SOME SOCIO-DEMOGRAPHIC CORRELATES OF SIZE OF PLACE: A REPLICATION IN MICHIGAN, 1970

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ABSTRACT

SOME SOCIO-DEMOGRAPHIC CORRELATES OF
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By

Carol Evelyn Lepper

The problem of this thesis is the nature of the relationships between socio-demographic characteristics and community size. The social characteristics examined were categorized into two sets of dependent variables: 1) currents of selective migration as measured by age distribution, sex ratio, fertility ratio, and dependency ratio; and 2) economic structure and function as measured by education, occupation, and income. The theoretical framework was adapted from the one used by Duncan and Reiss in their census monograph Social Characteristics of Urban and Rural Communities, 1950 and applied to the white and black population of Michigan communities in 1970. This study, then, is essentially a replication of the work just mentioned.

Comparing and contrasting the findings of the two studies shows that:

1. Both in 1950 and in 1970, the distribution of young children, with the exception of black males in 1970, is negatively correlated with size of place.

2. In the distribution of adults of wage-earning and family-rearing age, deviation in 1970 from the direct association found in 1950 was observed only among white females.

3. The only deviation in 1970 from the inverse association between distribution of the aged and size of place in 1950 was also among white females.

4. In 1970, as in 1950, the sex ratio was negatively correlated with size of place.

5. The inverse relationship between fertility ratio and size of place observed in 1950 was also found among Michigan whites in 1970. Direct comparisons of the black population were not possible due to procedural differences in the two studies.

6. Procedural differences also precluded comparison of the 1950 and 1970 relationship of dependency ratio to size of place among blacks. For whites in 1970 and the total population in 1950, however, an inverse association with size of place was found.

7. Differences in operationalization of the measure of educational attainment complicated analysis of this variable. The black population of 1970, however, appeared to conform more closely to the slight positive gradient along

the size of place continuum observed in 1950 than did the whole population.

8. In both 1950 and 1970 the proportion of white-collar workers was directly associated with size of place.

9. The two studies concurred in regard to the proportions of white professionals--the correlation with size of place was positive for males and negative for females. Among black professionals, the distribution of both males and females was directly associated with size of place, in contrast to the negative association for black females observed in 1950.

10. Among clerical workers in 1970, only black males did not conform to the direct association with size of place found in 1950.

11. Among blue-collar workers in 1970, white males and females and black females conformed to the negative correlation with size of place found in 1950, but black males did not.

12. In both 1950 and 1970, the percentage of the labor force in farming occupations was inversely related to size of place.

13. The strong positive relationship between income and size of place in 1950 was not consistently found in 1970, but this may be attributed to differences in operationalization of this variable.

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THE PROBLEM AND ITS BACKGROUND

The purpose of the present study is to examine the social characteristics of Michigan communities, classified by size, in 1970. Insofar as possible, this study will replicate portions of the census monograph, Social Characteristics of Urban and Rural Communities, 1950, by Otis D. Duncan and Albert J. Reiss, Jr.[1] Although the present study is in essence a replication of a national study in a single state, certain minor adjustments in the Duncan and Reiss procedures have been made. Size-class categories and the operationalization of certain social characteristics, for instance, have been modified.

Although it is probably a "matter of common knowledge," as Hawley claims,[2] "that as the size of the social aggregate increases the behavior of its members changes," empirical research on the social characteristics associated with community size is relatively new. The emergent American interest in population size and density can be traced to the Chicago school of the 1920's and 1930's. Such works

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[1] Otis D. Duncan and Albert J. Reiss, Jr., Social Characteristics of Urban and Rural Communities, 1950, New York: John Wiley & Sons, 1956.

[2] Amos Hawley, Human Ecology: A Theory of Community Structure, New York: The Ronald Press, 1950, p. 122.

as Zorbaugh's The Gold Coast and the Slum[3] and Thomas and Znaniecki's The Polish Peasant in Europe and America[4] reveal a nostalgia for the gemeinschaft values of village life which they felt were being destroyed by the increased individualism, heterogeneity, and mobility associated with urban living.

The very distinction between urban and rural is basically one of size and density. Wirth described the city as "a relatively large, dense, and permanent settlement of socially heterogeneous individuals,"[5] while Redfield saw the rural village as "small, isolated, nonliterate, and homogeneous, with a strong sense of group solidarity."[6] Social characteristics are here associated with population size, but the range of differences seems to be restricted to extremes on the rural-urban continuum.

A crucial element in the definition of "urban" by the United States Bureau of the Census is any incorporated place with a population of 2,500 or more. Yet the obvious contrasts between a town of 2,500 and a city of 2,500,000

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[3]Harvey W. Zorbaugh, The Gold Coast and the Slum, Second ed., New York: Knopf, 1927.

[4]W. I. Thomas and Florian Znaniecki, The Polish Peasant in Europe and America, Chicago: University of Chicago Press, 1929.

[5]Louis Wirth, "Urbanism as a Way of Life," American Journal of Sociology, 44 (1938), 5.

[6]Robert Redfield, "The Folk Society," American Journal of Sociology, 52 (1947), 293.

are so great that one would expect to find differing social characteristics within urban categories of differing sizes. Differences among urban places of different sizes are probably as significant as the difference between the urban and the rural populations.

Ogburn and Duncan suggest that the larger the city the more likely it is to include within its population deviations from the normal or average.[7] In the same vein of reasoning, the larger the city, the greater the number of potentially different occupations, or ecological niches, to be filled. A city's size may be considered an index of the extensiveness of its division of labor and the complexity of its social organization. With increased size there is greater status/role differentiation, and a more complex pattern of relationships among the individual unit parts arises.

On the basis of this reasoning, I would hypothesize that the characteristics of population will vary as the size of place varies. Hence, it is logical to use size of place as an independent variable in a study of this nature.

Differences in cities of various sizes, however, do not preclude similarities nor should their existence be disregarded by the social researcher. If, for instance, median

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[7]William F. Ogburn and Otis D. Duncan, "City Size as a Sociological Variable," Urban Sociology, edited by Ernest W. Burgess and Donald J. Bogue (Chicago: University of Chicago Press, 1967), p. 70.

educational attainment or median family income is the same in cities of 50,000 as in a city of 1,000,000, there would be no change anticipated in these characteristics if the population of the city of 1,000,000 all lived in cities of 50,000. Such hypothetical questions are an integral part of investigating the possibility or desirability of population distribution policy. Is anything gained by heavy concentrations of population in urban areas that could not be found in carefully planned, smaller, more widely dispersed population centers?

The proper experimental design for empirically investigating the effect of size, then, is to consider population size as the independent variable with various social characteristics of different sized places as dependent variables. The first important systematic study of differentials in the composition and organization of communities according to size was Ogburn's Social Characteristics of Cities,[8] which describes differences in various demographic, social, economic and organizational characteristics according to city size.

The most exhaustive work of this type, however, is the previously mentioned census monograph by Duncan and Reiss, who used four independent variables in their study of the 1950 U.S. population: 1) size of community;

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[8]William F. Ogburn, Social Characteristics of Cities, Chicago: International City Managers' Association, 1937.

2) spatial organization; 3) community growth and decline; and 4) functional specialization of communities. A replication of this study was done by Schnore[9] who examined selected characteristics of "urbanized areas" and "other urban areas" (both operationalized in specific demographic and ecological terms by the United States Bureau of the Census). He compared the findings of Duncan and Reiss concerning characteristics of urban areas by size in 1950 with the same characteristics in 1960. Although population density declined in all urban size classes over the decade, Schnore found that a positive association between size and density persisted, and that in both 1950 and 1960, the larger the size, a) the larger the proportion of "minority" population, and b) the higher the average socio-economic status (especially as measured by income). Schnore also noted that the inverse relationship between size of place and fertility found in 1950 was so greatly reduced as to be nonexistent.

The most recent study concerning size and social characteristics is that by Fuguitt and Field[10] who used community size, location, and growth as independent

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[9]Leo F. Schnore, "Some Correlates of Urban Size: A Replication," American Journal of Sociology, 60 (1963), 185-193.

[10]Glenn V. Fuguitt and Donald R. Field, "Some Population Characteristics of Villages Differentiated by Size, Location, and Growth," Demography, 9 (1972), 295-308.

variables in their analysis of social characteristics of all incorporated centers having 2,500 people or less in 1950 and located outside 1960 Standard Metropolitan Statistical Areas in Wisconsin. This study has limited relevance for us since a narrow sector of the size spectrum is explored.

Although Duncan and Reiss caution that they did not attempt to develop a theory of community structure to explain the correlates of community size, they do suggest that most of the data can be synthesized and

> . . . tentatively systematized in terms of three complexes of factors calculated to produce a pattern of variation in characteristics of communities according to size. These are: 1) persistent currents of selective migration; 2) family organization and functions; 3) economic structure and functions.[11]

Reasoning that present differences in race, nativity, age and sex composition among American communities of different size were produced in part by historical movements of people, Duncan and Reiss infer persistent currents of selective migration. They analyze the following variables: sex ratio, median age, age distribution, fertility rate, dependency ratio, race-nativity distribution, percentage urban of race-nativity groups, age distribution of race-nativity groups, sex ratios of race-nativity groups, rates of in-migration by age, movement from farms, and characteristics of movers.

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[11]Duncan and Reiss, op. cit., p. 3.

Indicators of the second complex used by Duncan and Reiss include the variables, age at marriage, marital status, age-standardized comparisons of marital status, and number of separated persons because generally speaking, the larger the community the smaller is the proportion of married and the greater are the indicators of family disruption.

The third major complex of factors is operationalized by education, labor force participation, unemployment, occupation, and income. These variables are grouped on the basis of the observation that the growth of cities has been accompanied by rising socio-economic levels and improving educational opportunities.

DATA AND PROCEDURES

Data from the 1970 census tapes for Michigan were programmed to aggregate characteristics by size of place. The size of place categories used, from largest to smallest, were: 1) Detroit; 2) places of 100,000 to 500,000 population; 3) places of 50,000 to 99,999 population; 4) places of 25,000 to 49,999 population; 5) places of 10,000 to 24,999 population; 6) places of 5,000 to 9,999 population; 7) places of 2,500 to 4,999 population; 8) Other urban territory; and 9) Rural population.

These categories differ from those size of place categories employed by Duncan and Reiss in Part I of their monograph, which were: 1) Urbanized areas of 3,000,000 or more; 2) Urbanized areas of 1,000,000 to 3,000,000; 3) Urbanized areas of 250,000 to 1,000,000; 4) Urbanized areas of less than 250,000; 5) Urban places outside urbanized areas of 25,000 or more; 6) Urban places outside urbanized areas of 10,000 to 25,000; 7) Urban places outside urbanized areas of 2,500 to 10,000; 8) Villages (incorporated and unincorporated) of 1,000 to 2,500; 9) Villages (incorporated only) of less than 1,000; 10) Other rural, nonfarm; 11) Other rural, farm.

In the Duncan and Reiss breakdown, the distinction between central cities and "fringes" of urbanized areas is disregarded. Such is not the case, however, in the present study. Since Detroit is nearly ten times as large as the next largest city, Flint, it was placed in a category of its own and the other nine Michigan cities which are central cities of urbanized areas were categorized according to the size of the city itself.

Since, according to the Bureau of the Census, "each urbanized area also includes (in addition to the central city) the surrounding closely settled incorporated places and unincorporated areas that comprise its urban fringe,"[12] the categorizing procedure of the present study left a residual category consisting of the fringes of urbanized areas and referred to as "other urban territory." In our analysis, data for this category were omitted due to its heterogeneous character.

The social characteristics used in the present study were: 1) Age distribution; 2) Sex ratio; 3) Fertility ratio; 4) Dependency ratio; 5) Education; 6) Occupation; and 7) Income. The first four of these variables reflect the first complex of factors suggested by Duncan and Reiss--persistent currents of selective migration--and the other

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[12] 1950 Census of Population, Vol. IV, Special Reports, Part 5, Chapter A, "Characteristics by Size of Place," p. 6.

three are reflections of the third complex--economic structure and functions. The specific form or operationalization of these variables was:

1. Age distribution
    a. Young--percentage 0-19
    b. Middle-aged--percentage 30-49
    c. Aged--percentage 65 and over
2. Sex ratio--males per 100 females
3. Fertility ratio--children 0-4 per 1,000 women 15-45
4. Dependency ratio--children 0-19 plus aged people 65 and over per 100 adults 20-64
5. Education--percent of the population 25 and over in three categories according to number of years of school completed:
    a. 0-6
    b. 7-11
    c. 12 or more
6. Occupation--percentage of the labor force in three broad occupational categories plus the percentage of the labor force in two specific white-collar occupations:
    a. White-collar
        1. Professional
        2. Clerical occupations
    b. Blue-collar
    c. Farming
7. Income--percentage of the population in four annual family income categories:
    a. 0-$4,999
    b. $5,000-$9,999
    c. $10,000-$14,999
    d. $15,000 and over

An initial set of tables was constructed to quantify the relationships between size of place and each of the variables considered by showing the percentage of the

population in each of the appropriate categories. Percentages were computed not only for the total population but also for whites, blacks, and other races, and, where appropriate, males and females. The "other races" category was later deleted from the tables since it constitutes a very small percentage of the population especially in certain size categories, and since it is not a homogeneous group, consisting mainly of Asians in urban areas and American Indians in rural areas.

To facilitate analysis of the data, a second set of tables was constructed by converting the percentages into ranks of one to eight (highest to lowest percentage). Hence, the tables show the ranking of each size of place category in the distribution of each of the socio-demographic characteristics used as dependent variables. A Spearman rank correlation coefficient, r_s, was then calculated using the ranks as paired measurements of the independent variable, x, and the dependent variable, y. Thus,[13]

$$r_s = 1 - \frac{6 \Sigma d_i^2}{n(n^2-1)} \quad , \quad \text{where } d_i = x_i - y_i$$

Since the first set of tables is not included in this thesis, the use of the ranks rather than the percentages on which they are based results in the loss of some

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[13]William Mendenhall, Introduction to Probability and Statistics, Third edition. Belmont, Calif.: Duxbury Press, 1971, p. 389.

information. To compensate for this, each table includes the range of the original percentages as well as a mean for the entire state, (including "other urban territory" not included in the ranked table categories).

THE DUNCAN AND REISS FINDINGS AND HYPOTHESES DERIVED FROM THEM

The hypotheses of the present study are based on those findings of Duncan and Reiss which pertain to the seven social characteristics under consideration. For each characteristic, hypotheses were formulated concerning the white population and the black population. Although not discussed in the present study, findings regarding the total population, in addition to the black and white, are included in the tables.

1. Age Distribution

a. White population.--Duncan and Reiss found that the proportion of the white United States population in 1950 aged 0-14 varied inversely with size of place, the gradient being relatively regular with the exception of several minor irregularities for some of the urban areas. Proportions of the population in the middle age groups tended to vary directly with size. In fact, disproportionate numbers in the middle age groups tended to give larger communities a higher median age than smaller communities. The proportion of the population aged 65 and over, like the proportion 0-19, varied inversely with size of place, the

gradient extending from urbanized areas to incorporated places of under 1,000, but not through the "other rural" categories, where the lowest percentage of aged persons was found.

The course of the birthrate, and especially the declining rate of the last ten years, undoubtedly will have produced changes in the age structure of individual communities in Michigan. But there is little reason to expect that variations by size of place in 1970 should not be similar to those in 1950.

Hence, it is hypothesized that the proportion of the 1970 Michigan white population in the younger and older age groups will vary inversely with size of place, while the proportion in the middle age groups will vary directly with size of place.

b. Black population.--In 1950, the proportion of young Negroes in the total Negro population rose from a low in the large urban places to a high in the rural places. In the urbanized areas of 3 million or more only 40 per cent of the Negro population was under 25, while 60 per cent was under 25 in the "other rural-farm" population, with a regular gradient between the two. Since Duncan and Reiss were considering the entire United States, these percentages were undoubtedly heavily influenced by the high concentration of Negroes in the rural south at that time.

In addition, Schnore found that the 1960 proportions of nonwhites in the total population outside the South were generally higher than in 1950, and that there was a more evident direct relationship between the proportions and size of place. Since the majority of Michigan's blacks live in Detroit or other large urban places, a relationship opposite that found by Duncan and Reiss is hypothesized for Michigan in 1970. Hence, it is hypothesized that the percentage of the Negro population in the younger age groups will be directly related to size of place.

One of the stronger direct relationships found by Duncan and Reiss was that between size of place and the percentage of the Negro population in the middle age groups. Applying the Spearman rank correlation to the data in Table 12 by Duncan and Reiss yields a correlation of over 0.99. Therefore, it is hypothesized that a direct relationship will be found between size of place and the percentage of Michigan black population in the middle-aged groups.

Duncan and Reiss found the proportion of Negroes 65 and over in the small villages to be greater than the proportion in the "other rural" areas, and more than twice as great as in the large urbanized areas. Since this was also the case for the native white population, it is possible that this finding will hold true for the Michigan black population of 1970. Hence, it is hypothesized that the proportion of the black population 65 and over will be

inversely related to size of place. In particular, it is expected that the proportion of older blacks in villages of 2,500-4,999 will be larger than in rural areas and will be much larger than in Detroit and other urban places.

2. Sex Ratio

a. White population.--Duncan and Reiss found little variation in the sex ratio by size of place for the entire United States in 1950, with two exceptions: 1) the sex ratio of the native white population, particularly those aged 65 and over, was inversely related to size; and 2) high values were observed in the "other rural-nonfarm" category, reasoned to be at least partially explained by a high percentage of institutionalized population, particularly the Armed Forces.

The effect of these factors may well produce the same sex ratio pattern in Michigan. The rural areas and the Upper Peninsula in particular are predominantly native white and contain an older-aged population. The Upper Peninsula, for example, is the site of two Air Force bases, two educational institutions with a high percentage of male students, and several mining companies with a high proportion of male employees. In view of these facts, it is hypothesized that the white sex ratio will vary inversely with size of place.

b. Black population.--In 1950, the Negro population had the lowest sex ratios of all groups (total population, white, Negro, and other nonwhites), being around 89 in all the urban areas but rising over 100 in the rural areas. In the absence of data about the nature of the distribution by sex of Michigan's black population along the size of place continuum, a similar finding is hypothesized for the present study. That is, Negro sex ratios will be inversely related to size of place (and will be lower than those of whites).

3. Fertility Ratio

a. White population.--The fertility ratio was inversely related to size of place in 1950, a smooth gradient exhibited in the fertility ratios all along the size of place scale. As mentioned above, Schnore found that this relationship had been greatly modified by 1960. His investigation, however, focused on urban areas whereas the present study treats the entire size spectrum for the state of Michigan. Therefore, on the assumption that the population of Michigan as a whole in 1970 is more like the U.S. Population in 1950 than the population of urban areas only in 1960, an inverse relationship between size of place and fertility ratio is hypothesized for the 1970 white population of Michigan.

b. Black population.--Marked variation in the relation between fertility ratio and size of place occurred

in the nonwhite population of the South, but this racial breakdown for the North Central Region was not made in the 1950 study. Marked variation from the indirect relationship observed for the entire U.S., however, would indicate at least some high fertility ratios in urban areas, where most of Michigan's black population is found. Again referring to Schnore's finding, it is assumed that the black population of Michigan in 1970 is more like that of urban areas in 1960 than like that of the entire U.S. in 1950. Hence, a very slight indirect relationship between size of place and fertility ratio is hypothesized for Michigan blacks in 1970.

4. Dependency Ratio

a. White population.--Duncan and Reiss found that the dependency ratio for the largest urbanized areas of the United States was 56 and rose steadily as size of place decreased, reaching a value of 92 in the small villages. The "other rural" category did not fit the pattern perfectly, but even so the dependency ratios for this category were higher than for any of the urban size categories. This latter finding is not easily attributable to a single demographic explanation, but persistent out-migration from rural areas, as has characterized Michigan over the last twenty years, would seem to be of major importance in producing an inverse relationship between size of place and dependency

ratio. Hence, it is hypothesized that the dependency ratio of the Michigan white population of 1970, even in the rural areas, will correspond closely to the indirect relationship with size of place observed in 1950.

b. Black population.--Duncan and Reiss did not consider dependency ratio by race, except in the South, where ratios for nonwhites were consistently higher than those for whites and where an even more marked inverse relationship with size of place was observed. In view of the fact that a very small proportion of Michigan's blacks currently reside outside of the larger urban areas, however, such a regular gradient is not expected for Michigan. Therefore, it is hypothesized that a weak positive relationship will be found between the dependency ratio of Michigan's black population in 1970 and size of place.

5. Education

a. White population.--For the white population in 1950, there was little systematic variation in education by size among urban places. The median number of school years completed, however, was higher in urbanized areas and other urban areas than in villages, and higher, in turn, in the villages than in the "other rural" areas.

It would seem reasonable to expect that general educational improvements over the last twenty years will have lessened differences in educational attainment by size

of place but that those differences which do occur among the white population will correspond with the relationship observed by Duncan and Reiss. Therefore, a direct (but not strong) relationship is expected between number of school years completed and size of place for Michigan's white population.

b. Black population.--Among the nonwhite population there was a direct relationship between education and size of place for the United States as a whole, but there was only a suggestion of a gradient over the urban range in the North Central Region. This situation is consistent with the finding for the white population of the entire U.S. In view of this, little or no differences are expected in the median number of school years completed by Michigan blacks over the urban range. The median should be noticeably lower, however, in rural areas since there is undoubtedly a higher proportion of elderly blacks who have completed fewer years of schooling in rural areas than in urban ones. Therefore, a modest direct relationship is hypothesized between size of place and number of school years completed for the 1970 Michigan black population.

6. Occupation

a. White population.--The percentage of the U.S. labor force in white-collar occupations in 1950 varied

directly with size of place while the percentage employed in blue-collar and farm occupations varied inversely with size of place. The next strongest relationship to size of place was found among clerical and kindred workers, where the percentage of the labor force in those occupations varied directly with size. The relationship of males in professions to size of place was direct, while that for females was inverse.

Since Michigan's economy is based mainly on manufacturing industries located in urban areas, it is hypothesized that the percentage of the white labor force in white-collar occupations and in clerical and kindred occupations will vary directly with size of place. On the basis of the Duncan and Reiss findings, the percentage of the male labor force in professions is expected to have a direct relationship to size of place while that of females to have an indirect one. The percentage of the white population of Michigan engaged in farming and blue-collar occupations is hypothesized to vary inversely with size.

b. Black population.--Duncan and Reiss found the degree of dissimilarity between white and nonwhite male occupation distributions to be relatively low for the rural-farm and for the largest urban populations, but higher for the intermediate size categories. The similarity of the distributions found in rural areas can no doubt be

attributed to the inclusion of the South, where a large proportion of the Negro population was found in rural areas.

Differences in the occupational distributions of white and blacks vis-a-vis the size of place patterns may appear for Michigan in 1970, but on the basis of the Duncan and Reiss findings, it is hypothesized that the above-mentioned relationships between occupation distribution and size of place for whites will be found among blacks as well. Therefore, it is hypothesized that the percentage of the black labor force in white-collar occupations, professions (with the exception of females) and in clerical and kindred occupations will vary directly with size of place, but that the percentage of the Michigan black labor force engaged in farming and blue-collar occupations in 1970 will vary inversely with size of place.

7. Income

a. White population.--A direct relationship between size of place and median cash income was evident in 1950 for the total U.S. population as well as for subgroupings by sex, age and color. Differences by size of place persisted even when adjustment was made for differences in occupation distribution or in education.

In view of these pronounced direct relationships, a direct association between size of place and income is hypothesized for the white Michigan population in 1970.

b. Black population.--A similar direct association between size of place and income is predicted for the 1970 black population of Michigan.

FINDINGS

Table 1 shows the rank of the percentages of the total, white and black populations, male and female, aged 0-14 in eight size of place categories. As hypothesized, the percentage of the white Michigan population of 1970 in the young age groups varies inversely with size of place. Table 1 also indicates that the expected high positive correlation between size of place and the percentage of the black population in the younger age groups is found for males but not for females, for whom a negative relationship is indicated.

The anticipated positive relationship between size of place and percentage of the white population in the middle age groups is not strongly confirmed, the rank correlation being 0.05 for males and 0.00 for females (see Table 2). Nor is the relationship between size of place and the percentage of the Michigan black population in the middle age groups as striking as the nearly perfect positive rank correlation found by Duncan and Reiss in 1950.

As hypothesized, the percentage of the white population aged 65 and over varies inversely with size of place for males but varies directly for females (see Table 3). Among the blacks 65 and over, the expected negative

Table 1. Percent of the population aged 0-14 ranked from high to low by size of place, race, and sex, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	7	8	5	8	8	7
100,000 - 500,000	2	4	1	3	5	3
50,000 - 99,999	3	3	2	2	2	5
25,000 - 49,999	8	7	4	7	7	6
10,000 - 24,999	5.5	6	3	6	6	4
5,000 - 9,999	5.5	5	6	5	4	2
2,500 - 4,999	4	2	7	4	3	1
Rural	1	1	8	1	1	8
Mean*	31.78	31.25	36.07	29.40	28.85	33.68
Spearman Rank Correlation	-0.31	-0.64	+0.74	-0.42	-0.64	-0.16
Range	33.3-28.3	33.4-23.5	41.5-25.9	31.8-25.8	31.8-20.6	42.1-31.6

*Includes "urban territory" not included in size of place categories.

Table 2. Percent of the population aged 30-49 ranked from high to low by size of place, race, and sex, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	8	8	2	8	8	1
100,000 - 500,000	1.5	1.5	1	2	2	4
50,000 - 99,999	1.5	1.5	4	1	1	6
25,000 - 49,999	7	6.5	7	6	6	3
10,000 - 24,999	6	3	5	4	4	2
5,000 - 9,999	4	6.5	6	5	5	5
2,500 - 4,999	4	4.5	8	7	7	7
Rural	4	4.5	3	3	3	8
Mean*	22.78	22.92	21.55	22.85	22.83	22.83
Spearman Rank Correlation	-0.07	+0.05	+0.55	0.00	0.00	+0.72
Range	23.6-21.0	23.8-20.1	22.2-16.9	23.3-21.5	23.4-19.8	21.8-18.7

*Includes "urban territory" not included in size of place categories.

Table 3. Percent of the population aged 65 and over ranked from high to low, by size of place, race, and sex, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	1	1	2	1	1	3
100,000 - 500,000	6	5	7	5	4	7
50,000 - 99,999	8	8	6	8	8	6
25,000 - 49,999	7	7	4	6	6	4
10,000 - 24,999	5	6	3	4	5	5
5,000 - 9,999	4	4	5	3	2	2
2,500 - 4,999	2	2	8	2	3	8
Rural	3	3	1	7	7	1
Mean*	7.55	7.81	5.51	9.43	9.88	6.09
Spearman Rank Correlation	-0.23	-0.16	-0.07	+0.12	+0.22	-0.23
Range	10.6-5.2	14.3-5.4	9.3-3.0	12.4-7.2	17.3-7.5	12.8-3.3

*Includes "urban territory" not included in size of place categories.

correlation is found but a different ranking pattern emerges. For both males and females, villages of 2,500 to 4,999 have the lowest percentage of blacks 65 and over, and rural areas have the highest.

Table 4 shows that the anticipated inverse relationship between size of place and the sex ratio of the white Michigan population in 1970 is confirmed. So also is the hypothesized inverse relationship with the black population. Negro sex ratios, however, are not consistently lower than white ones. In fact, in all size of place categories under 25,000, they are higher.

Ranking fertility ratios of the white Michigan population from high to low, by size of place, yields an expected negative correlation (-0.52), but it is not as significant as the perfect negative correlation found by Duncan and Reiss for the total United States population in 1950. Contrary to expectation, black fertility ratios in Michigan, 1970, are also negatively correlated with size of place, the highest one being found in small urban places of 2,500-4,999 (see Table 5).

The pattern of the relationship between size of place and dependency ratios among the white population strongly confirms the expected inverse relationship. The rank correlation is -0.92, with the highest dependency ratio in rural areas and the lowest in Detroit (see Table 6). The expected finding of a slight positive correlation between

Table 4. Sex ratio ranked from high to low, by size of place and race, Michigan, 1970.

Size of Place	Population		
	Total	White	Black
Detroit	8	8	7
100,000 - 500,000	6	6	5
50,000 - 99,999	3	2	6
25,000 - 49,999	7	7	8
10,000 - 24,999	5	5	4
5,000 - 9,999	2	3	3
2,500 - 4,999	4	4	2
Rural	1	1	1
Mean*	96.0	96.4	93.5
Spearman Rank Correlation	-0.76	-0.69	-0.83
Range	100.9-91.9	100.6-91.9	129.8-90.0

*Includes "urban territory" not included in size of place categories.

Table 5. Fertility ratio ranked from high to low, by size of place and race, Michigan, 1970.

Size of Place	Population		
	Total	White	Black
Detroit	4	6	6
100,000 - 500,000	3	3	3
50,000 - 99,999	6	5	4
25,000 - 49,999	8	8	8
10,000 - 24,999	7	7	7
5,000 - 9,999	5	4	2
2,500 - 4,999	2	2	1
Rural	1	1	5
Mean*	430.468	421.199	499.335
Spearman Rank Correlation	-0.35	-0.52	-0.28
Range	462.4-379.3	461.8-370.9	741.4-467.8

*Includes "urban territory" not included in size of place categories.

Table 6. Dependency ratio ranked from high to low, by size of place and race, Michigan, 1970.

Size of Place	Population		
	Total	White	Black
Detroit	7	8	7
100,000 - 500,000	5	5	3
50,000 - 99,999	8	7	4
25,000 - 49,999	6	6	5
10,000 - 24,999	4	4	2
5,000 - 9,999	3	3	1
2,500 - 4,999	2	2	8
Rural	1	1	6
Mean*	95.88	94.86	104.96
Spearman Rank Correlation	-0.88	-0.92	+0.08
Range	103.5-90.0	103.5-85.1	125.7-89.3

*Includes "urban territory" not included in size of place categories.

size of place and dependency ratios for the Michigan black population in 1970 is also confirmed.

Table 7 shows that only the percentages of the white male Michigan population in 1970 completing zero to six years of schooling are positively correlated with size of place. The percentages completing both seven to eleven years and twelve years or more are negatively correlated with size of place, contrary to the hypothesis made regarding educational attainment in general. Among the white female population of Michigan, a high positive correlation (0.84) is shown between size of place and the percentage of the population completing zero to six years of schooling (see Table 8). A slight positive correlation is found for white females completing seven to eleven years and a negative correlation of -0.26 for those completing twelve years or more.

Among black males, both the percentages completing zero to six years and seven to eleven years show a correlation of -0.11 with size of place. The percentage of black males completing twelve years or more, however, is positively correlated with size of place. The same pattern is found among black females, but the correlations are stronger. For the percentage completing zero to six years, the correlation is -0.66, seven to eleven years is -0.50, and twelve years or more is 0.77.

Table 7. Percent of the male population in three educational categories according to number of school years completed ranked from high to low, by size of place and race, Michigan, 1970.

Size of Place	Total			White			Black		
	0-6	7-11	12+	0-6	7-11	12+	0-6	7-11	12+
Detroit	1	2	8	1	2	8	7	5	2
100,000 - 500,000	2.5	5	5	4	6	6	8	2	4
50,000 - 99,999	6	6	3	6.5	5	3	5	4	5
25,000 - 49,999	2.5	4	6	3	4	4	6	6	3
10,000 - 24,999	5	7	2	5	7	2	1	7	6
5,000 - 9,999	8	8	1	8	8	1	4	8	1
2,500 - 4,999	7	3	4	6.5	3	5	3	3	7
Rural	4	1	7	2	1	7	2	1	8
Mean*	8.61	40.23	51.16	7.29	39.56	53.15	20.43	46.63	32.94
Spearman Rank Correlation	+0.63	-0.09	-0.26	+0.32	-0.11	-0.23	-0.11	-0.11	+0.58
Range	15.4-5.5	45.4-34.5	59.9-40.3	12.7-5.2	45.2-34.4	60.5-44.2	26.5-18.9	50.2-39.7	36.8-24.4

*Includes "urban territory" not included in size of place categories.

Table 8. Percent of the female population in three educational categories according to number of school years completed ranked from high to low, by size of place and race, Michigan, 1970.

Size of Place	Total			White			Black		
	0-6	7-11	12+	0-6	7-11	12+	0-6	7-11	12+
Detroit	1	1	8	1	1	8	6	8	1
100,000 - 500,000	3	4	5	3	5	5	8	3	3
50,000 - 99,999	5	6	3	4.5	6	3	3	7	4
25,000 - 49,999	2	3	6	2	4	6	7	6	2
10,000 - 24,999	4	7	2	4.5	7	2	4	2	7
5,000 - 9,999	8	8	1	8	8	1	2	4	6
2,500 - 4,999	7	5	4	6.5	3	4	5	1	8
Rural	6	2	7	6.5	2	7	1	5	5
Mean*	7.24	38.52	54.24	6.39	37.60	56.01	14.51	46.97	38.52
Spearman Rank Correlation	+0.79	+0.27	-0.26	+0.84	+0.08	-0.26	-0.66	-0.50	+0.77
Range	13.4-4.8	43.5-33.9	61.2-43.1	13.0-4.5	42.1-33.7	61.8-45.1	19.6-12.9	58.4-46.1	39.8-26.0

*Includes "urban territory" not included in size of place categories.

As hypothesized, the percentage of the white labor force in white-collar occupations does vary directly with size of place. In fact, the correlation between size of place and percentage of the white female labor force in white-collar occupations is 0.92 (see Table 9).

The same pattern is seen in the percentage of the black labor force engaged in white-collar occupations--a direct relationship to size of place with a stronger correlation for females than for males.

Table 10 shows that the across-the-board direct relationship to size of place among white-collar occupations in general does not hold for professional occupations. While moderate correlations in the 0.40's are observed for white males and black females, a low correlation (0.12) exists between size of place and the percentage of the black male labor force in professional occupations. For white females, an inverse relationship is found, in contrast to the 0.92 correlation between white females in white-collar occupations and size of place.

The only perfect correlation found in the present data between size of place and ranking of the various social characteristics considered is for white males in clerical occupations (see Table 11). This confirms the hypothesized direct relationship. The correlation for white females is similarly high (0.92).

Table 9. Percent of labor force in white-collar occupations ranked from high to low, by size of place, sex, and race, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	7	7	2	6	2	1
100,000 - 500,000	5	4	7	3	3	5
50,000 - 99,999	2	2	4	1	1	3
25,000 - 49,999	4	4	1	2	4	2
10,000 - 24,999	1	1	8	4	5	4
5,000 - 9,999	3	4	5	5	6	6
2,500 - 4,999	6	6	6	7	7	8
Rural	8	8	3	8	8	7
Mean*	34.30	36.20	16.51	58.10	60.40	45.12
Spearman Rank Correlation	+0.15	+0.27	+0.15	+0.58	+0.92	+0.83
Range	43.3-26.9	44.5-27.0	18.6-12.4	68.5-53.2	70.1-53.5	49.9-8.8

*Includes "urban territory" not included in size of place categories.

Table 10. Percent of labor force in professional occupations ranked from high to low, by size of place, sex, and race, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	7	7	5	8	8	2
100,000 - 500,000	5	3	6	6	6	7
50,000 - 99,999	1	1	1	2	2	1
25,000 - 49,999	2	2	2	3	3	3
10,000 - 24,999	3	4	7	4	4	6
5,000 - 9,999	4	5	4	1	1	4
2,500 - 4,999	6	6	8	5	5	8
Rural	8	8	3	7	7	5
Mean*	13.63	14.39	5.28	15.21	15.65	11.22
Spearman Rank Correlation	+0.25	+0.43	+0.12	-0.16	-0.16	+0.46
Range	18.24-9.19	18.49-9.20	7.47-2.17	18.04-13.45	18.14-13.95	12.45-4.39

*Includes "urban territory" not included in size of place categories.

Table 11. Percent of labor force in clerical occupations ranked from high to low, by size of place, sex, and race, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	1	1	3	3	1	1
100,000 - 500,000	3	2	7	1	2	3
50,000 - 99,999	2	3	4	2	3	4
25,000 - 49,999	4	4	2	8	4	2
10,000 - 24,999	5	5	6	4	5	5
5,000 - 9,999	6	6	8	6	7	6
2,500 - 4,999	7	7	1	5	6	8
Rural	8	8	5	7	8	7
Mean*	6.72	6.76	6.39	35.20	36.19	28.29
Spearman Rank Correlation	+0.98	+1.00	0.00	+0.67	+0.98	+0.91
Range	8.56-4.84	9.40-4.84	8.07-3.78	20.04-12.95	42.86-29.78	31.56-1.95

*Includes "urban territory" not included in size of place categories.

Striking contrasts are observed, however, between blacks and whites and between black males and black females. A zero correlation indicates no relationship between size of place and the percentage of the black male labor force in clerical occupations. On the other hand, the 0.91 correlation for the black female population indicates a strong direct relationship to size of place. Therefore, the hypothesis is confirmed for black females but not for black males in clerical occupations.

In the case of blue-collar occupations (Table 12), the white labor force is negatively correlated with size of place and, among females, especially so (-0.92). The black male labor force in blue-collar occupations, contrary to prediction, is somewhat positively associated with size of place, but black females conformed to the hypothesized negative relationship.

As hypothesized, the percentage of the labor force in farm occupations is negatively correlated with size of place, especially among whites (see Table 13).

Although not as direct as the relationship found by Duncan and Reiss in 1950, there is a direct relationship between size of place and income in Michigan in 1970, as shown in Table 14. Among whites, the highest correlation is found between size of place and the percentage of the population earning $15,000 or more, as expected. The

Table 12. Percent of labor force in blue-collar occupations ranked from high to low, by size of place, sex, and race, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	1	2	6	3	7	8
100,000 - 500,000	4	4	2	6	6	3
50,000 - 99,999	7	7	5	8	8	6
25,000 - 49,999	5	5	7	7	5	7
10,000 - 24,999	8	8	1	5	4	4
5,000 - 9,999	6	6	4	4	3	5
2,500 - 4,999	3	3	3	2	2	1
Rural	2	1	8	1	1	2
Mean*	58.30	56.70	82.60	35.20	33.40	54.48
Spearman Rank Correlation	+0.03	-0.14	+0.12	-0.57	-0.92	-0.21
Range	43.3-26.9	65.5-55.2	87.5-79.3	68.5-53.2	70.1-53.5	91.2-50.1

*Includes "urban territory" not included in size of place categories.

Table 13. Percent of labor force in farm occupations ranked from high to low, by size of place, sex, and race, Michigan, 1970.

Size of Place	Male			Female		
	Total	White	Black	Total	White	Black
Detroit	7	7	4.5	7.5	8	6.5
100,000 - 500,000	7	7	7.5	7.5	6	6.5
50,000 - 99,999	7	7	4.5	5.5	6	6.5
25,000 - 49,999	4.5	4.5	4.5	3	3	3.5
10,000 - 24,999	4.5	4.5	4.5	5.5	6	3.5
5,000 - 9,999	3	3	2	3	3	2
2,500 - 4,999	2	2	7.5	3	3	6.5
Rural	1	1	1	1	1	1
Mean*	1.90	2.10	0.20	0.45	0.46	0.39
Spearman Rank Correlation	-0.91	-0.91	-0.31	-0.83	-0.78	-0.45
Range	7.5-0.1	7.5-0.1	5.6-0.0	1.5-0.0	1.5-0.0	1.6-0.0

*Includes "urban territory" not included in size of place categories.

Table 14. Percent of the total population in four annual family income categories ranked from high to low, by size of place and race, Michigan, 1970.

Size of Place	Total			
	$0-4,999	$5,000-9,999	$10,000-14,999	$15,000+
Detroit	1	4	8	7
100,000 - 500,000	7	6	3	3
50,000 - 99,999	8	8	1	1
25,000 - 49,999	5	7	2	4
10,000 - 24,999	6	5	5	2
5,000 - 9,999	4	2	7	5
2,500 - 4,999	3	3	4	6
Rural	2	1	6	8
Mean*	14.61	28.20	30.51	26.67
Spearman Rank Correlation	-0.28	-0.55	+0.15	+0.39
Range	19.9-10.1	33.6-23.4	33.7-27.7	32.8-19.1

*Includes "urban territory" not included in size of place categories.

White				Black			
$0-4,999	$5,000-9,999	$10,000-14,999	$15,000-+	$0-4,999	$5,000-9,999	$10,000-14,999	$15,000-+
2	4	6	5	7	7	4	1
7	7	3	2	6	3	5	6
8	8	1	1	5	6	2.5	3
6	6	2	4	4	5	6	2
5	5	4.5	3	3	8	2.5	4.5
4	2	8	6	1	2	7	8
3	3	4.5	7	8	1	1	4.5
1	1	7	8	2	4	8	7
13.20	27.54	31.24	28.00	26.91	33.91	24.19	14.96
-0.47	-0.71	+0.46	+0.72	-0.45	-0.47	+0.23	+0.63
17.3-9.1	33.6-22.9	34.3-19.2	33.8-19.2	36.3-10.8	45.4-33.2	30.9-17.5	15.8-3.5

lowest correlation is for those earning $5,000-$9,999. Intermediate figures are found for the 0-$4,999 group (-0.47) and those earning $10,000-$14,999 (0.46). The same pattern exists in the relationship of the income of the black population to size of place, but the correlations are less strong.

An overview of all variables under consideration is given in Table 15, which presents a summary of hypotheses, findings, and the extent of agreement with the Duncan and Reiss findings.

Of the 58 relationships considered, 41 hypotheses were confirmed and 17 were not confirmed. For 39 of the findings, there was agreement with Duncan and Reiss, for 17 there was not, and for the remaining two, direct comparisons were not possible.

One-half of the discrepancies concerned education and income, for which procedural differences in the two studies made comparisons difficult.

Table 15. Summary of hypotheses, findings, and extent of agreement with the Duncan and Reiss findings.

Variable	Hypothesized Relationship with Size of Place	Confirmation of Hypothesis	Agreement with Duncan and Reiss
Age			
Percent 0-14			
White	-		
Male		yes	yes
Female		yes	yes
Black	+		
Male		yes	no
Female		no	yes
Percent 30-49			
White	+		
Male		yes	yes
Female		no	no
Black	+		
Male		yes	yes
Female		yes	yes
Percent 65+			
White	-		
Male		yes	yes
Female		no	no
Black	-		
Male		yes	yes
Female		yes	yes
Sex ratio			
White	-	yes	yes
Black	-	yes	yes
Fertility ratio			
White	-	yes	yes
Black	-	yes	NA*
Dependency ratio			
White	-	yes	yes
Black	+	yes	NA*

Table 15. Continued.

Variable	Hypothesized Relationship with Size of Place	Confirmation of Hypothesis	Agreement with Duncan and Reiss
Education			
White	+		
Male			
0-6 years		yes	yes
7-11 years		no	no
12+ years		no	no
Female			
0-6 years		yes	yes
7-11 years		yes	yes
12+ years		yes	yes
Black	+		
Male			
0-6 years		no	no
7-11 years		no	no
12+ years		yes	yes
Female			
0-6 years		no	no
7-11 years		no	no
12+ years		yes	yes
Occupation			
White-Collar			
White	+		
Male		yes	yes
Female		yes	yes
Black	+		
Male		yes	yes
Female		yes	yes
Professionals			
White	+		
Male		yes	yes
Female	-	yes	yes
Black			
Male		yes	yes
Female	-	no	no
Clerical			
White	+		
Male		yes	yes
Female		yes	yes
Black	+		
Male		no	no
Female		yes	yes

Table 15. Continued.

Variable	Hypothesized Relationship with Size of Place	Confirmation of Hypothesis	Agreement with Duncan and Reiss
Occupation			
Blue-Collar			
White	-		
Male		yes	yes
Female		yes	yes
Black	-		
Male		no	no
Female		no	no
Farming			
White	-		
Male		yes	yes
Female		yes	yes
Black	-		
Male		yes	yes
Female		yes	yes
Income			
White	+		
0-$4,999		no	no**
5,000-9,999		no	no
10,000-14,999		no	yes
15,000+		yes	yes
Black	+		
0-$4,999		no	no**
5,000-9,999		no	no
10,000-14,999		yes	yes
15,000+		yes	yes

*Agreement with the Duncan and Reiss findings on fertility ratio and dependency ratio is not applicable because the only racial breakdown of these two variables that they did was for all nonwhites in the South.

**The fact that low incomes are negatively correlated with size of place could be interpreted as further confirmation of the strong direct relationship observed by Duncan and Reiss. The difficulty here is comparing the present data to those of Duncan and Reiss.

DISCUSSION OF FINDINGS

In any research, there is the danger of what Duncan and Reiss refer to as "overinterpretation" of the data.[14] This is a particularly applicable risk in the present study since correlates of size were inferred from a ranking of percentages rather than the percentages themselves. This procedure can result in a spuriously smooth gradient.

Another problem is that when data for several hundred individual places are consolidated into eight size-of-place categories, distinctions are masked in the process. For instance, there are six Michigan cities in the 100,000 to 500,000 category--Dearborn, Flint, Grand Rapids, Lansing, Livonia, and Warren. Some of these cities in reality are suburbs of larger metropolitan centers and some are metropolitan centers in their own right. Also, some are functionally specialized which implies differing socio-demographic characteristics. Investigation of these possibilities is, of course, made impossible by consolidation of the data.

Nevertheless, some mode of consolidating and categorizing is obviously necessary. The question is not

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[14] Duncan and Reiss, op. cit., p. 22.

whether to consolidate data but how to do so in the most meaningful fashion. As pointed out above, the frequently used rural-urban dichotomy would be unsatisfactory due to the heterogeneous populations in both rural and urban areas. Analysis by county is also sometimes inconclusive since counties represent artificial political boundaries and may not reflect natural boundaries nor constitute meaningful social systems.

It is recognized that analysis along a single dimension, such as size, slights others that are equally important, such as location. The scope of the present study, however, is limited to data regarding size. Some of the following conclusions, therefore, may require the test of additional research.

Attributes of the age-sex structure for whites and blacks in Michigan in 1970 were examined in relation to size of place. These attributes included proportions of young, middle-aged and aged, the sex ratio, fertility, and dependency. Hence, twelve relationships were explored since the white and black populations were considered separately. As mentioned previously, Duncan and Reiss regarded variation anticipated in this complex of factors to be due to persistent currents of selective migration. While selective migration is the most important force in producing variation, birth and death rates must not be discounted in producing some of the variation.

The extent of the agreement between the findings of the present study and those of Duncan and Reiss regarding variations in the age-sex structure by size of place is sufficient to indicate that basic relationships observed in 1950 for the entire U.S. population are found to hold true for Michigan in 1970.

There have been no major changes in the relationship of age distribution and sex ratio to size of place. Dependency ratio, among whites, still bears a marked inverse correlation with size of place. Fertility still is inversely correlated with size of place, but to a modified degree. Some changes, such as that regarding the fertility ratio and the direct association between dependency ratio and size of place among blacks, were anticipated on the basis of observed currents of selective migration over the last twenty years. In Michigan, as in the United States, movement of whites out of central cities into "suburbs" and movement of blacks from rural areas into central cities have produced changes in the population composition of all size of place categories, thereby altering the relationship of some demographic characteristics to size of place.

Two hypothesized relationships with size of place failed to conform to our expectations. The proportions of young blacks, directly related to size of place for males, proved inversely related to size of place in the case of

females. Similarly, the proportions of aged whites, inversely related to size of place for males, was found to be directly related for females.

Such an inconsistent finding is no doubt a statistical artifact produced either by the use of ranks rather than percentages or by the small black population, especially in the smaller size of place categories, upon which the calculations are based. The former is perhaps more likely because in most cases the percentage differences between black males and black females are small. Table 16 (see Appendix) shows the number of people in each size of place category, by sex and race.

The difference in the directions of the correlations of older white males and females with size of place is more readily explained by selective migration and differential mortality than is that between young black males and females. In addition, the difference in the correlations is not as great.

The patterns found for the middle-aged are interesting deviations from the Duncan and Reiss findings. In 1950, age-sex pyramids representative of the total United States population showed large numbers in the middle age groups, particularly on the female side. In 1970, there is no correlation between size of place and ranked percentage aged 30-49 for white females (as well as the total

female population). Among black females, however, there is a high positive correlation.

In this particular characteristic (the relationship of size of place to percentage of the population in the economically productive years), the black population of Michigan in 1970 is apparently more similar to the United States population of 1950 than is the white Michigan population of 1970. This is no doubt a reflection of the urbanization of the black population over the last twenty years and the concomitant suburbanization of the white population. Heavy concentration of whites in smaller cities which range in size from 10,000 to 100,000, strongly affects the nature of the association between size of place and age structure of the population. Even in 1950, Duncan and Reiss noted that, "the size factor can . . . be ruled out as an explanation of differences between suburbs and independent cities."[15]

A further reflection of patterns of movement by whites and blacks over the last twenty years is suggested by the fact that the highest proportions of older white males and females are found in Detroit, while among blacks the highest percentages of the population aged sixty-five and over are found at the other end of the scale, in rural areas. The migration reflected is that of younger people

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[15] Ibid., p. 6.

who have moved away, leaving a high proportion of older people.

The fact that sex ratios of Michigan blacks in 1970 are not consistently lower than those of whites, as they were in 1950, can be partly accounted for by the fact that the United States black population in 1950 was predominantly rural whereas the Michigan black population in 1970 is predominantly urban. However, as Duncan and Reiss cautioned, the high sex ratios of rural areas may be statistical artifacts to some extent since most institutionalized populations, which are often predominantly male, are found in rural areas.

Even so, the inverse correlation of sex ratio and size of place in Michigan, 1970, is not entirely a spurious one which can be explained away by institutionalized populations. Among whites, the lowest sex ratio is found in Detroit, and among blacks Detroit has the next to the lowest ratio with the other size of place categories approaching an incremental inverse relationship.

The hypothesis of a direct relationship between size of place and fertility ratio among Michigan blacks was apparently unfounded, although the relationship is less clearly inverse among blacks than among whites. These two facts are further indications that the size-of-place continuum is a more productive approach to socio-demographic analysis than is the simple rural-urban

dichotomy. For instance, lowest fertility ratios among both blacks and whites are found in places of 25,000 to 49,999 population. Although part of the urban classification, places of this size are probably more typically suburban-like than central cities, as might be connoted by the word "urban."

When, as in the present study, fertility ratios are computed for all women of a particular age, an additional influencing factor seems to be the sex ratio. A rank correlation computed between sex ratio and fertility ratio for the Michigan data yields a positive correlation of 0.62 for whites and 0.58 for blacks. Therefore, high fertility ratios are related, to some extent, to high sex ratios, which in turn are partially explainable by the economic character and occupational structure of the community.

Differences in dependency ratios are the result of differences in effective fertility and/or the proportion of aged. Rank correlations computed between dependency ratio and three other dependent variables in the present data yield the following: 1) rankings of dependency ratio by size of place are highly correlated with rankings of fertility ratio by size of place for whites (0.70) but not for blacks (0.00); 2) dependency ratio, however, is more highly correlated with proportion of the black population aged 0-14 (0.48 for males and 0.29 for females) than with

the proportion aged 65 and over (-0.04 for black males and 0.15 for black females); 3) dependency ratio among whites is also more highly correlated with proportion of the population aged 0-14 (0.70 for both males and females) than with the proportion aged 65 and over (0.34 for white males and 0.00 for white females).

Three measures of socio-economic status for whites and blacks in 1970 were examined in relation to size of place. These measures included number of school years completed; percentage of the labor force in white-collar, blue-collar, farming, professional, and clerical occupations; and annual family income. Hence, twenty-five relationships were explored since the white and black populations were considered separately for all variables, as were the male and female populations for all variables except income. In the theoretical framework of Duncan and Reiss, these measures of socio-economic status are reflections of the economic structure and function of a community.

In general terms, there is some agreement between the Duncan and Reiss findings and those of the present study on all three of these measures. The greatest agreement is found in the percentage of the labor force in white-collar occupations, for which direct relationships to size of place emerged in all race-sex categories. According to Duncan and Reiss, the socio-economic status of the labor force is indicated by the percentage in

white-collar occupations.[16] Hence, we may conclude that relationships between the socio-economic indicators under consideration and size of place in Michigan, 1970, are not greatly different from what they were in the entire United States, 1950.

Even so, a number of findings concerning the economic structure were found to be contrary to what was hypothesized. For instance, the percentage of white males completing zero to six years of schooling conformed to the hypothesized direct relationship with size of place but but the percentages completing seven to eleven years and twelve years or more did not. This and several similar findings can be partly explained by differences in operationalization of the variables. When Duncan and Reiss analyzed the relationships between size of place and education, for example, they used median number of school years completed whereas the present study uses percentage of the population in three educational categories based on number of school years completed. When one general hypothesis based on a prior study is made regarding the relationship between size of place and a certain variable, such as education, but the data refer to specific educational levels, it is inevitable that the findings will differ in the extent to which they conform to the hypothesis.

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[16] Ibid., p. 37.

due to the scaled nature of the size of place continuum. Such findings, therefore, can be more meaningfully analyzed on an individual basis, rather than in general terms of agreement or disagreement with the hypothesis.

Among white males, the highest percentages completing 0-6 years and 7-11 years of schooling are found in Detroit and the rural areas, whereas the lowest percentages completing twelve years or more are found in Detroit and the rural areas. Thus, the middle range size of place categories have the highest median educational attainment. This is not entirely true for black males because the second highest percentage completing twelve years or more is found in Detroit, further suggesting that the suburban movement of blacks is lagging behind that of whites. Parallel conclusions can be drawn regarding the pattern of educational attainment for females, especially among blacks.

The distribution of the percentage of the labor force in white-collar occupations is similar to educational attainment, particularly among males. In the 1950's, Duncan and Reiss stated,

> A high proportion of white-collar employment may . . . be a factor favoring community growth, since the white-collar occupations have been increasing more rapidly than the manual occupations. A community prepared to expand its white-collar employment probably has a better chance to grow than one whose economic base does not require much white-collar work.[17]

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[17] Ibid., p. 9.

If this holds true for Michigan, communities in the middle size range (10,000 to 500,000) conceivably have the potential for growth related to expansion of white-collar occupations. By the same token, the black population of Detroit can be expected to grow due to the high percentage of both the male and female black labor forces in white-collar jobs there. The only anomaly is the fact that the third highest percentage of the black male labor force in white-collar occupations is found in rural areas. Since the "rural" classification, however, includes both farm and non-farm populations, it is heterogeneous, composed of village, rural-urban fringe, open country residents, and farm populations.

The upper echelons of the white-collar occupations, the professions, suggest a distribution of black professionals more like that of whites than is that of the whole black population. The highest percentage of the labor force in professions for all race and sex groups is found in communities of 50,000 to 99,999 (except for white females, where it is found in towns of 5,000 to 9,999), and for both male and female whites, the smallest percentages of the labor force in professions are found in Detroit and the rural areas. Deviation among blacks from the patterns just described can be accounted for by the nature of the distribution of the black population as already discussed.

It is unlikely that the high percentage of white women professionals found in places of 5,000 to 9,999 population indicates greater opportunity for professional women in small towns than in large cities. A better interpretation would be that there is a relative lack of occupational opportunity of any kind for women in communities of this size. Therefore, many women do not enter the labor force at all. Of those who do, a high percentage are professionals, perhaps teachers.

In the introduction to their monograph, Duncan and Reiss state, "Perhaps the proportion of clerical workers is the best single occupation indicator of the complexity of the division of labor."[18] If this is true, one more sign of a pervasive problem is encountered in the rank correlations for clerical occupations in Michigan. Of the sex-race groups under consideration, all but black males are very highly correlated with size of place. Perhaps these data may be construed as indicators of the chaotic job market existing for black males. Whatever increased occupational opportunity that might be implied along with the greater complexity of division of labor suggested by rising proportions of clerical workers does not seem to exist for black males. Interpretations are made difficult

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[18] Ibid., p. 5

when small numbers are involved, as in the case of black males in clerical occupations.

The majority of black males, of course, are found in blue-collar occupations. As might be assumed, the ranking of the percentage of the labor force in blue-collar occupations tends to reflect the reverse of the ranking of the percentage in white-collar occupations.

An interesting statistical artifact is again obtained concerning black males in blue-collar occupations. Even though the ranks themselves are essentially opposite, the rank correlations between size of place and both blue-collar and white-collar occupations are slightly positive due to the chance arrangement of the middle range ranks.

A final indicator of occupational distribution considered in the present study is the proportion of the labor force in farm occupations. The fact that such employment involves less than 2 per cent of Michigan's population further reveals the disparate nature of the rural population; many are employed in nearby towns at other than farm occupations.

Little explanation of the inverse relationship between size of place and percentage of the labor force in farming is necessary. In fact, this is one variable for which a rural-urban dichotomy might serve as an approach to analysis in view of the obvious inherent difficulties of farming in highly populated areas. For even though

strongly inverse relationships are obtained, there are many ties in the ranks of the percentages of the labor force in farming occupations, indicating that there is not a smooth gradient which decreases as size of place increases. But high percentages are clustered in rural areas and low percentages in urban areas.

In reviewing past trends and attempting to suggest possibilities for the future, it seems reasonably certain that distribution of white-collar occupations will have the far-reaching effects of the three major occupational groupings--white-collar, blue-collar, and farming. The percentage of the population in farming is so small as to be virtually negligible. Such a situation, however, could be interpreted as an indication that farming will move more and more toward agri-business, with large areas of land controlled by relatively few people.

Occupational expansion, then, will be either in white-collar areas or the blue-collar occupations other than farming. Since blue-collar jobs are more vulnerable to changes in technology than white-collar ones and since previous technological innovations have been accompanied by a concomitant increase in white-collar occupations, these occupations will undoubtedly take the lead in affecting other social characteristics of communities.

Regardless of possible effects of white-collar percentage on growth potential, there exists a quite apparent

relationship between occupational distribution by size of place and income distribution. For instance, among both white males and females, the lowest percentage of the labor force engaged in white-collar occupations is found in rural areas but the white population in rural areas has the highest percentage in the two lowest income groups. A similar situation exists for blacks.

Since the occupational distribution is seen to be related to the income distribution, perhaps the nature of the occupational distribution accounts for the fact that correlations between size of place and income are not as striking in the present study as those found by Duncan and Reiss. Another possible explanation is the use by Duncan and Reiss of more size of place categories than are here employed. Their breakdown of the "rural" category into "rural-farm" and "rural-nonfarm" would capture income differentials connected with farming that are not revealed in the present study.

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APPENDIX

Table 16. Total population in eight size of place categories by sex and race, Michigan, 1970.

Size of Place	Number of Places	Male			Female		
		Total*	White	Black	Total	White	Black
Detroit	1	723,672	402,768	316,200	750,106	438,269	344,324
100,000 - 500,000	6	443,989	399,333	43,012	472,117	424,253	45,830
50,000 - 99,999	14	525,015	491,309	30,780	549,045	513,058	32,899
25,000 - 49,999	23	417,351	381,656	33,374	445,622	406,128	37,073
10,000 - 24,999	44	342,562	363,937	20,012	363,937	345,225	21,064
5,000 - 9,999	58	199,578	193,614	4,987	208,498	202,808	4,627
2,500 - 4,999	86	147,638	146,183	907	156,642	155,095	744
Rural		1,165,263	1,143,961	17,314	1,154,643	1,136,966	13,344

*Includes whites, blacks, and all other nonwhites.

SOURCES OF ERROR

Statistics used in the present study were based on those recorded in the 1970 U.S. Census volume PC(1)-C24, General Social and Economic Characteristics, Michigan.[1] Data in this volume were derived from 15 per cent and 5 per cent sample questionnaires. Some items appearing on both sample questionnaires (occupation, for example) yielded a 20 per cent sample of the population.

Insofar as is possible to check, use of the 5 and 15 per cent samples for variables such as age distribution, sex ratio, fertility ratio, and dependency ratio rather than the 100 per cent sample (as recorded in the 1970 U.S. Census volume PC(1)-B24, General Population Characteristics, Michigan[2]) produced minimal error.

Comparing the numbers of the population enumerated in five-year age groups in the present study and the PC(1)-B24 volume for the state total, Detroit, and the six cities that comprise the 100,000 to 500,000 size of place category

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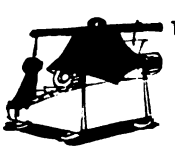
[1]U.S. Bureau of the Census, Census of the Population: 1970, General Social and Economic Characteristics, Final Report, PC(1)-C24, Michigan.

[2]U.S. Bureau of the Census, Census of Population 1970, General Population Characteristics, Final Report, PC(1)-B24, Michigan.

shows that the discrepancy is under 1 per cent in all cases except one--the state total black population aged 20-24, for whom the discrepancy is 3.5 per cent.

No means is available for checking the accuracy of data regarding the socio-economic characteristics--education, occupation, and income. Appendix C of volume PC(1)-C24 suggests that the chances are about 99 out of 100 that the difference (due to sampling variability) between the sample estimate and the figures that would have been obtained from a complete count of the population is less than 2-1/2 times the standard error. Table E of Appendix C lists factors of correction to be applied to the standard error. The highest correction factor suggested by the Census Bureau for variables used in the present study is that for occupation, 1.1.

In areas of small population, of course, any multiple of the standard error may produce errors that are relatively large. Since the aggregation of communities by size of place, however, produced only two populations (after breakdown by race and sex) smaller than 4,000, and since figures estimated for small populations are proportionately small, error due to estimation is minimized.



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