THE SELECTIVITY OF MICHIGAN MIGRANTS, 1949-1950

THESIS FOR THE DEGREE OF M. A.
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DONALD LYLE HALSTED

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AN ABSTRACT

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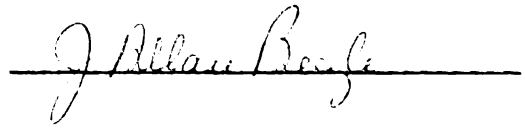
Approved 

Donald L. Halsted

The problem of selectivity of migrants has not been studied in this country, to any great degree, until the last three decades. Besides the problem of volume there have been three major difficulties in the accumulation of the knowledge in these studies, namely, the type of data used, the method used and theoretical orientation.

In 1940 and 1950 the problem of comprehensive and reliable data was met by the publication of migration data by the Bureau of the Census. This thesis proposes an approach to the other two difficulties mentioned above.

While the methodology in previous studies has many variations, most of the studies can be said to use the differential method of measuring selectivity of migrants. A new method is proposed on the bases that the differential method is logically unsound, obscure in definition, and is partly a function of the rate of migration. It is believed that this new method meets these criticisms.

Studies of migration selectivity have also exhibited a considerable lack of theoretical orientation. While the empirical generalizations found have been insightful, it is hard to evaluate their significance and stability. To this end, the hypothesis proposed, being derived from the larger field of ecology and the specific concept of dominance, allows the placing of migration selectivity in a larger perspective.

The specific, directional hypothesis proposed is not supported by the data. However, the results indicate that the relation of dominance and selectivity of migration is a fruitful area for further research.

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CHAPTER I

THE GENERAL FIELD OF MIGRATION

The movement of people from one habitat to another has been a characteristic phenomenon since the beginning of history. From the earliest period when social groups were organized on a mobile basis through the development of towns and settled areas, the rise of nation states, and the discovery and growth of the new world, people have been on the move. Numerous attempts have been made to isolate the essential factors and to characterize and explain such movements of people. Explanations have ranged from environmental conditions, war, political action, population pressure and desire for freedom, to the call of the wild and direct economic response.

Interest in the movement of population probably developed in the Middle Ages. But it was not until much later, along with a growing interest in science and a developing body of scientific knowledge, that any sort of analysis was undertaken. It was perhaps natural enough that certain Western European countries, beset by population and economic problems growing from the Industrial Revolution, began the first systematic count and analysis of population movements.[1]

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1 Taft, Donald R., Human Migration, Ronald Press Co., New York, (1936), p. 56.

MIGRATION DIFFERENTIALS IN THIS COUNTRY

In this country, internal movement and especially the field of migration differentials, as areas of study, were overshadowed for many years by the problems of immigration. While the general field of migration undoubtedly had several adherents, very few studies of migration differentials were made during this period.

When immigration to the United States was sharply restrictly, first by World War I and then by Federal Legislation in the early 1920's, the population student could still study the problems of assimilation and distribution of the immigrants.[2] During this period, industrial growth in the North and the resulting movement of Negro laborers, along with the growing awareness of the effects rural to urban migrations may have, led to a few studies of migration differentials.[3]

It was still later, with the crises of the depression of the late twenties and early thirties, and the magnitude of the concomitant population changes and problems, that the population students turned in earnest to the description and

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2 Thomas, Dorothy Swaine, "Research Memorandum on Migration Differentials", Social Science Research Council, Bulletin 43, (1938) pp. 1 and 2.

3 Ibid., pp. 2 and 3 and Appendix A.

analysis of migration differentials.[4]

BACKGROUND OF THE PROBLEM

Previous to 1940, population students had to rely on localized studies to obtain data suitable for an intensive analysis of migrants. Unfortunately, both the methods of gathering and analyzing the data varied greatly and in several cases the data were gathered during a period of crisis for the local area. Beginning in 1940 and continuing in 1950, the Federal Census has obtained comprehensive, nation-wide data on the movement of people. This thesis is based on the 1950 Federal Census data for Michigan.[5]

THE PROBLEM

This thesis is an examination of the differences between migrants and non-migrants[6] as exhibited in the 1950 data, and an attempt to account for these differences by an explanatory framework. The framework represents an extension

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4 Ibid., Appendix A. Of 111 American studies of migration differentials published up to 1938, only 23 were published before 1930. And of 23, 15 appeared after 1924.

5 The 1940 material has been analyzed by A. H. Hawley, in a report by the University of Michigan Bureau of Government, called Intrastate Migration in Michigan: 1935-1940. Because of the discrepancies in collecting and reporting between these two sets of data, no attempt will be made to incorporate the 1940 data.

6 Hereafter, the difference dealt with will be referred to as "selectivity". This term will be discussed and defined in the section on method.

of ecological principles to migration data. The central problem is the extent to which selectivity is accounted for by this general ecological framework.

The significance of this problem is two-fold. On the general scientific level it is a test of one type of hypothesis derived from a larger body of theory. Given that the assumptions and the indices used are correct, if the hypothesis is borne out then progress has been made in understanding migration. If the hypothesis is not borne out, this approach to migration may be rejected.

On the practical level, an acceptable hypothesis of this type would be of value to population students in predicting the future population characteristics of an area. If this prediction is accurate enough, then the future composition of areas in terms of age of population, years of school completed, and sex composition, would be available to urban planners and community development programmers. The data, per se, would not be used but rather the implications of the data for type of housing, number and type of jobs, etc., that will be most efficient for the type of population. Of course, any complete planning program would also require an accurate prediction of types of in-migrants.

DERIVATION OF THE HYPOTHESIS

Inasmuch as ecology is a general theory concerned with the distribution and movement of population, it should lend itself to an explanation of differential movement.

The hypothesis developed here is derived from the eco-

logical concept of urban domination. The focus of the concept of urban domination is upon the large urban center, which is viewed as extending its characteristics into surrounding areas to the degree that these areas are functionally interdependent with the urban center. Martin, in a recent review of research concerning urban dominance, finds that dominance is a function of distance to the urban center. He calls this relationship the "gradient principle" and states it as, "the extent of urban influenced changes in rural areas varies inversely with distance to the nearest city and directly with the size of that city".[7] This thesis represents an attempt to extend a similar principle to migration selectivity in the State of Michigan. However, two problems are involved: 1) the extension of the principle over a much wider area than in previous studies[8] and, 2) the use of a principle developed on static data (characteristics of people living in an area) to explain a dynamic phenomenon (migration).

The expectation that the general principle should hold over a wide geographical area is not without basis. R. D. Mckenzie, writing more than two decades ago, says, "One of

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7 Martin, Walter T., "Ecological Change in Satelite Rural Areas", American Sociological Review, Vol. XXII, No. 2, (1957), p. 176.

8 Ibid., The research based on urban domination has, for the most part, dealt with an urban area and its immediate surrounding area.

the outstanding trends in modern communal development is that of integration. The entire settlement pattern of the country is becoming knitted together into an ever finer web of functional interrelationships." Further, he notes that, "A national system of 'key' cities, each dominating a more or less definable trade area, is arising..."[9]. Hence, it would seem reasonable to assume that this principle should cover Michigan and that Detroit would be the dominant urban center for part, if not all of Michigan.[10]

Inasmuch as the gradient principle is based on research which was not concerned with migration, its application to migration data is postulated on the following considerations. Migration is usually viewed as a result of the "push-pull" factors credited to A. C. Haddon. Hawley interprets these factors as being the relation of population and subsistence. Push is here, the overpopulation of an area, (a larger population than the number of jobs available will support) and pull, the underpopulation, (a smaller population than the number of jobs available will support).[11] While these factors are set forth as a general principle to explain all

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9 McKenzie, R. D., "Integration and Dominance", Readings in Human Ecology, George Wahr (Publisher), Ann Arbor, (1934), p. 403.

10 The effect of Chicago is not considered here.

11 Hawley, A. H., Human Ecology, Ronald Press, New York, (1950), p. 329.

movement, further specification of factors is necessary to predict the pattern of selectivity.

The selectivity pattern is derived from considerations of the types of communities in which migrants originate. Hawley describes two types of communities, the dependent and the independent. He defines the dependent community, here taken to refer to the urban community, in these terms, "The primary orientation of the dependent community is not to the land but to a network of inter-community relations, and that network of relations or market situation, since it constitutes a highly flexible and changeable sustenance base, presupposes maximum mobility. In consequence, population in general, if not individuals in particular, is prepared for and habituated to readjustment through migration."[12] Orientation to migration is important, but other factors must be considered. Hawley comments, "Migration is facilitated also by the existence of a highly developed transportation and communication system."[13]

In contradistinction, the independent community (rural) would exhibit the polar tendencies of a relative lack of transportation and communication facilities, and a lack of orientation to migration.

While the concept of a completely independent community can not be used as one end of a continuum, it is possible to

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12 Ibid., p. 334

13 Ibid., p. 335

build a continuum of relative dependence. The continuum is here used to place different areas, with the urban centers located toward the end of relatively complete dependence and the rural areas placed toward the end of relatively little dependence. It would seem reasonable to assume that the migrants, relative to the populations from which they come, should reflect the variations in orientations to migration and in obstacles to migration, (i.e., lack of transportation and communication.) More specifically, it is expected that the greater the obstacles and the less the orientation to migration, the less likely all groups are to move and consequently the greater the difference between migrants and the population from which they come, (i.e., the greater the measure of selectivity). Inasmuch as urban areas are generally more oriented to migration and have relatively ample transportation and communication (relative to the urban areas), it is expected that, in general, migrants from urban areas will exhibit less selectivity than migrants from rural areas.

It is not necessary, for this study, to actually find what relation the various areas of Michigan have with Detroit. Bogue has shown that dependence varies directly with distance.[14] Consequently, in this study, distance will be used as the measure of dependence and therefore, of the difference

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14 Bogue, Donald F., The Structure of the Metropolitan Community, a Study of Dominance and Subdominance, Ann Arbor, (1950).

in selectivity expected.

On these considerations the following general hypothesis is advanced: The greater the distance an area is from an urban center the greater the difference between the migrants and the population of the area in which the migrants originated. From this is taken the specific hypothesis to be tested in this study, namely, The greater the distance an area is from Detroit the greater the measure of selectivity.

SOURCE OF DATA

The data upon which this thesis is based were obtained through the North-Central Regional Project 18 on migration. The special photostat sheets contain information based on a 20% sample of all mobile people within, into and out-of State Economic Areas.[15] The residence of any particular migrant was obtained for the date one year prior to the date of enumeration in 1950. For practical purposes the dates of April 1, 1949 and April 1, 1950 are accepted as the dates to

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15 State Economic Areas, hereafter abbreviated to SEA, is a general term used to refer to a county or group of counties of similar social and economic characteristics. There are two types of areas, non-metropolitan and metropolitan, referred to as State Economic Areas and State Metropolitan Areas, respectively. The term SEA will refer to both. Differentiation will be made, where necessary, by the use of the terms Metropolitan and Non-Metropolitan. In the Appendix tables and on the map, arabic numbers identify non-metropolitan areas and alphabet letters identify metropolitan areas. For a discussion of the construction of these areas see: Bogue, Donald J., State Economic Areas, U. S. Bureau of the Census, Washington D. C., (1956), p. 11.

which the data pertain. A mover is here defined as a person residing in a different house in 1949 than in 1950. The data are divided into two "counts", the Z-1 count and the Z-4 count.

Z-1 Count

This category includes data on the mobile population that were residing in the State of Michigan on the date of enumeration in 1950. It has four main divisions: Same County movers; Same SEA movers; Different SEA movers; and those Abroad and Not Ascertained. Same SEA movers are persons residing in a different county but in the same SEA in 1949 and 1950. Different SEA movers are persons residing in a different SEA, either in Michigan or another state, in 1949 and 1950. The Abroad and Not Ascertained category refers to all persons whose 1949 residence was outside the continental boundaries of the United States or whose 1949 residence could not be obtained from the information gathered. The four classifications of movers are presented for each of the SEA's in which the movers were residing in 1950.

The data are presented for the characteristics of color, residence in 1949, (farm, non-farm, Not Ascertained), distance moved, age, years of school completed, marital status, employment status, occupation and family income. The characteristics are cross-classified by residence in 1950 (urban, rural non-farm, and rural farm) with each residence classification divided into total males, non-white males, total females and non-white females. Except for Area F (Detroit

Metropolitan Area) information is not available for the cross-classification of color of mover. The distance moved characteristic applies only to the different SEA movers, and consists of three categories, Same State, Contiguous State and Non-contiguous State.

Z-4 Count

These data are similar to the different SEA mover classification of the Z-1 count. The data differ in this respect, they represent the characteristics of Different SEA movers by the area in Michigan in which they resided in 1949. As such they represent the out-migrants of an area between 1949 and 1950.

The format of these data differs from the Z-1 count sheets in this respect. The major divisions of the cross-classification are male and female with each subdivided into total non-farm (1949 residence), non-white non-farm, total farm, non-white farm, farm Not Ascertained, non-white farm Not Ascertained. The residence characteristics are for urban farm and non-farm in 1950.

SAMPLE DESIGN

Within each enumeration district five versions of the schedule are used, with each used approximately to the same degree. On each version a line has been preselected as a sample line - a different line for each version. For each individual a separate line has been filled out on the schedule. The sample then consists of the people found on these

preselected lines and represents approximately a 20% sample. To obtain an estimate of the total number of movers by characteristics, the sample figures were multiplied by five. The sample is unbiased.[16]

MIGRANTS

For this thesis migrants are defined as those movers who crossed a SEA line. This would be the Different SEA category in the Z-1 and Z-4 counts. While this definition is to a large degree arbitrary, certain considerations make it seem less so. This category, more than any other, represents the people moving a long distance and for the most part to a new type of area. While distance per se does not make movement significant, it is assumed that whatever local ties existed must be broken in large part. Also it is assumed that people moving to a new area are presented with a new situation. This is not likely true to the same degree of the Same SEA movers and especially not true of the Same County movers in general. This combination of a new area and distance are assumed to be the polarity of local movement or no movement and thus should best, within limitations of the data, distinguish non-movers or local movers and migrants.

METHOD OF ANALYSIS

Because the approach employed differs considerably from

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16 Special Report P-E No. 4B, United States Bureau of the Census, Washington, D. C., (1956), p. 11.

other methods of analysis, this section will present the method in detail and its rationale.

Aside from purely cursory descriptive studies, migration data are usually analyzed by one of two general methods. The first method concentrates entirely on the migrants. The characteristics of the migrants are usually summarized by some measure of central tendency such as the mean or median; or selected parts of a distribution may be utilized, such as the percent of migrants in certain age categories. Usually the migrants are grouped by the residential type of area of origin or destination, (i.e., urban or rural). Comparison is then made between migrants of these residential groupings using the measures indicated above.

The second method is usually referred to as migration differentials. This method compares the characteristics of the migrants with the characteristics of the population after the migrants have left or at the time they were leaving. The important point is that the comparison is between the migrant and the total population as if they were two separate populations. This type of analysis is usually some comparison of the central tendency of the population such as the mean or median, although a goodness of fit test is sometimes utilized.

The method utilized in this thesis attempts to measure more completely and without the tendency for bias of the differential method, the difference between migrant and nonmigrant population. To differentiate the results of this new method, they will be referred to as selectivity.

Acceptance of the method proposed is dependent on the answer to the question: what constitutes the valid difference between migrants and non-migrants? Which is more valid: the difference between two separate and distinct populations as proposed by the differential method or the difference between migrants and some theoretical population as proposed by the selectivity method? The answer arrived at by the writer is that the essential difference to establish is the difference between a migrant distribution and a theoretical distribution.

The rationale for using the proposed method is statistical and theoretical in nature. In order that the argument may be followed more easily the methods will be described and then compared. The discussion is limited to effects the two methods have on measures of differences of distribution. Age will be used as an example of a characteristic under investigation.

The differential method would compare the age distribution of the migrants with the non-migrants (the population in an area after the migrants had left). The non-migrant population would represent the original population minus the migrant population.

The selectivity method would compare the age distribution of the migrants with the population as it existed before the migrants had left. The distribution of the original population is used as a theoretical population, which would be approximated roughly by the migrant distribution, if only random selection processes are operating.

The first point of conflict may be considered theoretical. Of interest to the population student is the effect migration has upon a population and one way of measuring this is to find which groups are affected most by the migration processes. Given this goal it would seem more reasonable to measure how the migrants differ from the population before the migrants left, than to compare migrants with the population after the migrants left. For it is this original population upon which the migration processes are operating. The population after the migrants have left has already felt the impact of the migration processes.

Secondly, the differential method gives one no indication of the extent to which migrants vary from a random selection of the base population. The effect of not allowing for random differences is to arouse concern over the measure obtained. It is not known to what extent this measure of difference is a reflection of random processes. Inasmuch as this is true, the definition of just what is measured by the differential method is at best hazy. It will be noted further, that any comparison of measures of difference arrived at by the differential method compounds the difficulty in interpretation.

The selectivity method does allow for the random selection effect and is interpreted in the following manner. The measure is the effect migration has upon the original population. The greater the measure the more the migrants vary from the original population and consequently the greater

effect the migration has on the original population.

The last point of conflict and of great importance to this study is the lack of stability of the differential method. This lack of stability is due to the fact that the measure of difference in the differential method is a function of the rate of migration. That this is not true of the selectivity method can be demonstrated by taking two original populations that have the same proportional distribution but varying in the percent value they represent of their respective original populations. With the above populations, the selectivity method would yield identical values for the difference between the two populations and their respective migrants. The differential method requires that the migrants be subtracted from their original populations; the computation of the resulting populations' (non-migrant) proportional distributions and comparison of these final distributions with the migrants' distributions. The results obtained here will be different. This is the effect of the subtraction process noted above, which has the effect of varying the non-migrants' proportional distributions to the degree that the rate of migration between the two non-migrant populations is different.

On the basis of these considerations the selectivity method will be used.

The method employed involves the reconstruction of the 1949 population, i.e., the total population before the migrants had left. This is referred to as a base population or the theoretical population. This is the distribution on a

characteristic that a migrant population would resemble if random selectivity processes were operating. Its computation will be taken up in a separate section.

The measure of selectivity is computed by utilizing a chi square test for the differences between the distributions of the migrants and the base population. It is this value we refer to as the degree of selectivity and it is this value that is hypothesized as dependent upon distance from Detroit.

Because our unit of analysis is the SEA, we have to accomplish all the above computations for each SEA. Inasmuch as our final analysis is based on the relative size of these SEA's, chi square has an immediate disadvantage because it is a function of the total size of the population in an area. To overcome this disadvantage, a method of controlling for different size populations is needed. The control involves giving each population, both base and migration, in each area, a total size of 1,000. To find the size of a category in a distribution involves finding what percent the category represents of the original total (actual count) and multiplying it by ten. These proportions multiplied by ten will then equal 1,000.[17] It is these final distributions on which

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17 This procedure developed by Drs. Joel K. Smith, Assistant Professor of Sociology at Michigan State University and Charles Proctor, Instructor in the Department of Statistics at Michigan State University.

chi square is computed.

To test the hypothesis of the relation of distance and selectivity the Pearsonian coefficient of correlation with the .05 level of significance will be used. While the variables do not exactly meet the requirements of normalcy necessary for use of the Pearsonian r, the general effects of this bias are probably negligible. This is especially true of the variables of age and education. The findings in the other variable, percent male (which is subject to the greatest bias), are of such a magnitude that this bias would not cause a change in interpretation.

The general character of the hypothesis should be noted here. It deals only with the distribution of the measure of selectivity. An examination of the method will reveal that the value of selectivity between areas has two possible sources of origin. A difference between areas of the base population and a difference between areas of the migrants. Because of this we cannot say what the exact nature of the differences are. While this is not necessary for the hypothesis, some indication of the major source of this difference will be given.

BASE POPULATION

The base population is the population as it existed in 1949. The computation involves taking the 1950 population of an area, adding the Z-4 count Different SEA movers (out-migrants), subtracting the Z-1 count Different SEA movers (in-migrants), and subtracting the Abroad and Not Ascertained

category.[18] Inasmuch as the Census pro-rated the Abroad and Not Ascertained category and presents it as part of the total population in 1950, any computation of a base population from data found in the Census.[19] will differ slightly from the base population used here.

LIMITATIONS

The method employed here limits our comparison of migrants and base population to out-migrants of the areas in Michigan. Lacking stream data we cannot compute the 1949 population of the in-migrants of areas in Michigan. It is quite conceivable that control of type of area of destination and origin would be superior to the type of analysis given here and therefore of more value. The method of data collection also limits the characteristics that may be compared. This is because only 1950 characteristics are collected and thus the 1949 characteristics must be inferred from the 1950 data. Therefore, any characteristics that may change other than the same amount and in the same direction in all categories must be dropped. This involves leaving out of analysis: marital status, family income, employment status and occupation. As a result the study is limited to comparisons of age, sex and years of school completed. While

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18 See the note at the beginning of the Appendix.

19 Data necessary for constructing the base population is available in Special Report P-E, No. 4B, op. cit., pp. 140-145.

we reconstruct the 1949 data on the basis of 1950 characteristics, it should be noted that this method is consistent for all groups and therefore of no importance here.

MEASUREMENT OF DISTANCE

The general procedure in determining the distance SEA's are from Detroit, was to draw on a scale map of Michigan, series of concentric circles from the center of Detroit to the approximate center of the SEA's. For SEA's that were outstate no problems developed. For SEA's near Detroit, because of their number and shape, certain arbitrary decisions had to be made. If the SEA was of such a shape that its approximate center could not be readily located and if it was tied or close to another SEA, consideration was given to the area having most of its area closest to Detroit.[20]

In order to use the Pearsonian coefficient of correlation, measurement of the variables must be in at least an interval scale. To obtain an interval scale, the distance from the center of the Detroit area to the center of the other SEA's was measured on a scale map of Michigan in 16ths of an inch.[21]

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20 For a map listing the areas and showing the adopted center of the area, see Appendix Figure I.

21 See Appendix Table II.

CHAPTER II - FINDINGS

AGE

Of all the variables dealt with in migration, age seems to be the most stable.[1] Because of this stability, age should provide a better test of the hypothesis than other characteristics might.

The hypothesis is tested only for those migrants eighteen years and over in 1950. The younger groups, while important in many studies, have less value here. The decision was made on the basis of keeping the data as close as possible to people capable of making an independent choice of movement. A second reason for leaving out the young age groups was the probable difference in fertility between rural and urban areas and its close relationship to the expected age of the migrants. If rural migrants have larger families than urban migrants or some other relationship exists between family size and migration, the addition of children may add a biasing dimension to the measure of age. This writer feels that this possible bias should be left out.

The total correlation of distance and selectivity of

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1 Thomas, D. S., "Migration Differentials", op. cit., Chapter 1.

age is .6654[2] (Appendix Table III). This is significant at the .01 level, measured by the Analysis of Variance F test.[3] This indicates that the farther an area is from Detroit the less the migrants resemble their base population.

It would also be of value to determine what portion of this relationship is due to the differences between areas of the base populations. An indication of this may be obtained from the partial correlation coefficient of age selectivity and distance when median age of the base population is taken into account. This relationship has a coefficient of .4995 (Appendix Table III), and is significant at the .05 level. This may be interpreted as indicating that selectivity of age would not be significantly related to distance if all base populations had the same median age. This result is not surprising in view of the high relationships of distance and median age, and of selectivity of age and median age, .5985 and .5562 respectively (r_{xz} and r_{yz} in Appendix Table III). These relationships indicate that median age is non-random with respect to distance and that our selectivity measures vary with median age of the base population. Thus

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2 For a discussion of correlation, its computations and interpretations, see Hagood, Margaret, and Price, Daniel, Statistics for Sociologists, Henry Holt & Co., New York, (1952), Chapters 23 and 25.

3 Ibid., p. 430. All tests of significance in this thesis are by this method.

it should be expected that the relationship of selectivity of age and distance would decrease when median age of the base population is adjusted for. From these correlations, it is concluded that a large part of the selectivity seems to be due to differences in the base population between areas (i.e., the differences in the migrant populations between areas is not enough to account for the measure of selectivity.

There is another facet of the data that is important to the hypothesis. While the hypothesis has been set up to cover all areas of Michigan, it might have been hypothesized that the metropolitan areas will maintain different relationships to Detroit than the non-metropolitan areas exhibit. An indication that this is the case, may be seen by the relationships of selectivity and distance for these two types of areas. Here the relationship of the non-metropolitan areas is .6667 and for the metropolitan areas .2209 (Appendix Table III).

While earlier, the relationship of selectivity of age and distance was spelled out, further data must be presented before the exact relationship of age and migration can be stated. This is necessary because chi square does not reveal the direction of the differences between migrants and base population. Table IV in the Appendix gives the signed amount of difference between the migrants' and the base populations' distributions. If these signs are in the same direction for all areas then the direction of difference, as well as the

amount of difference, may be stated. With two exceptions the signs are the same for specific age groups over the areas. If this slight discrepancy is ignored we may conclude that migrants, when compared to the base population, differ in the same way for all ages, i.e., they tend to be over representative of the younger population and under-representative of the older population with the degree of representativeness decreasing with the distance from Detroit.

In summary several points are of interest. First, the data support the hypothesis, so it must be accepted for the variable of age. Secondly, it will be noted that all of the relationships of age and distance have not been examined for the metropolitan - non-metropolitan areas. This has been done because this is an exploratory part of the data and it is not necessary for testing the hypothesis. In connection with this, the total number of cases is so small that any subdivision of the cases such as type of areas, gives a number which is extremely small and any relationships based on these smaller numbers is at best only an indication of what might be found with a larger number of cases. Third, the control value (median age of the base population) is very weak. To actually test what the effect of the base population has on the difference value, the base populations would have to be standardized to some population distribution. The result would probably be about the same as indicated previously. Finally, the relationships are of such a nature that another test over a larger number of cases selected from

the entire United States would be desirable.

YEARS OF SCHOOL COMPLETED

While age has been the most stable characteristic in migration, many other demographic attributes of less stability are of at least equal value and interest, especially to urban planners and officials interested in their particular cities.

The data for years of school completed are reported for those persons twenty-five years and older in 1950. The hypothesized principle is of particularly little value in the area of education. The relationship of distance and selectivity of years of school completed, as measured by the coefficient of correlation, is -.0533 (Appendix Table III). This value for practical purposes may be considered zero. When the control for median years of school completed by the base population is added, the relationship becomes .1101 (Appendix Table III). This is in the predicted direction but hardly large enough for serious consideration. This is surprising in view of the relation of distance and median education of base population, -.5960, (Appendix Table III), (i.e., the farther an area is from Detroit, the lower the median education level of the base population in the area). That selectivity tends to increase with a decrease in median education level of the base population may be inferred from the positive relationship of selectivity of education of migrants and median education of the base population, .2337 (Appendix Table III).

Despite the above relationships of distance and selectivity to the control value, they are only slightly related to each other. The control brings out the positive relationship by affecting the variation in both variables with the result that they are more closely related. The partial correlation indicates that educational slectivity would be positively related to distance if all areas had the same median educational level in their base populations.

Also of interest is the relationship of distance and educational selectivity for metropolitan and non-metropolitan areas. For non-metropolitan areas this relationship may be considered zero, -.0695 (Appendix Table III). For metropolitan areas the relationship is high, -.6401 (Appendix Table III). This indicates that the negative of the principle operates in metropolitan areas, (i.e., the farther a metropolitan area is from Detroit the less the difference between migrants and their base populations). It will be noted that education tends to be inversely related to the types of areas when compared with the relationship of age to types of areas.

Certain considerations may be advanced as reasons for the hypothesis not being supported. The first of these is that the data are not of the same "pureness" as age data and therefore some other factor or factors must be controlled in order for the principle to emerge. One factor that may come to mind is the practice of the Census Bureau, in 1950, to allot the students to the area in which they attend school.

However, in view of the fact that the data are only for those persons twenty-five years old and over, the effect of this factor could be small.

Another consideration may be that the relationship of pull and of level of education in the population is of such a nature that it does not show in the present data. It is conceivable that the pull for educated people lessens the farther from Detroit an area is. And it is possible that accompanying this lesser pull, is a lower level of educational aspiration by the general population. This would be an especially appropriate proposal for the metropolitan areas. Similar propositions for the non-metropolitan areas are not evident, but they might be found upon detailed inspection of the original data.

Finally, it is possible that stream analysis would reveal patterns not evident in this analysis. Because data for origin and destination of migrants are lacking, this proposal cannot be further explored here.

The hypothesis must be rejected for the variable of years of school completed.

SEX

Sex ratios resemble age in having been one of the more stable variables in migration history. But unlike age and more like other variables, sex selectivity seems to bear a more complicated relationship to other variables. Whereas age selectivity seems to hold generally, other types of demographic selectivity seem to hold only in more specific situ-

ations.

To test the hypothesis, the percent of migrants that are male compared to the percent of the base population that is male, will be used rather than sex ratios. This value is simpler to compute and interpret and the general result is the same. No consideration will be given to whether the migrant group has more or less percent of males than the base population. This facet of the data will be explored later. The percent difference refers to the people eighteen years and older in 1950.

The hypothesis is not supported for the difference in percent of males in the migrant and base populations. The relationship is the reverse of that predicted, -.4065 (Appendix Table III). This indicates that the farther an area is from Detroit, the more the percent of males in the base population resembles the percent of males in the migrant population.

No control of variations in the base population will be used here. However, from an inspection of Table I in the Appendix, it will be seen that the proportion of males in the base population tends to increase with distance from Detroit. Therefore, control of this variable would probably reduce the negative relationship of distance and difference in percent male.

With respect to types of area, the relationship is much higher for non-metropolitan areas than for metropolitan areas, (although it is negative in nature). The relationships for

non-metropolitan and metropolitan areas are, respectively, -.5297 and .0599 (Appendix Table III). It will be noted that the relationship of type of area and percent male is the same as for age and type of area (ignoring signs for the moment).

The relationship of selectivity of sex and distance may be further specified. The final column in Appendix Table II shows the absolute difference in percent males between the migrant and base populations. In only one of the areas, is the migrants' percent of males less than the percent of males in the base population. If this difference is ignored it can readily be seen that migrants tend to be over-representative of males and that this over-representativeness decreases with distance from Detroit. It should be noted that this is not saying that migrants tend to be predominantly males, but rather that there are more males in the migrant population than would be expected on the basis of their representation in the base population.

While the sizable negative relationship of distance and percent males is interesting, the hypothesis has to be rejected for this variable.

CHAPTER III

SUMMARY

Any decision to accept or reject a hypothesis is dependent on the acceptance of four major factors: 1) the statistical model used, 2) the measures used in operationalizing the concepts being valid, 3) the number of cases as being large enough to give confidence in the findings, and 4) the data being a representative sample of the universe.

In this study the statistical model seems appropriate. Chi square, because it makes no assumption about the distribution of the population, is utilized on the variables of age and sex. The hypothesis is stated in a manner that is amendable to treatment by correlation analysis.

The operationalizing of the concepts raises the question of using distance as a lone measure of dependence. In a larger study it might be desirable to combine distance with other factors such as the automobiles per capita, public transportation available and, if possible, some measure of communication with other areas. The method of measuring the effect of migration on a population has been discussed in Chapter One.

The number of cases in this study is too small to give more than a tentative test of the hypothesis. However, it is large enough to indicate a similar study covering more cases would be worthwhile.

The question of the sample being representative of a larger universe refers to the year the data were collected.

There is some indication that a slight business recession occured during the period the data covers. However, the effect of this economic condition has been judged to be slight.[1] And it should be pointed out that this material is probably better than any other collected to date.

While the final decision in this study is to reject the specific hypothesis, a more general relationship appears that might be of value to examine. In the variables of age and y years of school completed, the high relationship (ignoring signs) between distance and the median values of the variables for the base population, will be noted. This indicates that people are not distributed at random according to our measure of dominance. The high relationship of certain types of areas and selectivity has already been noted. On the basis of these results it would appear that the ecological approach to the problem of distribution and movement of people may be fruitfully explored over a wider number of cases. With more cases, more confidence could be put in the results. Also the larger numbers of cases would permit further subdivision of the data, which in turn permits a more detailed analysis. It is also recommended that stream analysis be used in this larger study.

If the approach utilized in this study proves fruitless in a study similar to that sketched above, then this writer would be in favor of dropping the ecological approach to

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1 Op. cit., Special Report, F-E, No. 4B. p. 8.

understanding migration.

DATA NOT PRESENTED

Omitted from the Appendix Tables are the original data tables used in computing the figures found in Table I. The writer felt that the expense and time involved in preparing the original tables for use here would not be justified by the negligible value they would add. In comparison to Table I, the original tables would occupy roughly eight to ten times as much space. The tables that would be added are discussed below.

The first table required would be the summary of county data to obtain SEA data. This operation was necessary because the photostat sheets do not show figures for the total population in 1950. Also, the categories found in the census on county data are not comparable to the categories found in the photostat sheets. Therefore, collapsing of certain categories was necessary, as well as the addition of the specific categories across counties.

The second table required, would be composed of the following columns: the total 1950 population; the outmigrants, 1949-50; the in-migrants, 1949-50; the Abroad and Not Ascertained population; and the resulting base population. Besides requiring more columns these new tables require more space (compared to Table I), because the original figures vary in size from figures in the thousands to figures in the millions. Inasmuch as this original data is not used directly, its inclusion would add little to this study. If researchers are interested in this type of data, similar figures may be

obtained from Special Report P-E, No. 4B.

TABLE I. - Populations Used in Computing Chi Square Differences And Difference in Percent Male.

AGE[a]	Area 1		Area 2		Area 3		Area 4	
	B.P.	M.P.[b]	B.P.	M.P.	B.P.	M.P.	B.P.	M.P.
18-19	39	129	44	126	39	118	44	126
20-24	91	206	97	249	87	198	90	214
25-29	98	213	102	157	95	171	98	170
30-34	104	106	107	109	95	144	99	97
35-39	110	78	105	74	100	72	101	89
40-44	99	80	98	61	96	64	94	67
45-54	162	77	165	99	164	93	166	96
55-64	153	59	143	69	155	58	150	77
65 +	144	53	139	56	169	82	159	64
Total	1,000	1,001[d]	1,000	1,000	1,000	1,000	1,001	1,000
YEARS OF SCHOOL COMPLETED[a]								
Elem. -5	154	49	122	74	85	55	90	43
5-7	167	117	175	106	155	98	163	106
8	213	174	255	231	274	199	293	256
H.S. 1-3	167	159	167	193	166	219	171	209
4	193	258	182	225	193	234	174	219
Coll.1-3	51	100	51	96	68	103	64	80
4	44	130	33	53	43	79	32	66
N.R.	11	12	15	21	16	13	13	21
Total	1,000	999	1,000	999	1,000	1,000	1,000	1,000
SEX[c]								
Male	52.4	52.9	51.6	52.5	50.0	51.8	50.4	51.9
Female	47.6	47.1	48.4	47.5	50.0	48.2	49.6	48.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a - These are the original data's percent distribution multiplied by ten.
b - B.P. stands for Base Population and M.P. for Migrant Population.
c - These are the original data's percent at distribution.
d - These values vary from 999 to 1,001 as a result of rounding. The figures are not adjusted to equal 1,000 because the effect is neglible and because this paper is not prepared for the general public, which might find this discrepancy unacceptable.

TABLE I. - (Continued)

AGE	Area 5		Area 6		Area 7		Area 8	
	B.P.	M.P.	B.P.	M.P.	B.P.	M.P.	B.P.	M.P.
18-19	45	116	40	89	40	89	49	68
20-24	107	241	102	224	103	205	144	240
25-29	111	170	114	194	110	179	140	287
30-34	112	123	110	120	106	121	110	131
35-39	106	81	103	75	102	102	97	73
40-44	92	71	91	68	93	75	87	45
45-54	149	69	157	88	160	92	146	69
55-64	134	60	139	66	137	65	116	46
65 +	143	70	144	75	150	72	110	41
Total	999	1,001	1,000	999	1,001	1,000	999	1,000
YEARS OF SCHOOL COMPLETED								
Elem. -5	79	56	65	69	46	48	57	42
5-7	155	103	133	140	109	101	126	78
8	294	199	303	209	257	189	228	127
H.S. 1-3	168	190	178	169	220	227	174	129
4	182	207	200	197	227	219	201	179
Coll. 1-3	65	99	64	89	74	117	85	114
4	44	116	43	104	40	82	97	315
N.R.	13	29	14	22	27	17	33	16
Total	1,000	999	1,000	999	1,000	1,000	1,001	1,000
SEX								
Male	50.4	51.2	49.6	50.3	50.1	53.3	50.4	52.6
Female	49.6	48.8	50.4	49.7	49.9	46.7	49.6	47.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE I. - (Continued)

AGE	Area 9		Area A		Area B		Area C	
	B.P.	M.P	B.P.	M.P.	B.P.	M.P.	B.P.	M.P.
18-19	39	92	43	135	41	82	42	95
20-24	106	230	109	221	109	263	106	214
25-29	111	179	120	165	114	180	129	219
30-34	105	126	116	125	107	117	126	134
35-39	101	91	111	76	103	80	116	86
40-44	91	61	99	74	94	66	99	70
45-54	156	84	157	79	166	84	161	77
55-64	138	63	126	62	136	62	122	62
65 +	152	75	118	64	130	65	99	43
Total	999	1,001	999	1,001	1,000	999	1,000	1,000
YEARS OF SCHOOL COMPLETED								
Elem. -5	46	53	79	48	49	51	60	54
5-7	105	100	152	127	114	79	154	113
8	253	177	250	187	215	178	243	188
H.S. 1-3	217	192	209	170	219	197	239	248
4	241	244	205	242	228	243	195	225
Coll. 1-3	74	87	51	97	77	137	57	98
4	48	115	41	101	56	100	41	54
N.R.	17	32	13	28	21	14	10	21
Total	1,001	1,000	1,000	1,000	999	999	999	1,001
SEX								
Male	49.7	50.7	49.4	53.1	48.0	49.2	49.4	52.8
Female	50.3	49.3	50.6	46.9	52.0	50.8	50.6	47.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE I. - (Continued)

AGE	Area D		Area E		Area G	
	B.P.	M.P.	B.P.	M.P.	B.P.	M.P.
18-19	45	105	54	62	38	86
20-24	118	216	156	272	120	245
25-29	127	186	137	276	118	197
30-34	112	117	106	123	108	125
35-39	108	87	95	66	102	88
40-44	104	72	88	48	97	61
45-54	177	93	151	60	163	95
55-64	118	54	113	52	129	55
65 +	91	69	99	40	125	49
Total	1,000	999	999	999	1,000	1,001
YEARS OF SCHOOL COMPLETED						
Elem -5	47	41	30	30	40	19
5-7	119	89	90	63	103	58
8	227	190	200	132	216	200
H.S. 1-3	243	218	185	130	222	177
4	234	229	240	231	237	233
Coll. 1-3	75	110	130	115	86	128
4	40	101	113	281	80	166
N.R.	14	23	13	18	17	19
Total	999	1,001	1,001	1,000	1,001	1,000
SEX						
Male	49.6	47.1	49.1	49.6	48.4	49.8
Female	50.4	52.9	50.9	50.4	51.6	50.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

TABLE II. - Values Used in Computing Correlation Coefficients

AREA	Distance Value*	X^2 Value of Age	Median Age B.P.	X^2 Value Of Years of School Completed	Median Years of School Completed B.P.	Absolute Difference Value in % Male
1	147.5	473.9	42.95	382.1	8.84	0.5
2	115.5	640.4	42.30	116.8	8.80	0.9
3	76.5	542.5	44.25	116.4	8.95	1.8
4	64.5	507.6	43.60	119.1	8.84	1.5
5	32.5	444.1	41.05	216.4	8.91	0.8
6	57.0	378.2	41.70	131.2	9.00	0.7
7	29.5	317.2	42.10	97.8	10.20	3.2
8	15.5	382.1	37.95	589.5	10.53	2.2
9	39.5	389.2	42.10	136.0	10.33	1.0
A	24.0	442.8	40.05	192.8	9.27	3.7
B	49.0	424.5	41.40	111.1	10.41	1.2
C	63.0	361.9	39.20	74.5	9.54	3.4
D	17.5	282.8	39.55	135.2	10.32	2.5
E	24.5	381.2	37.45	301.3	11.92	0.5
G	47.5	378.7	40.70	154.4	10.89	1.4

* In sixteenths of an inch.

TABLE III. - Correlation Coefficients

	Age	Years of School Completed	Difference in % Males
r_{yx}	.6654	-.0533	-.4005
r_{yz}	.5562	.2337	
r_{xz}	.5985	-.5960	
$r_{yx.z}$	.4995	.1101	
Metropolitan			
r_{yz}	.2209	-.6401	.0599
Non-Metropolitan			
r_{yz}	.6667	-.0695	-.5297

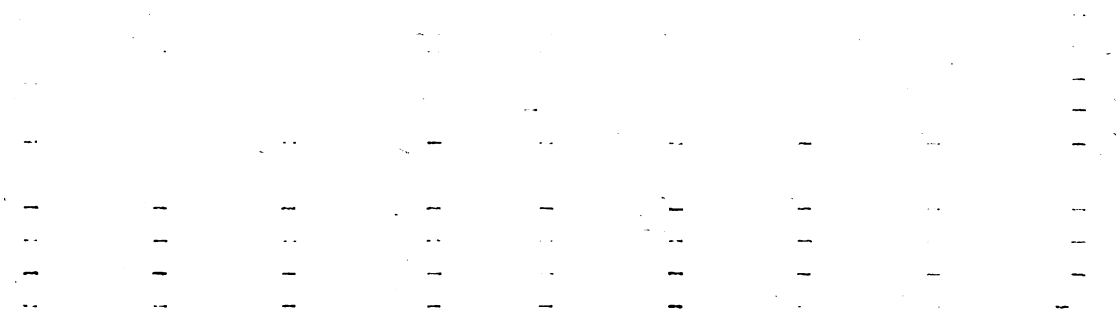
y - dependent value
x - independent value
z - value y is adjusted with

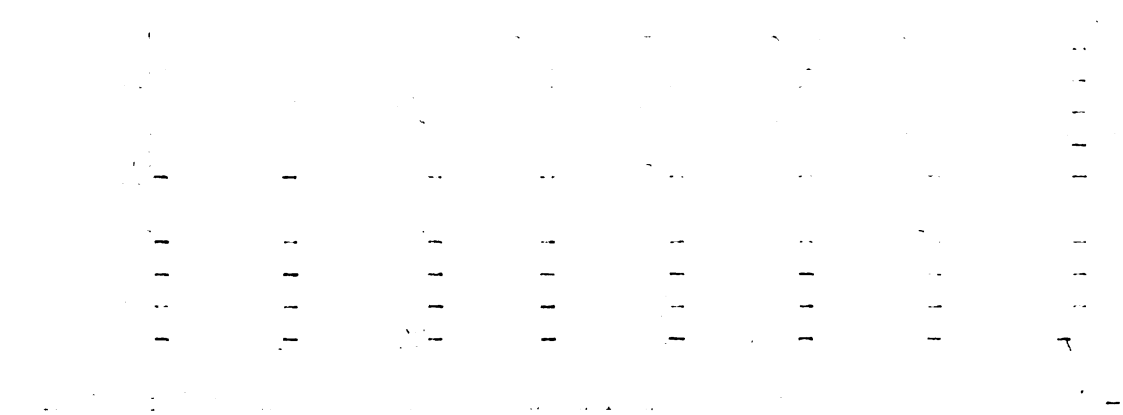
TABLE IV. - Differences in Distribution by Age Groups.

AGE	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
18-19	90	82	79	82	71	49	49	19
20-24	115	152	111	124	134	122	102	96
25-29	115	55	76	72	59	80	69	147
30-34	2	2	49	-2	11	10	15	21
35-39	-32	-31	-28	-12	-25	-25	0	-24
40-44	-19	-37	-32	-27	-21	-23	-18	-42
45-54	-85	-66	-71	-70	-80	-69	-68	-77
55-64	-94	-74	-97	-73	-74	-73	-72	-70
65 +	-91	-83	-87	-94	-73	-69	-78	-69

AGE	Area 9	Area A	Area B	Area C	Area D	Area E	Area G
18-19	53	92	41	53	60	8	48
20-24	125	112	154	108	98	116	125
25-29	68	45	66	90	59	139	79
30-34	21	9	10	8	5	17	17
35-39	-10	-35	-23	-30	-21	-29	-14
40-44	-30	-25	-28	-29	-32	-40	-36
45-54	-72	-78	-82	-84	-84	-91	-68
55-64	-75	-64	-74	-60	-64	-61	-74
65 +	-77	-54	-65	-56	-22	-59	-76

- indicates the number of migrants is smaller than the number of the base population.






KEWEENAW
HOUGHTON
ONTONAGON
GOGEBIC
BARAGA
MARQUETTE
IRON
1
DICKINSON
MENOMINEE
DELTA
ALGER
SCHOOLCRAFT
LUCE
CHIPPEWA
MACKINAC
2
EMMET
CHEBOYGAN
PRESQUE ISLE
MONTMORENCY
ALPENA
KEEWENAW
BENZIE
CRAWFORD
OSCODA
ALCONA
MANISTEE
ROSCOMMON
OGEMAW
IOSCO
3
4
MASON
LAKE
OSCEOLA
CLARE
GLADWIN
ARENAC
HURON
BAY
OCEANA
NEWAYGO
MECOSTA
ISABELLA
MIDLAND
TUSCOLA
SANILAC
5
MUSKEGON
GRATIOT
SAGINAW
C
A
OTTAWA
CLINTON
SHIAWASSEE
GENESEE
LAPEER
B
7
D
8
ALLEGAN
EATON
INGHAM
LIVINGSTON
OAKLAND
MACOMB
6
E
F
VAN BUREN
KALAMAZOO
CALHOUN
JACKSON
WASHTENAW
WAYNE
9
2
BERRIEN
CASS
ST. JOSEPH
BRANCH
HILLSDALE
LENAWEE
MONROE