

COMMUNITY STRUCTURE AND NET MIGRATION IN
NON-METROPOLITAN KANSAS COUNTIES, 1950-1970

by

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CHAPTER 1

INTRODUCTION: MIGRATION AND SOCIAL CHANGE

It is the purpose of this research to identify certain community characteristics which influence migration and to assess the impact of that subsequent migration on rural community development and growth. Investigation of non-metropolitan Kansas counties' migration during the decade of 1950-60 will lend some insights to the understanding of the interaction between migration and social change.

The presentation of this research starts with a discussion of the major concepts used and the theoretical value of this study. It then proceeds to the research design and justification for the operationalization of the variables. Chapter III concentrates on the findings and hypothesis testing. The fourth chapter discusses possible problems, solutions for the problems, and the applications of this study.

Migration as a Field of Study

The importance of demographic research cannot be overstressed. Many social problems are generated by population problems. On one hand, the composition and characteristics of the population of an area reflect the area's social and economic structure; on the other hand, the population processes affect the area's social structure, economic activities, governmental institutions, private institutions, such as retail trade pattern, and the provision of public services. Population,

in the long run, shapes the quality of life and determines the potentiality of the area's long-term development and growth.

Fertility, motality, and migration are the three major demographic processes. According to demographic transition theory, in developed countries (such as the United States), the birth rates and death rates are relatively stable; hence the migration pattern constitutes the major component of population change (U.S. Current Population Reports, Series P-23, No. 7, Nov. 1962). Large-scale migration can change the composition as well as the size of the population, because migration is selective in terms of social, economic, and demographic characteristics. Because of its selectivity, migration also affects an area's fertility and mortality patterns in a dramatic way. This selective feature of migration makes it an essential subject in sociological study.

Although migration is one of the three major components of population processes, it receives little attention by researchers compared to fertility and mortality. The unavailability of data is one of the major reasons for this hindrance. Despite the recent increasing efforts given to migration study, there is a lack of integration with respect to methodology and generalizations. One explanation for this might be that migration is an interdisciplinary field and there has been no general theoretical framework to guide the researchers systematically. Because of their relatively atheoretical approach to data, demographers are viewed by social scientists as technicians rather than sociologists (Goldscheider, 1971: 2). Although recent research attempted to go beyond descriptive analysis and bookkeeping, most of relational studies on migration focus

only on one-way approach. For example, most of them treat migration as a dependent variable and try to identify its causes (Kohn et al., 1973; Petto and Bender, 1974; Wrighton and Gatons, 1974). The reverse relationship has hardly been explored. What are the consequences of migration on the community level? What are the results of migration on the structural change of the community? Most sociologists agree that migration is a concomitant of social change. It is a determinant of social change as well as a consequence (Goldscheider, 1971: 73). In the real world, modernization always involves rural-to-urban migration (with the unique exception of the case of China). Then, migration can be used as a determinant of social development. Another key aspect in the development process is structural differentiation given the fact that development is always accompanied with an increase in specialization and functional expansion. Social differentiation becomes a sophisticated measurement of development. Differentiation reflects the level of development of a community. Change in differentiation indicates the growth or decline of the community relative to other subunits in the larger ecological system. An increase in differentiation implies a further functional expansion and hence growth. Decrease in differentiation, on the other hand, suggests decline of the community.

Given the issues underlying this study, a two-way approach, taking both determinants as well as consequences of migration into account, is employed. First of all, some socio-economic and locational variables that are theoretically relevant to migration are chosen at the beginning of a ten-year period, using factor analysis as the statistical procedure for the selection. Then, the correlation of these ecological variables

to the migration rates of the communities over the decade is analyzed. Finally, effect of these community characteristics and migration on community development, measured by differentiation, over the next ten-year period is assessed. A hypothesis regarding the impact of migration on community development and growth is tested, while controlling for other relevant variables. The time periods are chosen so that a time-lag in the response of community adjustment to population redistribution is allowed. By indicating the time periods as such, the causal model employed in this study can be more justified.

The ecological model of social change is applied in looking at social change in terms of community characteristics and aggregate migration pattern. This approach excludes from the model exogenous factors of social change. Federal programs of community development are the examples of exogenous factors. Another disadvantage of that ecological model is that endogenous non-ecological or non-economic factors are not included. Social movements are one example (J. Flora, 1967: 1). Other problems of the ecological model center on the ecological correlations. Menzel (1950) concludes that ecological analysis is proper when one is interested in characteristics of the areas rather than the characteristics of the individuals. This is somewhat self-conflicting since many areal characteristics are gathered from the aggregated individual characteristics. There is always some relationship between these two, but the correlation may not be perfect. Robinson (1950) discussed the dangers of ecological inference based on data collected from the aggregates of individuals. If one is willing to assume that areal characteristics and individual characteristics are

conceptually distinct, and no inference on the individual level is made from the community level, then one is safe in using the ecological model.

In sum, the analysis in this study is carried on one level - that of diagram is presented in Figure 1. It is hypothesized in this study that change in differentiation in one decade varies directly in response to net migration in the previous decade, initial when social and economic variables are controlled for. The higher the net in-migration rate, the more positive the change in differentiation, and vice versa. The concepts used in this study are discussed below. Their operationalizations and the theoretical rationales for them are discussed in the next chapter.

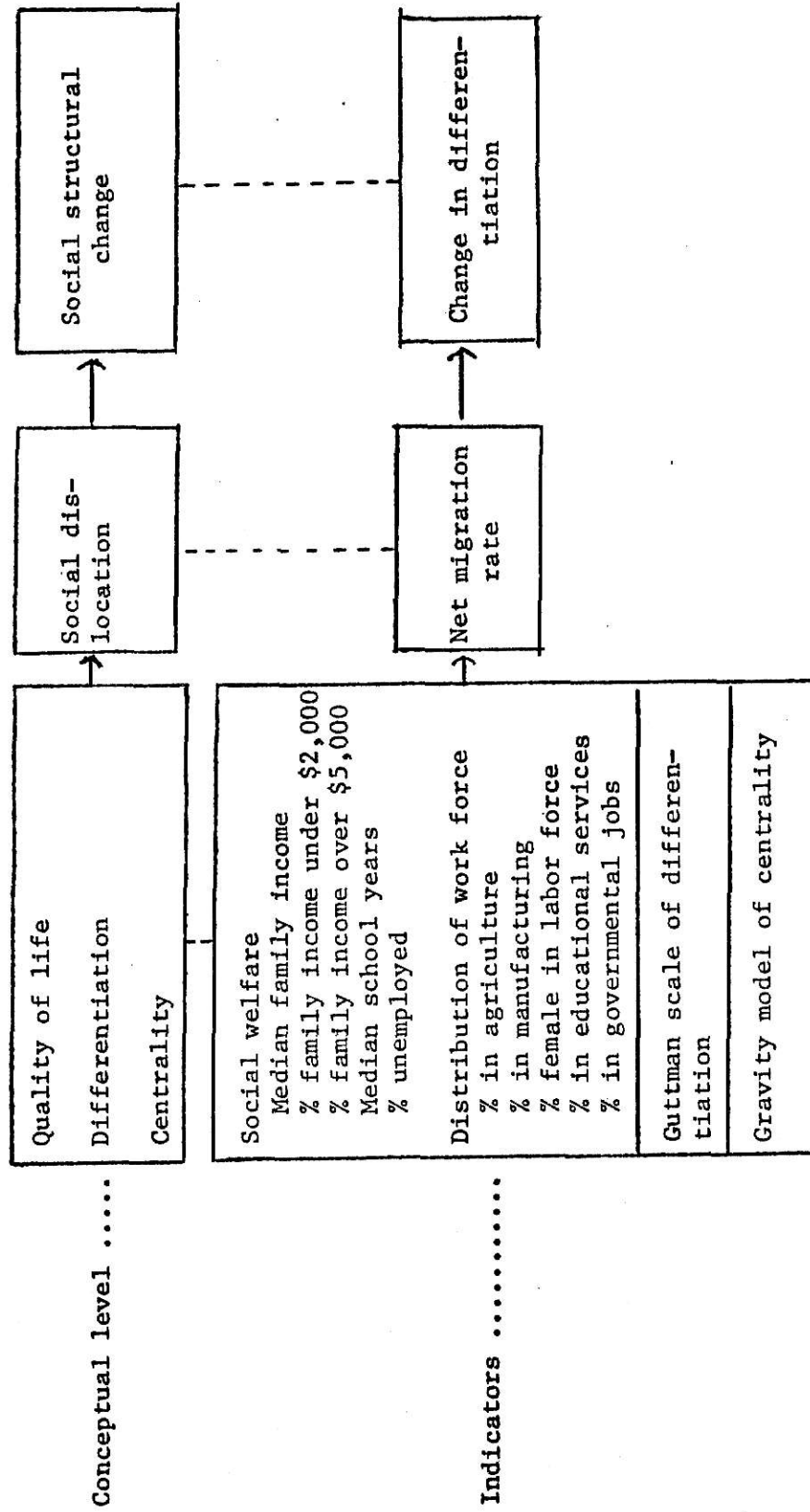
Prior Conditions of Migration

Central place theory and push-pull theory are utilized to explain net migration for the Kansas non-metropolitan counties during the decade of 1950-60. A review of these theories and their major concepts will help in understanding the background of the problem and the proposed causal model in this study.

The major proposition of the push-pull theory of migration is that migration is a demographic adjustment in which a population redistributes itself in response to certain community conditions. Guided by the push-pull theory, one can anticipate certain relations between different community conditions and migration in a community. The configuration of conditions represents the degree of attraction of the community. A community with favorable conditions is more likely to attract (pull) in-migration.

FIGURE 1

THE STRUCTURE OF THE CAUSAL MODEL FOR 101 KANSAS
NON-METROPOLITAN COUNTIES, 1950-70



Three types of community characteristics are expected to be important in influencing migration. They are (1) variables indicating social welfare (2) variables reflecting sectoral work force distributions; and (3) variables derived from the central place theory. The first two type of variables were derived from the push-pull theory. Centrality and differentiation arose from the central place theory.

Centrality

Centrality as used in this study bears a resemblance to the concept of central place in the central place theory. The measurement of centrality employed here is similar to the gravity model. A review of the central place theory and the gravity model would clarify the inclusion of centrality in this study. The rationale for its operationalization will be discussed in next chapter.

Central place thoery is often used to explain the development and growth of communities. Ecologists in general and central place theorists in particular have utilized the concept of central place to study functional networks of communities. A central place is located in the center of a hexagon and performs central functions for the hinterland surrounding it (Christaller, 1935, 1966 translation). There is a hierarchy of centers and hinterlands in which hinterlands of a larger center may serve as a center for other hinterlands in the next lower order. Central places relate to the size of place very well. A constant ratio exists between the population size of a particular city and the central city of the network of which it is a part. This size relation was well

illustrated for most of the cities in the United States in 1950 (Vining, 1950). A theoretical problem of the central place theory is that it does not conceptually differentiate between rank of function and rank of central place of the cities. This shortcoming makes it hard to generalize to different social systems with different levels of development.

The above argument is obvious considering a community in a less developed system could have rather simple functions while serving a hinterland which allows it to be placed in the same position in the centrality hierarchy as another functionally more complex city in a more developed system. As an alternative, as is done in this study, one may view the central place in terms of its communication with other units and treat it as a distinct feature from the functional complexity of the community. That revised concept of central place is called centrality in this study. Functional complexity refers to the concept of differentiation. Their theoretical relevance to migration is discussed below.

The central place hierarchy corresponds very well to the size-rank of the cities, suggesting that size can be used as an indicator of the central place. From the communication viewpoint, size determines the amount of interaction and exchange between two places. Two places with more population would have greater chance to communicate with each other than the two with less population if the distance between is the same. Thus size and distance are the two major components in determining exchange between two places. Migration can be viewed as an exchange of population between places.

Interestingly enough, a well-known approach for studying migration resembles the communication concept of centrality described above. This is

called the gravity model of migration. Size of population and distance are the major variables which explain migration in this model. Population size is a direct measure of the magnitude of the population-at-risk of migrating at the sending area and an indirect measure of the number of opportunities at destination. Physical distance is a surrogate for the monetary and psychic cost of overcoming space (Schwind, 1971: 80). In other words, physical distance is a proxy for intervening opportunities that retard migration. Actually, the gravity model can be utilized to all kinds of human interactions. In migration, the mathematical formula of the model is $M_{12} = \frac{P_1 \cdot P_2}{D_{12}}$ where P_1 , P_2 represent the population size of the origin and destination of migration respectively and D_{12} is the distance between these two places. The assumption in this model is that migration is related to the product of the size of the populations of the sending and receiving areas and inversely related to the distance between them (Carrothers, 1956: 94). There are a number of modifications of this model. For example, several studies used different values for the exponent of D (Carroll, 1955; Reilly, 1929; Schwartz, 1962; and Carrothers, 1956). It would be useful at this point to review some of the related concepts in migration studies in which the gravity model was employed.

Zipf was one of the pioneers applying the gravity model to migration study. He treated migration as a function of attraction divided by resistance (1946: 677). The total population of the sending and receiving areas is the attraction and the highway mileage between these two places is the resistance.

Stouffer earlier used a similar formula but conceptualized it in a different way. Stouffer's approach was called the intervening opportunity

model of migration. He defined attraction as the opportunity in the destination and resistance as the intervening opportunity between these two places (1940: 846). He hypothesized that migration from i to j is inversely related to the number of intervening opportunities between i and j and proportionally related to the number of opportunities in j . It was a derivation of the gravity model, for it substituted the total inflow to j and total outflow from i for the population of destination and origin and employed the total inflow between i and j instead of the physical distance.

Stouffer's approach has an advantage over Zipf's in that Stouffer used intervening opportunities measured as a function of physical distance rather than distance per se (Karp & Kelley, 1971: 8). One thing should be kept in mind: the gravity model, no matter how conceptualized and operationalized, is mainly useful for predicting gross migration, which is different from the net migration used in this study. But there is some relationship between net migration and gross migration in the same unit during the same time-period.

A study done by Issac Bogunjoko (1973) showed that net migration and centrality have a correlation of 0.3. That encouraged me to include centrality measured by the gravity model as one of the explanatory variables for net migration. Migration studies utilizing the gravity model have been verified for different places with different degree of success. For example, Anderson (1955). E. Miller (1972) and Galle & Taeuber (1966) applied this to intermetropolitan migration; Stouffer (1960) for intercity flows; and Wadycki (1975) for interstate migration streams. There have been no

studies made on intercounty net migration using the gravity model.

Centrality is not only relevant to migration but also to community development and growth. In broader sociological terms, centrality can be defined as a community's position relative to other communities in the total configuration of communication paths (F. Young, 1966: 67). The relative location of the community can affect its growth. Considering two equally differentiated communities, the one with higher centrality would be less likely to differentiate further, since it is more accessible to other communities than the one with lower centrality. So one can view centrality as the access which each sub-system has to the total information or resources in the entire system relative to the other sub-systems (J. Flora, 1967: 11).

Those definitions suggest that centrality is an indicator of the degree of linkage of communities to the larger system. The central place will integrate the sub-units around it by its services. In other words, the central place provides certain services that people living in the hinterland can travel to get them. It involves the interdependence of communities and accessibility to other communities. It also implies that competition exists in those communities for hinterland trade. To develop a sizable market and economy, there must be a distance from other central cities. The relationship between differentiation and centrality can be seen more clearly in Morrill's article:

.... a new central place emerges or an existing central place rises in level with its population no smaller than the hinterland and all the hinterlands are closer to the new central place than to any other existing central place. ... in a perfect situation, a hexagonal pattern would emerge (Morrill, 1965: 17).

From this argument, then, generalized inaccessibility to other communities (low centrality) influences differentiation. A place with a relatively large population size will not become more differentiated if people can get their needed services from another community a relatively short distance away.

Centrality can also be conceptualized as an exchange network in the larger system. Potentiality for further development in a particular locality is limited by the exchange relationship between the community and other communities. For most central place theorists, a central place is located physically in the center and performs central functions for its hinterland. Central functions and central places are generally assumed to be perfectly correlated by central place theorists. Although they may be highly correlated, they are not the same conceptually. This distinction should be kept in mind since we use centrality (similar to central place) as one of the independent variables to explain change in differentiation (similar to change in central functions).

Centrality as conceptualized above has a strong bias toward location and communication. In a highly developed system such as the United States, this theory becomes less powerful because of the improvement of the transportation facilities, localized places are freed from the limitation of geographic location (J. Flora, 1967: 7). Another disadvantage of the gravity model of centrality is that it is static. By using physical distance as one of the variables to calculate centrality, the central place hierarchy is less likely to change over a long period of time. Yet, in the real world, one can observe change in the dominant-subordinate pattern among the commu-

nities over time. Nevertheless, the gravity model has some heuristic value to sociological theory. It shows a hierarchy and dominance among the sub-systems within the larger system; it takes the interaction of the sub-systems into account; and it reveals the power structure among the communities.

Migration

There are many kinds of migration. International migration and internal migration are the two major ones. Within each kind of migration, different data has different utility and research significance. In internal migration there are two principal types of data available. One type of research, dealing with gross migration concerns the volume, direction and differential characteristics of migrants based mainly on place of residence at a specific time. Another way of studying migration focuses on the net flow of the migration. When the latter measure is used, the variables analyzed become ecological. Analysis shifts from interest in the individual to interest in the characteristics of the community. The success of different measures depends on the nature of the research and the purpose of the research. Each measure has its own advantages and shortcomings. Given the nature of our problem stated earlier, net migration will be used in this study, since we are interested in finding out the relationship between a community's relative attractiveness and its net population gain or loss which is attributed to migration.

Net migration is the residual between in-migration and out-migration. It can be a negative or positive number. In calculating net migration, the vital statistics method is the most frequently used because it is simple

and accessible. The formula for computing the net migration is

$$M = P_1 - P_0 - (B - D)$$

where M = net migration

P_1 = population at time 1

P_0 = population at time time 0 (previous time)

B = births

D = deaths

That formula sets net migration equal to the population at time 1 minus the population at a previous time minus natural increase (births minus deaths) over the same time period in the area.

Net migration figures, which are not affected by several-time movers and returnees within the time interval, have different implications and research value than gross migration data. Expressing migration in separate streams is considered inappropriate for inspecting the effect of regional economic and social variation on migration. Net migration also tells more about the population redistribution. It estimates the balance between the number of persons migrating into and out of a specific area. It shows the net gain or loss of population due to internal migration.

Net migration into the United States from other countries totaled about 2.6 millions in the decade of 1950-60, which comprises the national difference between the sum of migration for areas with net in-migration and areas with net out-migration. During the decade, out-migration counties had net loss of 11.3 millions while in-migration counties had a net gain of about 13.9

million persons through migration (Bowles & Tarver, 1966: V). Since the immigrants to the United States constitute a very small percent of Kansas population, this difference would not have a large affect on the estimation of net migration.

In using the residual method, the accuracy of the data depends on the complete registration of births and deaths and the population counts, and hence it is subject to the errors which may occur in such data. In developed countries such as the United States, the births and deaths registration is much more complete than in underdeveloped or developing countries. In such circumstances the error of the vital statistics residual method can be minimized.

It is decided to use migration rate rather than the number of migrants in order to eliminate the size effect on migration. But by using net migration rate to minimize the size effect, one has assumed that there is a high correlation between population size and net migration. If this is true, then one would over-correct the effect of size.

Differentiation

The concept of differentiation in sociology was borrowed from biological science. Using the organic analogy, sociologists, especially evolutionists and structural functionalists, applied this term to human society. Differentiation was defined by Durkheim as the result of the division of labor in society (Durkheim, 1964: 226). According to him, societal development can be viewed as a process of division of social labor. Division of labor is the differentiation of tasks and social functions, he further argued. A society's growth is proportional to the progress of the division of labor.

From this base, he conceptualized two kinds of social solidarity. Mechanical solidarity, rising from the collectivity and likeness of the group, functions to maintain social cohesion intact while maintaining all its vitality in the common conscience (Durkheim, 1964: 108). On the other hand, organic solidarity, which results from the division of social labor, operates to tie people much more strongly because of the interdependency among the different parts of the aggregate. What he postulated was that division of labor corresponds to the real moral density of the population and social structure derives from the division of labor and group solidarity.

Although Durkheim claimed there was no single cause of the process of division of labor because each particular circumstance depends on particular causes, he proposed a "constant" cause through the observations of the regular advance of the division of labor in human history. This constant cause would be the general cause of division of labor for all societies. The specific characteristics of each society will influence the magnitude of the effect of this constant cause. The "constant" cause of division of labor proposed by Durkheim was moral or dynamic density of the society. It is this relational model that helps to derive the hypothesis in this study.

Parsons, the major functionalist in American academic sociology, defines differentiation as "a process by which new kinds of social units, as distinguished from more of the same kind, come to be established" (Parsons, 1961: 229). In his famous book The Social System, He identified four subsystems within the action system. They are behavioral organism, personality system, social system and cultural system. Each system performs particular

functions within the action system while coordinating with other sub-systems. An adaptational function is fulfilled by the behavioral organism system, goal-attainment is the function of the personality system, integration is performed by the social system and cultural system performs the function of latent pattern maintenance (Parsons, 1966: 12). These four functions are referred as the AGIL scheme.

Social differentiation was viewed by Parsons as on the level of social system. Social differentiation is the division of a unit or structure in a social system into two or more units or structures that differ in their characteristics and functional significance to the whole system. Social differentiation involves changes in roles, norms, and values which are essentially the same as the AGIL scheme.

Frank W. Young studies the development of a community by looking at its degree of differentiation at two points of time. He defines differentiation as the diversity of publicly-discriminated meaning areas maintained by the social system (F. Young et al., 1968: 344). His meaning areas imply the different functions and specialties in a social unit. Differentiation, similarly defined by Ruth Young, is the complexity of the information-processing capacity of a social unit (R. Young, 1968: 364).

Many sociological theorists use social role divergence and functional effectiveness to characterize the concept of differentiation. For example, Smelser, one of Parsons's students defines differentiation as the evolution from a multifunctional role structure to several more specialized structures, a process whereby one social role or organization differentiates into two or more roles or organizations which function more effectively in the new

situation (Smelser, 1968: 128). Etzioni (1964) and Newman (1973) define differentiation similarly. All of them implicitly or explicitly suggest that the new social units differentiated from the old one are structurally distinct from each other but together are functionally equivalent to the original unit (for detailed discussion, see Smelser, 1968: 129; Etzioni, 1964: 261; and Newman, 1973: 24).

Summarizing from all the evolutionary theorists, both classical and modern, social development and differentiation are closely related. Most of the theorists assume that societies always move in the direction of complexity, i.e., become more differentiated. This is in an absolute term. Relatively, a community could experience de-differentiation compared to other communities if the increase in differentiation is less than that of other communities. Among these definitions, the one proposed by Frank W. Young in symbolic terms has greatest utility in sociological inquiry and hence is used in this study.

CHAPTER II

RESEARCH DESIGN AND PROCEDURE

Review of the Literature

Following is a review of some of the empirical research based on theoretical frameworks similar to those discussed in Chapter I. This will help to clarify our research design and procedure. Studies similar to the one used in this paper would be the ones that use community characteristics as ecological variables to account for net migration and community structural change in either direction (growth or decline).

Bogue et al. (1957) did the pioneer work in the multivariate analysis of migration rates. In their original work, characteristics of the area conceptually independent of migration were used as the independent variables to explain net migration. For the decade of 1940-50, they found that both for U. S. non-metropolitan and metropolitan areas, unemployment, percent of population with high school education or higher, per cent non-white, sex ratio, and median age are related significantly to net migration, with the variance explained from 61 percent to 85 percent. In non-metropolitan areas where the net out-migration was the heaviest, Bogue found a high per cent of labor force engaged in agriculture, low level of income and living standard and a high concentration of nonwhite population. Per cent in manufacturing had a moderate correlation with net migration in Bogue's study. The following is a list of his variables: per cent change, total population; per cent change, rural-nonfarm population; per cent change, rural-farm population; per cent in agriculture, 1950; per cent non-white, 1950; per cent change, nonwhite, 1940-50; per cent in manufacturing,

1950; median income, 1949; farm operation level of living index; rural-nonfarm level of living index; percent change in retail sales, 1937-47; infant mortality rate, 1939-40. As one can see, among the twelve variables he used, half of them are demographic variables.

Although these variables correlate highly with net migration rate, they only explain the variance in net migration rate "statistically" but did not explain why it would so happened. These variables are not conceptually distinct from migration. Secondly, they are measured by the change over the same period of time during which migration took place or measured by the end-period variables. In either case, there is an inherent simultaneity bias in the parameter estimates of multiple regression analysis, as Greenwood pointed out. Since migration may influence end-of-period levels of explanatory variables by influencing the behavior of these variables over the period of migration, simultaneous-equations bias may exist in the estimate (Greenwood, 1975: 519). This violation is not uncommon in migration studies. For example, Lowry (1966) studied net migration for the 52 largest SMSA during 1950-60, and found a significant high correlation between net migration and change in employment opportunity between 1950-60 (Lowry, 1966:45). Levy (1967) and Miller (1973) also used end-period variables to explain net migration. Pursell (1972) and Greenwood (1973) employed variables measured by change to explain migration that occurred over the same time interval. It is very likely that a mutual influence and adjustment between migration and these behaviors occur during the period. The assumption that migration is affected by these variables but does not in turn influence these factors is an invalid one in the real world. A possible solution, as used in this

study, is to specify an earlier time for the explanatory factors and hence to make sure that these factors occur in precedence to migration.

A study done by Anderson (1955), using 15 socio-economic characteristics to explain net migration for metropolitan areas in the North East and North Central Regions in the years 1935-40, showed that four variables were significant in promoting or retarding migration. They are per cent unemployed, mean rent, logarithm of population size and distance. The last two variables were combined as the measure of centrality in this study. In 1959, Watson found out that level of industry measured by per cent in manufacturing, economic opportunity measured by per cent unemployed explained the variance of migration rate most.

Research done by Beale (1974) showed that in the North Central Region, the relationship between population change in the 1960-70 period in counties and the per cent of workers engaged in agriculture and mining at the original time point was fairly strong, with a linear regression coefficient of $-.56$. In other words, by using per cent employed in agriculture and mining at the beginning of the ten-year period during which migration took place, he is able to explain about 38 percent of the variation in the migration pattern on the county level in the Central Region.

Gladys K. Bowles and James D. Tarver (1965) provided the first available net migration estimates for intercensal years and study for age-sex-color groups for all the counties in the United States. They claimed that in the United States as a whole, there was a difference in net migration rates depending on the degree of urbanism and ruralism. Although they predict migration very well, these demographic variables, as mentioned

earlier, can not offer much explanatory power to migration even though they have a high proportion of variation explained because they are not conceptually independent of migration. Besides, the migrations studied in this paper are essentially rural-to-urban migration. Thus one would expect a high correlation between urbanism, ruralism and migration. Most migration studies employing demographic variables such as dependency ratio, population size, and urbanism as determinants of migration do not give a clear conceptual rationale for including them. A good predictor is not necessarily a good explanation for the same behavioral pattern.

The push-pull theory assumes that migration is expected to be away from relatively low income localities and toward higher income localities. This assumption is well supported by various studies. Tarver and Bowles (1966b) found that net out-migration was heaviest from low income counties. However this relationship is not axiomatic. Counties with the highest median family incomes also experienced moderately high rate of net out-migration. Other characteristics of the areas apparently inflated the effect of income level on migration.

Many studies on internal migration in the United States show that income serves best as a pull factor and agricultural characteristics explains most as a push factor (Greenwood, 1974; Nicholls, 1961; and Perloff et al., 1960). There is a confounding point in these studies, because agricultural areas are relatively low income areas. The reason for these inconsistent findings may be that income level of the area serves as a sensitive predictor of migration only for those migrants who are in the labor force. Greenwood argues that income level is important only for young and job-seeking groups

(Greenwood, 1974: 5). Because of the confusing effects of income level and the confounding variables of income inequality, I coded "per cent of families under poverty level" and "per cent of families over high income standard" as well as "median income" as possible predictors of net migration rate.

Many migration investigations claim that migrants tend to be better educated. Hamilton (1959) argued that this generalization does not hold when one looks at age-specific migration rates. His argument was supported by his research on the educational selectivity of migration from the South where he found that rural-to-urban migration for young age groups tends to be selective of higher educational attainment, and the opposite is true for older age groups' migration. In this study, migration is not broken down into age-specific rates, and therefore Hamilton's argument can not be verified in this study. But the fact that ability of the ecological model to explain net migration rates declined from the young age group to older age groups should be kept in mind.

The contributions of the ecological variables to net migration rates also depend on the unit of analysis used. Barb pointed out that as the size of the unit of analysis increases the rate of migration decreases (Barb, 1972: 47). Caution should be taken when one compares the results based on different units of analysis.

We have reviewed some of the literature on how socio-economic characteristics affect migration. Now let us move to the review of the second part of the model used in this study-- how migration and those socio-economic characteristics influence community development and growth.

If most migrants tend to be younger and better-educated than non-migrants, then the result of out-migration will increase the aged dependency ratio of the community, reduce leadership and labor force, and make the community less attractive for industry, which may be an alternative employment opportunity for rural farm people. Out-migration also makes it difficult for the community to establish services because a certain population base is needed to support services.

The influence of out-migration on unemployment depends on the kind and amount of out-migration. Vanderkamp (1970) studied the effect of out-migration of a region on the level of employment of that region and found that for every five unemployed leaving the region, two additional people become unemployed in counties of the Canadian Maritime Provinces. This finding implies that with out-migration, whether migrants are employed or not, there is a decrease in retail or other service institutions leading to growth of unemployment.

Conning (1971) conducted a household survey of seven communities in a small region of Chile, and discovered that the rural-urban migration rate of each community varied positively with its level of differentiation. The same conclusion was reached by Bogunjoko (1973) who did a study on net migration rate and differentiation of Kansas counties. A high positive correlation was found between net in-migration and differentiation, especially for those groups in the productive ages (age 15-59).

A discussion on the differentiation scale is necessary at this time. Ruth Young, based on Frank W. Young's earlier definition of differentiation, developed a scale to measure the development of fifty-one non-Western autonomous nations in 1960, the year in which many new nations emerged. Her

measure of national development consists of three subscales: industrial diversity scale, communicative diversity scale, and external diversity scale (R. Young, 1968: 370). Industrial development refers to the diversity and differentiation of industrial organizations and their problem-solving ability. Communicative development is the degree of communications among a nation's subsystems or sub-units. These three structural dimensions are closely related, yet conceptually distinct. The concrete indicators of industrial development used by Ruth Young are different kinds of industrial products, economic institutions for processing economically relevant information, including production organizations, consumption organizations, distribution organizations, research organizations, international economic organization membership, and industrial innovations measured by the number of patents a nation has. Communicative development was operationalized by the overall intercommunication of institutions, non-economic as well as economic. Four indicators of external diversity were proposed: the number of embassies a nation has, the number of governmental level organizations, the number of nations from which it imports, and the number of nations to which it exports (R. Young, 1968: 372). The implication of Ruth Young's research is that the unidimensionality of the Guttman scale of differentiation makes it possible to rank the social units into a hierarchy from simple to complex, even though those social units belong to different cultural contexts. How to choose the institutional patterns as items in order to form a valid and reliable scale is a technical issue and requires not only theoretical background but also research experience. The choice of items in this study is discussed in the next Chapter.

Measurement of the Independent Variables: the Prior Conditions

The independent variables used in this study were categorized into three groups: (1) variables indicating social welfare (2) variables reflecting sectoral work force distribution and (3) variables derived from the central place theory--centrality. These variables, eleven in all, were factor analyzed in order to choose the variables to be included in the multiple regression analysis. These two kinds of statistical techniques will be discussed in the next chapter. Below is a list of the variables in the first two groups.

(1) Social welfare:

1. Median family income
2. Percent of families with income under \$2,000
3. Percent of families with income over \$5,000
4. Median school years completed by persons 25 years old or over
5. Percent unemployed

(2) Sectoral work force distribution (employed civilians 14 and over):

1. Percent of females 14 or over employed in civilian labor force
2. Percent of work force employed in agriculture
3. Percent of work force employed in manufacturing
4. Percent of work force employed in educational services
5. Percent of work force that is employed in governmental jobs

These variables were either taken directly or calculated from data in the 1952 County and City Data Book, published by the Bureau of the Census or

calculated formula

from the 1950 Census of Population-Kansas, Volume II, Part Eighteen. A brief explanation of their definitions appears below. All the information was gathered from the 20 percent sample of the 1950 Census of Population.

income: The sum of wage, salary, self-employment, and other earnings of persons 14 and over. It is the gross income before any deductions but excludes income-in-kind, withdrawal of bank deposits, tax refunds, gifts, inheritance and insurance payments.

family income: Total income (as defined above) earned by the members of the family within each household.

unemployment: Persons 14 or over who are not at work during the census week but are looking for a job. Temporarily ill or laid-offs were excluded.

labor force: Civilian labor force plus armed force.

civilian labor force: Employed plus unemployed.

government worker: Persons who worked for any governmental unit.

Means and standard deviations of these variables are given in Table 1.

Centrality of the largest city within the county is used as the centrality score of the county. These cities were grouped into five categories (orders) according to their degree of differentiation. Centrality score of the city is measured by the formula discussed earlier, namely $P_1 \cdot P_2 / D_{12}$ where P_1 is the population size of the city and P_2 is the population size of the city in the higher order and D_{12} is the physical distance between these two cities. If there is more than one city with higher orders, the centrality score was calculated by averaging all the centrality scores of a city with each of the higher-ordered cities. For example, Topeka was

TABLE 1
MEAN AND STANDARD DEVIATION OF THE SOCIAL AND ECONOMIC
VARIABLES IN 101 KANSAS NON-METROPOLITAN COUNTIES,
1950 and 1960

Variables	*Mean	*Std. Dev.
Median income	2601.9 (4520.2)	513.1 (720.9)
Percent income < \$2,000	36.7 (30.8)	10.7 (18.3)
Percent income > \$5,000	15.6 (8.6)	7.4 (3.5)
Med. Sch. yr. by 25+	9.7 (10.9)	0.9 (1.0)
Percent unemployed	1.8 (2.7)	1.1 (1.4)
Percent female in labor force	20.3 (28.6)	4.5 (3.9)
Percent in agriculture	39.0 (28.3)	13.5 (12.1)
Percent in manufacturing	4.7 (7.1)	4.6 (6.1)
Percent in educational service	4.5 (7.2)	2.6 (4.0)
Percent in government jobs	10.5 (14.0)	7.1 (4.5)

*N = 101

Note: Figures inside the parentheses refer to the data of 1960's.
Others refer to the data of 1950's.

ranked after Kansas City and Wichita. Hence the centrality score of Topeka is the average of the score of Topeka with Kansas City and Topeka with Wichita. The complete orders of the city and counties and their centrality scores are presented in the Appendix 1. Excluding the four metropolitan counties, these 101 non-metropolitan counties start from the second order which includes Saline, Reno, Douglas counties; cities of Salina, Hutchinson and Lawrence, respectively serve as their central places (Bogunjoko, 1973: 23).

Measurement of the Intervening Variable: Net Migration Rates

Net migration rate of each county in the period of 1950-60 is the intervening variable. It is proposed that the socio-economic characteristics do not have direct impact on community structural change measured by the change in differentiation. The effect of these ecological variables on change in differentiation is exerted through an intermediate variable - migration.

Data used are coded from the Population-Migration Report printed by the Economic Research Service, U. S. Department of Agriculture, under the title "Net Migration of the Population, 1950-60 by Age, Sex and Color." This was the first time that intercensal net migration estimates for age-sex-color groups have been prepared for all counties in the United States. (Bogue published the estimates for the 1940-50 decade for all the SMSA'S).

The following is a brief note on the methodology used in this ERS report. The population figures for each county were taken from the 1950 and 1960 Censuses of Population. Births and deaths are obtained from the National Vital Statistics Division. Then, net migration figures were residuals obtained by subtracting natural increase from the total change

between 1950 and 1960 in resident population in each county. These estimates were then adjusted to the Bureau of the Census estimates of total migration for the counties. Population changes were based on the 1950 and 1960 census of the population and on the data compiled by the U. S. Public Health Service and the Department of Defense. Estimates of births and deaths are based on data obtained from the National Vital Statistics Division of the U. S. Public Health Service. Figures are classified on a residence basis. The vital statistics for the counties were obtained from the birth and death registration and both are adjusted for underregistration. The major justification for using this residual method to calculate net migration is that it is rather straight-forward. In developed countries where registration is rather complete and accurate, this is a simple and yet reliable estimate of net migration. However, possible sources of errors in the Census (such as relative completeness of the 1950 and 1960 census) and in the vital statistics (such as underregistration and error of resident reports) should be kept in mind.

The net rate was expressed as a percentage of the 1960 survivors of the 1950 population and births during the intercensal decade. The problem of the proper population base to be used for computing net rate has plagued demographers for a long time. In this study, I think the 1950 population should be used as the denominator in computing the net migration rate for a theoretical reason. Since most of the counties in Kansas have experienced out-migration during the 1950's, the use of mid-period population or end-period population as the base would inflate the net rate. Besides, the end-period population or mid-point population is also affected by the migration during the period and hence confounds the problem of simultaneity discussed

in Chapter I. Because the data were obtained from a secondary source, the methodology is different from the one just mentioned. This is one of the tasks further research should include.

Kansas has been characterized by low population density. In 1950, total population was 1,905,299. Kansas ranked 31st in population size in the nation as a whole and 12th in land area (1950 Census of Population, U. S. Summary). Since the early twentieth century, there has been a trend toward urbanization in the State, characterized by rural-to-urban migration. In 1900, 12.5 percent of all Kansans resided in cities with population 10,000 or more. By 1960, the percent increased to 44 (Rohrer, 1961: Table 1). The 1960 census indicated a gain of 813,312 persons, a 14 percent increase over the 1,905,299 reported in 1950. But the Census of Agriculture showed that farm operators shrank to 1,041,340, two-thirds of its 1940 size, resulting from out-migration from the rural areas.

Table 2 reveals a wide range of variation in the net migration among Kansas counties. Most of the counties with large cities experienced positive net migration during the fifties. These counties were Johnson, Sedgwick, and Wyandotte metropolitan counties, and counties with a college or university such as Riley, Douglas, and Ellis. During the decade of 1950-60, 94 of the counties had net out-migration and only 11 showed net in-migration. Although most of the counties had a very high fertility rate to offset both deaths and out-migration, the counties educated their young, but the return in human capital investment went to other places. It is logical to say that a substantial out-migration equates with loss of human resources and hinders further community development.

TABLE 2

NET MIGRATION RATES FOR KANSAS COUNTIES, 1950-60

Counties with 20% and over net in-migration		Counties with 10.1% to 20% net out-migration		Counties with 20.1% to 30% net out-migration	
* Johnson	+67.7	Neosho	-10.3	Stevens	-20.0
Seward	+26.9	Pottawatomie	-10.8	Trego	-20.2
Saline	+24.6	Atchison	-11.0	Sherman	-20.4
		Rooks	-11.1	Stafford	-20.5
		Montgomery	-11.5	Mitchell	-20.7
Counties with 10% to 20% net in-migration		Barton	-11.6	Rice	-20.9
* Sedgwick	+17.5	Crawford	-12.0	Chautauqua	-21.3
Douglas	+10.4	Pratt	-12.8	Coffey	-21.4
		Jackson	-12.6	Lincoln	-21.4
		Finney	-12.8	Edward	-21.5
		Grant	-13.0	Washington	-22.0
		Greeley	-13.2	Stanton	-22.1
Counties with 0.1% to 10% net in-migration		Harper	-13.2	Woodson	-22.2
* Shawnee	+ 9.0	Clay	-13.4	Clark	-22.5
Butler	+ 6.2	Wabaunsee	-13.5	Comanche	-22.6
Harvey	+ 3.5	Kiowa	-13.6	Greenwood	-22.6
Morton	+ 3.5	Scott	-13.7	Sheridan	-23.0
Leavenworth	+ 2.1	Brown	-14.6	Gove	-23.3
Riley	+ 0.7	Labette	-14.6	Chase	-23.5
		Kingman	-14.7	Gray	-23.6
		Marion	-14.9	Rush	-23.6
		Pawnee	-15.5	Kearney	-24.6
		Doniphan	-15.7	Ness	-24.7
Counties with 0.1% to 10% net out-migration		Ellsworth	-15.7	Cheyenne	-25.1
* Sumner	- 3.6	Wichita	-15.8	Elk	-26.3
Jefferson	- 5.5	Decatur	-16.3	Hamilton	-26.4
Osage	- 5.6	Norton	-16.5	Russell	-26.6
Miami	- 6.1	Phillips	-16.5	Jewell	-28.7
* Wyandotte	- 6.1	Cherokee	-16.6	Wallace	-29.2
Cowley	- 6.3	Meade	-17.0		
Reno	- 6.8	Smith	-17.0		
Graham	- 7.0	Wilson	-17.4		
Lyon	- 8.1	Thomas	-18.0		
Dickinson	- 8.2	Republic	-18.1		
McPherson	- 8.3	Cloud	-18.3		
Franklin	- 8.6	Osborne	-18.4		
Geary	- 9.2	Marshall	-18.5		
Ford	- 9.4	Morris	-18.8		
Ellis	- 9.6	Hodgeman	-19.4		
Haskell	- 9.6	Nemaha	-19.4		
Ottawa	- 9.7	Logan	-19.5		
		Bourbon	-19.7		
		Linn	-19.8		

*Not included in the
sample.

Measurement of The Dependant Variable: Change in Differentiation

Change in differentiation, indicating the growth or decline of a community, is used as the dependent variable. Before discussing the measure of change in differentiation, attention should be given to the measurement of differentiation, for the former derives from the latter.

County differentiation was usually measured by the differentiation of the largest city and/or the county seat. In most cases, the largest city is also the county seat. If otherwise, both the largest city and the county seat are used as the sources to code the information on differentiation. Furthermore, if a city had a population of at least three-fourths of the largest city in the county, services available in that city were also coded as present in the county. Based on Frank Young's definition of differentiation, differentiation is the institutional diversity of the community. Accordingly, we counted the differentiation of occupations, institutions and services available in the city. For those counties for which services for more than one city were coded, if a particular service existed in any of the cities, it was coded as being present for the county.

The item list was developed by Dr. Jan L. Flora of the Population Research Laboratory. Items were chosen to include as many institutional sectors as possible. The items of the Guttman scale were formed in a way that a community which has a particular item will have all the items which precede to it on the scale. For example, in Table 3, a community which has a jeweler would also have a florist and cleaners. This unidimensionality enables one to rank the communities into a hierarchy from simple to complex and indicates the level of development.

As long as the items chosen are sensitive enough to discriminate the diversity among the different communities studied, this method is much better

TABLE 3

GUTTMAN SCALE OF GENERAL DIFFERENTIATION,
101 NON-METROPOLITAN COUNTIES, KANSAS, 1960-61

Step No.	Items	Cumulative percentage of sample included	Errors
1.	Cleaners (Services)	95	1
2.	Florist (Goods)	92	8
3.	Jeweler (Goods)	88	2
4.	Chiropractor (Medical)*	83	5
5.	Auto parts and supplies, new, as primary function (Goods)*	78	8
6.	Photographer (Services)*	72	4
7.	Bakery, retail (Goods)*	62	3
8.	Movers (Services)*	55	6
9.	Monuments (Goods)*	52	9
10.	Savings and loan (Finance)*	49	9
11.	Telegraph company (Transportation/Communication)*	45	6
12.	Taxi cabs (Services)*	42	3
13.	Roofers as primary function (Construction)*	38	8
14.	Musical instruments (Goods)*	37	2
15.	Office equipment as primary function (Goods)*	35	5
16.	Salaried fire department (Governmental)*	34	7
17.	Photo equipment, retail as primary function (Goods)*	32	7
18.	Signs as primary function (Goods)*	29	7
19.	Radio stations (Transportation/Communication)*	28	8

TABLE 3 (continued)

Step No.	Items	Cumulative percentage of sample included	Errors
21.	Chiropodist or podiatrist (Medical)*	24	11
22.	Hearing aids (Goods)*	22	7
23.	Colleges or University (Social welfare)*	20	5
24.	Delivery service as primary function (Goods)*	18	11
25.	Tailor (Services)*	17	7
26.	Landscape architects (Construction)	15	9
	Bike shop dealer, retail-primary function (Goods)*		5
27.	Flour mill (Agriculture)	14	8
28.	Auto renting/leasing as primary function (Services)	12	2
29.	Pawn broker (Finance)	11	4
30.	Advertising agency (Services)	10	7
31.	Store specializing in maternity apparel as primary function (Goods)	8	6
32.	Bonds-bail as primary function (Finance)	7	6
	Diaper service (Services)		3
33.	Pet shop as primary function (Goods)	5	2
34.	Optical goods or optician (Medical)	4	3
	County auditor (Government)		2
35.	County surveyor (Governmental)	2	0

Coefficient of scalability for scale with extreme items = .75

Coefficient of scalability for scale without extreme items = .65

*Indicates items which are in scale without extreme items.

TABLE 4

GUTTMAN SCALE OF GENERAL DIFFERENTIATION,
101 NON-METROPOLITAN COUNTIES, KANSAS, 1970-71

Step No.	Items	Cumulative percentage of sample included	Errors
1.	Jeweler-retail (Goods)	90	3
2.	Optometrists (Medical)*	85	3
3.	Heating contractor (Construction)*	76	5
4.	Photographers (Services)*	65	9
5.	Savings and loan (Finance)*	61	6
6.	Credit reporting agencies (Finance)*	47	6
7.	Radio station (Communication/transportation)*	41	3
8.	Newspaper-daily (Services)*	38	6
9.	Public certified accountant (Finance)*	37	7
10.	Taxi cabs (Services)*	35	3
11.	Office furniture and equipment as primary function (Goods)*	29	9
12.	Schools: colleges or universities (Soc. welfare)*	27	3
13.	Architects (Construction)*	26	7
14.	Employment agencies (Social welfare)*	25	7
15.	Dentists- orthodonists (Medical)*	24	6
16.	Appraisers (Finance)*	23	6
	Adjusters (Finance)*		6
	Copying & duplicating services (Services)*		6
17.	Travel agents (Communication/transportation)*	22	8
18.	Beer-wholesale (Goods)*	21	8

TABLE 4 (continued)

Step No.	Items	Cumulative percentage of sample included	Errors
19.	Book dealers - retail (Goods)*	20	8
	Auto renting & leasing as primary function (Services)		7
20.	Podiatrists (Medical)	19	5
21.	Park board (Governmental)	18	7
22.	Church of Jesus Christ of Latter Day Saints (Religion)	17	7
23.	Gynecology (Medical)*	16	6
24.	Airline companies (Communication/trans.)*	14	5
	Pawn brokers (Finance)		3
	Liquors-wholesale (Goods)*		6
25.	Day nurseries (Social Welfare)	12	8
	Army, Air Force, Navy or Marine recruiting station (Government)*		6
26.	Hearing aids (Goods)	11	6
	Delivery service as primary function (Services)		5
27.	Child diseases (Medical)	9	4
	Medicare information center (Social welfare)		7
28.	Bicycles- dealers (Goods)	8	8
	Optical dispensing (Medical)		3
29.	Veterans administration center (Social Welfare)	6	4
30.	Laboratory diagnosis (Medical)	4	2
	Neuropsychiatry (Medical)		0
31.	Detective agencies (Services)	3	1
32.	Skin specialists (Medical)	2	0
33.	Pentecostal Church (Religion)	1	1

Coefficient of scalability for scale with extreme items = .69

Coefficient of scalability for scale without extreme items = .65

*Indicates items which are in scale without extreme items.

than conventional approaches such as income, energy consumption, literacy etc. These traditional indicators of development not only depend heavily on economic and welfare-oriented statistics but also may be distorted by the uneven distribution of these indicators in the communities, especially in a capitalistic society.

Differentiation, on the other hand, takes different institutional spheres and organizations into account, and hence is more useful for systematic comparison. Although the item list consists of as many institutional sectors as possible, the number of items that fit into the Guttman scale of differentiation varies from sector to sector.

As can be seen from both Table 3 and Table 4, establishments selling good and commercial services dominated a large proportion of all the items, because these items are the most sensitive indicators of institutional diversity and are more publicly discriminated than those in other sectors. All the items coded have to be sensitive enough to discriminate the institutional diversity among the different cities under consideration. Items of near universality or extreme scarcity should not be included because they tend to artificially inflate the coefficient of scalability. This method, using presence or absence of the community items in order to apply to the Guttman scaling to rank the communities, has limited value at the upper end. The metropolitan counties were excluded because they are far more differentiated than all the other counties. The excluded counties are Johnson, Sedgwick, Wyandotte and Shawnee.

Items included goods, commercial, financial, transportation, construction, medical, social welfare, governmental and agricultural services, with a total of 109 items. These nine categories of items are combined into the

general differentiation scale. The data were coded by the employees of the Population Research Laboratory from the yellow pages of the 1960 telephone directories.

To avoid the artificial inflation of the coefficient of scalability, several steps are taken. First of all, the extreme items which appear on both extreme ends on the original scale (with cumulated scale scores less than 15 or greater than 85) are excluded. After the new scale results, these items are put back into the program and a final scale emerged. This would help to discriminate the extreme cases.

All the categories of differentiation formed subscales except for recreational differentiation. These nine subscales were factor analyzed and all of them loaded high on the same factor. Although two factors emerged, only one factor was identified, namely the general differentiation factor. The result was presented in Table 5. All the positive loadings suggest that these subscales differentiate in the same way that general differentiation does. The zero-order correlation of the subscales with general differentiation is shown in Table 6.

Recreational differentiation did not form a scale, because its scalability was lower than 0.65, the accepted criterion of scaling in this study. In other words, the recreational items were not publicly discriminated or reliable enough to fit in the general differentiation. Recreational facilities do not differentiate at the similar pace or in the similar direction with other institutional sectors in 1960. The same result was obtained for 1970 data by Bogunjoko (1973:13).

The agricultural subscale in 1950 loaded highly (0.72) on the general differentiation factor with all the other subscales. In contrast, the

TABLE 5
 FACTOR ANALYSIS OF DIFFERENTIATION SUB-SCALES FOR
 101 KANSAS NON-METROPOLITAN COUNTIES, 1960

Type of Differentiation	Factor loading	
	Factor 1	Factor 2
Establishments selling goods (14)	.95	.02
Commercial services (8)	.93	.08
Financial (4)	.91	.06
Transportation and communications (2)	.88	.17
Construction (2)	.82	.21
Medical (3)	.81	-.01
Social welfare (1)	.80	.08
Governmental (3)	.77	-.27
Agricultural (1)	.72	.18
Eigen value	6.52	1.07
Cumulative proportion of total variance explained	.65	.76

Note: Figures inside the parentheses denote the number of items in each sub-scale included in the general scale.

TABLE 6

ZERO-ORDER CORRELATIONS BETWEEN SPECIFIC DIFFERENTIATION AND
GENERAL DIFFERENTIATION, 101 KANSAS
NON-METROPOLITAN COUNTIES, 1960

Specific Differentiation	General Differentiation
Establishment selling goods	.95
Commercial services	.93
Financial	.91
Transportation and communication	.88
Construction	.82
Medical	.81
Social welfare	.80
Governmental	.77
Agricultural	.72

agricultural subscale did not correlate highly with the general differentiation scale in 1970 (Bogunjoko: 14). This suggests that in some counties agriculturally-related services are losing importance in comparison with other economic activities while others are specializing in agricultural services, independent of their level of differentiation. Agricultural services were part of the general activities for most of the counties in 1960. As agriculture declines, this sector becomes a specialized function for some counties where agriculture is still a dominating activity in the economy.

When the factor loadings of the 1960 subscales were compared among themselves, the agricultural services scale has the least correlation with general differentiation, suggesting that although agriculturally-related activities in 1960 differentiated parallel with the overall institutional differentiation, it was not as important as other institutional sectors such as goods, commercial, finance, etc.

A measure of change in differentiation was devised by using the difference between the county differentiation scale score of 1970 and 1960. If the differentiation scale score of 1970 was greater than that of the 1960's, the difference was given a positive value and vice versa. A positive number means there was a relative increase in differentiation. A negative number could mean that the county declined in differentiation relative to the counties as a whole.

This study attempts to determine the contribution of net migration to community growth or decline. Socio-economic variables were located to explain net migration rate of the counties. Ten variables indicating social welfare and sectoral distribution of work force were selected from the 1950 Census of Population for Kansas and the 1952 County and City Data

Book on the basis of their potential explanatory power as shown in previous studies or on theoretical grounds. Centrality measured by the gravity model was added as an additional independent variables.

Those are the socio-economic characteristics of Kansas counties in 1950 and are then used to explain variation in net migration rates over the following decade, 1950-60. Those characteristics are proposed as prior conditions of migration and functional expansion (change in differentiation) and are viewed as exercising influence on change in differentiation in the next decade, 1960-70, through the intervening variable of net migration rate. It is also assumed that these influences on change in differentiation are mediated by the original level of differentiation and hence differentiation in 1960 should also be controlled. Socio-economic characteristics in 1960 are also included to compare 1950 and 1960 socio-economic conditions.

Factor analysis and step-wise multiple regression are the statistical techniques used in this study for the analysis of data. Factor analysis was performed in order to choose proper variables to be run in the multiple regression. The utility and appropriateness of these two techniques of data analysis is discussed briefly below.

Factor analysis is a multivariate analysis technique which allows one to select independent variables which indicate discrete factors. The purpose of factor analysis is to use as few factors as possible to explain as much variation as possible while keeping the residual at a minimum. A number of procedures were performed in order to get the rotated orthogonal factor matrix. First, a correlation coefficients matrix of all the variables fed in was produced. Then these variables were grouped into distinct clusters. Finally, these were reduced to a few independent dimensions and

formed a rotated factor matrix with as little loss of information as was statistically possible. Each variable has a loading on each factor but it can be identified with only one factor. When more than one variable loads high on the same factor, only one should be chosen for further analysis. The choice should be based on sound theoretical reasoning. Factor analysis is necessary because (1) variables used as independent variables in the regression analysis should be uncorrelated to each other (2) the number of variables to be run in the regression should be kept to a minimum. In this study, only factors with eigenvalues greater than 1 were generated. Eigenvalues measure the amount of variance accounted for by the factor. An eigenvalue greater than 1 means that the factor account for more of the total variance than that explained by a single variable. The factors which emerge depend on the kind of data fed in. In this study, socio-economic variables were factor analyzed, so at least one factor of each type is expected.

In sum this chapter reviewed some of the literature on migration and community development studies. The two stage causal model in this study is partially stimulated by literature and partially to carry a step forward. I introduce migration as an intervening variable between community character and community structure change. The first stage model is suggested by the push-pull theory and gravity model of migration in which migration is viewed as a dependent variable. The second stage causal model is suggested by Durkheim's determinants of division of labor which is conceptually the same as differentiation.

CHAPTER III

PRESENTATION AND INTERPRETATION OF THE FINDINGS

The results and subsequent interpretations are based upon multiple regression analysis. Factor analysis was used in preliminary analysis to reduce the data into a few manageable dimensions without losing any significant information. After eliminating the redundant variables and condensing the data into a few factors, multiple regression analysis is appropriate. Multiple regression analysis helps to assess the independent relative contribution of a number of variables to the dependent variable by looking at the proportion of variance explained. The multiple regression coefficient represents the direction and amount of change in the dependent variable caused by the change of a standard deviation in the independent variable while holding all other independent variables constant.

Before discussing the multiple regression analysis, a brief discussion of the zero-order correlation matrix and factor analysis is necessary.

Selecting the Independent Variables

Although the relationships of the socio-economic variables to migration, as shown in Table 7, were quite different from other studies, the zero-order correlations were in the expected direction except unemployment. The literature suggested that percent unemployed would correlate negatively with net migration. Surprisingly, we found a positive correlation between net migration and unemployment (.32). This can be explained by looking at the relation between net migration, percent of the work force in agriculture, and percent of the work force in manufacturing.

TABLE 7

ZERO-ORDER CORRELATION OF THE PRIOR CONDITION OF MIGRATION
IN 1950 AND NET MIGRATION RATES, 1950-1960, FOR 101
KANSAS NON-METROPOLITAN COUNTIES

Variables	Net Migration Rate
Median family income	.22*
Percent of families with income less than \$2,000	-.23*
Percent of family income over \$5,000	.05
Median school years completed by persons 25 or over	.34**
Percent unemployed	.32**
Percent female 14 or over in civilian labor force	.40**
Percent in agriculture ^a	-.55**
Percent in manufacturing ^a	.40**
Percent in educational services ^a	.25**
Percent in governmental jobs ^a	.11
Centrality	.45**

*Significant at .05 level.

**Significant at .01 level.

^aPercent of employment in these sectors were calculated using the total persons employed in the civilian labor force as the demonimator.

Percent in agriculture had the largest zero-order correlation with net migration rate ($-.55$), indicating that there was a very high negative association between net migration and the percent of county labor force engaged in agricultural activities. This conformed to many other investigations that out-migration was highly associated with agriculture. In other words, agriculture serves as one of the push factors in the process of migration. In Kansas, percent unemployed correlated negatively with percent in agriculture ($-.60$) and positively with percent in manufacturing ($.71$), and had a positive correlation ($.32$) with net migration rate. In farming areas, many people are self-employed and cannot be laid off. Hence underemployment is high but unemployment is lower than in urban areas. Although unemployment is much higher in manufacturing areas than in agricultural areas, median family income is much higher in the former than in the latter, in part because of the underemployment which is so prevalent in rural areas. This differential in potential earning power may in part account for rural-to-urban migration even though unemployment is higher in urban areas. Non-economic factors play important roles as well. For example Uhlenberg (1973) studied the Negro movement from the South from 1860 to 1920 and the exodus from Southern Appalachia between 1930 and 1960. The most significant finding in his study was that despite the pull factors of favorable socio-economic opportunities in Northern areas, Southern Negroes did not migrate there contrary to the push-pull model prediction (Uhlenberg, 1973: 297). Similarly, long economic deprivation in Southern Appalachia did not lead to a massive outmigration during 1930 to 1960 (302). Non-economic factors such as a community's linkage with the larger system allowing inhabitants to acquire knowledge of other places (centrality), ties with family and community and

the ability to assimilate in a new environment may also be important in determining migration (which partially explains why migration is selective of the young and skilled).

The second largest zero-order correlation with net migration in this study was centrality which was consistent with Duncan's (1959) investigation which found that cities with a high percent of the labor force engaged in manufacturing are located near central places and vice versa (Duncan, 1957: 176). All the socio-economic variables had high zero-order correlations with net migration rate except percent of families with median income over \$5,000 and percent of work force in governmental jobs.

The self-correlations of 1950 and 1960 socio-economic variables are presented in Table 8. In the second stage, multiple regression analysis, in which change in differentiation between 1960 and 1970 was the dependent variable, the 1950's variables were replaced by the corresponding ones for the 1960 because the latter variables were expected to be more immediate causal variables than their 1950 counterparts. The self-correlations shown in Table 8 indicate that each variable correlated highly with itself at the two points in time except percent in poverty (.28) and percent in governmental jobs (.16).

Eleven causal variables, ten measures of socio-economic structures and centrality, were proposed on the basis of prior studies in which they had been found to be dominant factors in the process of migration. These variables were measured at the beginning of the time period during which migration takes place and thus are called the prior conditions of migration. These variables were indicators of the social, economic, and locational characteristics of the 101 nonmetropolitan counties in Kansas in 1950.

TABLE 8

ZERO-ORDER CORRELATIONS OF THE 1950 SOCIO-ECONOMIC VARIABLES WITH
THE SAME VARIABLE IN 1960, 101 KANSAS NON-METRO-COUNTIES

Variables, 1950	Corresponding variables, 1960
Median family income	.81
Percent of families with income under \$2,000	.28
Percent of families with income over \$5,000	.72
Median school years completed by persons 25 or over	.70
Percent unemployed	.55
Percent female 14+ in civilian labor force	.49
Percent in agriculture	.93
Percent in manufacturing	.90
Percent in educational service	.66
Percent in governmental jobs	.16

Source: U. S. Census of Population--Kansas, Vol. II, Part Sixteen,
Washington D. C.: U. S. Government Printing Office, 1950.

U. S. Census of Population--Kansas, Vol. I, Part Eighteen,
Washington D. C.: U. S. Government Printing Office, 1960.

Factor analysis was used to isolate these original independent variables into a few manageable dimensions. The purpose was to logically and systematically eliminate the redundant variables and reduce the original variables to a few independent components which are more appropriate in the multiple regression analysis. The factor loading structures of these eleven variables appear in Table 9. The variables appear in descending order of the principal loadings of the variables on each factor. The factors were named according to the concept expressed by the cluster of the variables.

Three rotated factors with eigenvalues greater than one emerged. Variables loading high on the first factor are median family income, percent of families with incomes of less than \$2,000., percent of families with incomes over \$5,000, and median school years completed by persons 25 years old or over. Thus this factor was termed "income-education".

Percent of work force engaged in agriculture and percent of work force in manufacturing loaded on the second factor with opposite signs. Thus it was named the "ruralism-urbanism factor. A high percent of females in the labor force and, as previously mentioned, high unemployment were positively associated with urbanism and negatively associated with ruralism. High income counties were not characterized by concentration of manufacturing (correlation with median family income was .02) and educational services (correlation with median family income was .07) contrary to the results often found in the literature. It implies that in a highly developed system, such as in the United States, manufacturing communities are characterized by "middle class" rather than by the population with income on both extremes.

The third factor contained two sectoral work force variables, percent in educational services and percent in governmental jobs, and a structural variable, centrality, therefore a centrality factor was identified.

TABLE 9

FACTOR ANALYSIS OF THE PRIOR CONDITIONS OF MIGRATION,
101 KANSAS NON-METROPOLITAN COUNTIES, 1950

Variables	Factor loadings		
	Factor 1	Factor 2	Factor 3
Median family income	-.97		
Percent income under \$2,000	.97		
Percent income over \$5,000	-.89	-.26	
Median school years	-.69		.42
Percent in manufacturing		.88	
Percent unemployed		.87	
Percent in agriculture	.36	-.82	
Percent female 14+ in labor force		.57	.34
Percent in education			.85
Centrality		.25	.74
Percent in governmental jobs			.62
Eigenvalue	3.47	2.84	1.73
Cumulative proportion of variance explained	.32	.57	.72

Note: All loadings which are not significant at the .01 level (less than .25) are omitted.
 Factor 1: income-education; Factor 2: ruralism-urbanism
 Factor 3: centrality

Female labor force participation relates to educational and governmental institutions where typical female employment is available. But female labor force participation loaded even higher on the ruralism-urbanism factor. Differentiation in 1960 and net migration rate during the 1950-60 decade were then added to the other potential independent variables in the 1960 factor analysis. Table 10 reveals the loadings for this factor analysis. The result is extremely similar to the 1950 factor analysis.

Differentiation in 1960 emerged on the same factor as agriculture and manufacturing, thus the ruralism-urbanism factor was renamed as the differentiation factor which is more conceptual than the former. Differentiation, the institutional complexity of the system, taps directly the overall structure as a contrast to percent in agriculture and percent in manufacturing, which are built from attributes of only one sector. From the factor loading, differentiation alone can represent a number of characteristics of urbanism and ruralism. It correlated highly and negatively with percent in agriculture ($-.80$) and highly and positively with percent in manufacturing ($.61$). Net migration rate of 1950-60 emerged highly on the differentiation factor ($.65$) and moderately on the income-education factor ($.42$).

Besides the differentiation factor described above, this final factor analysis, as shown in Table 10, produced two factors which are similar to those of the previous ones, namely the income-education dimension and the centrality dimension. The only difference between these two factor structures is that the income-education factor is losing its importance to the differentiation factor in that the latter emerged as the first factor while the former changed from the first to the second factor. The centrality factor remained in the same relative position.

TABLE 10

FACTOR ANALYSIS OF THE PRIOR CONDITIONS OF MIGRATION,
NET MIGRATION AND DIFFERENTIATION, 101 KANSAS
NON-METROPOLITAN COUNTIES, 1960

Variables	Factor loading		
	Factor 1	Factor 2	Factor 3
Percent in agriculture, 1960	-.88	-.25	
Percent in manufacturing, 1960	.84		
Differentiation, 1960	.83		.28
Percent unemployed, 1960	.76	-.34	
Net migration rate, 1950-60	.65	.42	
Percent female in labor force, 1960	.53	.43	
Median income, 1960		.91	
Percent income over \$10,000, 1960		.86	
Median school years, 1960		.75	.29
Percent income under \$3,000, 1960		-.58	
Centrality	.27		.83
Percent in educational services			.75
Percent in governmental jobs			.68
Eigenvalue	4.44	2.69	1.54
Cumulative proportion of variance explained	.34	.55	.67

Note: All loadings which are not significant at the .01 level (less than .25) are omitted.

Factor 1: differentiation. Factor 2: income-education.
Factor 3: centrality.

The next logical step is to choose proper items within each factor for further analysis. The factors which emerged are characterized by the variable which loaded highly on one factor and low on all the other remaining factors. If a variable loads highly on one factor, statistically, it will have a low loading on all the other factors. Thus the selection is based on the uniqueness or distinctiveness among the isolated components. Ideally, the items chosen are uncorrelated with one another. If more than one variable loaded highly on the same factor and loaded low on all the remaining factors, the choice is based on their face validity or theoretical import while minimizing the confounding effect (multicollinearity).

From both factor analyses (1950 and 1960), median income and median school years are chosen as the key variables to represent the "income-education" dimension. (Median income reflects more about the distribution of the wealth and resources of the community and hence is more theoretically relevant to the overall index of living standard and quality of life of the community.) The proportion of families with incomes at both extremes only represent a small proportion of the county population and were dropped out even though they have similar loadings as those of median income and median school years. Furthermore, percent of families with income over \$5,000 had a very low zero-order correlation with net migration rate (Table 7) and percent of families below poverty was rather unstable for the two time periods (Table 8). Of the variables which loaded high on the first factor, median income and percent of incomes under \$2,000. are redundant (their correlation is $-.96$). The same argument is true for median income and percent with income over \$5,000, whose correlation is $.86$. Median income and median school years had a moderately high correlation of $.58$ and hence are selected as items to be run alternatively in the multiple regression.

On the second factor, both percent unemployed and percent in manufacturing had a high negative correlation with percent in agriculture. Because we are looking at non-metropolitan counties and several urban areas are excluded, percent in agriculture is expected to have a greater impact on community characteristics than percent in manufacturing. Differentiation, which is more conceptual and loaded on the same factor as agriculture and manufacturing, should be used as the major item of the factor. But because differentiation in 1950 was not available for this study, percent in agriculture in 1950 is used as a substitute for the former.

Both percent in educational services and governmental jobs are chosen as the representing items for the centrality factor. These two variables only correlated moderately with each other (.36). Centrality is also included because of its theoretical value. Due to the high correlation between centrality and percent in educational services (.53), these two variables are run alternately in the multiple regression. Percent female 14 or over employed in civilian labor force which loaded moderately on all three of the factors is dropped because of the ambiguity of its identity.

A total of three factors were identified in the factor analysis, which despite the intercorrelation were relevant for subsequent regression analyses of migration. These variables were median family income, median school years completed by persons 25 or over, percent in agriculture (as a substitute for differentiation in 1950), percent in educational services, percent in governmental jobs, and centrality. The rationale for these selections is mentioned earlier. Table 11 is the intercorrelation matrix of these variables. The multiple regression requires that variables fed in as the independent variables should be uncorrelated with one another.

TABLE 11

INTERCORRELATIONS OF THE VARIABLES LOADING HIGHLY ON THE FACTOR
ANALYSIS OF THE PRIOR CONDITIONS OF MIGRATION, 101 KANSAS NON-
NON-METROPOLITAN COUNTIES, 1950

Variables	2	3	4	5	6
1. Median family income	.58*	-.38*	.07	-.01	.07
2. Median school years		-.39*	.39*	.06	.35
3. Percent in agriculture			-.26*	-.17	-.38*
4. Percent in educational services				.36*	.53*
5. Percent in governmental jobs					.24
6. Centrality, 1970					

*Significant at the .05 level.

There are several moderately high correlations in Table 11. For example, median family income correlated $-.38$ with percent in agriculture; median school years correlated $-.39$ with percent in agriculture, $.39$ with percent in educational services and $.35$ with centrality; percent in agriculture correlated $-.38$ with centrality and percent in educational services and percent in governmental jobs had a correlation of $.36$. These intercorrelations are not terribly high and they represent distinct factors. As long as the intercorrelations are within an acceptable range, it is more important to include all variables which are theoretically meaningful. Nevertheless, these nonnegligible intercorrelations should be taken into consideration when interpreting the results of the multiple regression.

In the second factor analysis, the 1960 socio-economic variables replaced their 1950 counterparts with similar results. In the final factor analysis, where net migration and differentiation in 1960 were added into the data, the same variables were chosen for the regression except percent in agriculture in 1960 is substituted for differentiation in 1960. Their intercorrelation is $.80$. Percent in agriculture in 1950 can be viewed as a surrogate of differentiation in 1950. It would have been more consistent theoretically and methodologically if a differentiation measure had been available in 1950.

Because of the high correspondence between the 1950 and 1960 socio-economic variables, the intercorrelations of the variables chosen from the final factor analysis resembles that of the selected variables from the first factor analysis. The major difference lies in the intercorrelations of the new added variables, namely differentiation in 1960 and net migration rate of 1950-60. These intercorrelations are presented in Table 12.

TABLE 12

INTERCORRELATIONS OF THE VARIABLES LOADING HIGHLY ON THE FACTOR ANALYSIS
OF THE PRIOR CONDITIONS OF MIGRATION, NET MIGRATION AND DIFFERENTIATION,
101 KANSAS NON-METROPOLITAN COUNTIES, 1960

Variables	2	3	4	5	6	7
1. Median income, 1960	.67*	.27*	.17	.06	.20	.47*
2. Median school years, 1960		.16	.31*	.16	.20	.32*
3. Differentiation, 1960			.35*	.10	.48*	.53*
4. Percent in educational services, 1960				.17	.59*	.19
5. Percent in governmental jobs, 1960					.41*	.16
6. Centrality, 1970						.45*
7. Net migration, 1950-60						

*Significant at the .05 level.

Net migration correlated significantly with all the other variables except percent in educational services (.19) and percent in governmental jobs (.16). It is reasonable that these variables correlated highly with net migration because they are proposed to be the prior conditions of migration and were treated as the independent variables in the first-stage multiple regression where the net migration rate is the dependent variable. As in 1950, because of their high correlations, median income and median school years completed by persons 25 or over ($r = .67$) as well as percent in educational services and centrality ($r = .59$) were run separately in the multiple regression. Differentiation in 1960 correlated highly both with centrality ($r = .48$) and net migration ($r = .53$). Centrality also correlated moderately with percent in governmental jobs ($r = .41$). Median income did not correlate significantly with either differentiation or centrality.

Because median family income and median school years as well as centrality and percent in educational services are fed into the multiple regression alternately, there were four combinations of independent variables when the net migration rate was run as the dependent variable. The results of these multiple regressions are discussed in the next section and the detailed illustration of the beta weights, significant level of beta weights, multiple R 's and R^2 's as well as their increments are presented in Appendix 5.

Contribution of the Independent Variables and the Intervening Variable (Net Migration)

Having identified the principal components of the community characteristics relevant to migration, it is time to look at their independent contributions to net migration. These relationships were addressed empirically

based on the results of all the multiple regressions shown in Appendix 5. The significance level of each individual variable was evaluated by a test which measures the significant contribution of the individual independent variable to the dependent variable in terms of the standard deviation.

The first variable entered in the first selection of the regression equation was percent in agriculture, producing a beta weight of $-.44$, a multiple R of $.55$ and multiple R^2 of $.30$. This means that percent in agriculture explained thirty percent of the variance in the net migration rates, a count of almost one-third of the total variance in the dependent variable. Centrality (with beta weight of $.28$) was added in the second step, and multiple R increased to $.61$, implying that percent in agriculture and centrality combined explained almost two-fifths of the variation in net migration rates in the succeeding decade. The final choice from all the four step-wise regressions are presented in Table 13.

Percent in agriculture and centrality combined explained as much variance in net migration rates as all the other equations. Our purpose is to select the equation that accounts for as much variance as possible with as few variables as possible. When a variable added did not raise the R, the regression model was considered complete. If a newly-entered variable increased the multiple R, but the increment was insignificant as determined by the F-test, the variable and all the variables after this would be considered worthless and the regression model is viewed as complete. An independent variable could have a high zero-order correlation with the dependent variable without raising the multiple R because this independent variable was highly correlated with another independent variable that was already in the equation. The above relationship could be either one of the following situations: (1) Z influences Y through X which is Z-X-Y,

TABLE 13

MULTIPLE REGRESSION ANALYSIS OF THE PRIOR CONDITIONS OF MIGRATION
TO NET MIGRATION RATE FOR 101 KANSAS NON-METROPOLITAN COUNTIES,
1950-60

Variables	Beta weights	Significant level
Percent in agriculture	-.44	.001
Centrality	.28	.005

$R = .61$

$R^2 = .36; < .01$

so when X is controlled, the partial correlation between Z and Y equals zero or is negligible. (2) X and Y's relation depends on their common antecedent Z, so when Z is controlled, the partial correlation between X and Y becomes zero or insignificant. One should keep these in mind when interpreting the results of the multiple regression.

Among the four selections of multiple regression, percent in agriculture entered the equation first in all the selections, followed by centrality whenever centrality is included. Percent in education, percent in governmental jobs, median school years and median income were not significant even at the .10 level in terms of the t-test, and hence are not considered as major contributors to net migration.

Income and educational attainment are two important variables in traditional migration studies. A careful reexamination of the intercorrelations between income and other variables fed into the multiple regression and the intercorrelation between education and other variables is necessary. Median family income correlated $-.38$ with percent in agriculture, convincing the researcher that the income variable is related to net migration through percent in agriculture. Percent in agriculture, a semi-structural variable, was viewed as a substitute for the differentiation in 1950. Thus, median income has no independent effect on net migration, but rather operates through differentiation to promote net migration.

Although the multiple R^2 (the total variance in the dependent variable explained) is not very high, it is important to emphasize that each of the independent variables is indeed independent conceptually from the dependent variable. One could have thrown in a lot of demographic variables, those indexing age structure for instance, and yielded a very high R^2 . But as

mentioned earlier, variables which are not conceptually independent of net migration should not be used as the explanation of net migration even though they produce a highly statistically significant R^2 . These variables are simply not valid in explaining net migration.

It is also possible that the results are due to the selection of variables from the factor analysis. Should a variable of equal loading be chosen instead of the ones selected in this study, a different picture might result. For example, median family income was chosen as the key item instead of percent of families below the poverty level or percent of families with high income. But from the zero-order correlation, percent in poverty had an even higher correlation with net migration than median income did. To test whether percent in poverty contributes to net migration, percent in poverty is substituted for median family income. Its beta weight and the resultant multiple R were much the same as when median family income was used. The conclusion that whatever effect income may have on net migration is through percent in agriculture is reconfirmed.

That percent in agriculture contributes most to the explanation of the variance in net migration rates is best explained through its relationship with differentiation, which has a high negative correlation with percent in agriculture in 1950. People are not moving out simply because of agricultural changes but also because of the specific characteristics associated with agricultural communities. Lack of services is one of the major characteristics in these communities. This may explain more fully why almost all the literature in rural-to-urban migration cite the importance of agriculture as one of the major push factors in the process of migration.

Another contributor to net migration is centrality. Counties with high centrality were net in-migration counties. A county with high

centrality is accessible to other communities in the larger system, obtaining more information and having more communication with the outside world. But high centrality alone tells nothing about the direction of migration. It could mean either that people in the county have more linkage with the outside and hence are provided with a greater chance to out-migrate, or that people outside the county can get information about this particular community and hence would in-migrate. In reality, perhaps both situations happened, but since I am looking only at net migration, the latter is of greater significance. This is made even clearer when one looks at the association of centrality with other community characteristics. Centrality correlated highly with percent in educational services (.59) and percent in governmental jobs (.41) in 1960. University and college towns as well as governmental establishments always attract migrants because of the job opportunities provided in these institutions. Such institutions are established and flourished in more central counties. This can be seen most clearly in the case of governmental development. Those areas which are central and have communication with the larger system (both state and federal) are most likely to be chosen as the location for new governmental agencies. Of those places with colleges and universities, the more central ones have the greater access to other communities and hence are able to attract more students, which in turn boosts employment in education.

Although it is invalid to say that income and unemployment, which are the key variables in traditional migration studies, are unimportant to net migration, it is obvious from the overriding of income by other structural variables and the moderate correlation between agriculture and median income (-.38) that outmigration in Kansas is not strongly associated with poverty

or race, unlike many other agricultural areas, especially the South. This finding conformed to Beale's finding that in the North Central Region as a whole, out-migration was associated with high education, high median income, good housing conditions, etc. compared to other heavy out-migration areas in the United States (Beale, 1974:14). He concluded that the North Central Region exported its young to avoid rural poverty. In this study, places with lower median income experienced out-migration, but the correlation is not strong (zero-order correlation of .22 with net migration rate).

Intercorrelations of the Independent Variables, Intervening Variable, and the Dependent Variable

After having discussed socio-economic and structural characteristics which relate to net migration, it is time to see how those characteristics and net migration itself affect community development and growth. Development is measured by the differentiation level of the community and growth is measured by the change in differentiation during the ensuing ten-year period.

Table 14 gives the zero-order correlation with change in differentiation of the variables selected from the factor analysis. Only percent in educational services had a correlation at the .05 significance level (.20). Most of the correlations are negligible, indicating that there are other important variables related to change in differentiation which are not included in this study. Even when we look at the correlation between change in differentiation and other variables which are not selected from the factor analysis, all the zero-order correlations are less than .20 and therefore not significant at the .05 level (with 99 degrees of freedom). Differentiation in 1960 correlated $-.18$ with change in differentiation, implying that there

TABLE 14

ZERO-ORDER CORRELATION OF THE PRIOR CONDITIONS AND NET MIGRATION
WITH CHANGE IN DIFFERENTIATION, 101 KANSAS NON-METROPOLITAN
COUNTIES, 1960-1970

Variables	Change in differentiation, 1960-70
Median family income, 1960	.03
Median school years completed by persons 25 or over	.18
Differentiation	-.18
Percent in educational services	.20*
Percent in governmental jobs	.04
Centrality	.03
Net migration	.04

*Significant at the .05 level.

was a slight convergence in level of differentiation among the counties over time. Centrality and net migration are not correlated ($R = .03$ and $.04$ respectively) with change in differentiation. Again, like differentiation and change in differentiation, these zero-order correlations may be masked by other factors. The best way to assess their real contribution to change in differentiation is through multiple regression.

The intercorrelation of the independent variables is shown in Table 12. Again, median family income and median school years as well as percent in educational services and centrality were fed into the program as alternate pairs because of their high correlation ($.67$ and $.59$ respectively). Thus, a total of four possible combinations of variables are run when change in differentiation is the dependent variable. Their results are presented in Appendix 5. The first variable entered in all four selections of the regression equation was differentiation in 1960, explaining only three percent of the variance. Because the differentiation scale is not an interval scale, variance explained in the dependent variable is reduced. And since the major concern in this study is to see the independent contribution of migration to change in differentiation (as set by the hypothesis) and the relative importance among the independent variables, it is more important to look at the standardized beta weight of each variable rather than focusing on the total predictive power of all the variables.

Net migration entered as the second or third variable in all four stepwise regressions. Its contribution in all cases was positive. That is, net in-migration in one decade contributed to a growth in differentiation in the succeeding decade.

Since it is hypothesized that the relationship between change in differentiation and net migration is in the positive direction, the test of

significance of the beta weight is based on the one-tailed t-test. The independent contribution of differentiation and net migration to change in differentiation explains the reason why the zero-order correlations of the former two with change in differentiation are small or even negligible. Net migration made a positive contribution to change in differentiation while differentiation had a negative contribution whose magnitude is even higher than net migration's. Since there is a high positive correlation between net migration and differentiation, the negative impact of differentiation on change in differentiation causes the positive contribution of net migration to change in differentiation to become much stronger once differentiation is controlled for. In other words, both differentiation and net migration contribute to change in differentiation more in the presence of each other than standing alone.

Differentiation had a substantially negative contribution to change in differentiation. This negative beta weight becomes even more negative when the extreme cases on both ends of the differentiation scale in 1960 are excluded.¹ It was surmised that perhaps the interaction between differentiation and centrality is operating in bringing such a result. This is a reasonable guess since there is a high correlation between differentiation and centrality (.48). When a measure of discrepancy between the county's rank on centrality and differentiation was devised, the independent

¹It was anticipated that the negative relation between differentiation and change in differentiation would disappear or be reduced after taking out the extreme cases on both ends of the scale, since communities at either end had a statistically smaller likelihood of either differentiating further or decreasing in differentiation. However, to our surprise, the negative beta correlation was reinforced from $-.26$ to $-.66$, a more than 80 percent increase after this deletion.

contribution of differentiation and net migration to change in differentiation remained the same.²

The best combination of variables for explaining change in differentiation suggested by the multiple regressions in Appendix 5 is composed of differentiation in 1960, percent in educational services, and net migration rates, with a multiple R of .38 and multiple R^2 of .15. Table 15 shows the beta weight of each variable, the significance level of the beta weight, and the multiple R as well as the R^2 . All three independent variables have significant standardized regression coefficients.

Percent in educational services and centrality are highly correlated and both loaded on the centrality factor. The result may be interpreted by saying that percent in educational services is one measure of centrality. The income-education factor, as in the first stage, does not make an independent contribution to the dependent variable. Whatever effect it may have on change in differentiation is through differentiation and centrality, since both show positive, although modest, correlation with the income and education variables.

Figures 2 and 3 show alternate versions of the two-stage causal model. If educational services is viewed as one measure of centrality, the result of Figure 3 does not violate the conceptualization of the relationship between centrality and differentiation and between centrality and migration. The reason for focusing on both is to maximize the validity of our

²Discrepancy is measured by subtracting the rank on centrality from the rank on differentiation. If the rank of differentiation score of the county is higher than that of the centrality's, the discrepancy is assigned a positive score and when the opposite is true, a negative sign is given. This device helps to eliminate the effect of multiplicability between centrality and differentiation and determine the real contribution of differentiation (or centrality) to change in differentiation.

TABLE 15

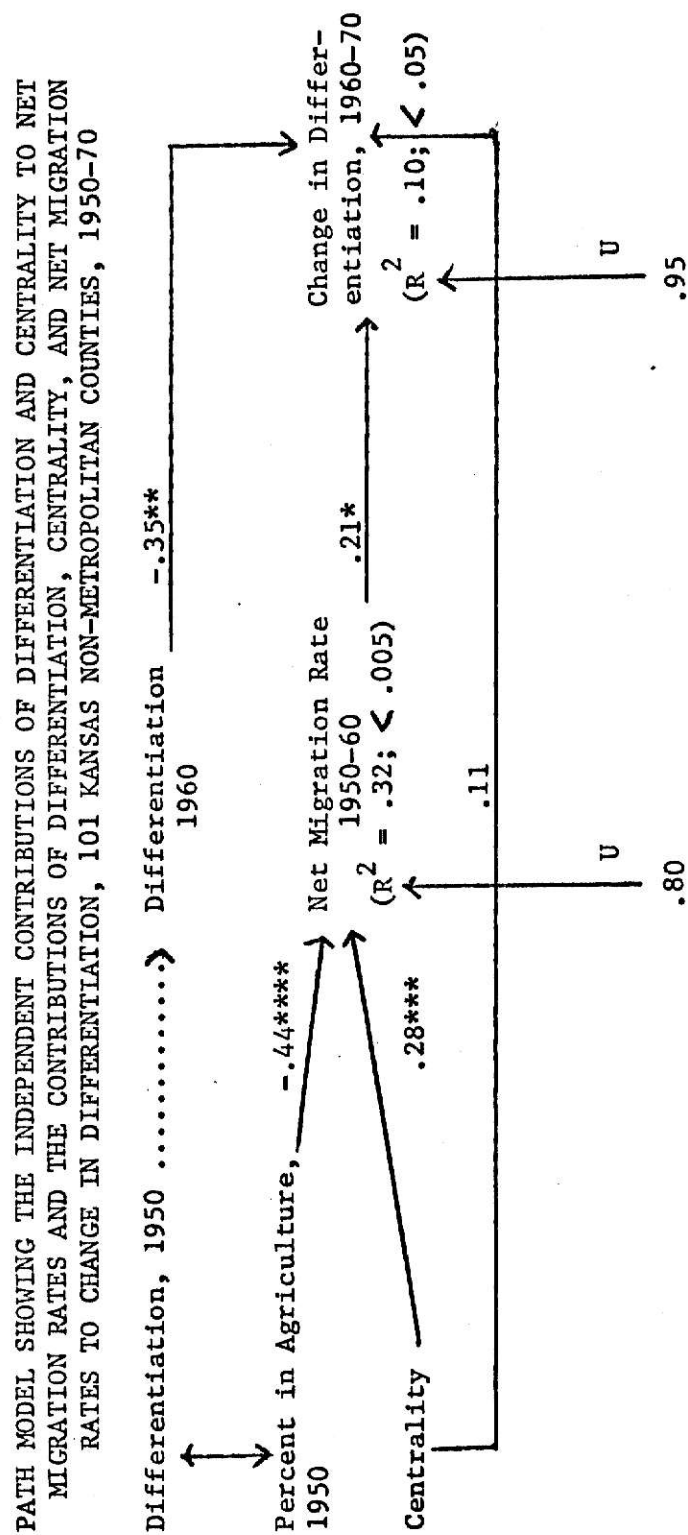
FINAL CHOICE OF VARIABLES AND THEIR BETA WEIGHTS
ON CHANGE IN DIFFERENTIATION, 1960-70, for
101 KANSAS NON-METROPOLITAN COUNTIES

Variables	Beta weight	Significance level
Differentiation, 1960	-.44	.001
Percent in educational services, 1960	.30	.005
Net migration rate, 1950-60	.25	.025 (one-tailed)

$$R = .38$$

$$R^2 = .15; < .05$$

FIGURE 2



* Significant at the .05 level (one-tailed test).

** Significant at the .01 level.

*** Significant at the .005 level.

**** Significant at the .001 level.

study. One of the major purposes of this study is to test the hypothesis that increase in differentiation is caused by net in-migration while controlling for other major variables. It is more desirable to control for something which had a strong contribution to net migration rather than control for something irrelevant to net migration. Centrality had a .28 beta coefficient as against the contribution of percent in educational services (.12) to net migration. The stronger independent contribution of percent in educational services than centrality to change in differentiation suggests that more measures of centrality should be devised, and the relation between its conceptualization and measurement be made more explicit and direct.

Migration made a moderate contribution to change in differentiation, with beta weight of .21 (significant at the .05 level), thus confirming the hypothesis.

In summary, this chapter identified three factors which represent community characteristics attracting migrants or pushing out migrants. These factors are income-education, differentiation, and centrality. The multiple regression analyses indicated that differentiation and centrality are more effective explanatory variables for migration on the macro level than the socio-economic status variables such as income and education. This unique finding may help to bridge the gap between the discipline of sociology and demography. Sociological demographers often attempt to conceptualize migration on the macro level, but their operational methods are often inadequate for this task. This may be due to the easy accessibility of census data such as general socio-economic characteristics of the population, e.g. income, education, labor force participation. When migration is studied on the macro level, it is more fruitful, as suggested by the findings in this

study, to use structural variables such as differentiation and centrality rather than aggregated variables such as income and education as predictors of migration. Several theoretical and methodological advantages exist for the structural approach. Structural variables such as differentiation and centrality represent the "real" characteristics of the community rather than characteristics aggregated from individuals. Second, they directly tap the overall structure of the community rather than being based indirectly on the assumption that structure as a whole is an accumulation of the sectors. The third advantage of the structural approach is that it is systematic. Differentiation summarizes every sector and institution of the system. Another advantage of the structural approach is that it has higher cross-cultural validity. As long as the unit under study is a system, it is more valid to compare two systems in different cultural contexts in terms of differentiation than in terms of other variables such as income, education, percent employed in agriculture, or manufacturing because aggregate variables are subject to the uneven distribution of these attributes in different cultures.

Although on the macro level socio-economic status variables do not contribute independently to net migration, but are subsumed under differentiation and centrality, this study does not negate the proposition that income and educational attainment are major determinants for selection of migrants. It is important that one be explicit as to the level of inference. In other words, these socio-economic status variables may still be the best predictors of individual mobility. Migration can be viewed as the process through which individuals achieve or upgrade their socio-economic status. When the research interest is shifted to prediction of community or areal prediction of migration, the emphasis should be on the structural approach

with community characteristics as mechanisms of inducing or retarding net migration, the emphasis should be on the structural approach. I am not denying the importance of the SES variables which are confirmed as legitimate by almost all the literature of migration, but rather claiming that level of inference should be explicit.

The fact that net migration tends to increase the level of differentiation when controlling on initial level of differentiation and centrality needs some explanation. Initial differentiation is the best predictor of change in differentiation. The fact that centrality did not contribute significantly to change in differentiation does not mean that centrality is not important to change in differentiation but rather suggests that the centrality measure in this study is not adequate. This can be seen more clearly when one looks at the conceptual and statistical relationship between centrality and percent in education in this study. They both loaded highly on the same factor and had a strong correlation. Most of the educational institutions are located in geographically central places. Thus the significant independent contribution (.28) of percent in educational services to change in differentiation can be viewed as a contribution of centrality in that percent in educational services is a rough centrality measure. Therefore, Figures 2 and 3 should be interpreted as two operational measures of the same process. Both initial differentiation and centrality had significant independent contributions to net migration and change in differentiation. That controlling on initial differentiation and centrality, net migration still had a strong independent contribution to change in differentiation shows that migration is an important agent for community change, which confirms the hypothesis of this research.

Level of initial differentiation was negatively related to change in differentiation. It is not expected that this would be true in all systems. At particular levels of differentiation, inequality may increase, at others it may decrease. It is reasonable to assume that at different levels within the same system, inequality of differentiation may be changing in opposite directions. The divergence or convergence needs more careful examination. In this study, county differentiation was approximated by differentiation of county seat and the largest city within the county. So, there is a convergence between initial differentiation and change in differentiation among the largest cities of the counties. Between small communities and large ones, a divergent pattern of divergence in level of differentiation may be more likely to happen.

These are the immediate findings of this study. Some general suggestions and implications are explored in the next chapter.

CHAPTER IV

SYNTHESIS AND PROSPECT

This chapter is an attempt to synthesize the major findings described in Chapter III using a more general sociological framework to depict the significance of this research. Like many other studies, there are problems, both theoretical and technical, in the overall design of this work. As a remedy some possibilities for further study are proposed. A brief discussion of the applied implications serves as an epilogue to this thesis.

Significance of Findings and Suggestions for Further Research

The most significant findings of this study are the demonstrations that, for the 101 Kansas non-metropolitan counties during the 1950-60 decade, (1) net migration rates were adequately explained by differentiation measured by percent of county labor force employed in agriculture and by centrality, implying that structural variables are more powerful in accounting for variation in net migration rates on the macro level than other aggregated or sectoral variables; (2) socio-economic status variables which are extensively used by traditional migration studies (as suggested by the dominance of the push-pull model) turned out to be poor predictors for net migration when the structural variables such as differentiation and centrality are included, leading the researcher to believe that net migration should also be viewed from a structural perspective; (3) net migration had an independent contribution to change in differentiation when initial differentiation and centrality were held constant, thus partially confirming the hypothesis that community differentiation increases in response to net in-migration.

Differentiation and migration interact in reality. A more differentiated place provides more diversified occupations and roles that can attract different people with different kinds of skills and specialties, which in turn promotes further expansion of different services. This new expansion of institutions and organizations would then cause further immigration. It is unrealistic if not impossible to delineate the exact causality between these two mutually dependent social processes. The causal relationship in this study is designated for analytical purposes. It allows one to examine the effect of differentiation on migration and the effect of migration on change in differentiation.

Centrality is another factor that influences migration. From a communications point of view, centrality is necessary for mobility. It is instrumental in diffusing information to stimulate migration. Communities with low centrality are isolated by poor means of communication from other communities.

Centrality, differentiation, and migration are major phenomena in the process of modernization and development. As a social system moves from rural dominance to urban dominance, its structure changes. All three variables are positively related. Increase in one causes an increase in the other two. Technological change leading to greater productivity results in a decrease in farm labor demand. Population redistribution through rural-to-urban migration occurs and industry shifts from agricultural-predominant to manufacturing-predominant. With all these changes, an increased diversification of economic activity and social organization occurs. Rising income and consumption level increase the demand for goods and all kind of services. Therefore, the system differentiates to meet

new demands. With rises in savings and investment levels, industry shifts from labor intensive to capital intensive, thus creating more services and trade industry. But urbanization is not the final stage of development. In recent decades, suburbanization had taken place. This suburbanization mainly occurs within the metropolitan areas which are not included in this study. But it is reasonable to believe that there was no decentralization during the fifties among the non-metropolitan counties in Kansas.

Change and development are many-faceted phenomena. Exclusively dwelling on one approach may result in the omission of a number of other approaches which are legitimate. Emphasis on structural variables is not complete in itself but that approach is more comprehensive and inclusive than other traditional analyses of migration and development. It helps to amend some of the theoretical flaws of the aggregated or sectoral approach and provides a new perspective which has fewer methodological limitations. It has something to offer as a tool for studying the diverse phenomena encompassed with migration and development.

Even though many social scientists claim that migration and development are oriented by an individual's attitudes, values, and motivations, overall structural characteristics are crucial in affecting individuals' attempts to maximize personal welfare and benefits and in converting those psychological factors into real actions. Migration and differentiation are necessary (if not sufficient) conditions for social change and development in that both involve the reallocation and redistribution of resources and of the population which manages the resources.

Most studies of social differentiation have been based on cross-sectional data, examining differentiation at a certain point of time. That

static approach does not deal with change over a period of time. By using a dynamic approach, as I did in this study, one gets a clearer picture of change. The result can be compared to cross-sectional studies. This type of analysis is useful for theoretical development and for attempting to influence applied social change.

Like most studies, there are problems, both theoretical and technical left to be solved. If time and effort allow, further improvement of the validation of the concept of differentiation and centrality should be devised. The lack of fitness between theoretical concept and operational definition can be diminished by more refined measurements of these structural variables. To establish valid operationalization, a precise definition of the concept is necessary. Differentiation can be operationalized as institutional complexity in the community or the diversity of meaning areas within the community. Different types of communities have different degrees of comparability between meaning areas and institutional complexity. In this paper, the first definition of differentiation was used and operationalized. Thus, the measure of differentiation would introduce a bias against the satellite communities whose institutional complexity is smaller than its diversity of meaning areas (this is opposite to Flora's study in 1967 where the second definition of differentiation was used).

The measure of change in differentiation differ from absolute number to scale step or scale score. Here, difference between scale scores at the two time points is used as the measure of change in differentiation. The major purpose of using change over time is to allow diachronic and synchronic comparison. The problem of all the above measurements is that they are ordinal rather than interval data. This tends to depress the inter-relationship among the variables and result in less predictability. To

assume that change at higher levels of differentiation is equal to change at lower levels even when the amount of change units (scale scores) is the same is not valid.

The problem with the centrality measure in this study is that it is static and narrow. Because population sizes and physical distance to another city of a higher order are utilized to calculate the centrality score, it remains relatively the same over time. With modern transportation and communication system (mainly automobiles, highways and long-distance calls), the distance measure is losing its sensitivity gradually because physical distance is becoming a less of a hindrance for accessibility to other communities. Other qualitative measures of centrality which reflect the interaction and interdependency of the communities should be devised. Quantitative flows (goods, persons, telephone calls) as well as social connections (joint organizations, political representation to the larger regions etc.) may be used as supplementary measures of centrality.

Operationalization of centrality is subject to change over time. A careful examination of the historical setting of the time period under studied is very important. In this study employment in educational services turn out to be a very important measure of centrality. This could be due to rapid expansion of the higher educational institution in the fifties and sixties, and these institutions are most likely to be established in central places.

A key factor for determining the power of the model is the unit of analysis. Is the county a profitable unit for analyzing net migration and change in differentiation? Most of the time, as the size of the unit increases, the net migration rate decreases. The opposite is true for

differentiation and change in differentiation and centrality. But since we are not concerned about the absolute score but about the relative score, this bias equally exists in all cases. The real problem lies in the definition of county. County, by its definition is not a "true" community on which data of centrality and differentiation and migration rates are available and are used in this study. Within the county boundaries, there exists considerable variation in population distribution, centrality and differentiation patterns. Most of a county's population lies in large communities, while only a small percent of its population lives in cities less than 1,000. The county seat is generally the most viable type of rural community for further growth. Unless counties are broken down into real communities, we actually do not know what is going on within the county. Another question should be asked regarding the time-period. The ten-year period, which ignores return migration and more-than-one-time movers, may not be appropriate in determining causality and in detecting actual change over such a long time. The age-specific net migration should be looked at in future studies.

Despite all the problems discussed, a valuable conclusion was reached in this study. Migration, at least in the 1950-60 decade in Kansas, should not only be studied using the conventional approach in which socio-economic status variables are extensively used. Even though this study only provides a partial picture of the determinants and consequences of migration, it tells us that structural approach not only bridges the theoretical gap between sociological and demographic disciplines but also offers a new perspective for migration and development studies. Social demography emphasizes the role of social institutions and organizations in demographic

processes. But sociological research using structural variables is hardly practiced. Institutions and organizations should be an integral part of social demography. Exclusion of these macro variables may result in misleading conclusions.

Following are several implications drawn from this study. It is believed that these applied implications would be valuable to planning agencies, private or public, and to decision-makers who constantly seek strategies for community development and revitalization.

Implications

To demonstrate the value of the structural approach to migration, a number of implications are proposed.

(1) Migration is inevitably an integral part of larger changes, especially given the operation of the laissez-faire economy in our society. Efforts to stop migration may be self-defeating. This can be seen from the lack of success of the Area Development Act through which non-agricultural (industrial) development in rural areas in the United States was supposed to halt out-migration from the rural areas. In Kansas, people out-migrate despite the low unemployment rate in the rural areas. Rural industrialization does provide additional jobs and source of income. The point is, who gets the jobs? Perhaps people who benefit from the federal programs are commuters living outside the community where the plant is located. In such cases, the new industry does not help the retail trade and services of local economy, since the employees in the factories are not local people. Perhaps a better way to deal with out-migration from rural communities, especially those out of the reach of urban centers, is to face it and prepare for alternatives for its outcome. As suggested by this study, heavy

out-migration both results in decline in community services and stems from lack of services. So, one way to revive the rural community is for government to provide public facilities, medicare services, educational facilities and other social services. Private agencies would be reluctant to establish those services and facilities since the return from those facilities in rural areas is small due to the small population base. Legislation to protect family farms against corporate farms is necessary in order to ease the heavy out-migration in the rural areas where rural farm rather than rural non-farm population is shrinking. The government should attempt to ameliorate the so-called "developmental squeeze" on certain segments of the population in our society. In the process where a shift from labor-intensive to capital-intensive operation of the economy occurs, family farms are losing competitive power to corporation farms whose owners are more likely to be absentee farmers. Protecting family farms would increase the profit of farm operators and increase their purchasing power, and thus contributing to the vitalization of the rural economy.

(2) If planning programs continue to be politically-oriented, inequality in development is most likely to increase between populated and sparse areas. This kind of orientation is not consistent with the underlying ideology of the programs which are claimed to help the most "needy" community. Instead, these programs tend more likely to serve the "middle class" communities.

(3) The differentiation scale lends some evidence as to the future needs of the communities. It would be useful for planning agencies who seek to establish certain facilities for the communities. It helps to

determine what the community needs and which community is in need of certain type of services.

(4) Due to the effect of centrality on change in differentiation, development strategies should also take, in addition to the differentiation mentioned above, the relative centrality of the community in question into account. For example, if two communities have the same degree of differentiation, it would be more realistic to establish facilities in the less centralized community than in the more centralized one simply because the former is farther away from a central city where those services or facilities may be available. This strategy would ensure a better result in fulfilling a development program. It also serves as evaluative tool for planning and development programs.

(5) Because of the interwoven network formed by the larger system as described in the concept of centrality, development in one community can affect other communities. If the competing market principle of the central place theory holds, a development program promoted in a community would decrease the market of other communities in the surrounding areas. Prosperity at the expense of other communities may not be advantageous to the whole ecosystem. Careful evaluation of the trade-offs is necessary before the action is taken.

BIBLIOGRAPHY

Anderson, Theodore R.

- 1955 "Intermetropolitan Migration: A Comparison of the Hypotheses of Zipf and Stouffer.", American Sociological Review, Vol. 20: 287-291.

Barb, Kenny H.

- 1972 "Predicting Migration in Kansas: An Evaluation of Alternative Procedures for Selecting Predictors and Models.", Unpublished Master Thesis, Kansas State University.

Beale, Calvin L.

- 1964 "Rural Depopulation in the U. S.: Some Demographic Consequences of Agricultural Adjustments.", Demography, Vol. 1: 264-242.
- 1969 "Demographic and Social Considerations for U. S. Rural Economic Policy.", American Journal of Agricultural Economics, Vol. 51, No. 2 (May): 410-427.
- 1974 "Quantitative Dimensions of Decline and Stability Among Rural Communities." in Communities Left Behind, the Iowa State University Press: Ames: 3-21.
- 1975 "The Revival of Population Growth in Nonmetropolitan America", Economics Research Service Bulletin, No. 605, Washington D. C.: United States Department of Agriculture.

Blanco, Cicely

- 1963 "The Determinants of Interstate Population Movement.", Journal of Regional Science, Vol. 5, No. 1: 17-84.
- 1964 "Prospective Unemployment and Interstate Population Movement.", Review of Economics and Statistics, Vol. 46 (May): 221-222.

Bogue, Donald J., et al.

- 1957 Subregional Migration in the U. S., 1935-40. Vol. 1, Streams of Migration Between Subregions: A Pilot Study of Migration Flows Between Environments. Oxford, Ohio: The Scripps Foundation.

Bogue, Donald J., and Calvin L. Beale

- 1964 "Recent Population Trends in the U. S. and Their Causes." in Our Changing Rural Society: Perspectives and Trends, edited by Hames H. Copp, Ames, Iowa: Iowa State University Press: 72-126.

- Bogunjoko, Issac
 1973 The Impact of Differentiation and Centrality on the Age-Specific Migration in Kansas Counties, 1960-70. Unpublished Master Thesis, Kansas State University.
- Borgatta, Edgar F.
 1955 "An Error Ratio for Scalogram Analysis.", Public Opinion Quarterly, Vol. 19: 96-100.
- Bort, George H.
 1967 "Pattern of Regional Economic Development in the U. S. and Their Relation to Rural Poverty." Report to the National Advisory Commission on Rural Poverty, U.S.D.A.
- Bowles, Gladys K.
 1962 "Adjustment Processes Associated with Migration, with Special Reference to Population Redistribution in the Great Plains between 1950 and 1960." in Proceedings of the Great Plains Agricultural Council, Fort Collins, Colorado: 103-32.
- Bowles, Gladys K., and James D. Tarver.
 1966 Net Migration of the Population, 1950-60, by Age, Sex, and Color. Washington D. C.: U. S. Government Printing Office.
 1966 "The Composition of Net Migration Among Counties in the United States, 1950-60.", Agricultural Economics Research, Vol. 18, No. 1 (January): 13-19.
- Bunting, Robert L.
 1961 "A Test of the Theory of Geographic Mobility.", Industrial and Labor Relations Review, Vol. 15 (October): 75-82.
- Buzenburg, Mildred E.
 1963 "The Interrelationships of Regions Population Change and Change in Number of Retail Firms in Selected Areas on Non-metropolitan Kansas.", Economic and Sociology Report, No. 2, Kansas Agricultural Experiment Station.
- Caroll, Douglas J.
 1955 "Spatial Interaction and the Urban Metropolitan Regional Description: Papers and Proceedings of the Regional Science Association.
- Carrothers, Gerald A.
 1956 "An Historical Review of the Gravity and Potential Concepts of Human Interaction", Journal of the American Institute of Planners, Spring: 94-103.
- Chilton, R. J.
 1966 "Computer Generated Data and the Statistical Significance of Scalogram.", Sociometry, Vol. 29: 175-181.

- Christaller, Walter
 1966 Central Places in Southern Germany Translated by Carlisle W. Baskin. Englewood Cliffs, N. J.: Prentice-Hall & Co. (Original in German Published 1935).
- Clark, Carroll D., and Roy L. Roberts
 1936 "People of Kansas", Kansas Planning Board: Topeka, Chapter three and four.
- Conning, Arthur M.
 1971 "Rural Community Differentiation and the Rate of Rural-Urban Migration in Chile.", Rural Sociology, Vol. 36: 296-315.
- Ducan, Otis D. and Phillip M. Hauser
 1959 The Study of Population: An Inventory and Appraisal. Chicago: University of Chicago Press.
- Duncan, Otis D.
 1959 "Human Ecology and Population Studies." in The Study of Population. Chicago: University of Chicago Press, 678-716.
 1961 "Gradients of Urban Influence on the Rural Population." in Urban Research Methods, edited by Jack P. Gibbs, Princeton, New Jersey: D. Van Nostrand Co.: 550-555.
 1966 "Path Analysis: Sociological Examples.", American Journal of Sociology, Vol. 72 (July): 1-16.
- Durkheim, Emile
 1964 The Division of Labor in Society. New York: Free Press.
- Eisenstadt, Samuel N.
 1964 "Social Change, Differentiation and Evolution.", The American Sociological Review, Vol. 28, No. 3 (June): 375-385.
- Ellenbogen, Bert L.
 1974 "Service Structure of the Small Communities: Problems and Options for Change." in Communities Left Behind, Ames: Iowa State University Press.
- Etzioni, Amitai, and Eva, Etzioni, Editor
 1964 Readings on Social Change. Englewood Cliffs, New Jersey: Prentice Hall.
- Flora, Cornelia B.
 1970 "Mobilizing the Masses: The Sacred and the Secular in Columbia.", New York: Latin America Studies Program Dissertation Series, Cornell University.
 1971 "Migration in Kansas: Out Migration and Population Trends." Manhattan, Kansas, Agricultural Experiment Station, Kansas State University.

- 1973 The Impact of Migration on Kansas, Manhattan, Kansas, Agricultural Experiment Station, Kansas State University.
- Flora, Jan L.
 1967 "A Communications Approach to Development: An Inter-village System in Southwestern Puerto Rico.", unpublished Master's Thesis, Cornell University, Ithaca: New York.
- 1971 "Elite Solidarity and Land Tenure in the Cauca Valley of Columbia." Ithaca, New York: Latin American Studies Program Dissertation Series, Cornell University.
- Folse, C. L., and W. W. Riffe
 1969 "Changing Patterns of Business Services and Population in Illinois Rural Villages.", Illinois Agricultural Economics, Department of Agricultural Economics, Agricultural Experiment Station.
- Fuguitt, Glenn V.
 1971 "The Places Left Behind: Population Trends and Policy for Rural America.", Rural Sociology, Vol. 36, No. 4: 449-470.
- Galle, Omer R., and Karl E. Taeuber
 1966 "Metropolitan Migration and Intervening Opportunities.", American Sociological Review, Vol. 31: 5-13.
- Goldscheider, Calvin
 1971 Population, Modernization, and Social Structure. Little, Brown and Company: Boston.
- Gordon, Robert A.
 1968 "Issues in Multiple Regression.", American Journal of Sociology, Vol. 73: 592-616.
- Greenwood, Michael J.
 1973 "Urban Economics Growth and Migration: Their Interaction.", Environment and Planning, Vol. 5: 91-112.
- 1974 "Research On Internal Migration in the U. S.: A Survey of the Findings.", Research Paper of Arizona State University.
- 1975 "Simultaneity Bias in Migration Models: An Empirical Examination.", Demography, Vol. 12, No. 3 (August): 519-536.
- Hathaway, Dale E.
 1960 "Migration From Agriculture: The Historical Record and Its Meaning." Agricultural Economics Research, L, 379-391.
- Hamilton, Horace C.
 1951 "Population Pressure and Other Factors Affecting Net Rural-Urban Migration.", Social Forces, Vol. 30 (December): 209-215.

- 1959 "Education Selectivity of the Net Migration From the South.", Social Forces, Vol. 38 (October): 33-42.
- 1965 "Practical and Mathematical Considerations in the Formulation and Selection of Migration Rates.", Demography, Vol. 2: 429-443.
- Hammond, John L., Jr.
1973 "Two Sources of Error in Ecological Correlation.", American Sociological Review, Vol. 38, No. 6 (December): 764-777.
- Harman, Harry A.
1967 Modern Factor Analysis. Chicago: University of Chicago Press.
- Hassinger, Edward
"The Relationship of Retail-Service Patterns to Trade Center Population Change." Unpublished Manuscript.
- Howard, William G., and David R. Heise
"Relations Between Urban Services and Urban Population." Unpublished Manuscript.
- Karp, Herbert H., and K. Dennis Kelly
1971 Toward an Ecological Analysis of Intermetropolitan Migration. Markham Company: Chicago.
- Klemmack, David L., et al.
1973 "Non-Random Exogenous Variables in Path Analysis." American Sociological Review, Vol. 38, No. 6 (December): 778-784.
- Kohn, Robert M., et al.
1973 Determinants of Interstate Migration, by Race 1965-1970. Annals of Regional Science, Vol. 7, No. 1, (June): 100-112.
- Lee, Everett S.
1966 "A Theory of Migration.", Demography, III, No. 1: 47-57.
- Lowry, I. S.
1966 Migration and Metropolitan Growth- Two Analytical Models. San Francisco: Chandler Publish Co.
- Marsh, Robert M.
1967 Comparative Sociology. New York: Harcourt, Bruce and World, Inc.
- Menzel, Herbert
1953 "A New Coefficient for Scalogram Analysis.", Public Opinion Quarterly, Vol. 17: 268-280.
- Miller, Edward
1972 "A Note on the Role of Distance in Migration: Cost of Mobility Versus Intervening Opportunities.", Journal of Regional Science, Vol. 12: 475-478.

- Miller, Willard E.
 1960 "Population and Functional Change of Villages in Western Pennsylvania.", Western Pennsylvania Historical Magazine, Vol. 43 (March): 59-75.
- Miller, Willard E.
 1973 "Is Out-Migration Affected by Economic Conditions?", Southern Economics Journal, Vol. 39 (January): 396-405.
- Morrison, Peter A.
 1972 The Impact and Significance of Rural-Urban Migration In The United States. Santa Monica, California: The Rand Corp.
- Namboodiri, Krishnan N., et al.
 1975 Applied Multivariate Analysis and Experimental Designs. McGraw Hill, Inc.: 460-468.
- Newman, William
 1973 American Cultural Pluralism. New York: Macmillan Co.: 23-26.
- Nicholls, W. H.
 1961 "Industrialization, Factor Markets and Agricultural Development." Journal of Political Economy, Vol. 69: 440-461.
- Okun, B., and R. W. Richardson.
 1961 "Regional Income Inequality and Internal Population Migration." Economic Development and Cultural Change, Vol. 9 (January): 128-143.
- Park, Robert E.
 1936 "Human Ecology." American Journal of Sociology, Vol. 42 (July): 1-15.
- Park, S. C.
 1972 "The Relationships Between Structural Change in The U. S. A.: A Regression Analysis." Unpublished Master's Thesis, Kansas State University.
- Parsons, Talcott
 1961 "Some Considerations On The Theory of Social Change." Rural Sociology, Vol. 36, No. 3: 219-239.
 1966 The Social System. New York: The Free Press.
- Perloff, Harvey S.
 1960 Regions, Resources and Economic Growth. Baltimore: Johns Hopkins Press.
- Petto, Anthony C., and Bender, Lloyd D.
 1974 Out-Migration: Responsiveness to Local Economic Conditions in the Ozarks. Growth and Change, Vol. 5, (April): 8-12.

- Price, Daniel O., and Melanie M. Sikes
1975 Rural-Urban Migration Research In The U. S.: Annotated Bibliography and Synthesis. Washington D. C.: U. S. Government Printing Office.
- Pursell, Donald E.
1972 "Determinants of Male Labor Mobility." Demography, Vol. 9: 257-261.
- Raimon, Robert L.
1962 "Interstate Migration and Wage Theory." Research of Economic Statistics, XLIV (November): 428-438.
- Reilly, William J.
1929 "Methods for the Study of Retail Relationships." Studies in Marketing #4, Bureau of Business Research, Austin: University of Texas (Monography).
- Robinson, W. S.
1950 "Ecological Correlations and The Behavior of Individuals." American Sociological Review, Vol. 55 (June): 351-357.
- Rohrer, Wayne C.
1961 "A Century of Migration of the Kansas Population." Economics and Sociology Report No. 1, Agricultural Experiment Station, Kansas State University.
- Schuessler, Karl F.
196 "A Note on Statistical Significance of Scalogram." Sociometry, Vol. 24: 312-318.
- Schwartz, George
1962 "Laws of Retail Gravitation: An Appraisal." University of Washington Business Review, Vol. 22 (October).
- Schwind, Paul J.
1971 Migration and Regional Development in the U. S., 1950-60. Research Paper No. 133, Department of Geography, University of Chicago.
- Shryock, Henry S., and Jacob S. Siegel
1973 The Methods and Materials of Demography. Washington D. C.: U. S. Government Printing Office.
- Smelser, Neil J.
1968 Essays in Sociological Explanation. Englewood Cliffs, New Jersey: Prentice Hall.
- Stewart, Charles T., Jr.
1960 "Migration as a Function of Population and Distance." American Sociological Review, Vol. 25: 347-355.
- Stinner, William F. and Gordon F. Dejong
1969 "Southern Negro Migration: Social and Economic Components of an Ecological Model." Demography, Vol. 6 (November):

Stouffer, Samuel A.

1940 "Intervening Opportunities: A Theory Relating Mobility and Distance." American Sociological Review, Vol. 5: 845-867.

1960 "Intervening Opportunities and Competing Migrants." Journal of Regional Science, II (Spring): 1-26.

Tarver, James D.

1961 "Predicting Migration." Social Forces, Vol. 39 (March); 207-213.

Tarver, James D., and William R. Gurley

1965 "The Relationships of Selected Variables with County Net Migration Rates in the U. S., 1950-1960." Rural Sociology, Vol. 30 (March): 3-13.

Thomlinson, Ralph

1962 "The Determination of a Base Population for Computing Migrations Rates." Milbank Memorial Fund Quarterly, Vol. 40, No. 3 (July): 356-366.

U. S. Bureau of the Census

1950 U. S. Census of Population- Kansas. Vol. II, Part Sixteen, Washington D. C.: U. S. Government Printing Office.

1960 U. S. Census of Population- Kansas. Vol. I, Part Eighteen, Washington D. C.: U. S. Government Printing Office.

1952 County and City Data Book. Washington D. C.: U. S. Government Printing Office.

1962 County and City Data Book. Washington D. C.: U. S. Government Printing Office.

Vanderkamp, John

1970 "The Effect of Out-Migration on Regional Employment." Canadian Journal of Economics, Vol. 3: 541-550.

Vining, Rutledge

"A Description of Certain Spatial Aspects of an Economic System." Economic Development & Cultural Change, Vol. 3: 147-195.

Wadycki, Walter J.

1975 "Stouffer's Model of Migration: A Comparison of Inter-State and Metropolitan Flows." Demography, Vol. 12, No. 1 (February): 121-128.

Wrighton, Fred M. and Paul K. Gatons

1974 "Is Out-Migration Affected by Economic Conditions? : Comment." Southern Economic Journal, Vol. 41, No. 2 (October): 311-313.

- Young, Frank W.
1966 "A Proposal for Cooperative Cross-Cultural Research On Intervillage Systems." Human Organization, Spring: 46-50.
- 1970 "Reactive Subsystem." The American Sociological Review, Vol. 35, No. 2: 297-307.
- Young, Frank W. and Isao Fugimoto.
1965 "Social Differentiation in Latin American Communities." Economic Development and Cultural Change, Vol. 13, No. 3: 344-352.
- Young, Frank W., et al.
1968 "Differentiation and Solidarity in Agricultural Communities." Human Organization, Vol. 27, No. 4: 344-351.
- Young, Ruth C.
1968 "A Structural Approach to Development." Journal of Developing Areas, II (April): 363-376.
- Zipf, George K.
1946 "The $P_1 \cdot P_2 / D$ Hypothesis on the Intercity Movement of Persons." American Sociological Review, Vol. 11: 677-686.

APPENDIX 1

CENTRALITY OF KANSAS COUNTIES MEASURED BY THE GRAVITY MODEL IN 1970

County	City	Score	Order
Johnson	Kansas City	200,000	
Sedgwick	Wichita	179,894	1
Wyandotte	Kansas City	3,000	
Shawnee	Topeka	141,094	
Douglas	Lawrence	70,956	2
Reno	Hutchinson	20,529	
Saline	Salina	18,270	
Leavenworth	Leavenworth	20,713	
Riley	Manhattan	7,367	
Lyon	Emporia	7,013	
Geary	Junction City	4,823	
Crawford	Pittsburg	4,063	
Montgomery	Coffeyville	2,589	3
Cowley	Arkansas City	2,548	
Barton	Great Bend	2,402	
Ellis	Hays	1,855	
Ford	Dodge City	1,294	
Seward	Liberal	1,141	
Atchison	Atchison	2,030	4
Harvey	Newton	1,950	

APPENDIX 1 (continued)

County	City	Score	Order
Butler	El Dorado	1,608	
Franklin	Ottawa	1,369	
McPherson	McPherson	993	
Labette	Parsons	906	
Neosho	Chanute	897	
Sumner	Wellington	809	
Bourbon	Ft. Scott	791	
Dickinson	Abilene	597	
Allen	Iola	586	4
Cloud	Concordia	455	
Pratt	Pratt	430	
Russell	Russell	306	
Cherokee	Baxter Springs	301	
Pawnee	Larned	273	
Sherman	Goodland	160	
Thomas	Colby	152	
Miami	Paola	424	
Woodson	Yates Center	238	
Clay	Clay Center	208	
Anderson	Garnett	205	5
Brown	Hiawatha	194	
Jackson	Holton	190	

APPENDIX 1 (continued)

County	City	Score	Order
Greenwood	Eureka	184	
Osage	Lyndon	181	
Rice	Lyons	174	
Kingman	Kingman	170	
Pottawatomie	Westmoreland	164	
Marion	Marion	147	
Mitchell	Beloit	135	
Wilson	Neodesha	135	
Marshall	Marysville	125	
Morris	Council Grove	123	
Coffey	Burlington	109	
Harper	Anthony	102	5
Nemaha	Sabetha	99	
Republic	Belleville	96	
Jefferson	Oskaloosa	90	
Ottawa	Minneapolis	88	
Scott	Scott City	81	
Ellsworth	Ellsworth	80	
Barber	Medicine Lodge	75	
Phillips	Phillipsburg	73	
Norton	Norton	71	
Rooks	Stockton	70	

APPENDIX 1 (continued)

County	City	Score	Order
Grant	Ulysses	68	
Doniphan	Troy	67	
Linn	Mound City	64	
Edwards	Kinsley	63	
Wabaunsee	Alma	61	
Smith	Smith Center	60	
Trego	WaKeeney	56	
Lincoln	Lincoln Center	56	
Kiowa	Greensburg	56	
Chase	Cottonwood	55	
Chautauqua	Sedan	54	
Osborne	Osborne	53	5
Washington	Washington	52	
Stafford	St. John	50	
Stevens	Hugoton	50	
Graham	Hill City	47	
Rush	La Crosse	46	
Logan	Oakley	46	
Meade	Meade	43	
Ness	Ness City	43	
Decatur	Oberlin	40	
Gray	Cimarron	36	

APPENDIX 1 (continued)

County	City	Score	Order
Jewell	Mankato	35	
Wichita	Leoti	34	
Lane	Dighton	33	
Morton	Elkhart	33	
Kearny	Lakin	30	
Sheridan	Hoxie	29	
Hamilton	Syracuse	29	
Rawlins	Atwood	28	
Clark	Ashland	27	
Cheyenne	St. Francis	26	
Haskell	Sublette	26	
Hodgeman	Jetmore	25	
Comanche	Coldwater	25	
Elk	Howard	22	
Gove	Quinter	21	
Stanton	Johnson City	17	
Greeley	Tribune	17	
Wallace	Sharon Springs	17	

Source: Issac Bogunjoko, The Impact of Differentiation and Centrality on the Age-Specific Migration in Kansas Counties, 1960-70. 1973, pp. 59-63.

Note: These same figures are also used as the centrality of 1950 and 1960. Johnson County, Sedgwick County, Wyandotte County and Shawnee County are excluded from this study.

APPENDIX 2

NET MIGRATION RATES OF KANSAS COUNTIES, 1950-60

Cheyenne	-25.1	Rawlins	-20.8	Decatur	-16.3	Norton	-16.5	Phillips	-16.5	Smith	-17.0	Jewell	-28.7	Republic	-18.1	Washington	-22.0	Marshall	-18.5	Nemaha	-10.3	Brown	-14.6	DO	-15.7
Sherman	-20.4	Thomas	-18.0	Sheridan	-23.0	Graham	-7.0	Rooks	-11.1	Osborne	-18.4	Mitchell	-20.7	Cloud	-18.3	Clay	-13.4	Riley	-10.8	Pottawatomie	-12.6	Atchison	-11.1	Jefferson	2.1
Wallace	-29.2	Logan	-19.5	Gove	-23.3	Trego	-20.2	Ellis	-9.6	Russell	-26.6	Lincoln	-21.4	Ottawa	-9.7	Dickinson	-2.9	Geary	-2.9	Wabaunsee	9.0	Shawnee	-5.5	Douglas	10.4
Greeley	-13.2	Wichita	-15.8	Scott	-13.7	Lane	-9.8	Ness	-24.7	Barton	-11.6	Ellsworth	-15.7	Saline	24.6	Marion	-8.2	Morris	-18.8	Lyon	-8.1	Osage	-5.6	Franklin	-8.6
Hamilton	-26.4	Kearny	-24.7	Finney	-12.8	Hodgeman	-19.4	Pawnee	-15.5	Stafford	-20.5	Reno	-6.8	Harvey	3.5	Butler	-14.9	Chase	-23.5	Greenwood	-22.6	Woodson	-22.2	Allen	-14.3
Stanton	-22.1	Grant	-13.0	Haskell	-19.6	Ford	-9.4	Edwards	-21.5	Pratt	-12.3	Kingman	-14.7	Sedgwick	17.5	Harvey	6.2	Elk	-26.3	Chautauqua	-21.3	Wilson	-17.4	Neosho	-19.4
Morton	3.5	Stevens	-20.0	Seward	26.9	Clark	-22.5	Comanche	-22.6	Barber	-9.8	Harper	-13.2	Sumner	3.6	Cowley	-6.3	Montgomery	-11.5	Labette	-14.6	Cherokee	-16.6	Crawford	-12.0

Source: Gladys K. Bowles and James D. Tarver, Net Migration of the Population, 1950-60, by Age, Sex, and Color., 1966, U. S. Government Printing Office. PP. 354-372.

APPENDIX 3

VARIABLE NAMES FOR CORRESPONDING VARIABLE'S
NUMBERS IN CORRELATION MATRICES IN APPENDIX 4

1. median family income, 1950
2. percent of families with income less than \$2,000, 1950
3. percent of families with income over \$5,000, 1950
4. median school years completed by persons 25 years old or over, 1950
5. percent unemployed, 1950
6. percent of females 14 and over employed in civilian labor force, 1950
7. percent of civilian labor force employed in agriculture, 1950
8. percent of civilian labor force employed in manufacturing, 1950
9. percent of civilian labor force employed in educational service, 1950
10. percent civilian labor force employed in governmental jobs, 1950
11. centrality measured by the gravity model in 1970
12. median family income, 1960
13. percent of families with income under \$3,000, 1960
14. percent of families with income over \$10,000, 1960
15. median school years completed by persons 25 years old or over, 1960
16. percent unemployed, 1960
17. percent of females 14 and over employed in civilian labor force, 1960
18. percent of civilian labor force employed in agriculture, 1960
19. percent of civilian labor force employed in manufacturing, 1960
20. percent of civilian labor force employed in educational service, 1960
21. percent of civilian labor force employed in governmental jobs, 1960
22. county net migration rate, 1950-60
23. general differentiation, measured by the cumulated scale scores, 1960-61
24. general differentiation measured by the cumulated scale scores, 1970-71

APPENDIX 3 (continued)

25. change in differentiation, 1960-70 (24-23)

APPENDIX 4

ZERO-ORDER CORRELATION MATRIX OF ALL THE VARIABLES FOR
101 KANSAS NON-METROPOLITAN COUNTIES, 1950-1970*

Variable Numbers																									
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
1	-.96	.86	.58	.00	-.09	-.38	-.02	.07	-.01	.07	.81	-.27	.67	.66	-.13	.35	-.24	-.12	.16	.04	.22	.13	.25	.20	
2		-.82	-.63	-.02	.07	.41	.00	-.09	.01	-.10	-.77	.28	-.64	-.66	.13	-.39	.27	.12	-.20	-.05	-.22	-.15	-.27	-.21	
3			.47	-.23	-.27	-.06	-.25	.01	.03	-.02	.67	-.27	.72	.61	-.33	.17	.08	-.35	.05	.03	-.05	-.14	-.02	.19	
4				-.05	.19	-.39	.01	.39	.06	.35	.50	-.27	.40	.70	-.08	.40	-.32	-.06	.41	.15	.34	.27	.38	.20	
5					.36	-.60	.71	-.05	-.02	.16	.08	.00	-.12	-.17	.55	.31	-.57	.67	.04	.01	.32	.54	.51	-.10	
6						-.45	.32	.18	.14	.28	.02	-.04	-.15	-.04	.26	.49	-.49	.38	.15	.04	.40	.60	.58	-.03	
7							-.66	-.26	-.17	-.38	-.47	.13	-.18	-.26	-.54	-.59	.93	-.58	-.33	-.12	-.55	-.80	-.85	-.05	
8								.03	-.04	.25	.14	-.12	-.07	-.16	.55	.29	-.65	.90	.12	-.07	.40	.61	.55	-.15	
9									.36	.53	.11	-.09	.06	.26	.02	.26	-.23	.02	.66	.14	.25	.30	.36	.10	
10										.24	-.02	-.02	.07	-.10	.01	.01	-.03	-.05	.19	.16	.11	.11	.13	.01	
11											.20	-.11	.11	.20	.12	.35	-.37	.25	.59	.41	.45	.48	.50	.03	
12												-.40	.78	.67	-.06	.47	-.44	.10	.17	.06	.47	.27	.35	.12	
13													-.38	-.31	.03	-.21	.16	-.07	-.05	.06	-.34	-.13	-.17	-.06	
14														.51	-.23	.25	-.09	-.13	.10	.01	.22	.04	.12	.16	
15															-.19	.27	-.21	-.20	.31	.16	.32	.16	.25	-.18	
16																.19	-.56	.60	.05	.02	.29	.50	.47	-.10	
17																	-.61	.24	.31	.05	.44	.57	.62	.02	
18																		-.64	-.27	-.12	-.63	-.79	-.81	-.01	
19																			.11	-.08	.43	.60	.51	-.22	
20																				.17	.19	.35	.45	.20	
21																					.03	.10	.11	.04	
22																						.53	.49	.04	
23																							.88	-.18	
24																								.23	
25																									

* See Appendix 3 for the corresponding variables names
for the variable's numbers.

APPENDIX 5

STEP-WISE REGRESSION SHOWING THE INDEPENDENT CONTRIBUTIONS OF THE
VARIABLES TO NET MIGRATION, 101 KANSAS
NON-METROPOLITAN COUNTIES, 1950-60

Step No.	Variables	Beta weights	Multiple R	Multiple R ²	R ² increase
1	Percent in agriculture	-.51***	.55	.30	
2	Percent in education	.10	.56	.31	.01
3	Percent in government	-.04	.56	.31	.00
4	Median income	.02	.56	.31	.00
1	Percent in agriculture	-.43***	.55	.30	
2	Centrality	.28**	.61	.37	.07
3	Median income	.04	.61	.37	.00
4	Percent in government	.01	.61	.37	.00
1	Percent in agriculture	-.48***	.55	.30	
2	Med. school yrs.	.12	.57	.32	.02
3	Percent in education	.06	.57	.32	.00
4	Percent in government	.05	.57	.32	.00
1	Percent in agriculture	-.42***	.55	.30	
2	Centrality	.26*	.61	.37	.07
3	Med. school yrs.	.08	.61	.37	.00
4	Percent in government	.01	.61	.37	.00

*Significant at the .01 level.

**Significant at the .005 level.

***Significant at the .001 level.

APPENDIX 6

STEP-WISE REGRESSION SHOWING THE INDEPENDENT CONTRIBUTIONS OF THE
VARIABLES TO CHANGE IN DIFFERENTIATION, 101
KANSAS NON-METROPOLITAN COUNTIES, 1960-1970

Step No.	Variables	Beta weights	Multiple R	Multiple R ²	R ² increase
1	Differentiation	-.36****	.18	.03	
2	Net migration	.16*	.26	.07	.04
3	Median income	.12	.28	.08	.01
4	Centrality	.11	.30	.09	.01
5	Percent in government	.00	.30	.09	.00
1	Differentiation	-.35****	.18	.03	
2	Med. school yrs.	.17	.28	.08	.05
3	Net migration	.16*	.31	.10	.02
4	Centrality	.10	.32	.10	.00
5	Percent in government	-.02	.32	.10	.00
1	Differentiation	-.43*****	.20	.04	
2	Percent in education	.30*****	.33	.11	.07
3	Net migration	.21**	.38	.14	.03
4	Median income	.08	.39	.15	.01
5	Percent in government	.00	.39	.15	.00

APPENDIX 6 (continued)

Step No.	Variables	Beta weights	Multiple R	Multiple R ²	R ² increase
1	Differentiation	-.42*****	.20	.04	
2	Percent in educational service	.28***	.33	.11	.07
3	Net migration	.22**	.38	.15	.04
4	Percent in governmental jobs	-.01	.39	.16	.01
5	School years completed	.09	.39	.16	.00

Note: Net migration is tested by one-tailed t.

*Significant at the .2 level.

**Significant at the .05 level.

***Significant at the .025 level.

****Significant at the .01 level.

*****Significant at the .005 level.

*****Significant at the .001 level.

COMMUNITY STRUCTURE AND NET MIGRATION IN
NON-METROPOLITAN KANSAS COUNTIES, 1950-1970

by

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B. S., National Taiwan University, 1974

AN ABSTRACT OF A MASTER'S THESIS

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ABSTRACT

This study was carried out to determine the relationship between community development and change, and the redistribution of population. In addition to identifying structural variables which could account for variation in net migration rates, an effort was made to test a hypothesis stating that the impact of net migration on community growth, specifically the change in level of differentiation, would be positive. The units of analysis for this study were 101 non-metropolitan counties in Kansas. Variables used were socio-economic characteristics (those relating to socio-economic status and to economic base), centrality, net migration rates, differentiation and change in differentiation.

Data on socio-economic characteristics were gathered from the 1950 and 1960 U. S. Census of Population. Centrality measured by the gravity model using physical distance between communities as denominator and the product of their population sizes as the numerator, referred to the relative accessibility of the community to other units and the relative position in the total configuration of the communication paths in the larger system. The socio-economic characteristics and centrality were used as the independent variables. Net migration rates for 1950-60, the intervening variable, were calculated using the vital statistics residual method. Differentiation, an indicator of the level of development, is the institutional complexity and diversity in the community, measured by Guttman scale of community services and organizations in 1960 and 1970 respectively. Change in differentiation (the dependent variable), an index of growth, was measured by the difference of scale scores between 1960 and

1970. It was hypothesized that increase in relative differentiation was caused by net in-migration, controlling on the socio-economic variables, centrality and original level of differentiation. It was expected that if a community has more migrants move in, the need to provide certain services such as retail trades, finance, recreational and medical services will cause the community to increase its institutional complexity.

Factor analysis and multiple regression were the major statistical techniques used in this study. A two-stage path analytic model was constructed using variables for the three decennial years between 1950 and 1970. Three factors were identified from the independent variables. They are income-education, differentiation (including measures of ruralism-urbanism) and centrality which included percent of work force in government and in educational services, along with centrality itself. Step-wise regression showed that the structural variables of differentiation and centrality were more predictive of net migration and of change in differentiation than were the socio-economic variables which are sectoral or aggregated variables. Furthermore, the income-education dimension was overridden or subsumed by the other independent variables. This study suggests a new perspective for migration and community research which has much theoretical and methodological significance compared to the conventional research in which SES variables drawn from the census are extensively used. When migration is viewed from the macro level, the structural approach, as suggested by this study, is more fruitful.

When net migration was included as an independent variable in the second-stage regression equation, it had an independent contribution to change in differentiation, with beta weights ranging from .22 to .28, thus weakly confirming the hypothesis.

Although this project was seen as capturing only one aspect of the complex phenomena of migration and community development, it lends support to the claim that migration creates observable social change. However, the macro approach to the study of migration and community development should not be considered fully mature. Furthermore, it complements rather than competes with, micro level study of migration and community change.