RESIDENTIAL DIFFERENTIALS IN FERTILITY, MICHIGAN 1960

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ABSTRACT

RESIDENTIAL DIFFERENTIALS IN FERTILITY

MICHIGAN 1960

By Yogini B. Thanawalla

The major concern of this thesis is with residential differentials in the number of children ever born per 1,000 white ever married women 15 to 44 years old. The study is based on the census of population of the United States in 1960 for the State of Michigan. A brief review of differential fertility from early 18th century constitutes the first part of the thesis. The second part tests the hypotheses.

General findings are as follows:

1. The fertility ratio in Michigan in 1960 was higher in rural-farm areas, intermediate in rural-nonfarm and lowest in the urban areas. This was also true for the age groups of women from 25 to 34 and from 35 to 44. The only exception was for the age-group of women 15 to 24 years of age.
2. Urban, rural-nonfarm and rural-farm areas of metropolitan areas of Michigan in 1960 had lower fertility ratios than the respective residence sections of non-metropolitan areas.
3. Residential differences in fertility were greater for metropolitan than for non-metropolitan areas of Michigan in 1960.

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Chapter 1 - Introduction

The Problem

The major concern of this thesis is residential differentials in the fertility of white married women. The study is restricted to the analysis of 1960 data for the State Economic Areas of Michigan. The first part of the study deals with the theoretical background which provides a basis for the hypotheses to be tested. The second part is an analysis of the data for three residential categories within metropolitan and non-metropolitan areas, and for three age groups of white married women.

The descriptive part of this study covers a review of some of the findings from studies dealing with differentials in fertility. Special emphasis is placed upon the so-called rural-urban differential in fertility. A section will be devoted to differential fertility in Michigan since 1940 in order to provide background data and to help in understanding current fertility differentials.

The analytical part of this study is concerned with differential fertility rates for different residential groups, by age of married white women, in Michigan for 1960. A comparison is made between the major categories - metropolitan and non-metropolitan State Economic Areas -- as a generalized control for the degree of urbanity. Differences are pointed out among SEA units for three age groups of white married women residing in rural-farm, rural-nonfarm and urban areas. The two major variables used, therefore, are residence and age group of women.

Rural-urban differentials in fertility seem to be prevalent in all parts of the world, and perhaps they could be detected from the time urban centers first appeared if the proper data were available. The rural-urban differential in fertility was the first of the differentials to be identified and for some time this emphasis was dominant in population studies. One can find residential differentials of considerable magnitude in the underdeveloped countries. In western countries, these differentials started to decline generally at least by the beginning of the 20th century. With increasing urbanization, disruption of traditional social organization, and mass communication, rural-urban differences to a considerable extent have been eliminated. T. Lynn Smith, among others, has pointed out this trend as well as the importance of the problem.[1]

Since diminishing fertility rates are directly related to the degree of urbanization, it is of interest to determine whether residential differentials exist in a state such as Michigan which has a large proportion of urban population and a high degree of interaction between rural and urban residents. Furthermore, change in the definition of rural-farm population in 1960 served to "upgrade" this segment of the population. The question arises as to whether earlier differentials still exist. Thus, the main emphasis in this thesis is on two questions: do residential differentials in fertility still exist and if so, what is their magnitude?

[1]Smith, T. Lynn, Fundamentals of Population Study, Chicago: J. B. Lippincott Company, 1960, p. 313.

Background of the Problem

The level of fertility has been studied in relation to many variables. Differentials in fertility in the United States have been examined for geographic divisions and regions, and comparisons have been made among states in these different divisions.[2] Thompson has observed that rural versus urban differentials in fertility are found in all regions of the United States and that the rural-farm population had higher birth rates than rural-nonfarm or urban populations. Furthermore size of the urban place is found to be inversely related to fertility. Differentials for cities of 250,000 or more, regardless of location in any of the regions, however, have largely disappeared.[3] This means that the size of place and degree of urbanization reflected by it cease to affect reproductive behavior among cities of 250,000 or more. Duncan and Reiss, using 1950 Census data, show differentials according to residence in the United States. They rank four regions according to degree of urbanization and then compare fertility for the different residential groups in these regions.[4]

Most of the work on differential fertility has shown that as urbanization spreads, the birth rates fall. As T. Lynn Smith puts it, the more urban an area, the lower the fertility of the population and the more rural an area the higher the rate of reproduction.[5] It has also been found that

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[2] Grabill, Wilson H., Kiser, Clyde V., Whelpton, Pascal K., The Fertility of American Women, New York: John Wiley and Sons, Inc., 1958, p. 53.

[3] Thompson, Warren S., Population Problems, New York: McGraw-Hill Book Company, Inc., New York, 1953, p. 176.

[4] Duncan, Otis D. and Reiss, Albert J. Social Characteristics of Urban and Rural Communities, 1950. New York: John Wiley and Sons, Inc., New York, 1956, p. 50.

[5] Smith, Op. Cit., p. 309.

the size of the city exerts different degrees of influence on the surrounding area. The larger the size of the place, the greater the influence. Duncan and Reiss have demonstrated this point in detail.[6] Differentials are also discussed in terms of variations within the city. The evidence shows that the suburban population is more fertile than that of the central city.[7] In accordance with the theory of urban influence, the greater the distance from the central city, the higher the fertility ratio. It has been found that residents of urban fringe areas are more fertile than residents of the central city and less fertile than the population living in non-metropolitan areas. Taking metropolitan and non-metropolitan residential units, Bogue[8] discusses the differential population growth in these two areas and emphasizes the point that rural as well as urban parts of the non-metropolitan areas grow faster than that of metropolitan areas. Only part of this growth, however, is due to birth rate differentials.

A majority of studies show a decline in urban and rural fertility rates and therefore a narrowing of the differentials. Grabill indicates that rural fertility declined in the United States much more rapidly than urban fertility.[9] This leads to the question, do differentials exist in an urbanized state and if so, are rural fertility levels higher than urban?

Previous population studies for the state of Michigan showed that for the most part the population of the state is urban, and still the growth of

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[6]For detail see Duncan and Reiss, Op. Cit., Chapter 2.

[7]Duncan, Reiss, Op. Cit., p. 132.

[8]Bogue, Donald J., The Population of the United States, Glencoe: The Free Press, 1959, Pg. 51-52.

[9]Grabill, Kiser, and Whelpton. Op. Cit., pp. 51-112.

the population is rather rapid. This growth could be the result of birth-rates, death rates or migration. How much of this can be attributed to the birth-rate? The first study on differential fertility for Michigan in 1940 noted a great difference by residence as well as higher fertility for the rural population.[10] The fertility ratio[11] for urban areas was only 295 as compared to 467 for the rural population. Variations for the different parts of the state were also noticed. The rural-farm populations of the Upper Peninsula and the northern part of the lower peninsula were marked with highest fertility; rural-farm birth-rates were found to be lowest in the southern and western counties of the lower peninsula where there are large cities. Most of the urban places in Michigan are situated in the southern part of the lower peninsula and the proportion of the rural-farm population is highest in the northern portions of the state.[12] The general theory of urban influence on the nearby rural areas seems to be supported as the rural parts of the upper peninsula and northern part of the lower peninsula had higher fertility ratios than the southern metropolitan as well as non-metropolitan areas.

Another bulletin published in 1957[13], based on 1950 census data, showed that in all residence groups the fertility ratio in Michigan was higher than

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[10] Beegle, J. Allan., Differential Birth Rates in Michigan, Michigan State College, Agricultural Experiment Station, Section of Sociology and Anthropology, East Lansing, 1948.

[11] Fertility ratio = $\frac{\text{No. of children under 5}}{\text{No. of females aged 15-44}} \times 1{,}000$

[12] Beegle, J. Allan., Op. Cit., p. 14.

[13] Beegle, J. Allan., Halsted, Donald, Michigan's Changing Population, Bulletin 415, Op. Cit.

comparable rates at the national level. Between 1940 and 1950, the urban fertility ratio increased 47 percent, the rural-nonfarm ratio increased 32 percent, and the rural-farm ratio increased 22 percent. The 1960 report found a continuation of relatively high fertility for the rural population.[14]

In view of the findings from past studies, it is expected that the highest fertility will be found in the rural-farm population, intermediate in the rural-nonfarm population, and lowest in the urban population. Further, it is expected that this rank order will also be true for each of the three age-groups of white women in these three residence groups.

Statement of Hypotheses

The foregoing discussion leads to the following hypotheses:

1. The fertility ratio[15] will be highest in rural-farm, intermediate in rural-nonfarm and lowest in urban populations for each age-groups of women.
2. The fertility ratio will be higher in non-metropolitan than in metropolitan State Economic Areas for each residence and age-group of women.
3. Residential differentials (rural-farm versus urban, rural-nonfarm versus urban and rural-farm versus rural-nonfarm) in the fertility ratio will be greater in non-metropolitan than in metropolitan State Economic Areas.

Definitions

It is essential here to define the major concepts used in the present analysis. Since the data came from the United States Bureau of Census, these

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[14] Beegle, Allan J., Phadtare, Hambir, Rice, Rodger, and Thaden, John F., Michigan Population 1960, Bulletin 438, M.S.U. Agricultural Experiment Station, East Lansing, 1962.

[15] Children ever born per 1000 ever married white women of specified age.

terms are defined in accord with census practice.

Rural-Farm, Rural-Nonfarm and Urban Residence:. - Due to numerous social changes, the separation of rural and urban populations of the United States has been accomplished under differing definitions. As pointed out by the Taeubers the rural farm population as presently defined is not necessarily engaged in agricultural activities.[16]

According to the 1960 Census of Population, the urban population comprises all persons living in a) places of 2,500 inhabitants or more incorporated as cities, boroughs, villages and towns, b) the densely settled urban fringe, incorporated or unincorporated, with a population of at least 2,500. All other areas, not defined as urban are considered rural. Before 1960, unincorporated areas regardless of their high density were considered non-urban. The rural population, then is divided into rural-farm and rural-nonfarm residence categories. All people, having 10 acres or more of land and selling products worth $250 or more are categorized as rural-farm population. It then follows that those not meeting the urban or rural-farm specifications are classed as rural-nonfarm residents. Thus, this residual category may include persons living in the open country, in small towns and villages, as well as those residing outside the incorporated limits of large cities.

Metropolitan and Non-metropolitan Areas. - A metropolitan area refers to a county or group of counties having a large city and thickly populated adjacent territory. The official definition of the Bureau of the Census describes it as an area including a city with 50,000 inhabitants or two contiguous counties having two cities with a combined population of 50,000

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[16] Taeuber, Conrad and Irene B. Taeuber, The Changing Population of the United States, New York: John Wiley and Sons, Inc., 1958, p. 118.

and socially and economically integrated. All other areas, not included in Standard Metropolitan Statistical Areas are considered non-metropolitan areas. Thus, the State Economic Areas are subdivided into metropolitan and non-metropolitan areas.

State Economic Areas. - State Economic Areas are relatively homogeneous subdivisions of states. They consist of single counties or group of counties which have similar economic and social characteristics.[17] These areas recognize state boundaries and are important units of sufficient size for many analytical purposes.[18] A grouping of counties forming an economic area is supposed to be as much different as possible from the surrounding groupings of counties.

Bogue believes that as a descriptive device, economic areas permit easy assemblage of a great many different kinds of statistical data for testing a variety of hypotheses related to behavior and environment.[19] This quality makes them an appropriate unit for analyses in the field of demography. Besides being homogenous, their more or less equal size and limited number within a state aids in comparative description. Thus, the State Economic Area used here represents a set of internally homogeneous sub-areas forming a total environment.[20]

The Measure of Fertility. - There are many different ways of measuring fertility. Sorokin believed that the true rural-urban difference in

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[17] United States Census of Population 1960, United States Summary PC (1) 1A Washington D. C., U.S. Government Printing Office, 1961.

[18] Bogue, The Population of the United States, Op. Cit., p. 76.

[19] Ibid., p. 77.

[20] Bogue, Donald J., "Economic Areas as a Tool for Research and Planning," American Sociological Review, Vol. XV, pp. 409-416.

birth rates may be determined only when populations compared are standardized.[21] It is essential, therefore, for fertility rates to be standardized, the extent of which may depend upon the degree of accuracy desired. The 1960 Census of Population has used the term "fertility ratio" to denote the number of children under 5 years old per 1,000 women 15 to 49 years old. The ratio is a measure of effective fertility or of children surviving after most infant mortality has occurred.[22]

In this study fertility is measured in terms of the number of children ever born per 1,000 ever-married white women between the ages of 15 and 44. This basic ratio is computed separately for three age groups of married white women, namely 15 to 24, 25 to 34, and 35 to 44. This measure of fertility standardizes for the age of women. It is also "effective" in the sense that it does not rely on birth registration. It also avoids the clumsy decimals by fixing relative frequency of the phenomena for 1,000 women.

Methods and Procedure

The data used in this study emanate from the 1960 Census of Population of the United States. The data were collected by an enumeration process which allocates people according to their usual place of residence. The data used here are the byproduct of the original 25 percent sampling procedures used extensively in 1960, and have not been published in the form utilized here. No statistical tests for significance of differences have been made in this study. The population used for the study is 25 percent of the total population of Michigan in 1960 and represents the universe. Thus

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[21] Sorokin, Pitirim A., Carle C. Zimmerman, Charles J. Galpin, Systematic Source Book of Rural Sociology, Vol. III, Minneapolis: The University of Minneapolis Press, 1930-32, p. 135.

[22] United States Census of Population, 24B Michigan. Washington D.C. U.S. Government Printing Office, 1961, p 9.

any difference is considered a significant difference.

The first step in the study was to calculate the ratio of children ever born to white married women. The computation was done by dividing the number of ever-born children by the number of ever-married women, multiplied by one thousand. The formula is as follows:

$$\frac{\text{Number of children ever-born}}{\text{Number of ever-married white women, 15-44}} \times 1{,}000 = \text{fertility ratio}$$

In order to test the hypotheses, ratios were computed for State Economic Areas (abbreviated SEA hereafter). Ratios were computed for the two main divisions of SEA's, Metropolitan and non-metropolitan, which again were separated into three residential categories - Urban, Rural-nonfarm and Rural-farm.

The differentials for rural-farm versus rural-nonfarm, rural-farm versus urban, and rural-nonfarm versus urban were obtained by subtracting the ratio of the second category from that of the first in each combination for metropolitan and non-metropolitan areas separately. This difference was again divided by the second residential group in each combination and multiplied by one hundred. The same procedure was followed to obtain the differentials of metropolitan versus non-metropolitan in all the three residential categories for all three age groups of women. Differentials among respective age-groups of women for all the three residential categories were also obtained by the same process for each individual SEA units. All SEA units were also ranked for three residential categories both for metropolitan and non-metropolitan together and separately.

Order of Presentation

The following chapter (Chapter II) gives a brief summary review of

selected studies of differential fertility. Chapter III presents an analysis of the 1960 data bearing upon the hypotheses of this study. Areas of high and low fertility are indicated. Chapter IV is an attempt to summarize the findings and to draw conclusions from the findings.

Chapter 2 - Review of Literature: Residential Differentials in Fertility

The following review of literature deals explicitly with studies of rural-urban differentials in fertility and with birth-rate trends. Discussions of differential fertility are found in almost all books dealing with population and many of them review empirical studies dealing with differential birth rates. Although approaches of different authors to birth rate studies and their reasoning concerning existing differentials are reviewed, this thesis deals only with the white population residing in the state of Michigan and the fertility measure utilized is children ever born per 1,000 ever married white women between fifteen and forty-four years old. At the same time, a brief survey of fertility differentials using other variables such as social class, occupational level, and education, is given.

Origin of Rural-Urban Differentials

Rural-urban differentials were imperceptible during the period of initial development of the city but through a very gradual process, this differential widened. Even before the Middle Ages, the cities of Egypt and Babylonia had a large percentage of agricultural population, and other characteristics of the population were such that group differentials were either very small or did not exist. With economic development, increase of population, and inventions in the technical field, the city-country differentiation became visible in demographic studies. This process was slow but took place in most parts of the world. The various countries of the world have never had a uniform definition of urban and rural population. Some defined it in terms of

population size and some defined it morphologically. A French writer, Rumelin employed demographic characteristics and asserted that cities have lower birth rates and higher marriage rates, but these properties vary according to the size of the city at various times and places.[1] Differences have become more clear-cut in terms of occupation, environment, size of community, homogeneity and heterogeneity of population, social stratification, and mobility. These are described by Sorokin and Zimmerman who present a "rural-framework" and an "urban framework." The essence of this typology leads to the assumption that rural and urban worlds are separate from each other.[2]

Historical Perspective on Differentials

Regarding the family differences of these two worlds, it is said that "the data show that the average number of children born in rural families is higher, the proportion of childless marriages or marriages with one child is lower, while the proportion of the marriages with many children is higher than in urban families."[3] This situation is also examined by historical evidence. The development of urbanization in the past was marked by falling birth-rates. "Present urban-rural differences are practically identical with these in ancient urban societies; and the recent trends in the family institution are in essence identical with the trends which took place in Rome and Greece parallel to the growth of urbanization in those societies."[4]

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[1] Sorokin, Pitirim A., Zimmerman, Carle C., Galpin, Charles J., Systematic Source Book of Rural Sociology, Vol. I, Menneapolis: The University of Minnesota Press, 1930, Chapters III and IV.

[2] Sorokin, Pitirim A., Zimmerman, Carle C., Principles of Rural-Urban Sociology, New York, Henry Holt and Company, 1929, Chapter II.

[3] Ibid., p. 344.

[4] Ibid., p. 345.

In general, throughout the world, urbanization is associated with falling birthrates. In spite of the fact that age and sex distribution is more favorable to the cities, rural areas in different countries show higher crude birth rates than urban areas. Empirical evidence is provided by highly urbanized countries like the United States, England and France (where rapid decline in the crude birth rate has occurred). Standardized birth rates for the period 1910 to 1925 in many countries show higher birth rates associated with the major occupation, agriculture. Generally, agriculturists and miners have higher fertility than other occupational groups. Data for England, Switzerland, Belgium, Germany, Australia and other industrialized countries show the urban standardized birth rate to be declining rapidly, resulting in a large difference between rural and urban fertility. The possible reasons given for this higher birth rate in rural than urban districts are familism, religion, traditional morals, social organization, economy, lower density of population, age of marriage and lower mobility.[5]

Differentials due to rural-urban residence and other variables have a long history in most countries of the world about which we have demographic knowledge. Although different techniques of measurement are applied, they show a general tendency. For England and Wales, Thompson uses the measure of number of children born to each one hundred couples of completed fertility, by social status, by duration of marriage, and by age at marriage. He found that there was rapid increase in the differential in fertility between the lower and the upper classes due to rational control of the size of family on the part of the upper and middle classes.[6] A 1960 U.N. report by Johnson

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[5] Ibid., Chapter 9.

[6] Thompson, Warren S., Population Problems, New York: McGraw-Hill Book Company, Inc., 1953, pp. 182-185.

says that an inverse relationship between fertility and social class was observed in the nineteenth century. But due to a decline in lower class birth rates, there was gradual contraction. Rural-urban differentials were more prominent after 1900. Only after 1931 they began to narrow. In 1950, rural fertility was still found to be higher than urban fertility. Here the ratio used was computed for children under five per 1,000 women twenty to forty-four years old. Further, the 1950 census data show a highly positive relationship between college educated women and fertility rates in England and Wales. But this may have resulted from the combined effect of other socio-economic variables. Occupational differentials were marked since 1900, but there has been a gradual decline.[7] In France, too, the differentials between white-collar workers and manual laborers were substantial but have tended to decline. A positive relationship between economic condition and family size was found only in Stockholm.[8] Most of the other European countries such as Norway, Belgium, Germany, Sweden, Switzerland and Netherlands coincide with the pattern shown in the case of England and Wales.[9] In Denmark and Sweden, the differentials due to rural-urban residence were large because of the rapid decline in birth rates for the urban population, which later on narrowed with a rapid increase in urban birth rates compared to rural birth rates during the period from 1910 to 1950.[10]

A report on the expected family size values in West Germany by the

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[7] Johnson, Gwendolyn Z., "Differential Fertility in European Countries" in Demographic and Economic Change in Developed Countries, Princeton: Princeton University Press, 1960, Chapter II.

[8] Op. Cit., pp. 185-186.

[9] Op. Cit., Chapter 2.

[10] Ibid., Chapter 2.

University of Michigan shows an inverse relationship between the size of community and fertility for two religious groups, namely Catholics and Protestants. However, the process of urbanization has reduced the fertility differentials between them. Fertility differentials by occupation are smaller in cities, but they show a U-shaped curve, that is, the highest and the lowest status group in the rank order of occupation have higher fertility. The same pattern is seen with regard to educational differences. This differential, however, is not very pronounced.[11]

While discussing the relationship between urbanization and fertility ratio, Robinson listed nineteen non-western countries and fourteen of them have lower fertility ratio for their urban population than the rural population. In some countries, such as Mexico and India, with the increase in urban fertility, the differentials are narrowing.[12]

A more detailed account of fertility rates in India by Kingsley Davis shows that rural-urban fertility differentials have existed since 1891 and there is no trend of widening or narrowing over the period up to 1941. An inverse relationship between size of the city and fertility was reported to be prominent. Differentials exist even between the larger and the smaller cities. The three largest cities, Bombay, Calcutta and Madras, averaged lower than the whole provinces of Bombay, Bengal and Madras respectively.[13] Differentials due to class, caste, occupation and socio-economic status were

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[11] Freedman, Ronald., Baumert, Gerhard., Bolte, Martin, Expected Family Size and Family Size Values in West Germany, The University of Michigan: Program for Research in Population and Human Ecology, 1960, p. 146.

[12] Robinson, Warren C., "Urbanization and Fertility: The Non-Western Experience," The Milbank Memorial Fund Quarterly, July 1963, Vol. XLI, No. 3, pp. 296-297.

[13] Davis, Kingsley, "Human Fertility in India," American Journal of Sociology, Vol. 52, pp. 244-246.

found to be pronounced. Religious differentials are discussed in terms of Hindu and Moslem religious groups where the former affects the fertility rate by emphasizing widow non-marriage.[14] These differentials mentioned are confirmed by the United Nations report. As in the case of other countries, here too, agricultural groups tend to have highest fertility rates. The groups which have adopted the ideal of a small size family are relatively few in number and do not help in bringing down the general fertility level.[15]

Fertility rates according to occupational status in Brazil are higher for employers than for employees which is contrary to what has been found in other countries. This is primarily true of the rural areas. In Egypt differentials are mainly based on religion. Moslems have higher fertility than Catholics and urbanization does not seem to have affected the Moslems in Cairo. Wide variations are found among the Jews of Palestine according to their country of origin. Puerto Rico has higher fertility for its rural population than its urban.[16]

Thus, in most countries the general pattern in differentials is one of widening with the process of urbanization, then contracting over time as the practice of contraception spreads. But in some of the underdeveloped and overpopulated countries, differentials are still wide and the process of contraction is very slow. Having briefly examined differentials on a world-wide scope, let us now consider residential and age-group differentials in the United States.

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[14] Ibid., p. 251.

[15] United Nations, Department of Social Affairs, The Determinants and the Consequences of Population Trends, Population Studies No. 17, New York: United Nations, 1953, pp. 95-96.

[16] Ibid., pp. 94-95.

Rural-Urban Differentials in the United States

Rural-urban differentials in the United States have existed for a long time and various explanatory theories have been developed. These differentials were explained by some early demographers in terms of the biological capacity of population, environmental conditions, use of contraceptives and others.

Grabill, Kiser and Whelpton give a brief account of fertility differentials in the colonial period, nineteenth and early twentieth centuries. Rural-urban differentials were receiving attention in the United States as early as 1750, but since only five per cent of the population lived in urban areas, they were not of great demographic import. These differentials were attributed to relatively fewer married adults and later marriage in cities than on farms.[17] There were some old and simple methods of contraception used during this period and their usage could be the main factor causing differential fertility.

Kiser has shown graphically that the trend of decline in fertility during the periods 1800-1840 and 1910-1950 was similar, widening at first and then narrowing.[18] Further, accounting for urban and rural declines he writes:

> "Between 1810 and 1840, on a national basis, both the urban and rural ratios of children under five years old declined by about two hundred children per 1,000 women; between 1840 and 1910, the decline amounted to about two hundred thirty in the urban population and three hundred fifty in the rural population; and between 1910 and 1940 the decline amounted to about one hundred sixty in the urban population and two hundred thirty in the rural population. Thus, absolute differences in urban and rural fertility narrowed over the years, as measured by ratios of young children to women.[19]

In 1810 the national fertility ratio was similar to the rural fertility

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[17] Grabill, Wilson H., Kiser, Clyde V., Whelpton, Pascal K., The Fertility of American Women, New York: John Wiley and Sons, Inc., 1958, p. 11.

[18] Kiser, Clyde V., "Differential Fertility in the U.S.", in Demographic and Economic Change in Developed Countries, Princeton: Princeton University Press, 1960, pp. 80, 81.

[19] Grabill, Kiser, Whelpton, Op. Cit., p. 16.

ratio, but as more people became urban residents the national ratio approached the urban fertility ratio since the fertility ratio of urban areas was declining. This trend of narrowing between the rural and urban fertility was questioned by Woofter. He writes that from 1910 to 1940 the differential widened instead of contracted. He poses the problem of the measurement of indigenous fertility. According to him the comparison of rural ratios of children under five years of age to women of childbearing age is not comparable to urban ratios because of the migration from rural to urban areas and the elimination of foreign-born population.[20] This suggests that differentials may not be due to a differential in birth rates. Westoff concludes that between 1910 and 1940, the rural-urban fertility differentials were more or less stable and the ratio of urban to rural fertility fluctuated only between .54 and .60.[21] Both have agreed that an increase in urban birth rates has occurred and thereby the differential narrowed. The fertility measurement used by Westoff is for the children under five ever born to 1,000 women twenty to forty-four years old.

Kiser states that during the decade 1940-1950 the increase in urban fertility was 52 per cent, with rural areas showing only a 22 per cent gain. Although the rural fertility has remained consistently higher than urban, during the period from 1810 to 1940, the absolute decline was greater for rural populations than urban ones.[22] At the national level "rural fertility has been higher in frontiers than in the settled areas, higher in the

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[20]Woofter, T. J., "Trends in Rural and Urban Fertility Rates," Rural Sociology, Vol. XIII, 1948, pp. 3-9.

[21]Westoff, Charles F., "Differential Fertility in the U.S., 1900-1950," American Sociological Review, Vol. XIX, 1954, p. 554.

[22]Kiser, Op. Cit., p. 82.

subsistence agricultural than in the commericial agricultural areas, particularly those of higher income. And for any given color or nativity group, rural fertility has been higher in areas where educational and other opportunities were more limited, lower in areas of greater opportunity."[23]

Grabill confirms this in his discussion of the rural-urban differential by regions and divisions of the United States. He compares the birth rates of women of different age groups on the basis of rurality and urbanity of the states. The number of children ever born to white women seventy to seventy-four in 1910 was lowest for the mostly rural states, namely Maine, New Hampshire and Vermont. The largely urbanized states such as Massachusetts, Rhode Island and Connecticut had higher fertility than those rural states mentioned above; but these states had a decreasing fertility ratio for rural-nonfarm and rural-farm areas. Rural-farm fertility was lower than urban because of the large percentage of foreign-born white women living in urban areas. Grabill believes that differential fertility for the period 1910-1940 may be explained by the length of time which the area had been settled.

The differentials discussed for the age group from forty-five to forty-nine years are for the years 1910, 1940 and 1950. It was found that predominantly rural states had highest fertility and predominently urban states had lowest. Data for the children ever born to white women twenty-five to twenty-nine years old between 1940 and 1950 are not reliable since migration of women in this age group was heavy.

> "Nationally, the fertility ratios increased in size by one hundred thirty children per 1,000 women in urban areas; by one hundred thirty in rural-nonfarm areas; and by one hundred ten in rural-farm areas. The

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[23]Taeuber, Conrad, Taeuber, Irene B., The Changing Population of the United States, New York; John Wiley and Sons, Inc., 1958, p. 262.

majority of the states had absolute increases in fertility ratios of about these magnitudes in urban and rural areas, regardless of the level of fertility in 1940."[24]

Grabill[25] reports that the total number of children born to women fifteen to forty-nine in 1910 and 1950 is lower in urban areas than rural-nonfarm or rural-farm areas. This holds true for all the age-groups when broken into groups of five years. In some cases rural-nonfarm is higher than rural-farm. The greatest number of children are born to the women in age-group twenty-five to twenty-nine years old. Data for 1952 on the number of children ever born per 1,000 white women by age, marital status, and size of urban and rural areas show that the number of children was larger in rural-farm areas than in rural-nonfarm and urban areas. When urbanized areas are classed by size, the number of children is lower for the larger urbanized areas than the smaller urbanized areas. The smallest urbanized area had lower fertility than both rural-nonfarm and rural-farm areas.[26]

When the fertility ratio of white women once married is analyzed by the age of women and husbands' occupation, there is general decline in the fertility ratio for all age-groups, at all occupational levels. The percentage of change in fertility ratios in 1940 from that of 1910 is generally larger for all occupational groups in urban areas than in rural-farm areas. In quite a few cases, the change in rural-nonfarm areas exceeds the percentage change in urban areas for the respective occupational level and age-group.[27]

Detailed figures for the number of children ever born in each age-group

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[24]Grabill, Kiser, Whelpton, Op. Cit., p. 69.

[25]Ibid., p. 73 (table 25).

[26]Ibid., p. 89 (table 31).

[27]Ibid., p. 122 (table 49).

of white women, by residential category and occupational level are analyzed for the years 1910, 1940 and 1950. These data show clearly that the number of children was lower in 1940 than in 1910 for all age groups of women by residential categories and occupational levels. However, the number of children in all categories increased from 1940 to 1950, with the rural-farm ratio the highest, rural-nonfarm intermediate, and the urban ratio the lowest. The differential between rural-farm and urban has been decreasing. There are variations in differentials among various occupational and age-groups with no definite pattern.[28]

The fertility ratio is also found to be inversely related to the level of education in all residential areas. At each education level, the rural-farm ratio tends to be higher than rural-nonfarm and rural-nonfarm higher than the urban. The rural-urban differentials are almost the same in 1940 as in 1950.[29]

Fertility differentials for women in the labor force show that in all residential groups, women who are in labor force have fewer children than those not in the labor force. All age-groups of rural-farm women who are in the labor force have higher fertility than respective age-groups of women in the labor force in rural-nonfarm areas. Rural-nonfarm ratios were higher than those in urban areas.[30] These findings are confirmed by Kiser in a report at the conference of the Universities' National Bureau Committee for Economic Research.[31]

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[28] Ibid., pp. 131-132, (table 54).

[29] Ibid., pp. 205, (table 76).

[30] Ibid., pp. 265, (table 95).

[31] Kiser, Op. Cit., Chapter 3.

It has been shown that there is a marked difference between the rural-nonfarm and rural-farm population in their type of county distribution. For the entire United States, the fertility ratio is inversely related to the degree of urbanization of the county in which the rural population is located and the tendency is greater in rural-farm than rural-nonfarm populations.[32]

Another general pattern noticed by Duncan, Grabill and Bogue is that rural-farm and rural-nonfarm population of metropolitan counties had lower fertility ratios than the corresponding parts of non-metropolitan counties. It is, then, assumed that a rural community in proximity of a large urban center may have even lower fertility ratio than the urban place of less than 25,000.

This suggests the strong impact of urbanization on declining fertility rates. Bernard Okun provides evidence to test this impression. He hypothesized that if the rural birth ratio is greater than the urban birth ratio, it should be the case that states which have a larger proportion of their population living in urban areas would tend to have a lower refined birth ratio. By using correlation analysis, he found that there is an association between the states with low ranks in the ratio of children zero to four to women aged fifteen to forty-four and states with high ranks in the proportion of people living in urban areas.[33] Urbanization is measured in terms of

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[32]Duncan, Otis D., Reiss, Albert J., Social Characteristics of Urban and Rural Communities 1950, New York: John Wiley and Sons, Inc., 1956, p. 39.

[33]Bernard Okun has made it clear that this measurement (children to women of childbearing age) is not possible to obtain before 1910. Okun, Bernard., Trends in Birth Rates in the United States Since 1870, Baltimore: The John Hopkins Press, 1958, pp. 53-55.

women fifteen to forty-four living in an urban area. Further, he examines the validity of the hypothesis by making observations on the increasing urbanization of states and decreasing refined birth rates. On the basis of the coefficient of correlation, he found that the states which experienced a smaller increase in the number of people living in urban areas were the states which experienced larger percentage declines in the refined birth ratio within their urban and rural districts.[34] He examined all the states for two periods, 1910 to 1930, and 1930 to 1950 and found that in some states birth rates declined even with decreasing urbanization. The findings suggest that urbanization by itself does not cause a decline in fertility ratios. However, urbanization, in combination with other factors such as ecnomic development and social change contribute to a fluctuating birth rate.

Okun further hypothesized that population redistribution[35] in urban areas may have contributed to the decline in birth rates. His hypothesis is that urban intensification contributed to the decline of the urban refined birth ratio. From the findings, he concluded that it does account for a small part of the decline in fertility in the urban area and, therefore, he did not reject the hypothesis.

If urbanization or intensification of urbanization do not account much for the decline in fertility, what factors account for the persistence of rural-urban differentials? Okun has quoted Warren Thompson who suggested that degree of rurality of a state's population has greater influence on the rural fertility.

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[34] Ibid., p. 58.

[35] Here Okun refers to it as the proportion of urban intensification which suggests the nature of urban dwellers among communities of different sizes rather than proportion of people living in urban areas.

> "Where a large part of the population of a state is rural, there the attitudes of mind and habits of life of the entire population tend to be those distinctive of rural dwellers; but where a large part of the population is urban, the attitudes of mind and habits of life characteristic of urban dwellers tend to permeate the entire community, at least as regards births. Even the rural population of a highly urbanized state has a lower ratio of children than in a more rural state."[36]

This statement is supported by Okun's positive correlation of rural and urban fertility ratios, i.e. states with high urban fertility rates also tend to have high rural fertility.[37]

Rural-Urban Differentials in Michigan

The state of Michigan is highly urbanized. Since all the large cities are situated in the south, we would expect that the rural areas in southern part of the lower peninsula would have lower fertility than the rural areas of northern part of the lower peninsula and upper peninsula due to their proximity to urban centers. What is the general situation of differentials for the state of Michigan since 1940?

The report, "Differential Birth Rates in Michigan", indicates that the urban residents had a fertility ratio of 295 compared to 467 for the rural-farm population in 1940. This report also indicates that the ratio for the urban dwellers is thirty-five per cent below that of the rural-nonfarm segment of the population.[38] Variations among rural-farm fertility ratios depend on the location of the area in the state. The highest fertility was found for those rural-farm areas which are isolated from the big cities in

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[36] Ibid., p. 81. Quote taken from Warren S. Thompson, Ratio of Children to Women, 1920, p. 91.

[37] Ibid., pp. 82-83.

[38] Beegle, Allan J., Differential Birth Rates in Michigan, East Lansing: Michigan State College, Agricultural Experiment Station, Section of Sociology and Anthropology, 1948, p. 9.

the northern part of the lower peninsula and the eastern part of the upper peninsula. The lowest rural-farm fertility ratio was found in those counties containing a large city in the southern-most part of the state and western part of the upper peninsula. "Thus the data for Michigan indicate a clear association between birth rate and place of residence."[39] Furthermore, fertility levels in Michigan in 1940 were inversely related to size of urban center and to the type of farming. Areas with commericalized farming had lower rates of reproduction than self-sufficient farming areas. Analysis of other kinds of farming indicates that the economy of the areas has a relation to fertility ratio.[40]

Another report on Michigan's changing population supplies information on the increase in birth rates for the three residential categories. Statistics for 1940 and 1950 show that increase for rural-farm areas was lowest, that is, eighty-nine children under five years for every 1,000 women fifteen to forty-nine years old; while the increase for rural-nonfarm and urban areas was one hundred thirty-one and one hundred twenty-four respectively. In general, a greater increase in fertility took place in the areas marked by lower fertility before.[41] Comparing the fertility ratio in 1950 to that of 1960, it seems that birth rates increased for both areas, and differentials have narrowed. Still higher rural than urban fertility rates persist.[42]

In summary, it is evident from the foregoing discussion that differentials

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[39] Ibid., p. 14.

[40] Ibid., pp. 19-22.

[41] Beegle, Allan J., Halstead, Donald, Michigan's Changing Population, East Lansing: Michigan State University, Agricultural Experiment Station, 1957, pp. 12-14.

[42] Beegle, Allan J., Phadtare, Hambir, Rice, Rodger, and Thaden, John F., Michigan Population 1960, East Lansing; Michigan State University, Agricultural Experiment Station, 1962, p. 28.

for rural-urban areas have existed for many years and in diverse cultures. In the period from 1910 to 1940, the rural-urban fertility differential was found to be narrowing. However, the differential still persists in Michigan as well as in the United States.

Chapter 3. - Residential Differentials in Fertility

This chapter presents the empirical evidence bearing upon the hypotheses stated in Chapter 1. As indicated previously, the data utilized to test the hypotheses refer to white women in selected age-groups, categorized by rural-farm, rural-nonfarm and urban residence. These data refer to state Economic Areas of Michigan in 1960 and derive from the 1960 Census of Population. State, Economic Areas, more or less homogeneous groups of counties, were utilized as the smallest sub-unit of the state's population in order to ensure a sufficiently large base for the computation of fertility rates. The measure used is the number of children ever born per thousand white ever married women divided into three age groups between 15 and 45.

Based upon previous studies of the residential differential in fertility, previous studies of fertility in Michigan, and general knowledge of the character of Michigan's population, it is hypothesized that systematic differences by residence exist in 1960. However, the magnitude of the residential differential has been narrowing over time and evidence suggests that no great gulf separates urban and rural people. Furthermore, the change in the rural-farm definition in 1960 served to alter the character of the farm population itself. Such forces raise doubt regarding the existence of residential differences in fertility in 1960.

Hypothesis I

The first hypothesis considered here may be stated as follows:

The ratio of children ever born per 1,000 white ever married women will be highest in rural-farm, intermediate in rural-nonfarm, and lowest in urban

Table 1

Rank of ratios of children to women 15-44 by residence and metropolitan and non-metropolitan status, Michigan 1960

Metropolitan and Non-metropolitan SEA	Residence		
	Urban	Rural-nonfarm	Rural-farm
Total of all Areas	3	2	1
Metropolitan Areas Total	3	2	1
Area A	3	2	1
Area B	3	2	1
Area C	3	2	1
Area D	3	2	1
Area E	3	2	1
Area F	3	2	1
Area G	3	2	1
Area H	3	2	1
Area J	3	2	1
Non-Metropolitan Areas Total	3	2	1
Area 1	3	2	1
Area 2	3	2	1
Area 3	3	2	1
Area 4	3	2	1
Area 5	3	2	1
Area 6	3	2	1
Area 7	3	2	1
Area 8	3	2	1
Area 9	3	2	1

Figure 1 State Economic Areas of Michigan, 1960

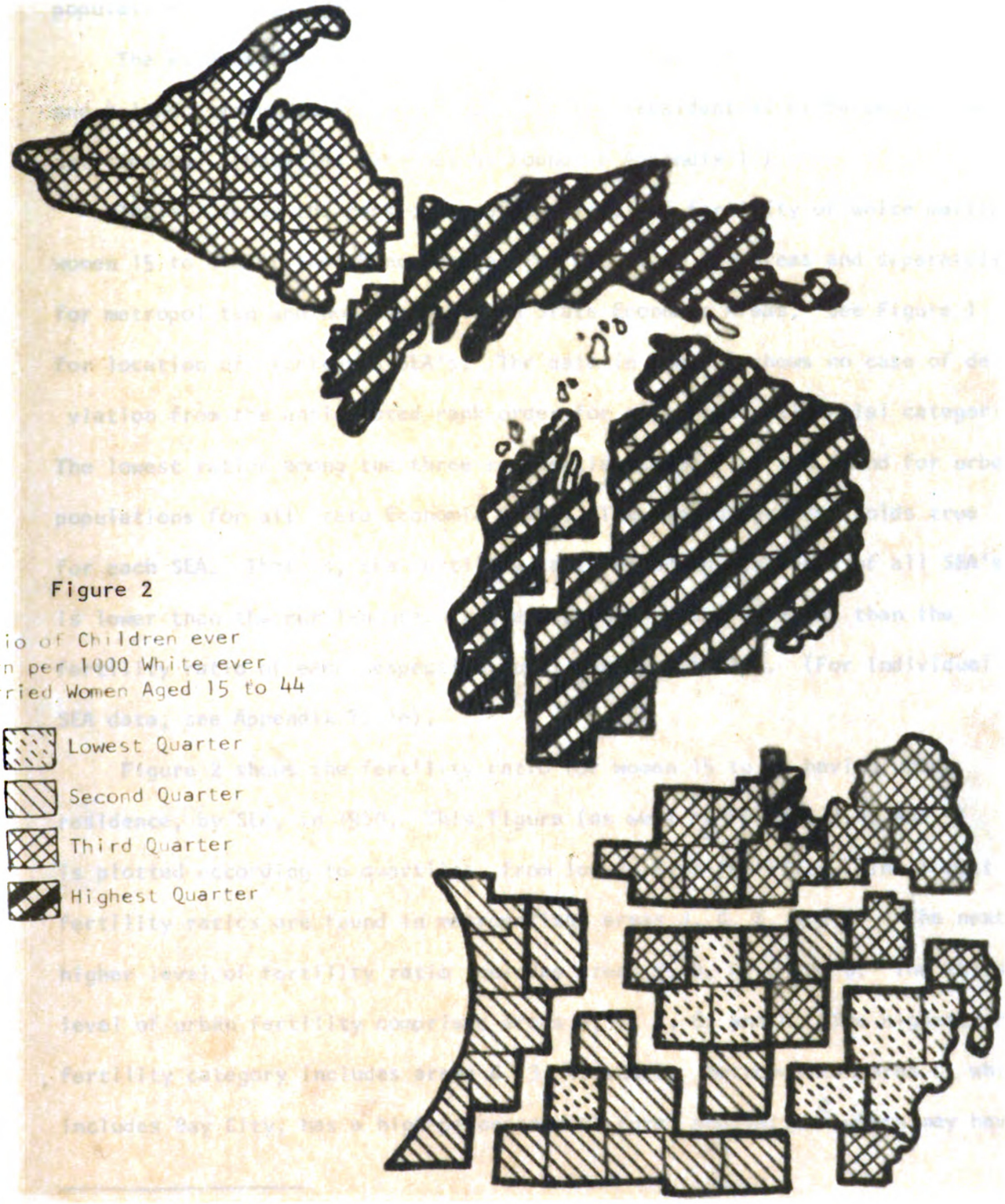

Figure 2 Ratio of Children ever Born per 1000 White ever Married Women Aged 15 to 44

population for each age-group of women.

The evidence bearing upon this hypothesis, summarized in tables 1,2,3 and 4 lend strong support to the existence of residential differentials as anticipated. (Detailed data may be found in Appendix 1.)

Table 1 shows the rank order of the level of fertility of white married women 15 to 44 for the three residential groups in all areas and separately for metropolitan and non-metropolitan State Economic Areas. See Figure 1 for location of Michigan's SEA's. The data in Table 1 shows no case of deviation from the anticipated rank order for all three residential categories. The lowest ratios among the three residential categories are found for urban populations for all State Economic Areas. The rank order also holds true for each SEA. That is, the fertility ratio of urban residents of all SEA's is lower than the rural-nonfarm residents which again is lower than the fertility ratio of each respective rural-farm population. (For individual SEA data, see Appendix Table).

Figure 2 shows the fertility ratio for women 15 to 44 having urban residence, by SEA, in 1960. This figure (as well as Figures 3,4, and 5) is plotted according to quartiles, from low to high fertility. The lowest fertility ratios are found in metropolitan areas J, G, E, and F.[1] The next higher level of fertility ratio includes areas 9, D, H, 6 and B. The third level of urban fertility comprises areas 5, 1, 7, 8, and A. The highest urban fertility category includes areas C, 3, 4, and 2. Metropolitan area C, which includes Bay City, has a high percentage of rural population[2] which may have

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[1] The names of SEA's here and hereafter are mentioned in rank order.

[2] Beegle Allan J., Phadtare Hambir, Rice, Rodger, and Thaden John F., Michigan Population 1960, Bulletin 438.

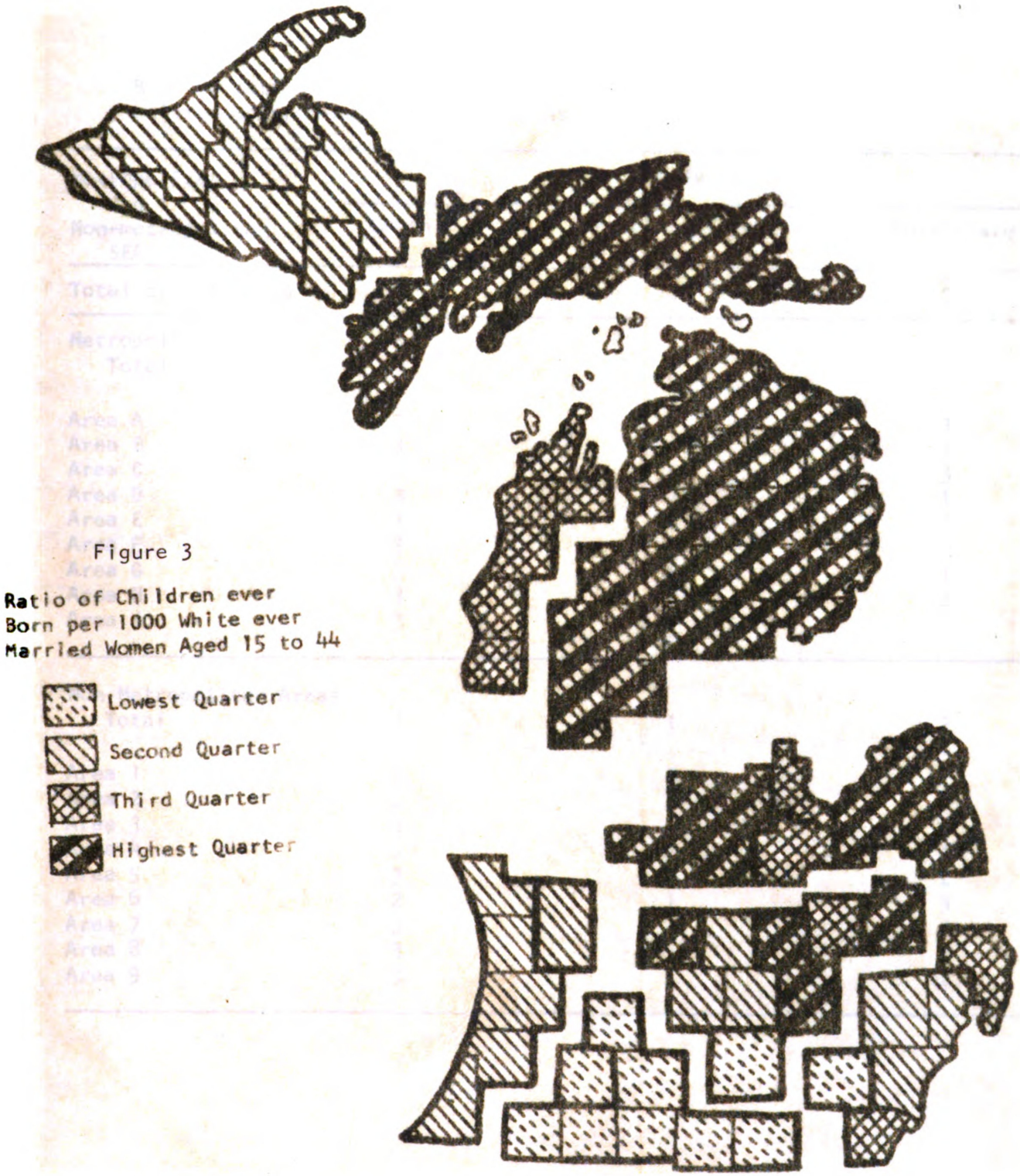

Figure 3 Ratio of Children ever Born per 1000 White ever Married Women Aged 15 to 44

Table 2

Rank of ratios of children to women 15-24 by residence and metropolitan and non-metropolitan status, Michigan, 1960

Metropolitan and Non-metropolitan SEA	Residence		
	Urban	Rural-nonfarm	Rural-farm
Total of all Areas	3	1	2
Metropolitan Areas Total	3	1	2
Area A	2	1	3
Area B	3	2	1
Area C	2	1	3
Area D	3	2	1
Area E	3	2	1
Area F	3	1	2
Area G	3	2	1
Area H	3	1	2
Area J	3	1	2
Non-Metropolitan Areas Total	3	1	2
Area 1	3	2	1
Area 2	2	1	3
Area 3	3	2	1
Area 4	3	2	1
Area 5	3	1	2
Area 6	2	1	3
Area 7	3	1	2
Area 8	3	1	2
Area 9	3	1	2

some effect on the fertility ratio. Generally, urban fertility is highest in those portions of the state containing small urban places.

Figure 3 provides a comparison of the fertility ratios of rural-nonfarm populations among all SEA's. Those areas which have the lowest fertility ratio for urban residents do not necessarily have the lowest fertility ratio for rural-nonfarm (or rural-farm residents). As shown in Figure 3 the lowest rural-nonfarm fertility ratios are found in SEA's J, 9, H and G and the highest ratios are found in Areas 4, 5, 7, and 2. Ratios of children ever born to rural-nonfarm white women tend to be lower in metropolitan SEA's and in areas within commuting range of metropolitan centers. The eastern part of the upper peninsula and the northern part of the lower peninsula, however, exhibit high rural-nonfarm ratios.

Figure 4 shows the fertility ratio of rural-farm populations in the state by SEA's. The lowest fertility is found in areas G, J, H, and 9 while the highest fertility ratio is found in the Areas 3, C, 2 and 4. Most of the rural-farm areas in the southern part of lower peninsula have low fertility, possibly because of the influence of surrounding metropolitan areas.

The average fertility ratio for rural-farm areas is 3035 while that for rural-nonfarm and urban areas are 2660 and 2414, respectively. Metropolitan Areas J and G exhibit the lowest fertility for the entire population). On the otherhand, non-metropolitan areas 2 and 4 have the highest fertility ratio.

Considering the group of white married women aged 15 to 24, as shown in table 2, exceptions are found in the expected pattern, both in metropolitan and non-metropolitan areas. Except for areas A, C, 2 and 6, urban fertility ranks lowest in both metropolitan and non-metropolitan areas. Areas B, D, E, G, 1, 3 and 4 show the expected pattern. Areas A, C, 2 and 6 have the

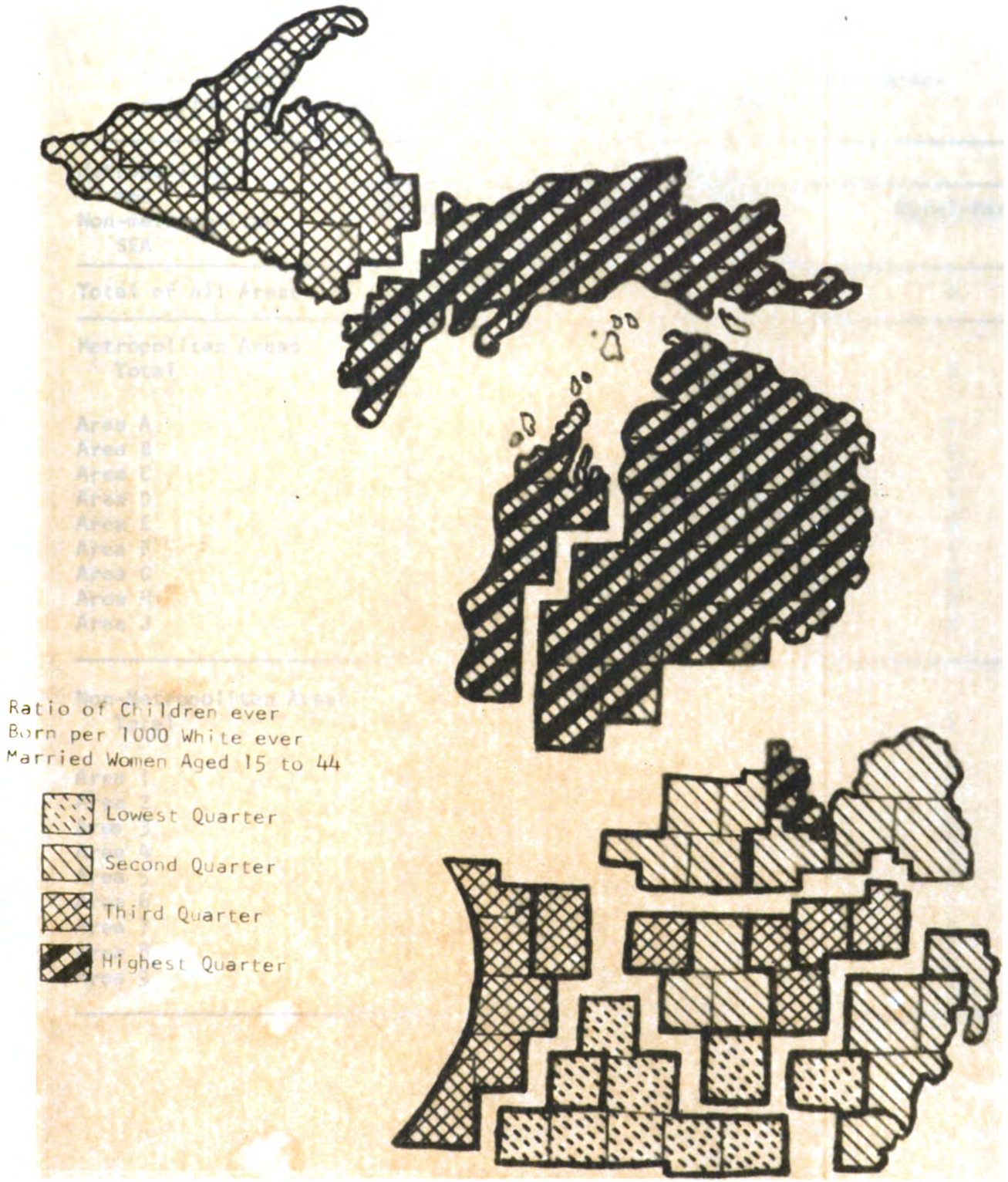

Figure 4 Ratio of children ever born per 1000 white ever married women aged 15 to 44

Table 3

Rank of ratios of children to women 25-34 by residence and metropolitan and non-metropolitan status, Michigan, 1960

Metropolitan and Non-metropolitan SEA	Residence		
	Urban	Rural-nonfarm	Rural-farm
Total of all Areas	3	2	1
Metropolitan Areas Total	3	2	1
Area A	3	2	1
Area B	3	2	1
Area C	3	2	1
Area D	3	2	1
Area E	3	2	1
Area F	3	2	1
Area G	3	1	2
Area H	3	2	1
Area J	3	2	1
Non-Metropolitan Areas Total	3	2	1
Area 1	3	2	1
Area 2	3	2	1
Area 3	3	2	1
Area 4	3	2	1
Area 5	3	2	1
Area 6	3	2	1
Area 7	3	2	1
Area 8	3	2	1
Area 9	3	2	1

Table 4

Rank of ratios of children to women 35-44 by residence and metropolitan and non-metropolitan status, Michigan, 1960

Metropolitan and Non-metropolitan SEA	Residence		
	Urban	Rural-nonfarm	Rural-farm
Total of all Areas	3	2	1
Metropolitan Areas Total	3	2	1
Area A	3	2	1
Area B	3	2	1
Area C	3	2	1
Area D	3	2	1
Area E	3	2	1
Area F	3	2	1
Area G	3	1	2
Area H	3	2	1
Area J	3	2	1
Non-Metropolitan Areas Total	3	2	1
Area 1	3	2	1
Area 2	3	2	1
Area 3	3	2	1
Area 4	3	2	1
Area 5	3	2	1
Area 6	3	2	1
Area 7	3	2	1
Area 8	3	2	1
Area 9	3	2	1

lowest ratio in rural-farm, intermediate for urban and highest for rural-nonfarm. The areas which are in disagreement with the hypothesis do not show any apparent peculiar characteristic which might help to understand the findings. As summarized in Table 2, in aggregate and for more than half of the metropolitan and non-metropolitan SEA's, the fertility of white married women 15 to 24 in the rural-nonfarm population stands highest among the residence groups.

The age-groups of white married women 25 to 34 and 35 to 44 (see tables 3 and 4) conform to the hypothesis, except for one case in both age-groups in one metropolitan area. Area G, for both age groups of white married women has higher fertility ratios in rural-nonfarm than in rural-farm areas. This area is highly urbanized.[3]

In summary, hypothesis 1 is generally supported. The predicted rank of fertility level does not hold true for the age group of women 15-24 years of age. In this case, the rural-nonfarm population outranks the rural-farm population in about two-thirds of the SEA's. On the one hand, this difference may signify the beginning of a change in fertility differentials by residence. On the other hand, it may merely be a reflection of the "up-grading" of the rural-farm population brought about by more rigid definition procedures in 1960.

Hypothesis II

Further residential differentials are assumed in terms of metropolitan and non-metropolitan SEA's of the State. Since fertility differentials exist for the three residential categories (with the exception of one age group),

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[3] Ibid., p. 21.

Table 5

Ratio of children ever-born per 1,000 white ever-married women in metropolitan versus non-metropolitan State Economic Areas, by residence and age group of women, Michigan, 1960

Metropolitan and Non-Metropolitan SEA	Age Group of Women			
	15-44	15-24	25-34	35-44
Metropolitan Areas				
Total	2342.1	1289.9	2484.3	2627.3
Urban	2294.9	1258.6	2434.4	2567.7
Rural-nonfarm	2586.7	1468.2	2751.6	2965.9
Rural-farm	2965.0	1425.3	3055.2	3326.9
Non-metropolitan Areas				
Total	2630.9	1433.7	2790.6	3049.8
Urban	2453.0	1321.6	2633.3	2818.3
Rural-nonfarm	2663.5	1514.5	2837.0	3119.9
Rural-farm	3064.4	1425.8	3132.1	3424.7

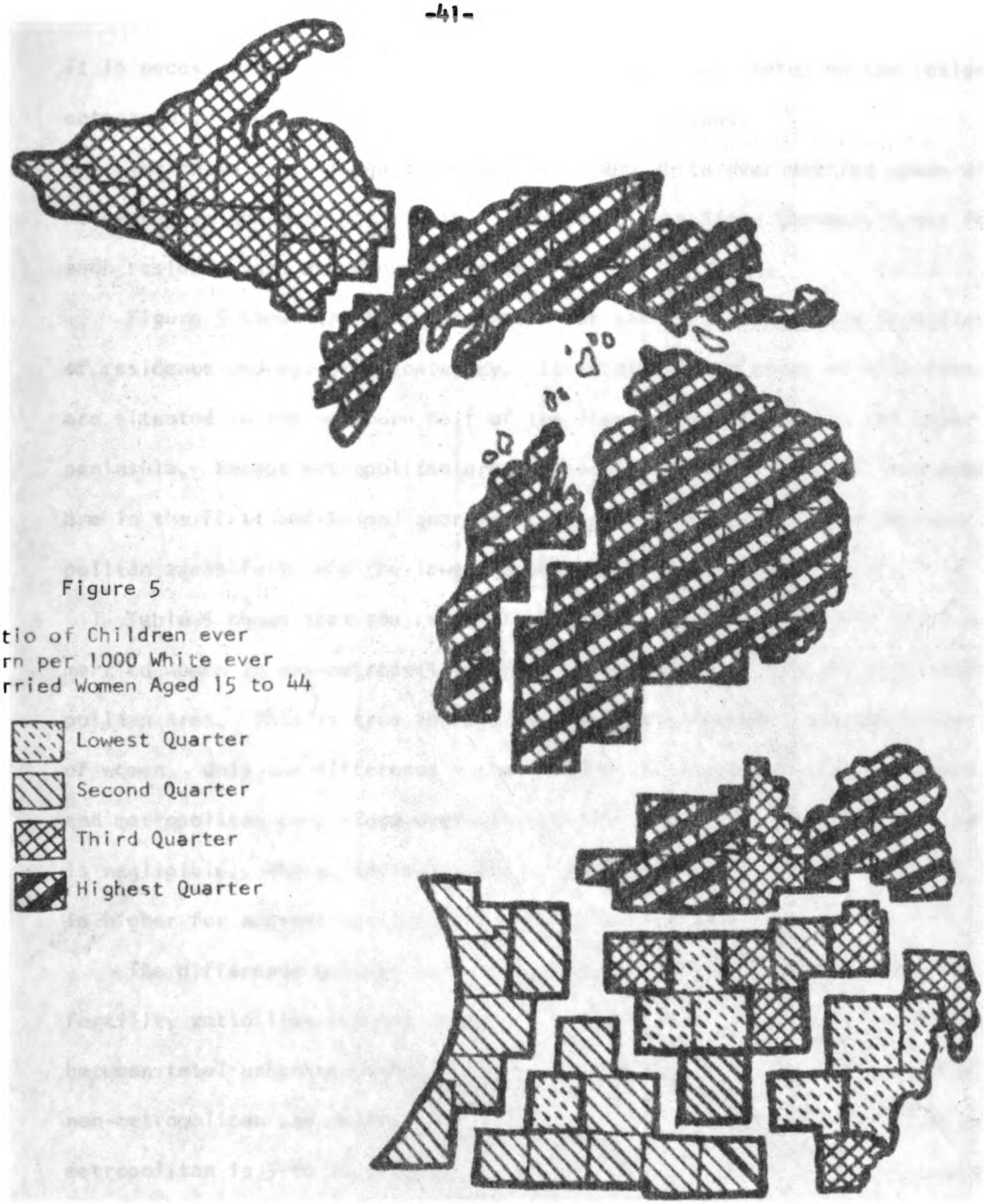

Figure 5 Ratio of Children ever Born per 1000 White ever Married Women Aged 15 to 44

it is necessary to examine the effect of metropolitan status on the residence categories. Thus, our second hypothesis is as follows:

The ratio of children ever born per 1,000 white ever married women will be higher in non-metropolitan than in metropolitan State Economic Areas for each residence and age-group of women.

Figure 5 shows the fertility ratio for the total population regardless of residence and age-group category. It is clear that areas of high fertility are situated in the northern half of the lower peninsula and in the upper peninsula. Except metropolitan areas A and C, all other metropolitan areas are in the first and second quarter of the index and none of the non-metropolitan areas fall into the lowest quarter in fertility.

Table 5 shows that the ratio of children ever born per 1,000 white ever married women in non-metropolitan areas is greater than the ratio in metropolitan area. This is true for all residential categories and age-groups of women. Only one difference - that between non-metropolitan rural-farm and metropolitan rural-farm ever married white women 15 to 24 years of age is negligible. These findings support the hypothesis that the fertility ratio is higher for non-metropolitan areas than metropolitan areas.

The difference between total non-metropolitan and total metropolitan fertility ratio lies between 11 and 16 percent for all age groups. Differences between total urban non-metropolitan and metropolitan, total rural-nonfarm non-metropolitan and metropolitan and total rural-farm non-metropolitan and metropolitan is 5 to 10 percent, 3 to 5 percent and 0 to 3 percent, respectively. The smallest percentage difference is found in rural-farm non-metropolitan and metropolitan areas. Metropolitan and non-metropolitan status does not appear to make much difference for rural-farm category.

Table 6

Range among SEA's in ratios of children ever born per 1,000 white ever married women in metropolitan versus non-metropolitan State Economic Areas by residence and age group of women, Michigan 1960

Metropolitan and Non-Metropolitan SEA	Age Group of Women			
	15-44	15-24	25-34	35-44
Metropolitan Areas				
Total Population	2094(J)	947(J)	2209(J)	2665(J)
	2641 (C)	1465(D)	2714(C)	3120(C)
Urban	1965(J)	893(J)	2113(J)	2515(F)
	2528(C)	1428(D)	2618(H)	2980(C)
Rural-Nonfarm	2366(J)	1149(J)	2445(J)	2763(G)
	2716(A)	1609(C)	2892(A)	3265(C)
Rural-Farm	2603(J)	911(J)	2521(J)	3026(J)
	3371(C)	1664(D)	3550(B)	3862(C)
Non-metropolitan Area Total Population	2459(9)	1363(6)	2650(9)	2818(9)
	2875(2)	1535(3)	2982(2)	3384(2)
Urban	2317(9)	1240(5)	2559(6)	2581(9)
	2704(2)	1399(4)	2882(4)	3228(2)
Rural-Nonfarm	2485(9)	1445(6)	2641(9)	2944(9)
	2991(2)	1704(2)	3073(2)	3516(2)
Rural-farm	2837(9)	1259(6)	2979(5)	3113(9)
	3478(4)	1782(3)	3656(2)	3915(4)

Table 6 points out the areas of highest and lowest fertility ratios, by residence group, age-group of women, and metropolitan status. Area J, Washtenaw County, is lowest in fertility in 14 out of 16 comparisons. Area C, Bay County, has the highest ratio in 9 out of 16 of the comparisons. Area D, appears three times with the highest fertility ratio and area A appears twice in this category. Note that the Detroit metropolitan area (Area F) which is the most urbanized area, is intermediate among the metropolitan areas in fertility level.

Among non-metropolitan areas, area 9 appears frequently as having the lowest fertility level. If we consider the influence of urbanized areas on the surrounding non-metropolitan population, then non-metropolitan areas 7 and 8 should have lower ratios than others. Next to the lowest fertility rank is found in area 6. At the same time it is noteworthy that table 6 shows area 2 as the most fertile among most of the residential categories and by age groups of women. Areas 4 and 3 are next to appear in the same rank order. (See also Figures 2, 3, 4, and 5.)

In general, the hypothesis that the ratio will be higher in non-metropolitan than in metropolitan State Economic Areas is accepted on the ground of empirical evidence.

Hypothesis III

These findings lead us to attempt to predict the range of differentials among different residential categories in metropolitan and non-metropolitan areas. Thus, the third hypothesis is as follows:

Residential differentials (rural-farm versus urban, rural-nonfarm versus urban and rural-farm versus rural-nonfarm), in the ratio of children ever born per 1,000 white ever married women, by age group of women will be greater

Table 7

Percent by which the ratio of children ever born per 1,000 white ever married women, by age group of women in the rural-farm population exceeds that of the urban population for metropolitan and non-metropolitan State Economic Areas, Michigan, 1960

Age group of Women	Metropolitan	Non-metropolitan	Differential greater in non-metropolitan than in metropolitan
15-44	29.2	24.9	---
15-24	13.2	7.9	---
25-34	25.5	19.0	---
35-44	29.6	21.5	---

Table 8

Percent by which the fertility ratio by age group of women in the rural-nonfarm population exceeds that of the urban population for metropolitan and non-metropolitan State Economic Areas, Michigan, 1960

Age group of Women	Metropolitan	Non-metropolitan	Differential greater in non-metropolitan than in metropolitan
15-44	12.7	8.6	---
15-24	16.6	14.6	---
25-34	13.1	7.7	---
35-44	15.5	10.7	---

Table 9

Percent by which the fertility ratio by age group of women in the rural-farm population exceeds that of the rural-nonfarm population for metropolitan and non-metropolitan State Economic Areas, Michigan, 1960

Age group of Women	Metropolitan	Non-metropolitan	Differential greater in non-metropolitan than in metropolitan
15-44	14.6	15.0	+
15-24	- 2.9	- 5.9	+
25-34	11.0	10.4	-
35-44	12.2	9.8	-

in non-metropolitan than in metropolitan State Economic Areas.

The expected higher ratio of children ever born per 1,000 white ever married women, by age group of women, is found greater for rural-farm population than urban population in both metropolitan and non-metropolitan areas. However, the assumption that the differential would be greater in non-metropolitan than metropolitan is proved false by our evidence. Table 7 shows that for each age group of women, the percentage by which the rural-farm population exceeds that of urban is greater for metropolitan than non-metropolitan areas. The difference is about 4, 5, 6, and 8 percent.

The expected higher ratio of children ever born per 1,000 white ever married women by age-group of women is found greater for rural-nonfarm population than urban population in both metropolitan and non-metropolitan areas. But, as in the case of rural-farm and urban, here too, the differential is not greater for non-metropolitan than metropolitan. As shown in table 8, metropolitan differentials are about 4 to 5 percent higher than non-metropolitan, except for the age group of 15 to 24 where it is 2 percent greater than non-metropolitan.

Table 9 shows the percentage differentials for rural-farm and rural-nonfarm population. Here we find two cases which are in agreement with our expectation. For the total population of women 15-44, the differentials are greater for non-metropolitan than metropolitan areas by only 4 percent. The fertility ratio in metropolitan areas for the age-group of 15 to 24 is greater for rural-nonfarm than rural-farm by 2.9 percent and for non-metropolitan areas for the same age-group rural-nonfarm ratio is higher than the rural-farm by 5.9 percent. For the age groups 25 to 34 and 35 to 44 the fertility ratio again is higher for rural-farm than rural-nonfarm in both metropolitan and non-metropolitan areas and metropolitan differentials are greater than

non-metropolitan.

On the whole, hypothesis III is rejected.

Chapter 4. - Summary and Conclusions

The major concern of this study is residential differences in fertility in Michigan in 1960. The data used derive from the 1960 Census of Population and are restricted to white women, classified by age and residence. The unit of analysis is the State Economic Area, generally a multi-county unit which is more or less economically and socially distinct from surrounding areas. The measure of fertility used is the number of children ever born per 1,000 ever married white women.

Two major reasons for undertaking the present study may be made explicit. First, in view of the known narrowing of rural-urban fertility differentials in the United States, it seemed justifiable to seek an answer to the question of their existence in 1960. It was felt that the use of a highly urban state such as Michigan would offer a rigorous test. Second, the use of new criteria to delineate the rural-farm population in 1960 served to make this aggregate more homogeneous and to "up-grade" its character. This event raised the question concerning the level of fertility of this population and seemed to suggest that rural-farm versus urban differentials might be reduced.

The data were analyzed in such a way as to test three hypotheses. The first hypothesis was generally supported by the data. Ratios of children ever born per 1,000 ever-married white women were highest in rural-farm, lowest in urban, and intermediate for rural-nonfarm areas. This ranking by residence holds true for each age group of women except those aged 15 to 24. In this instance rural-nonfarm white women generally outrank rural-farm women in fertility level.

The data support the second hypothesis, namely, that fertility ratios are higher in non-metropolitan areas than in metropolitan areas for each residence and age group of women. In only one comparison was the difference negligible: that for rural-farm women aged 15 to 24. But even in this instance the non-metropolitan fertility level was higher than the metropolitan fertility level.

The third hypothesis, which predicted that residential differentials by age group of white women would be greater in non-metropolitan than metropolitan areas, proved to be largely incorrect. While the rural-farm ratio exceeded the urban ratio by about 8 to 30 percent, the magnitude of this differential was greater in metropolitan than non-metropolitan areas for each age group of women. Similarly, the rural-nonfarm ratio was in excess of the urban ratio by approximately 8 to 17 percent but the size of this differential was always greater in metropolitan than in non-metropolitan areas. Finally, while the rural-farm ratio exceeded the rural-nonfarm ratio (except for age group 15 to 24) by as much as 15 percent, this differential was greater in non-metropolitan than metropolitan areas only for women 15 to 44 and for women 15 to 24. Thus, the data generally support the opposite of the hypothesis as stated.

As predicted, this study shows that residential differences in fertility were apparent in 1960. Fourthermore, the aggregates delineated by the application of residence criteria are sufficiently distinct so that regularized patterns of fertlity are manifested. In fertility behavior in Michigan, residents of rural-farm areas rank highest, residents of urban areas rank lowest, and residents of rural-nonfarm areas rank in an intermediate position. Levels of rural-farm and rural-nonfarm fertility, however, are relatively

similar. In fact, rural-nonfarm married women 15 to 24 years of age exhibit higher fertility than rural-farm women. It may be that the explanation of this reversal in expectation is due to an allocation of lower socio-economic elements to the rural-nonfarm population which would have been classified as rural-farm in earlier censuses.

The study strongly reflects the importance of urbanization in the determination of fertility levels. In all instances, metropolitan status reduced fertility level when age and residence category were controlled. In other words, the presence of a large urban center appears to depress fertility levels for the surrounding rural population aggregates. However, the magnitude of residence group differentials in fertility were generally larger within the metropolitan than the non-metropolitan areas. Why the rural-farm versus urban fertility differential, for example, should be greater in metropolitan than non-metropolitan areas is not clear. Contrary to expectation, the same situation generally prevailed with respect to rural-nonfarm versus urban and rural-farm versus rural-nonfarm differentials. Apparently, norms regarding family size are shared by all segments of the population outside metropolitan to a greater extent than within metropolitan areas. At least this appears to be the situation in Michigan as of 1960.

APPENDIX TABLE I

Ratios of Children Everborn to Women 15-44 by Residence and Age-Group in Metropolitan and Non-Metropolitan Status, Michigan, 1960

	Total All Residence Groups				Urban			
	15-44	15-24	25-34	35-44	15-44	15-24	25-34	35-44
TOTAL ALL AREAS	2426	1336	2571	2748	2319	1270	2464	2606
Metropolitan Areas								
Total	2342	1290	2484	2627	2295	1259	2434	2568
Area A	2594	1435	2699	3047	2506	1397	2583	2939
Area B	2476	1309	2650	2828	2431	1276	2616	2772
Area C	2641	1377	2714	3120	2528	1302	2606	2980
Area D	2447	1465	2629	2762	2359	1428	2552	2659
Area E	2408	1322	2604	2809	2256	1210	2448	2656
Area F	2297	1262	2424	2541	2278	1252	2405	2515
Area G	2337	1311	2563	2663	2250	1227	2476	2616
Area H	2489	1430	2684	2754	2408	1401	2618	2675
Area J	2094	947	2209	2665	1965	893	2113	2548
Non-Metropolitan Areas								
Total	2631	1434	2791	3050	2453	1322	2633	2818
Area 1	2565	1406	2739	2913	2449	1347	2635	2772
Area 2	2875	1480	2982	3384	2704	1329	2817	3228
Area 3	2713	1535	2829	3097	2538	1319	2574	2965
Area 4	2829	1497	2975	3369	2638	1399	2882	3054
Area 5	2705	1477	2839	3202	2448	1240	2643	2873
Area 6	2552	1363	2717	2931	2411	1288	2559	2776
Area 7	2664	1450	2850	3106	2471	1314	2695	2881
Area 8	2658	1431	2814	3030	2501	1318	2653	2827
Area 9	2459	1415	2650	2818	2317	1364	2569	2581

	Rural-Nonfarm				Rural-Farm			
	15-44	15-24	25-34	35-44	15-44	15-24	25-34	35-44
Total All Areas	2635	1498	2805	3062	3038	1426	3111	3400
Metropolitan Areas								
Total	2587	1468	2752	2966	2965	1425	3055	3327
Area A	2716	1531	2892	3233	2954	1280	3014	3376
Area B	2566	1450	2689	2972	3266	1475	3550	3487
Area C	2712	1609	2753	3265	3371	1150	3435	3862
Area D	2696	1596	2860	3017	3105	1664	3101	3515
Area E	2637	1549	2864	3071	2946	1609	3103	3223
Area F	2564	1394	2712	2921	2996	1333	2937	3381
Area G	2513	1520	2742	2763	2552	1626	2567	2740
Area H	2497	1468	2750	2791	2714	1445	2874	3270
Area J	2366	1149	2445	2847	2603	911	2521	3026
Non-Metropolitan Areas								
Total	2664	1515	2837	3120	3064	1426	3132	3425
Area 1	2647	1457	2811	3031	3037	1571	3182	3198
Area 2	2991	1704	3073	3516	3469	1265	3656	3746
Area 3	2672	1614	2886	3008	3307	1782	3289	3589
Area 4	2742	1516	2913	3306	3478	1608	3430	3951
Area 5	2751	1624	2901	3332	2940	1409	2979	3346
Area 6	2650	1445	2816	3003	3015	1259	3139	3324
Area 7	2950	1530	2859	3088	3040	1399	3101	3456
Area 8	2722	1506	2895	3119	3006	1396	3053	3411
Area 9	2485	1461	2641	2944	2836	1403	2994	3113

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