural decrease counties in central Texas, Beal noted that "the area lacks physiographic or cultural unity," but the counties share "a former dependency on cotton production and a lack of alternative newer forms of employment" (Beal, 1969, p. 95).

METHODS

We are generally following Chang's methods of analysis (with some modifications) so that comparability of the two studies will be possible. Following Chang, we have divided the 254 Texas counties into three groups: natural decrease counties, low natural increase counties, and high natural increase counties. Natural decrease counties are designated as those counties which registered more deaths than births during the period 1968-72 taken as a whole. Counties with a higher number of births and deaths during the five-year period are designated as natural increase counties. The natural increase counties were further classified into two groups by the formula, (Number of Births—Number of Deaths during 1968-1972)/(1970 county population) X100; those counties with a rate of natural increase below the state average (5.69) are designated as "low natural increase" counties while those whose rate is higher than the state average as "high natural increase" counties. The same formula was utilized to compute a rate of natural decrease for the natural decrease counties. We believe that this way of defining natural decrease (and increase) permits the inclusion in the natural decrease group of only those counties in which the phenomenon occurred consistently over time; only those counties which showed a net decrease over the five-year period are considered natural decrease counties. Counties which showed a net decrease over the five-year period, but which did not register more deaths than births in at least 3 of the 5 years, were placed in the low increase group. In addition we excluded those counties which registered a very small number of births and deaths and where the small excess in deaths could be due to chance fluctuations. Thus, after eliminating marginal cases, we are left with 65 counties which conform to our definition of natural decrease. The low natural increase group consists of 132 counties, while the high natural increase group consists of 57 counties.

The data employed in this study are from the vital statistics of Texas and the nation, and from the 1970 census of population.

FINDINGS

The 65 natural decrease counties constitute about 26 percent of all Texas counties and had a mean population of 10,170 in 1970. Thus, on the average, they are smaller than the low increase counties which had a mean population of 29,244, while the high natural increase counties were much larger with a mean population of 117,089. The natural decrease counties had a combined population of 668,294 constituting less than 6 percent of the state population, whereas the natural increase counties, which make up about 74 percent of all counties, had more than 94 percent of the population of Texas.

In general, the natural decrease counties were primarily rural while the increase counties were mostly urban. Of the 65 decrease counties 32 had populations classified as less than 30 percent urban with 27 of these being completely rural. Of the 189 increase counties, 138 (or 73 percent) were at least 30 percent urban. Among the high increase group only 3 counties had populations that were less than 30 percent urban. This is reflected in Table 1 which shows the proportions of the urban population for the three county groups. In addition, the table shows that the proportion of the rural farm population was much higher in the natural decrease counties.

The Effect of Migration

Past research (Beale, 1969; Chang, 1974) has attributed the phenomenon of natural population decrease to a lopsided age-structure resulting from age-selective migration, mainly the out-migration of young adults. Chang's findings from Iowa counties show that, while out-migration was the case for most counties, the natural decrease group was characterized by heavier migration losses than the increase counties. In fact, he found that every natural decrease county had experienced out-migration during the 1960's. The relationship between out-migration and natural decrease is not as clear in the case of Texas. As in Iowa, most of the Texas counties showed migration losses from 1960 to 1970; but, curiously, some of the natural decrease counties experienced net-in-migration (See Table 2). In fact the proportion of counties which experienced in-migration was similar for all three county groups, with the high natural increase group having the highest mean out-migration. Closer examination of the data, however, reveals that 17 of the 18 decrease counties with net-in-migration from 1960 to 1970, had experienced generally heavy out-migration from 1950 to 1960. Thus, natural decrease in these counties is the outcome of earlier out-migration of young adults. We suspect that for some of these decrease counties with net-in-migration in the 1960's, migration gains resulted from in-migration of older people (migration data by age are not available at the moment). While the migration flow reversed itself in the 1960's in these counties, the age-structure was not altered significantly (and in most cases the trend was toward aging of the population), so that lower fertility in 1970 than in 1960 permitted the occurrence of natural decrease.

While the counties experiencing out-migration were proportional in all three county groups we believe that the long term effect of migration varied among the groups; in other words, migration is age-selective, and in the case of the decrease counties it has contributed to a trend toward aging. Table 3 reveals, that several measures of age, such as the median age, percent of population 65 years old and over, index of aging (index of aging = [P65+/Po-14] X 100), etc., indicate that the natural decrease counties have a much older population than the other two groups. While the average median age for the decrease counties, for example, was 41.1, it was only 24.2 for the high increase counties.

The fact that the increase counties, and particularly the high increase group, experienced on the average slightly heavier out-migration than the decrease counties can perhaps be explained as follows: A high portion of the population of the high increase counties was Spanish-speaking (See Table 4). These counties generally experienced heavy out-migration and at the same time high natural increase because of high fertility levels (See Table 5). On the average, the proportion of the Spanish-speaking population was very high in the high increase counties and very low in the case of the decrease counties. A zero order correlation of .56 between the percent Spanish and the rate of natural increase for all counties (N=254) adds more support to this. Therefore, despite heavy out-migration, high levels of fertility make for substantially young populations and permit high levels of natural increase.

The Effect of Fertility

Net-migration and fertility both interact to influence the age-structure of population and both, therefore, contribute to the occurrence of natural decrease or increase. Table 6 shows that the fertility level of the decrease counties is lower than that of the increase counties. While the level of fertility in the decrease counties is in every case above the replacement level, lower fertility in these counties plays an important role since natural decrease is more likely to occur when fertility is lower.

The relationship between fertility and natural decrease is not altered when we control for the urban component of the counties. Table 7 shows that the natural decrease counties with less than 30 percent of their populations classified as urban show lower fertility ratios than the other two increase groups with the same level of urbanization. In fact their fertility ratios are lower than those of the county groups classified as 30 or more percent urban.

Similar results are obtained when we compare the number of children ever born per 1,000 women of all marital classes for the Urban, Rural Non-Farm, and Rural-Farm population components of the three county groups; for all three population components fertility is much higher for the high increase counties than the decrease counties (See Table 8). The table also shows that, except in the case of the decrease counties, the rural farm population has lower fertility than the urban population, a finding similar to Chang's comparison of Iowa counties. In addition, the rural farm population of the natural decrease counties shows lower fertility than the urban populations of both the low increase and high increase counties.

DISCUSSION

Our findings on the relationship between fertility and natural decrease are similar to Chang's findings for Iowa counties. But, in the case of Texas, the high proportion of Spanish-Speaking persons in the populations of the natural increase counties contributes greatly to the fertility differentials. It would be wrong to argue that inadequate fertility has caused natural decrease in Texas, since the fertility levels for the natural decrease counties, while quite low, are above replacement levels. But, as Chang notes in the case of Iowa, "low fertility, must have contributed to the imbalance of births and deaths..." (Chang, 1974, p. 665). Low fertility then, when coupled with the effect of age-selective migration on the age structure of a population should be viewed as an important variable in the study of natural population decrease.

The effect of migration and natural decrease is not clear in the data on Texas counties, especially when 18 of the 65 natural decrease counties were found to have migration gains during the 1960's. Migration trends for longer time intervals, and by age, must be examined in order to shed light on the effect of migration on age structure and consequently natural decrease. We have also seen how the high proportion of Spanish persons in high natural increase counties interacts with migration and fertility to cloud the relationship between net-migration and natural decrease. Counties with large Spanish populations experienced high levels of natural increase in spite of high levels of out-migration, because of very high fertility.

The relationship between net-migration and natural decrease can be further clarified when migration data by age become available. More research is needed on Texas counties and other major natural decrease areas in order to lend our findings more support. As they stand at the moment, our findings are preliminary and tentative, and must, therefore, be regarded with caution.

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Table 1. Urban and Rural Farm Populations of Texas Counties by Classification Groups: 1970.

	All Counties (N=254)	Natural Decrease (N=65)	Low Increase (N=132)	High Increase (N=57)
Mean Percentage, Urban Population	43.1%	26.9	40.8	67.7
Mean Percentage Rural Farm Population	12.2	18.9	11.2	6.9

Table 2: Rates of Net Migration of Texas Counties by Classification Groups: 1960-1970

Net Migration Rate	All Counties (N=254)	Decrease Counties (N=65)	Low Increase Counties (N=132)	High Increase Counties (N=57)
-15.0 and over	36.6	33.8	34.1	45.6
-10.0 to -14.9	15.4	12.3	16.7	15.8
-5.0 to -9.9	11.4	12.3	12.1	8.8
Less than -5.0	9.1	13.8	8.3	5.3
Less than 5.0	7.9	10.8	8.3	3.5
5.0 to 9.9	3.9	4.6	3.8	3.5
10.0 and over	15.7	12.3	16.7	1.8
Total	100.0	100.1	100.0	100.2
Mean	-8.3	-7.5	-7.7	-10.6

Table 3. Measurers of the Age Structure of All Texas Counties and the Classification Groups: 1970

Measures of Age[a]	All Counties (N=254)	Natural Decrease (N=65)	Low Increase (N=132)	High Increase (N=57)
Median Age	32.2 yrs.	41.1	31.2	24.2
Index of Aging	53.8	94.1	46.0	25.8
Youth Dependency Ratio	47.1	39.0	47.6	55.1
Aged Dependency Ratio	22.6	34.4	21.2	12.7
Percent of Population 65 years and older	13.3	19.8	12.6	7.5

[a] All of the figures are means.

Table 4. Net Migration by Percent of Population Spanish-Speaking in 1970 for Texas County Groups: 1960-1970

Net Migration	Natural Decrease Percent of Population Spanish-Speaking		Low Increase Percent of Population Spanish-Speaking		High Increase Percent of Population Spanish-Speaking	
	< 30 (N=65)	≥30 (N=0)	< 30 (N=113)	≥ 30 (N=19)	< 30 (N=26)	≥30 (N=31)
In	27.7	0.0	34.5	0.0	38.5	12.9
Out	72.3	0.0	65.5	100.0	61.5	87.1
Total	100.0	0.0	100.0	100.0	100.0	100.0

Table 5. Fertility Ratio by Percent of Population Spanish-Speaking for Texas County Groups: 1970

Fertility Ratio	Natural Decrease Percent of Population Spanish-Speaking		Low Increase Percent of Population Spanish-Speaking		High Increase Percent of Population Spanish-Speaking	
	<30 (N=32)	≥30 (N=33)	< 30 (N=52)	≥ 30 (N=80)	< 30 (N=3)	≥30 (N=54)
Less than 300	43.8	24.2	5.8	2.5	0.0	1.9
300 to 349	31.3	48.5	34.6	23.8	0.0	7.4
350 to 399	21.9	24.2	50.0	36.3	66.7	24.1
400 to 449	3.1	3.0	7.7	26.3	33.3	37.0
450 and over	0.0	0.0	1.9	11.3	0.0	29.6
Total	100.1	99.9	100.0	100.2	100.0	100.0

Table 6. Fertility Measures for Texas County Groups: 1970

Fertility Measures	All Counties (N=254)	Natural Decrease (N=65)	Low Increase (N=132)	High Increase (N=57)
Mean Fertility Ratio	371.0	322.1	373.3	421.5
Mean General Fertility Rate	99.0	85.3	100.8	110.4
Mean Children Ever Born Per 1,000 Women of All Marital Classes	3245.7	3046.8	3187.2	3589.5

Table 7. Fertility Ratio for Texas County Classification Groups by Percent Urban: 1970

	Natural Decrease Percent of Population Urban			Low Increase Percent of Population Urban			High Increase Percent of Population Urban		
Fertility Ratio	<30 (N=32)	30-59 (N=25)	≥60 (N=8)	<30 (N=48)	30-59 (N=45)	≥60 (N=39)	<30 (N=3)	30-59 (N=17)	≥60 (N=37)
Less than 300	46.9	20.0	25.0	2.1	0.0	10.3	0.0	0.0	2.7
300 to 349	25.0	52.0	62.5	22.9	20.0	43.6	0.0	0.0	10.8
350 to 399	21.9	28.0	12.5	41.7	55.6	25.6	0.0	11.8	35.1
400 to 449	6.3	0.0	0.0	16.7	24.4	15.4	33.0	47.1	29.7
450 to over	0.0	0.0	0.0	16.7	0.0	5.1	66.7	41.2	21.6
Total	100.1	100.0	100.0	100.1	100.0	100.0	100.0	100.1	99.9

Table 8. Mean "Children Ever Born" for the Urban, Rural, Farm, and Rural Non-farm Populations by All Counties and by Classification Groups.

	All Counties (N=254)	Natural Decrease (N=65)	Low Increase (N=132)	High Increase (N=57)
Total Population	3245.9	3046.8	3187.2	3589.5
Urban	3282.3	2976.7	3244.5	3617.5
Rural Non-Farm	3553.6	3320.1	3434.9	4050.6
Rural Farm	3275.8	3168.6	3132.1	3586.6