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Theoretical considerations in the analysis of migration

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THEORETICAL CONSIDERATIONS
IN THE ANALYSIS OF MIGRATION

by

Albert Frank Anderson

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subject: Rural Sociology

Approved:

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Iowa State University
Of Science and Technology
Ames, Iowa
1962
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INTRODUCTION

The changing distributions of human populations have interested men for many years, but only relatively recently have those changes been subjected to systematic analysis. The quantity of migration research undertaken during the past thirty years suggests that migration has been and continues to be one of the most popular, and perhaps important, topics in the study of population. Nasrat (44) for example cites thirty-three studies directly concerned with the analysis of migration. Cowgill (11) has recently cited twenty-seven studies of a similar nature and a number of others which though not primarily oriented toward the analysis of migration have nevertheless contributed to the understanding of migration and its relation to economic, psychological, and social phenomena. Though these studies were generally conducted by sociologists, only one study is cited by both sources. A perusal of the professional journals indicates that the fifty-nine different studies cited by Nasrat and Cowgill represent only a part of the evidence of the sociologists' interest and contribution to the analysis of migration.

Because the majority of the studies of migration were conducted prior to the Second World War, at least one writer has suggested that interest in migration research is declining (13). Of the works cited by Nasrat and Cowgill, approximately
two-thirds report on investigations conducted before 1945. Some of the later studies, such as those reported by Thompson (59) and Bogue and Hagood (4), involved extensive analysis of migration data from the 1940 census, but were not completed and published until considerably later.

But the significant changes in the distribution of the population of the United States, changes which can reasonably be expected to be related to the socio-economic functioning of society, ensure that migration will continue to interest the sociologist as well as the demographer. Data from the U. S. Census of Population indicate that each year approximately one-fifth of the population of the United States changes residence. Two-thirds of these moves are intra-county or local and one-third inter-county. During the 1950-1960 decade, Iowa had a net residual migration loss of approximately 230,000 people, or eight percent of its 1950 population. For some counties the losses were as great as one-fifth or more of their 1950 populations. Similar losses were experienced by some states, others had correspondingly large gains as a result of in-migration. Such changes do not occur independently of the social structures of the systems in which they take place.

The sociologists' interests in migration are reflected in several general types of research. Early migration studies were often oriented toward the patterns of migration within
states and among them. Considerable interest has been shown in the selectivity of migration, the characteristics of particular migrant streams, and the comparison with the characteristics of the populations at the places of origin and destination. Concern has more recently been shown for the effects of migration upon the individual and effects of migration losses and gains upon the social systems experiencing the changes. A few studies have been primarily oriented toward the treatment of migration as a dependent variable which is to be predicted as a function of one or more independent variables, but the bulk of the studies of migration, particularly those conducted by sociologists, have made their major contributions to the description of migration as a social phenomenon rather than to its prediction.

The intent of the present study is to present a theoretical framework applicable to the analysis of migration which will offer a basis for the explanation of and prediction of migration as a characteristic of the social system. The framework developed has been employed in an analysis of the 1950-1960 migration data for the counties of Iowa, and the findings of that analysis are reported and discussed in the later chapters of this study. Before proceeding with further comments on the nature of the present study, some attention will be given to the past migration research which serves as the foundation for current migration analyses, including the
present one. Later in this chapter two studies particularly relevant to this study will be considered in more detail.

Contemporary Migration Research

A brief topical review of the reported researches on migration will give a perspective for the present study.

Patterns of migration

Studies dealing with the patterns of migration have tended to be primarily descriptive in nature, indicating areas of in-migration and out-migration and either inferring or demonstrating through traced movements of populations that streams of migration do exist, flowing from regions of out-migration to particular areas of in-migration. Thompson (60, pp. 295-303) in summarizing the findings for these patterns of migration identified two major nineteenth century streams, a general east-to-west migration and a rural-to-urban stream. Several additions to those two streams have developed during the present century. A south-to-north movement has developed as part of the rural-to-urban stream with the failure of the predominantly rural South to absorb its large natural increases in population as the precipitating factor. Thompson noted that this south-to-north movement stopped during the depression years of the 1930's. Recent research would indicate that this stream is once again flowing, though some question exists concerning the strength of the flow. Hitt (28) took issue
with the estimates of substantial migration losses for the South reported by Maclachlan (40). Thompson also suggested that the east-to-west migration may now be in large part a rural-to-urban movement. As the rural population continues to decline and rural areas become unable to support heavy migratory streams, the rural-to-urban stream can be expected to diminish in size.

Perhaps the most significant of the newer migration streams is the movement to the suburbs which characterizes the metropolitan areas of the nation. The comprehensive analysis of the 1935-1940 migration data by Bogue, et al. (5), identified general migration streams between metropolitan areas and between non-metropolitan areas in addition to the heavy non-metropolitan to metropolitan population flow. With the anticipated decline in rural-to-urban migration, these other streams may be expected to receive more attention in future research. But the relatively high migration losses which characterize the rural counties of Iowa indicated that rural-to-urban migration remains the predominant migration stream within the state.

Selectivity of migration

In terms of the quantity of research stimulated, the selectivity of migration is probably the most fertile areas of migration research. Concern has been shown for the community that is losing population through out-migration. The fears
stem not only from the loss of population, but also from the possibility of the loss of the productive or potentially productive members of the community. On the other hand, other communities have feared the influx of migrants who would possibly be unproductive and dependent upon the community. Cowgill (11) suggested that such concerns have frequently stimulated migration research.

The bulk of the research on selectivity and the characteristics of migrants indicates that differentials exist between the characteristics of migrants and the characteristics of the populations from which they leave or to which they move. Though no broad generalizations with regard to these differences may be made, some generalizations are possible for particular migration streams. Thompson (60, pp. 303-306) summarized the data for the United States from the 1940 census indicating that sex ratios, for example, were 101 for intra-state migrants, 103 for migrants moving to contiguous states, and 110 for migrants moving to non-contiguous states, suggesting that the farther the move, the higher the sex ratio of the migrants involved. If race is taken into consideration, however, the generalization does not hold for non-whites. Whites were characterized by sex ratios of 100, 103, and 112 for moves within the state, to a contiguous state, and to a non-contiguous state, respectively. The corresponding figures for non-whites were 109, 100, and 93. The sex ratio for
migrants to urban communities was 95 as contrasted to 117 for the migrants to rural-farm populations. While the sex ratios for whites and non-whites did not differ markedly for migrants to rural-farm communities, 117 for white and 116 for non-white, for migrants to urban areas the white sex ratio of 95 compared to a non-white ratio of 88.

Some of these findings have been substantiated by other investigators, others have not. Mauldin (42) reported that among high school graduates from three Tennessee and North Carolina towns the girls were more migratory than were the boys, but girls were more likely to move to rural areas than were boys, a finding which does not parallel Thompson's. Jehlik and Wakeley (33) explained the differences in the sex ratios of the urban and rural populations of Iowa in 1950 as resulting from larger numbers of girls migrating to the urban areas. Others using the same census data as Thompson have reported similar findings.

As was the case for sex, age differentials appear consistently between migrant and non-migrant populations, the fifteen to thirty-four age bracket being disproportionately represented among the migrants. While the reported age at which the peak migration rate occurs varies from study to study, the ages generally fall within those limits. Thompson (60) indicated that the peak rate in the urban-to-suburban stream for 1935-1940 fell in the thirty to forty-four age
Nasrat (44) noted that urban-to-rural movements tend to involve older age groups. With only few exceptions, however, migrant streams are populated by the young adults in the fifteen to thirty-four age bracket.

The characteristics of education and intelligence have been the subject of many studies with some inconsistencies being reported. On the basis of census data, migrants are generally characterized as better educated than non-migrants. When particular migratory streams are studied, however, different findings may result. Nasrat (44, p. 14) noted that the hypothesis has been presented that rural-to-urban migration tends to select from the two extremes of the rural population and some evidence has been offered in support of it. Gist, et al. (20), in Kansas, Mauldin (42) in Tennessee and North Carolina, and Sanford (50) in Alabama report out-migrants from rural communities who have above average educations as compared to the non-migrant populations they left. None report a selectivity from the below average segment of the population. Both Mauldin and Sanford reported the in-migration to the same communities of persons having below average educations. Hobbs (29) reported similar findings for communities in the anthracite coal region of Pennsylvania. The findings reported by Bogue, et al. (5, p. 58), based on census data for the United States support the same conclusion, though they noted that the actual number of
persons involved in migration from rural communities who have education beyond the high school level was small.

Others have reported no evidence of selectivity on education. Freedman and Hawley (19) reported finding no evidence of selectivity on the basis of either education or occupation with reference to either the source or destination population when adequate controls were applied. Klineberg (36) earlier concluded that his study of New Jersey rural-to-urban migrants offered no support to selectivity with respect to intelligence. Cowgill (11, p. 270) commenting on another work by Freedman (18) stated:

In fact, migrants proved in the main to be very much like other people. As would be expected, they reflected their background. If they came from a poverty-stricken section of the South, they tended to be poor and lacking in skills, but if they hailed from a wealthy suburb of Cleveland, they had most of the characteristics of wealthy suburbanites. Likewise, the migrants tended to be attracted by their own type; hence incoming professional people settled in the same sections of Chicago in which professional people already lived and the unskilled laborers gravitated to areas inhabited by unskilled labor.

On the other hand, Bogue and Hagood (4), using data from the 1940 census for 1935-1940 migration in the United States, reported significant differentials with respect to all characteristics considered, including sex, color, age, household status, marital status, education, and several occupational characteristics. When related variables were controlled by cross-tabulation, differentials were present both with reference to the place of origin and the place of destination.
The investigators suggested that internal migration is selective of persons with particular combinations of traits, and that selectivity can vary in pattern and intensity between places, and between different periods of time (4, p. 125).

The research on the selectivity of migration indicates that age, sex, color, education, and occupation are characterized by migration differentials. The research also indicates that while these differentials exist, certain segments of the population which may be characterized by combinations of these traits are geographically more mobile than others, but when within these segments those who migrate are compared with those who do not, little evidence of differentials may be found.

The interpretation of the findings on selectivity leads to the general conclusion that selectivity in the major migration streams involves characteristics that have economic ramifications in the sense that the characteristics are such that the migrant will find better job opportunities at the destination than existed at the source. Findings reported by Turner (65) support that conclusion. Turner reported that fifty-seven percent of a sample of in-migrants in Kalamazoo, Michigan, gave economic or job reasons for moving while eighteen percent indicated the influence of friends and relatives as the basic force and another eighteen percent
gave better living conditions as the motive. Migration is to a large extent, but not solely, brought about in response to the need for a redistribution of the population which will take the capable to the place where their abilities are needed.

Consequences of migration

Interest has been shown in another aspect of migration, the adjustment of the migrant to his new home. Zimmer (73) and Sharp (51) both reported that migrants in the Detroit area have lower participation scores than non-migrants. Assuming that integration into the community would vary as a direct function of participation, their findings lend support to the hypothesis that migrants do have adjustment problems. In a Baltimore study investigating the relationship between personality disorders and migration, Tietze, et al. (64), interpreted their findings as supporting the hypothesis that personality disorders lead to adjustment problems which in turn lead to mobility, implying that personality disorders did not result from maladjustments following migration. Martinson (41) reported personality differences between high school students who later migrated and those who did not. The data from the 1940 census data analyzed by Bogue and Hagood led them to conclude that given a good secondary education, family support, and no other factors discriminating against them, rural-to-urban migrants were not greatly handicapped in adjusting to city life. Cowgill (11, p. 271) stated that a
change, from the earlier view that migration was disorganizing to the individual and the social groups involved, to a more neutral view has followed from the studies by Freedman (18), Rossi (49), and others who have found no relationship between social disorganization and migration when rates have been based upon residence at the place of destination rather than the place of origin.

These somewhat contradictory data suggest the hypothesis that problems of adjustment for migrants increase as selectivity with respect to the population at the place of destination increases. Bogue and Hagood interpret a portion of their data on the tentative assumption that such a relationship exists. When referring to the adjustment of young adult native white male migrants from farms to cities, for example, they commented that the remarkable similarity of the migrant to others of his own age in the city indicated that the migrant was under no great disadvantage in adjustment to city life (5, p. 116).

Concern has also been shown for the effects of in-migration or out-migration upon the receiving or sending social systems. Cowgill (11, p. 274) cites recent studies in Mississippi and Kansas that have interpreted migration losses as economic losses to the systems. Others are aware of the effects of migration on other characteristics of a population. In Iowa Jehlik and Wakeley (33) described some of the
consequences of migration for the state. Bauder (2) did the same for the southern Iowa counties where migration losses have been high in recent years. Such concern is certainly not new, however. Brindley (9) for example warned in 1912 of the threat to Iowa of continued population losses.

But in-migration and population gain have been seen by others as threats to the stability and organization of society. Insofar as areas of high in-migration have also been characterized by mental illness, crime, delinquency, and other evidences of social disorganization, some writers have concluded that migration is the cause of the disorganization. The hypothesis offered by Holt (30), in his analysis of holiness religions in which he stated that the holiness movement is largely the natural product of the social disorganization and cultural conflict from rural-to-urban migration and urbanization of the rural population, is representative of the view.

In his discussion of value judgments in migration research, Cowgill (11, p. 274) points out that reactions to migration are not only negative, but may also be positive as exemplified by the "push-pull" theories of migration which view migration as an adaptive process which is inherently beneficial to society and to the individual. Bogue, et al. (5, p. 2) have stated that personal adjustment, social stability, and social change rest upon the movement of
peoples and that balance among the various parts of the economy can be maintained only by a continuous process of migration. The following statement from Bogue and Hagood (4, p. 126) would suggest a similar perspective:

Thus, one major driving force behind internal migration to cities and among cities appears to be the need to distribute and redistribute the potential and actual specialists, experts, and managers to places where their abilities can be used most profitably in the economy.

Cowgill concluded that migration research during the past three decades has tended to change from studies reflecting value orientations of the researcher to more objective studies in the sense that the researcher in his report does not reveal, implicitly or explicitly, judgments concerning the desirability or undesirability of the phenomenon he is studying.

Prediction of migration

The fourth general direction that migration analysis has taken, having briefly considered patterns of migration, selectivity of migration, and consequences of migration, has been oriented toward the explanation of or the prediction of migration as a dependent function of one or more other variables. This orientation is characterized by two distinct types of work, the first directed toward the statement of predictive empirical laws which equate migration to functions of other empirical variables. The second approach has been directed more toward the definition of migration in terms of
its socio-economic correlates.

The first approach has led to two major works which have stimulated considerable research. Stouffer (56) stated in his hypothesis that the number of persons going a given distance is directly proportional to the number of opportunities at that distance and inversely proportional to the number of intervening opportunities. Data from Cleveland residential tracts supported the hypothesis, using as operational measures of opportunity the housing available for occupancy. Bright and Thomas (8) applied the hypothesis to 1930 census data for all forty-eight states and found the hypothesis supported. They defined opportunities as the actual number of persons born in other states who were residing in a given state of destination and intervening opportunities as the accumulated number of native born persons settling in all states between the state of origin and state of destination.

Zipf (74) offered a hypothesis which in its most elementary form represents a simplification of the hypothesis stated by Stouffer. Zipf hypothesized that total migration between two areas varied directly with the product of the populations of the two areas and inversely with the distance between the two areas. Movement from a given area to others would vary as a function of the ratios of the populations of the other areas to their distances from the given area.
Stewart (54, p. 348) noted that if, for the hypothesis presented by Stouffer, opportunities vary directly with population and the population between the places of origin and destination is distributed uniformly so that intervening opportunities vary linearly with distance, then Stouffer's hypothesis reduces to Zipf's. Stewart went on to note that research findings suggest that distance should be weighted more heavily in the relationship and he concurred with Anderson's (1) conclusion that the exponent for distance should generally be greater than one. The evidence for the influence of population size on the migration indicates that the exponent probably varies considerably with the basic type of economic structure and the stage of economic development of the systems.

Among the other studies that dealt with migration as a function of population size and distance was Bogue and Thompson's (6) analysis of 1940 census data for migration between 1935 and 1940. They concluded that, among other things, a close inverse relationship existed between the distance to be traveled and the rate of migration out of an area. Stewart (55) reported a similar relationship among population, distance, and "migration" to four schools, Princeton, Yale, Harvard, and Massachusetts Institute of Technology. The potential of the population defined as the ratio of the total population of a given state to the
distance between that state and a given school was found to be directly proportional to the size of the undergraduate population from that state attending the school.

The second approach to the prediction of migration has placed the emphasis on the determination of the socio-economic correlates of migration. Migration is treated as a function of a number of independent variables by Bogue, et al. (5), in their study of migration streams between economic subregions of the United States during the 1935-1940 period. Multiple correlations varying from 0.71 to 0.96 were found between thirteen variables* and in, out, and net migration for each of the four migration streams involving combinations of metropolitan and non-metropolitan subregions. The interpretation of the findings emphasized several points. Differences in employment and unemployment between regions were clearly related to differences in migration rates, areas of high unemployment being characterized by high out-migration and low in-migration. Migration followed basic shifts in the national balance of the economy with five patterns indicated,

*The thirteen variables were: logarithm of size in 1940; percent urban in 1940; level of living index, rural total; level of living index, rural-farm; net reproduction rate, 1935-1940; percent non-white, 1940; sex ratio; median age; percent unemployed, male; percent in agricultural industries; percent classed as white collar workers, male; percent completing high school, some or four years of college; and rate of in-migration on the out-migration regression; rate of out-migration on the in-migration regression. Only the first twelve variables were related to net migration.
these including a rural-to-urban movement, a westward movement, a south-to-north movement, and an urban-to-suburban movement which are the same streams denoted by Thompson (60) which were referred to earlier. The fifth pattern involved a patterned exchange among the metropolitan areas.

Two factors, above average education and employment in a white collar job were related positively to both in-migration and out-migration. Finally, the authors cautioned that economic factors alone did not account for migration, that several of the variables reflect more than the economic interdependencies of the regions. The study will be considered in more detail in the following chapter.

Earlier, Thorndike (62) analyzed migration as a function of three variables, distance, income differentials, and "goodness" differentials. He defined migration between two states as the ratio of those born in A residing in B to those born in B residing in A. Applying this definition to the Negro population living in 1930, led to the explanation of ninety-four percent of the variance in their migration in terms of the three variables.

More recently, Nasrat (44) correlated three economic measures of deprivation to rural-farm net migration data in the application of a systematic theory to the analysis of migration. He reported multiple correlations ranging from 0.34 to 0.60 for the state of Iowa and for four sub-sets of
counties. Correlations tended to be higher for those sub-
sets which excluded counties not having an urban center.

The studies cited above indicate that the researchers
who have attempted to predict migration as a resultant of
several other variables have met with a considerable degree
of success, the success generally increasing with the
heterogeneity of the areas used as units in their analyses
and with the number of variables used as predictors. Further
reference will be made to a number of these studies as the
foundation for the present study is developed.

Two general comments have been made with reference to the
research that has given consideration to the analysis of
migration data and related problems. The article by Cowgill
which has been cited previously pointed out the part that
values of the researcher have played in stimulating migration
research and also in influencing the interpretations of the
meaning and significance of migration. Others have offered
the general criticism that migration research, or sometimes
more generally population research, has not proceeded from any
systematically developed theoretical base. Nasrat (44, p. 20)
concluded from statements made by Thompson (61), Hauser (26),
Francis (17), and Firey (16) that much of the knowledge of
migration has been amassed without any attempt to develop a
systematic theory. Among those who would refute these critics
have been Davis (13) and Gutman (23). As Gutman suggested, the
problem may basically stem from differences in definitions of theory. The sociologists who have been critical of population research have accepted the conception of theory as a system of logically inter-related propositions, according to Gutman, while the demographers prefer a broader definition which for population might encompass "'the widest body of rigorous reasoning' concerned with the impact of population variables on society" (23, p. 333).

Migration analysis has tended toward one or the other of two extremes, either emphasizing the development of empirical laws which are limited to the consideration of only a few simple variables, or else forsaking the theoretical development in favor of attempts to discover empirical uniformities among larger quantities of data.

The theories which have been offered to explain or predict migration have ranged from purely explanatory to purely predictive with few theories combining or compromising the two. The demographers and some sociologists have shown a preference for predictive theories, usually equating migration to some function of population and distance. The works of Zipf (74) and Stouffer (56) and some of the research that they stimulated have been cited. Zipf offered a basic P/D model for the prediction of migration. Stouffer varied the formulation through the use of his concept of intervening opportunities which tend to vary as a function of population and
Thornthwaite (63) explained migration as being somewhat analogous to the flow of an electric current, migration being a direct function of pressure gradients and an inverse function of resistances. The analogy was explanatory, however, and Thornthwaite did not attempt to operationalize his concepts. Economists and sociologists have shown some preference for the explanatory, ex post facto theories, speaking in terms of pushes and pulls, economic readjustments, and redistributions (4, 5, 21, 37, and 63).

While the demographers have disagreed as to the past importance of theory to the population researcher, Hauser (26) noted that the sociologists' major contribution to the analysis of population phenomena was the placing of emphasis upon social and cultural factors rather than the biological or genetic ones offered earlier. He stated that sociology had made no major contribution to the development of a systematic theory that would be applicable to population phenomena. The study conducted by Nasrat (44) would appear to be a step toward such a contribution to the analysis of migration data.

The Present Study

The present study is an attempt in the spirit of Nasrat's work to bring the theoretical and the empirical a little closer together. The basic task to be undertaken is that of
developing a systematic theory from which can be deduced hypotheses which relate empirical variables, at least one of those variables being an index of migration. Insofar as empirical evidence supports the hypotheses, the theory will be judged to be useful and merit further application and development. Failure of the empirical evidence to support the hypotheses would suggest that the applicability of the theory to the empirical phenomena be questioned.

Working from the concept of theory widely held in sociology, this study will present a systematic theory consisting of three logically inter-related concepts, the relationship among these being stated in a general hypothesis. To each of the three concepts a number of empirical variables will be epistemically correlated and the empirical hypotheses among the variables stated.

The general concepts to be used are cohesion and deprivation, as used by Nasrat, and a third concept ambiguity. The relationship among these three concepts will be stated as follows: cohesion varies inversely with deprivation which varies directly with ambiguity. The empirical hypotheses will follow from this general relationship.

The section that follows will present a review of the two studies upon which this one is grounded.
Research Basic to the Present Study

Emphasis must be placed on two analyses of migration which are particularly relevant to the present study both with regard to the concepts used and the methodology. The first study is the analysis by Bogue, et al. (5), of migration between subregions of the United States between 1935 and 1940. The other is that by Nasrat, Conceptual Variable Analysis of Rural Migration in Iowa (44). The findings of other researchers are important to the development of the present study, but their influence is more indirect, being transmitted through the two studies which will be given major attention.

Subregional migration

Consideration will first be given to the analysis by Bogue, et al. (5), of the various migration streams between subregions of the United States between 1935 and 1940. The study was one of a series of twelve intensive analyses of population distribution directed by the staff of the Scripps Foundation (5). It is of particular interest because of its comprehensiveness and its use of correlation and regression techniques in the analysis of the data.

Non-metropolitan and metropolitan subregions of the United States were used as the units for one aspect of the study, each subregion being of state size or smaller and consisting of one or more counties generally similar with respect to physical and cultural characteristics. The subregions were
designated as either non-metropolitan or metropolitan on the basis of the 1930 populations, metropolitan subregions consisting of counties having fifty percent or more of their population within metropolitan districts as defined for the 1930 census. These two types of subregions were the basis for defining four migration streams: non-metropolitan-to-non-metropolitan; non-metropolitan-to-metropolitan; metropolitan-to-non-metropolitan; and metropolitan-to-metropolitan.

Multiple regression analyses were made between a set of twelve or thirteen independent variables and each of the migration streams. These variables were noted in the preceding chapter. Separate analyses were run for out-migration with the data for the independent variables taken from the places of origin, in-migration with the data taken from the places of destination, and net migration using the characteristics of the place of destination. Including analyses for total in, total out, and total net migration for each of the two subregional types, metropolitan and non-metropolitan, eighteen regressions were run, yielding multiple correlation values ranging from 0.70 to 0.96.

The number of independent variables having beta coefficients significantly different from zero for any given migration stream ranged from three, size, unemployment, and in-migration, for total out-migration from metropolitan subregions, to all twelve for net migration from non-metropolitan
subregions to metropolitan. The findings indicated in general that the four migrant streams analyzed are related to unique sets of characteristics both at the places of origin and the places of destination. Thus, the forces that have pushed migrants out would appear to differ as the destinations differ and the forces that pull differ as the sources differ. In some instances the same characteristic at the place of origin is related positively to migration to one destination, negatively to the other. The rural total level of living index, for example, is positively related to migration from non-metropolitan to metropolitan subregions, but negatively related to migration from one non-metropolitan subregion to another. The rural-farm level of living index, on the other hand, is negatively related to the first stream, but is not significantly related to the latter. These findings led to the conclusion that neither a "push" nor a "pull" theory alone would predict migration adequately (5, p. 69).

In all cases but one the two directions of flow were positively correlated with one another, indicating that areas gaining migrants from an area were also losing migrants to that area. The one exception was the flow to non-metropolitan subregions from metropolitan ones which correlated slightly negatively with the non-metropolitan to metropolitan stream. Two explanations for the inconsistency were offered. The stream may have been a backflow of unsuccessful migrants or
the stream may have represented a movement to relatively permanent suburban residential developments (5, p. 72). The correlations referred to above were the partials, not the zero order coefficients.

One relationship not consistent with the logical expectation was a negative relationship between net reproduction rates and out-migration from the non-metropolitan regions, those areas with higher birth rates characterized by lower out-migration. This reversal was explained as a result of the peculiar economic situation during the depression years which left the rural populations of the middle-western states more mobile than those of the southern states which were characterized by higher net reproduction rates.

The characteristics reported to be related to rates of migration were in general similar to those reported by other researchers who have analyzed only segments of the streams investigated by Bogue, et al. The study demonstrated that migration rates could be expressed as linear functions of selected environmental data and that such relationships accounted for large proportions of the variance among migration rates to and from internally homogeneous subregions of the United States. The findings further indicated that the characteristics related to migration vary both with the nature of the place of origin and with the nature of the place of destination. The study was unique in its use of out-migration
data in an analysis of migration from units of smaller than state size during a relatively short period of time. Previous studies had relied on change in residence from the state of birth for analyses of out-migration.

Perhaps the major shortcoming of a study such as this one conducted by Bogue, et al., is that the research that it stimulates tends to be restricted to extrapolations of the empirical relationships previously reported. Thus, a hypothetical 1960 study using the Bogue study as a reference would proceed on the expectation that the relationships found twenty years earlier would still hold. Merton (43, pp. 96-99) noted that a system of inter-related general concepts from which the empirical relationships are derivable offers a more secure basis for prediction and explanation than does the extrapolation of empirical relationships from one study to the next. Merton cites as an example the relationship between suicide and religious faith. Catholics generally are characterized by lower suicide rates than Protestants. On the basis of the past empirical relationship, future predictions would state that Catholics will have lower suicide rates than Protestants. Durkheim (15), however, related suicide to low social cohesion which deprives the individual of the psychic support which would sustain the person when subjected to the acute stress and anxieties that might precipitate suicide. Because Catholics have greater social cohesion than Protestants,
suicide rates among Catholics are lower. Should social cohesion among Catholics decrease relative to cohesion among Protestants, suicide rates among Catholics would be expected to increase relative to those among Protestants.

With reference to the analysis of migration, the foregoing suggests that the approach of most general value to the science of sociology would involve the development of a system of inter-related conceptual variables to which would be related empirical measures of those concepts, including among those measures one or more indices of migration. The work by Nasrat (44) illustrates this approach.

Conceptual variable analysis

Nasrat (44, p. 27) offered a general hypothesis relating inversely two sociological concepts, cohesion and deprivation, to which empirical variables were epistemically correlated. Cohesion was defined, after Hamblin (24), as the degree to which the units of a social system accept the roles prescribed by the system. Deprivation was defined, also after Hamblin, as the degree to which achievement expectations exceed achievement actualities.

Rural net migration rates were linked operationally to cohesion as a negative measure of cohesion, a net migration loss being scored positively. Leaving the system by migrating was taken to be a rejection of prescribed roles. An index of out-migration would have been preferred to the net migration
data used since, as Francis (17, p. 264) noted, cohesion is a characteristic of a group and can be an influence only upon members of that group, except when it may make membership in that group desirable to an outsider.

Because out-migration data are not available for the unit of study selected by Nasrat, the county, net-migration rates were used. The rates used were for the 1940-1950 census period and were determined by the residual method. The total rural population change between 1940 and 1950 for each county was reduced by the portion due to natural increase, and the remainder, taken to be the portion of change due to migration, divided by the 1940 rural population to give a rate of net migration. The sign on the rate was changed so that a net loss was expressed positively.

Three indices were used as operations of deprivation. The coefficient of variation was based on the variance of the farm operator level of living index for the country over the preceding twenty year period and was used as a positive index of deprivation. The coefficient of deprivation was measured as the percentage gain in income between 1939 and 1947 and was used as a negative index of deprivation. The coefficient of relative rewards was based on the average per capita income in 1947 for each county and was a negative measure of deprivation.

Hamblin (24, p. 3) defined the social system as a population of individuals who are functionally differentiated and
engaged in collective problem solving. This is the definition Nasrat used. Nasrat justified the use of the county as a social system on two grounds. First, the county is the smallest unit for which migration data are generally available, and, second, the county has been often used as a social system by other researchers.

Nasrat derived three empirical hypotheses from the general hypothesis and tested those empirical hypotheses using data from the ninety-nine Iowa counties, treating each county as a social system and unit of analysis. Correlations of 0.03, -0.23, and -0.53 were found between net migration and the coefficients of variation, deprivation, and relative rewards, respectively. The last two correlations are statistically significantly different from zero at the five percent level. All three correlations were in the predicted direction.

Nasrat then analyzed the same data for groups of counties selected on the basis of the size of the largest incorporated place in the county, classifying them first into those having no urban center (population of 2500 or more) and those having one or more urban centers. The latter group was then subdivided into those having largest centers of 2500-4900, 5000-24,999, and 25,000 or more population.

No significant correlations were reported for the relationship between net migration and the coefficient of
deprivation. Significant correlations were found between net migration and both the coefficient of deprivation and the coefficient of relative rewards for counties with cities of 5000-24,999 population, but not for the other groups. Multiple correlations between net migration and the three coefficients for the same groups were statistically significant for all counties at 0.56, for counties with urban places at 0.60, and for counties with places of 5000-24,999 population at 0.60.

Nasrat's analysis indicated that the relationships were the strongest among the counties with larger incorporated places. With two exceptions, the directions of the correlations were as predicted. For counties with places of 2500-4999 population and those with places of 5000-24,999 population, the correlations between net migration and the coefficient of variation were -0.02 and -0.25. These were explained as the result of the increasing incomes of rural people who in those counties had opportunities for non-farm employment which raised the level of living.

The study has demonstrated the application of the method of conceptual variable analysis to the analysis of migration, giving evidence of the potential of such an approach for use in the explanation of and prediction of migration. Wakeley and Nasrat (67) illustrated a provisional application of an extended form of the basic hypothesis by adding a third concept, anomie, and applying the general relationships
established to the analysis of the contemporary farm problem. Increasing anomie as indicated by the absence of clearly defined patterns of goal oriented behavior is stated to be related to deprivation, a failure to achieve the goals. Deprivation is in turn related to lesser conformity to the roles of the system as indicated in part by out-migration. Out-migration reduces the population so that, assuming no loss in total rewards gained, the per capita share of rewards increases, reducing deprivation and increasing cohesion.

The poor predictability of the general hypothesis with respect to data from the more rural Iowa counties led Wakeley and Nasrat (67) to suggest that migration from rural counties is a relatively forced migration and that the decision to remain in or leave the county may be influenced more by intra-county than inter-county differences, that is, that the pushes within a system may be more important than the pulls from other systems in inducing migration. Little evidence has been published which would either substantiate or discredit this view. Turner (65) has reported that sixty-two percent of the migrants to Kalamazoo gave reasons for moving which reflected the pull of Kalamazoo rather than the push of the areas of origin. The conclusion reported by Bogue, et al. (5), that neither a push nor a pull theory alone can account for migration, has already been mentioned.

The present study takes as a point of departure the work
of Nasrat. An attempt will be made to strengthen and extend the theoretical framework developed in his work. Though the general methodology will remain the same, a slightly different approach will be taken to the analysis of the data. Consideration will be given to the methodology and the analysis of the data in the chapters following the next chapter which will present the theoretical framework for the analysis.
Few researchers have attempted to relate migration to a more general concept integrated into a system of general relationships. Nasrat has been one of those few and it is from his work that the present study gains its major impetus. Before proceeding with the development of the theoretical framework for the present study, however, some consideration should perhaps be given to the concept of theory as it is to be used here, and also to the general sociological perspective that the study shall reflect.

The Nature of Social Theory

The literature of sociology reflects a variety of conceptualizations of the nature of social theory, varying from the post factum interpretations offered by some researchers, interpretations which are often quite tenuous, to the formal arrangements preferred by a number of those who are more oriented toward logical systems. Merton (4, pp. 85-96) has referred to five types of work that have often been termed theory in sociology, those five including statements of methodology, general orientations, definition and analysis of concepts, post factum interpretations, and empirical generalizations. Davis (13, p. 314) perhaps added another category when he commented, critically, that theory in the social sciences has often referred to long stretches of purely verbal
analysis to which the inclusion of any empirical evidence leads to the removal of the work from the realm of theory.

The more formal definitions of theory typically refer to theory as a deductively connected set of laws. Werkmeister (70, p. 487) stated: A theory, reduced to its bare essentials consists of a set of definitions and postulates from which certain theorems or laws descriptive of observed facts can be logically derived. And Greenberg (22, p. 439) stated: By a theory of science, we mean first that there exists a set of empirical generalizations of universal scope; that is a set of implications with universal quantification (We expect) moreover that such generalizations will not stand isolated but that numbers of them will be deducible from general statements called laws.

While such a formal view of theory would seem to represent the preferred or ideal, the nature of the phenomena with which the social sciences, particularly sociology, must be concerned, or perhaps the scientist's present perception of those phenomena, suggests that the development in the immediate future of an extensive, systematic formulation of social laws explaining a wide range of social phenomena is rather unlikely.

Because the theories of the physical sciences more closely approach the ideal formulation, they have often been used as models for social theory. A comparison of the natures of the
concepts used by the two general disciplines points up some of the difficulties the social scientist faces. Concepts such as mass, length, and time used in physical mechanics have empirical referents which are fairly specific and clear. As Rapoport (48, p. 350) noted, they are concepts which are measureable and relatively unambiguous, and were, at least until recently, quantities which could be considered to be objectively real. And perhaps just as important to their systematic relationship has been their limited numbers. Thus, from three basic concepts a theory was developed from which the behavior of physical objects under certain conditions could be predicted with a high degree of success.

The sociologist on the other hand does not always have concepts with obvious empirical referents, nor conversely, do the empirical events suggest unambiguous concepts. Rapoport (48, p. 351) commented: The stuff from which human relations and social structure are made is not evident intuitively. It must somehow be distilled or abstracted from innumerable "events," and the selection of these events depends to a great extent on one's experience, cultural background, and biases.

This has often led in social thought to a preoccupation with the problem of definition to the point that, as both Merton and Rapoport have indicated, social theory is often presented as systems of definitions which at best describe, rather than explain, human behavior. This preoccupation is
necessary, however, when the phenomena with which the sociologist must be concerned do not suggest unambiguous concepts. Both for the sake of consistency in his own work and for communication with others, the sociologist must devote considerable attention to the task of definition. Even so, lengthy verbalization by no means assures that ideas will be communicated. The letters and exchanges published in the various journals bear witness to the presence of such difficulties of communication. The problem occasionally becomes evident elsewhere. Two general works in sociology (10, 34) have offered different interpretations of the pattern variables defined by Parsons (46, 47). Nasrat (44, p. 32) pointed out the existence of confusion arising over the concept of anomie as used by Durkheim (15, pp. 252-253). Hamblin (24) argued that the concept as used by Durkheim referred to an uncontrolled increase in expectations beyond what can actually be gained. This has been more commonly referred to as "deprivation" or "relative deprivation," anomie being used to refer to "normlessness." Hamblin also argued that Durkheim used integration, cohesion, and collective orientation interchangeably to refer to the same dimension, but at that time failed to give any name to a dimension which was defined as the number of obligatory beliefs and practices.

These few examples illustrate additional problems encountered in conceptualization. Different terms may be
applied to the same concept, or the same term may be used to refer to different concepts. Concepts have on occasion been used which have not been explicitly referred to by a particular term, and of a more serious nature, inadequately defined concepts have been not infrequently employed. Until consensus is reached on basic concepts with respect to both definitions and nomenclature, the matter of definition will continue to be more than a formality in social research.

The problems of conceptualization have not prevented attempts to relate general concepts. Some of those attempts have been of such a scope that they have been envisioned as ultimately yielding hypotheses applicable to extensive ranges of social phenomena, if not to all. The present work while endeavoring to proceed on the basis of a systematic theory, is not intended to offer a model from which all human behavior may be predicted. The concept of theory to be used is that presented by Merton (43, p. 5) which he referred to as "theory of the middle range:"

Throughout this book----the term sociological theory refers to logically interconnected conceptions which are limited and modest in scope, rather than all-embracing and grandiose. Throughout I attempt to focus attention on what might be called theories of the middle range: theories intermediate to the minor working hypotheses evolved in abundance during the day-by-day routines of research, and the all inclusive speculations comprising a master conceptual scheme from which it is hoped to derive a very large number of empirically observed uniformities of social behavior.
Theories of the middle range are defended by Merton as a necessary foundation upon which the more inclusive theories may some day be built. Extrapolating from the experiences of the biological, medical, and physical sciences suggests that the future development of sociology as a science will be paced step-by-step by the contributions of many men to special theories closely linked to social phenomena. But just as concentration on the development of grand conceptual schemes may hinder the growth of a science, so may over-emphasis on special theories. Again Merton (43, p. 10) commented:

To concentrate entirely on special theories is to run the risk of emerging with unconnected ad hoc speculations consistent with a limited range of observations and inconsistent among themselves. To concentrate entirely on the master conceptual scheme for deriving all subsidiary theories is to run the risk of producing twentieth-century sociological equivalents of the large philosophical systems of the past, with all their varied suggestiveness, all their architectonic splendor and all their scientific sterility.

The desired nature of the theory to be applied to the analysis of migration requires, then, that a system of two or more general concepts be logically related to each other. At least one of those concepts should have operationally linked to it an index of migration. The concepts need only be operationally linked to a limited range of social phenomena, but would desirably be of such a nature that they might reasonably be expected to be of use when the time comes for further integration of social theories.
The theory to be presented here is systematic in the sense that Merton has used the term, consisting of a set of general concepts logically related to one another in the form of general hypotheses or postulates. Because the logicality of the relationships depends in part upon perspective, the next section of this chapter will be devoted to the outlining of the general orientation from which the conceptual variables and their relationships are derived.

The General Orientation

The development of the theoretical framework for the present study shall begin with a brief sketch of the general orientation from which the problems of sociological analysis are approached.

Man is viewed as a creature whose nature is such that he has certain recurrent needs which must be met if he is to survive. Satisfaction of these needs requires that man act, making demands upon his environment. The needs are such that only a limited range of behavior, but more than one act, will meet any given need. But man is a creature who possesses few, if any, instinctive behavior patterns so that most, if not all, of the acts of man represent either random or learned responses to his own inner motivations and his external environment as they are perceived and interpreted by him. The range of behavior that a man can display during his first few years is so severely restricted that only under unusual...
circumstances would man survive without the attention of and interaction with other men. Much of the behavior which man learns results from the controlled experiences to which he has been exposed by others. Even the process of teaching is the result of systems of interaction which have defined such behavior as normative. Man thus survives as a species in part as a result of the patterns of interaction among men.

The existence of patterns of interaction requires that certain conditions be met. Interaction depends in part upon the expectations that one man has of another, expectations which are reinforced by the same repeated behavior of the other person under similar circumstances. Interaction also depends upon the perception of that pattern by the men involved as a more desirable one than any alternative form of behavior. Values develop in an interaction system which rationalize the particular pattern of behavior as more desirable than alternative patterns, and sanctions may be imposed to reward conformity to or punish deviancy from the desired behavior. Man may as a result develop systems of "learned" needs in addition to his original physiological ones.

Interaction systems generally consist of patterns of inter-relationships among men, the patterns being oriented toward the acquisition of resources, anything which either directly satisfies or is instrumental in satisfying a need. The resources that are gained as a result of the interaction
are distributed among the participants as rewards. Hamblin (24, p. 3) described the process in these terms, using social system as synonymous with interaction system:

A social system is defined as a population of units, individuals or groups, cooperating to solve a problem. In cooperating to solve a problem, resources are produced and distributed as rewards. Units are normally oriented toward optimizing rewards for themselves.

Units participate in the problem solving with the expectation of being rewarded with resources, resources being used here in the broadest sense. Punishment might be thought of as a negative resource so that cooperative participation in an involuntary social system, such as a prison if convicted criminal or the army if he is a draftee, would gain rewards for the participant in the sense that punishment would be withheld.

Social systems differ with respect to the number and type of problems with which they are concerned and with respect to the rewards which will be gained as a result of the actions of the system. Many of the dichotomies and continua employed by sociologists to describe social systems encompass such distinctions. Folk-urban, Gemeinschaftlike-Gesellschaftlike, commensalistic-symbiotic, localite-cosmopolite, and mechanical solidarity-organic solidarity have been used, among others, to refer to systems which on the one hand tend to be characterized by strong personal relationships which are in themselves rewarding and on the
other hand tend toward formal, well-defined patterns of relationship which are basically instrumental, being oriented toward the solution of problems and the acquisition of resources.

An interaction system is structured, consisting of social positions related to others through patterns of expected behavior. Thus, each social position may be characterized as having two parts, a system of behavior which the holder of the role is expected to display and a system of behavior which the holder of the position can expect of others with respect to him because he occupies that social position. The obligations associated with a particular social position are commonly designated a role and the behavior which a person has the right to expect of others as an occupant of that social position is termed the status.

The success of a social system in its attempts to solve a given problem will depend in part upon the nature of the defined system of interaction and how well the units in the system conform to that system. Roles in a system may be defined with varying degrees of accessibility to the units who must fill them. In general, the more relevant a system of roles is to the solution of a problem, and the more easily the roles may be carried out by the units, the greater will be the success of the social system in its problem solving activity.
The ease with which a unit can carry out a given role will depend upon the general nature of the demands of the role relative to the abilities of the unit, and the preciseness with which the role is defined. A system of roles so defined as to assure the successful resolution of a problem may fail to do so if certain roles within the system are so ambiguous that the units cannot conform to them.

Man assumes roles with the expectation of being rewarded for conforming to them. If the roles in a particular social system are relevant to the solution of the problem which when solved yields rewards, and the roles are so defined that men may conform to them, the system may be expected to solve the problem and distribute the rewards, reinforcing the conformity of the men if the rewards meet or exceed expectations.

This is the general orientation from which the particular relationships to be used in the present analysis will be developed. It represents an over-simplification of human motivation, and perhaps envisions a social system as a thing too real, but it will serve as a basis for that which follows.

Theoretical Framework

The conceptual variables cohesion, deprivation, and ambiguity are to be inter-related to form the theoretical framework for the analysis of migration. Because these variables are used as social system variables, consideration will first be given to the concept of the social system. Then
the conceptual variables will be defined and their inter-relationships established.

The concept of social system to be used here is that defined by Hamblin (24, p. 3) as a population of units, individuals or groups, cooperating to solve a problem. Nasrat (44, p. 29) cited the concepts which Loomis and Beegle, Sorokin, and Parsons have referred to as "social system," noting that they differed from the concept offered by Hamblin. Loomis and Beegle (39, p. 4) characterized social systems as being composed of persons who interact more with members than with non-members when operating to attain their objectives. Sorokin (52, p. 40) offered a broader concept of the social system, defining it as consisting of the meaningful interaction of two or more human individuals by which one party tangibly influences the overt actions or the state of mind of the other. Loomis (38, p. 4) recently defined the social system as:

composed of the patterned interaction of members. It is constituted of the interaction of a plurality of individual actors whose relations to each other are mutually oriented through the definition and mediation of a pattern of structured and shared symbols and expectations.

This statement is similar to an earlier statement by Parsons (47, p. 16) which characterized the social system as consisting of:

a plurality of individual actors interacting with each other in a situation which has at
least a physical or environmental aspect, actors who are motivated in terms of a tendency to the optimization of gratification, and whose relations to their situations, including each other, are defined and mediated in terms of a system of culturally structured and shared symbols.

Johnson (34, p. 6) defined a group as a system of social interaction involving some degree of cooperation among its members for the attainment of common goals. Another characteristic of a group, according to Johnson, is the sense of belonging together that is involved in common membership. His concept would appear similar to that offered by Hamblin.

These characterizations of the social system do not differ so greatly as to rule out the possibility that the writers had the same basic concept in mind.

In describing the structure of social systems the various writers have differed in the particular elements that they recognize as basic to a system. Loomis and Beegle referred to two basic "type-parts" of social systems, the social structure and the value orientation. The social structure consisted of roles, status, authority, and rights while the norms and ends or objectives comprise the value orientation. Loomis later added elements he termed belief (knowledge), sentiment, and facility to those noted in the earlier Loomis and Beegle work. For Johnson, the basic elements were subgroups, roles, regulative (permissive) norms, and cultural values. Roles as used by Johnson encompassed the elements of
role, status, authority, and rights as presented by Loomis and Beegle. Hamblin preferred to emphasize roles and resources, conceptualizing roles as incorporating both the expected behavior associated with the particular social position and the normative behavior expected of all units in the system. This concept of role encompassed both roles and regulative norms as the terms were defined by Johnson, and roles, status, authority, rights, and norms as defined by Loomis and Beegle. Resources were for Hamblin the manifestations of the values which have been incorporated as elements in the systems of the other writers.

Though differences exist among the sets of elements offered as comprising the social system, the differences represent the varying degrees to which particular sociologists prefer to break down the social system rather than basically different conceptualizations of the social system.

The essential characteristics of a social system would include: a number of units interacting, who possess a common value orientation, which induces them to engage in a cooperative effort to gain resources, which are meaningful to the units in the sense that they directly satisfy needs or are instrumental in satisfying needs. The structure of the system consists basically of patterns of behavior expectations, some of which apply to all social positions in the system (norms) and others which apply to particular social positions
Of the possible conceptual variables which might be drawn from this conceptualization of the social system, cohesion, deprivation, and ambiguity would seem to offer particular promise for analyzing the phenomenon of migration. Nasrat used cohesion and deprivation in his analysis of migration. Others have used cohesion and ambiguity or similar concepts in the analysis of empirical data. Harp (25) employed all three concepts in an analysis of participation in purchasing co-operative associations.

Nasrat defined cohesion as the degree to which units of a social system accept the roles prescribed by the system, the same definition Hamblin developed earlier. The concept refers to the varying degrees to which units may conform to the behavior expectations comprising the roles which they occupy, non-conformity indicating non-acceptance and, thus, low cohesion. The usefulness of the concept is obvious for it can be readily linked to indices of conformity and deviancy.

Some confusion has arisen concerning the concept of cohesion as defined here and that which Francis (17) termed "group cohesion." Francis described group cohesion as Gemeinschaft in character as compared to structural cohesion which is Gesellschaft. Harp (25) used the term "structural cohesion" suggested by Francis to identify the concept which
he defined as the acceptance of prescribed roles. Hamblin suggested that the term "social integration" be used for a concept he defined as the degree to which units of a social system are oriented toward optimizing rewards for other units, a concept which would appear similar to the group cohesion suggested by Francis. Because the concept used here will be identified only as cohesion, the reader should bear in mind that the term refers to the concept defined as the degree to which units of a social system accept the roles prescribed by the system.

Deprivation was defined by Nasrat as the degree to which achievement expectations exceed achievement actualities. Hamblin referred to the same concept as "anomie" which Durkheim used to refer to an uncontrolled increase in expectations accompanying a break-down of normative structure. Because anomie has usually been used to refer to concepts closely related to normlessness, the concept used here will be termed deprivation as Nasrat identified it.

A similar concept has been used by other researchers. Harp used essentially the same concept in his analysis of member participation in cooperatives. Merton (43, pp. 229 - 230) commented on the use of the concept by the authors (57) of the American Soldier as an intervening variable developed to aid in the interpretation of the findings. Both Merton and Harp preferred "relative deprivation" to "deprivation."
While the concept as it will be used here is "relative", deprivation being relative to expectations, the use of "deprivation" rather than "relative deprivation" to denote the concept should give rise to no particular difficulties. Deprivation as used here will be defined as the degree to which achievement expectations exceed achievement actualities.

The relationship between cohesion and deprivation, cohesion varies inversely with deprivation, is based on the premise that units participate in a social system taking on one or more roles with the expectation of gaining rewards as a result of their participation. As a result of their participation the units do in fact gain rewards and these when compared with expectations may be less than, equal to, or greater than their expectations. The failure of the rewards gained to equal or surpass expectations would presumably discourage continued conformity to the roles, with greater discrepancies between expectations and actualities being accompanied by stronger tendencies toward deviancy. The general relationship of cohesion varying inversely with deprivation closely parallels the theories of reinforcement of behavior in the learning process which have been offered by the psychologists.

Deprivation is defined as being a function of expectations and actualities which might themselves be treated as conceptual variables. Expectations are characterized by
qualitative and quantitative aspects, being oriented first of all toward certain types of ends, both material and non-material, and toward sizes or numbers of those ends. While expectations may in general be delineated by the value structure of a social system, some further restriction would be anticipated as a consequence of a unit's perception of the experiences of others, both within and outside his own system, and as a consequence of his own experience. The status associated with a particular role would also be expected to influence the expectation of reward held by the occupant of that role.

On the other hand, the rewards actually gained as a result of occupying a social position would tend to vary as a function of characteristics of the position and the social system of which the position is a part. The role structures of social systems may vary in their appropriateness to the solution of the problems faced by the system. Of the writers who have dealt with the appropriateness of a social structure with respect to the resolution of problems, Hawley (27) has perhaps given the subject the most attention.

If the general function of a role system is goal attainment through the resolution of a problem, then the system serves the purpose of bringing the efforts of individual units to bear upon the problem in a coordinated way. Goal attainment depends, then, upon the acting out of those roles by the
units in the system. As a consequence, goal attainment will depend not only upon the appropriateness of the role system with respect to the problem, but also upon the appropriateness of the role system with respect to the units. For successful goal attainment, roles must be defined so that they contribute to goal attainment and at the same time are so defined that units may conform to them. Neither of these conditions may be met if roles are not precisely defined and the possibility of such a failure leads to the third conceptual variable, ambiguity.

Ambiguity is defined, also after Hamblin, as the degree to which roles in a social system remain undefined. This concept is similar to a more common concept found in contemporary research literature, anomie, which is, as previously noted, usually associated with normlessness. But a distinct difference exists between the two. Merton (43, p. 162) distinguished between what he termed the cultural structure and the social structure of a system, the cultural structure defined as that organized set of normative values governing behavior which is common to members of a designated society or group, and the social structure defined as that organized set of social relationships in which members of the society or group are variously implicated. Anomie, according to Merton, is conceived as a breakdown in the cultural structure which, at the extreme, would lead to the disintegration of
the value system. Ambiguity as defined here is a characteristic of the role system which is part of the social structure rather than the cultural. It is related to a concept which Merton (43, p. 175) referred to as relative accessibility to the goal or the life-chances in the opportunity-structure. Merton has hypothesized that anomie will follow from inaccessibility to the goals.

The relationship between ambiguity and anomie may be clarified if reference is made to the topology of modes of individual adaptation offered by Merton (43, p. 140). Merton suggests that in a system of interaction there are present both cultural goals, which presumably would be related to the value structure, and institutionalized means for obtaining these goals, the roles of the social structure. Units may deviate from or conform to either or both goals and means and, if deviating, may either purely reject or reject and substitute for the former goals or means. Dubin (14) has elaborated upon the topology by distinguishing between institution norms and institutional means, the norms establishing the boundaries between prescribed and proscribed behavior. This concept of norms is equivalent to the category of norms Johnson termed regulatory.

Merton began with five modes of adaptation; conformity, acceptance of both goals and means; innovation, acceptance of goals, rejection of means; ritualism, rejection of goals,
acceptance of means; retreatism, rejection of both goals and means; and rebellion, substitution for both goals and means. The extension by Dubin yielded fifteen modes, conformity and fourteen modes of deviancy.

If ambiguity leads to deprivation which in turn leads to low cohesion and if this low cohesion is manifested in deviations from the institutional norms and cultural goals in addition to or rather than deviancy from the means, then it is possible for ambiguity to lead to anomie inasmuch as anomie is characterized by disrupted and conflicting value systems. A system characterized by anomie, on the other hand, is not likely to be characterized by well defined systems of roles so that anomie would appear to accompany or precede a further breakdown in the social structure.

The introduction of Merton's typology leads to one particular question concerning the general relationships being developed. The possibility that deprivation may lead to deviancy from values rather than from roles suggests that a unit may adjust to deprivation by adopting a value-orientation which yields expectations that can be met through continued conformity to the prescribed roles. The present concept of cohesion encompasses only deviancy from the means or roles and excludes alternative reactions to deprivation. Cohesion would tend to vary directly with ritualism, the abandoning or scaling down of cultural goals to the level
where aspirations can be satisfied. As Merton has noted, the question may be raised as to whether such behavior is genuinely deviant. The leveling of aspirations would appear to be a widely used approach to balancing small discrepancies between aspirations and actualities. Whether ritualism represents a form of deviancy or not, the adaptation that it permits would have to be taken into consideration when analyzing reactions to deprivation.

The theoretical framework to be applied in this analysis of migration can now be stated. It consists of the inter-relationships among three general, conceptual variables: cohesion, defined as the degree to which units in a social system accept their prescribed roles; deprivation, defined as the degree to which achievement expectations exceed achievement actualities; and ambiguity, defined as the degree to which roles in a social system remain undefined. The general hypothesis which relates these three general concepts may be stated as follows: cohesion varies inversely with deprivation which varies directly with ambiguity.

Because migration from a social system represents a rejection of roles within that system, an index of migration may be used as a measure of the cohesion of a system. Thus, the framework is applicable to the analysis of migration. In the following chapter the methodology for the study shall be presented in which the epistemic correlations between the
general conceptual variables and their empirical operations will be established and the general method of analysis outlined.
METHODOLOGY

The general method of analysis to be used in this study of migration is basically that suggested by Hamblin (24) and used by Nasrat (44) in his analysis of migration. The method, conceptual variable analysis, includes four steps: (1) the stating of general hypotheses relating general concepts which have been expressed as variables; (2) the developing of operations which are logical empirical referents of the general concepts; (3) the relating of the operations in empirical hypotheses which parallel the general hypotheses; and (4) the testing of the empirical hypotheses for significance and evaluating the relationships.

The first step has been completed; three conceptual variables have been defined and the general hypothesis relating those concepts stated. The major portion of the present chapter shall be devoted to a consideration of the empirical measures selected as operations for the general concepts and to establish the epistemic correlations that link the empirical variables to the general conceptual variables. The empirical hypotheses shall then be stated and a discussion of the statistical methods of analysis to be used will conclude the chapter.

The Unit of Study

The county has been selected as the basic unit of analysis for the present study, and while the county is
perhaps not the purest form of the social system, there are
certain considerations which favor its use here.

The county has been considered to be a social system in
the sense that it encompasses a system of interdependent,
functionally differentiated economic and governmental roles.
Rural farm communities with rural incorporated places as
focal points function as subsystems within the county. These
communities are to some extent dependent upon the larger
urban places within the county and also upon the county seat
town as service centers and distributive centers. The
county has a governmental structure and federal and state
programs are often administered through county offices.
Many people participate in county-wide organizations, and
people identify with their counties.

Counties have been treated as social systems by other
researchers. Nasrat (44) used Iowa counties in his analysis
of migration. Jehlik and Wakeley (33), Francis (17), and
Jonassen (35) have referred to or used the counties as social
systems. Wakeley and Nasrat (67, p. 17), in an article
summarizing the study by Nasrat, have stated: Counties
obviously show social system characteristics in varying
degree, but under the conditions noted no excuses need to be
made for considering counties as social systems.

The primary reason for using the county rather than any
form of social system is that the county is the smallest
system for which a variety of data is available, particularly migration data. Because the study has been arbitrarily limited to the state of Iowa, the county is the largest unit smaller than the state that would lend itself to social system analysis.

Thus, the units of study are the ninety-nine Iowa counties, each county being considered a social system.

Epistemic Correlations

An epistemic correlation is a statement of logical relationship between a general concept and an empirical variable. The general method employed in this study requires that the general hypotheses relating the conceptual variables yield sets of empirical hypotheses which will parallel the general hypotheses. Each empirical variable must thus be linked directly to a conceptual variable. The validity of the linking of the two variables, empirical and conceptual, must ultimately be established solely on the basis of judgment. Because the relation between the empirical and conceptual variables is based on judgment, the relationships established in the following section will tend to vary in their validity. Not only may the validity of the relationships vary from variable to variable at a given time, but the validity of a given relationship may vary over time since the validity of a relationship will in some cases be situational. Merton (43, pp. 96-99) has noted this possibility with regard to
Durkheim's use of the concept social cohesion. It is this possibility which in fact makes the general method fruitful.

Twelve measures of the three general concepts have been developed, five for cohesion, four for deprivation, and three for ambiguity. In the pages that follow the epistemic correlations for each concept and its operations will be discussed. In all cases the measures are based on county data obtained between 1949 and 1960.

**Measures of cohesion**

Five operations have been selected to be used as measures of cohesion, defined as the degree to which units in a system accept their prescribed roles. The operations are rates of: net migration; church membership; membership in fundamental-istic sects; committals to penal institutions and committals to mental institutions. The first two of these, rates of net migration and church membership, are taken to be positive measures of cohesion, the remaining three negative measures.

In developing the epistemic correlations which relate each operation to the general concept cohesion, reference shall be made to the typology of modes of adaptation presented by Merton (43, p. 140) which was introduced in the preceding chapter. The operations will be considered in the order given above, beginning with net migration.

Perhaps the most complete rejection of the roles prescribed by a system while yet maintaining the value
orientations of that system would be the leaving of the system. Out-migration would, thus, represent a rejection of roles and would be a logical negative measure of cohesion, increasing out-migration indicating decreasing cohesion. But because out-migration data are not available for counties, rates of net migration have been used instead. This confounds the measure by introducing in-migration.

The problem is not a new one. Francis (17, p. 264) noted that cohesion is a characteristic of groups and can act only upon members of those groups. Low cohesion may be related to the expulsion of members, but high cohesion would be related to holding power for persons in the system and to the attraction of outsiders into the system only in the sense that the cohesion would make the particular system desirable to members and non-members. If the latter were a common occurrence, a negative correlation would be expected between in-migration and out-migration. But in one of the few studies using in- and out-migration data, Bogue, et al. (5, pp. 65-66), reported positive correlations of 0.43 and 0.69 between in-migration and out-migration for non-metropolitan and metropolitan subregions of the United States, respectively. The correlation between out-migration and net-migration was 0.52 for non-metropolitan subregions and 0.01 for metropolitan.

The findings reported by Turner (65) would also suggest that the relative cohesiveness of a system exerts little
attractive force on non-members, at least not in a direct manner. Though the majority of the migrants he interviewed reported being attracted by characteristics of the system of destination rather than expelled by the old, the characteristics were primarily economic.

These findings suggest that net-migration may be an inadequate substitute for out-migration data. But in a state such as Iowa where net-migration data for counties generally show losses for the 1950-1960 census period, the ratio of losses through out-migration to gains through in-migration could be expected to be fairly high, so that the overall effect of in-migration on net migration for Iowa between 1950 and 1960 may not be as great as was reported for the United States between 1935 and 1940. The error would tend to be greatest for those counties characterized by high in-migration which would generally be the larger, urban counties.

Some of the characteristics of a system which attracts non-members may also be correlates of high cohesion. The job opportunities, for example, which are often cited as the attractive characteristic may be a correlate of an expanding industrial area which has been successful in part because of high cohesion within the total social system.

Because the operations which have been selected for the concepts are generally oriented toward the male adult roles in the system, an index of male adult migration may have been
preferable to the total net migration figure used. Because the age-sex distributions for 1960 were not available when the index was developed, the possibility was not further explored.

Net migration rate has been used, then, not because it represents the best index of migration that might have been used as a measure of cohesion, but because it is the only one available for the social systems analyzed. Net migration for the period between 1950 and 1960 was determined by the residual method, the change in population in a county between 1950 and 1960 not due to births or deaths presumably resulting from migration. While the residual method for determining net migration may not give the truest picture of the change in population due to migration, the resulting figures do represent the movement of living people who have been members of the social system.*

The total residual net migration for each county has been divided by the 1950 population of the county to give a rate of net migration, the operation used here. In general, the measures which have been employed in this study have, where appropriate, been expressed as rates to control on the effects of differential population size, which if treated as a

*Other methods of estimating change in population due to migrations project a population forward or backward to a reference year and determine by applying birth rates and survival rates the size of the expected population at that reference year which would yield the original population. The difference between the expected and actual populations for the reference year is attributed to migration.
separate variable or omitted would seriously confound the relationships among those variables which correlate highly with population size.

Church membership has been adapted as a positive measure of cohesion. Religion has been generally characterized as a social mechanism which reinforces the values and behavior most basic to the integration of society. Though this conceptualization of religion has been questioned by Merton (43, p. 42), as well as others, the structures of religion, the churches, would seem in the counties of Iowa to perform the functions which have been attributed to them. Williams (72, p. 316) has observed that in the religious institutions of America worldly success is widely and overtly approved rather than condemned, ignored, or covertly sanctioned, and, further, that with some conspicuous exceptions, organized religion in contemporary America takes a conforming or conserving attitude toward the main features of the social order. The survival of the churches as they now exist would in fact depend upon the worldly success of their members.

Williams goes on to note the tendency for the well satisfied, secure groups in society to support those churches which approve of and reinforce the secular order while the deprived tend toward sectarian withdrawal. These tendencies, insofar as they would apply to the social systems of Iowa, are relevant to the validity and use of rates of church membership.
as a positive measure of cohesion. In Iowa which has continued to be identified with the "Bible Belt" of America, the normative expectations of religious belief and participation are still strong.

The report on church membership in the United States issued by the National Council of Churches (45) in 1957 is the source for the data on church membership. An index of membership was computed for each county by expressing total church membership as a percentage of total population.

The three remaining measures of cohesion can be considered together since their relationships to cohesion are based on a common argument. Crime, mental illness, and fundamentalism are all three taken to represent rejection of the defined roles of the social system. Within the typology set forth by Merton (43, p. 140) crime would represent "innovation" in the sense that the cultural goals may be maintained, but the institutionalized means or roles for obtaining them are rejected. Mental illness involves a disassociation from both cultural goals and institutionalized means and would be categorized by Merton as "retreatism." The fundamentalist rejects the dominant cultural goals and means and substitutes goals and means which are for him more consistent in the sense that the means will satisfy the goals. Although Merton does not refer to fundamentalism as an example, the pattern would appear to fit his description of
"rebellion." Williams (72, p. 335) has described fundamentalism as stressing otherworldly concerns rather than social issues and has observed that the sects are often most strongly supported by those groups that have been increasingly assaulted by rapid social change and by insecurity-engendering cultural influences.

These three patterns of behavior would serve as adaptations to deprivation, involving in the adaptation some deviancy from the roles prescribed by the system. All three, however, involve very small, but different, portions of the population so that when measures are based on committals to penal institutions, committals to mental institutions, and membership in fundamentalistic sects, as they have been here, relatively few cases of role rejection are directly involved. Thus, a more useful application of these patterns would result if each general category of behavior were considered to be a continuum of deviancy ranging from conformity through minor degree of deviancy to extreme deviancy of the particular type. Then, assuming that the general distributions are similar for all systems and that the cut-off points on the distributions where deviancy becomes reported and recorded are the same for all systems, a higher rate of recorded deviancy in one system relative to another would lead to the inference that rates are higher at the more extreme unrecorded deviancies as well. This essentially would justify the
argument that a county with a higher rate of mental committals than another county, for example, would also have a higher rate of unreported mental illness. Measures of this nature have generally been interpreted as though such were the case.

The rates of criminal committals have been based on the average annual committals of residents of each county to state correctional institutions during the 1950 to 1960 period expressed as a percentage of the 1950 population of the county. Similarly, the rate of mental committals has been based on the average annual first-time committals of residents of each county to state mental hospitals during the 1950-1960 period, again expressed as a percentage of the 1950 population of the county. Both the crime and mental committal data were taken from reports of the Iowa Board of Control (32).

The rates of fundamentalism have been based on the total reported membership for seventeen churches* listed in the report by the National Council of Churches (45). The churches are those considered to be most sectarian in nature,

*Those seventeen churches are: Seventh Day Adventists; Assemblies of God; Church of God (Cleveland, Tennessee); Church of God (Anderson, Indiana); Evangelical Mission Covenant Church of America; Open Bible Standard Churches, Incorporated; General Covenant of the New Jerusalem in the United States of America; International Church of the Foursquare Gospel; Church of God in Christ; Church of God of Prophecy; National Spiritualist Association of Churches; Brethren in Christ and United Brethren in Christ; Apostolic Christian Church of America; Advent Christian Church; Pentecostal Church of God of America; Pilgrim Holiness Church; and United Missionary Church.
representing the most extreme reactions to the secular orientations of the contemporary church.

Because the adaptations offered by Merton represent alternatives which are to a certain extent mutually exclusive, the application of the measures of cohesion selected here is accompanied by the assumption that other forms of deviancy are either inconsequential or occur with the same frequency throughout the counties of Iowa. On the other hand, it is because of the possibility of selectivity with respect to these various alternative reactions to deprivation that measures of cohesion other than migration have been included in the analysis. Thus, a failure of migration to function as an adaptive mechanism to deprivation might be explained if other mechanisms are so functioning.

Measures of deprivation

The development of measures for deprivation, defined as the degree to which achievement expectations exceed achievement actualities, requires that the major value orientations of the systems be identified. In his rather elaborate treatment of American value orientations, Williams (72, pp. 388-442) identified fifteen major value configurations. These have served as a starting point for the development of measures for deprivation. The basic problem is to select major values that would be commonly held throughout the ninety-nine counties of Iowa, and which would lead to
expectations and rewards which can be ascertained and which can be expected to vary widely enough so as to have significant differential consequences for the systems. Of the value configurations* Williams identified, two would seem to meet these criteria, "achievement and success," and "material comfort." Achievement refers to the value placed upon personal achievement in American society, especially secular occupational achievement. Williams has observed that success as indicated by the gaining of rewards has come to symbolize achievement. Insofar as this is true, the expectation of income and income actually received when expressed as a ratio would offer a reasonable measure of deprivation.

Material comfort is sufficiently descriptive to need no clarification. Because income is a more direct reward for participation in the social system than are the items upon which level of living indices are based, measures based on income data have been selected for deprivation.

Direct measures of expectations are not available for the counties, so the measures of deprivation have been based upon the ratios of the average family income for each county to the equivalent figure for possible referent systems. The

*These value configurations are: "achievement" and "success;" "activity" and "work;" "moral orientation;" "humanitarian mores;" efficiency and practicality; "progress;" material comfort; equality; freedom; external conformity; science and secular rationality; nationalism-patriotism; democracy; individual personality; racism and related group-superiority themes.
use of the referent systems to estimate expectations of income is based on the premise that if expectations are not strictly limited by the definition of the social position which a person occupies, they may be influenced by the experiences of others outside the system, or those of others within the system, or they may be influenced by the person's past experience. Thus, four measures of deprivation have been developed using for one referent the average income per family for the state, for a second the mean of the average income per family for the bordering counties, and for a third the average income per family for the county ten years earlier.

The fourth measure is an index of the fluctuation of the average income in the system over time and represents an attempt to measure the possible influence of differences in income within the system upon expectations. The relevance of this index as a measure of deprivation is perhaps not apparent. The use of the index follows the interpretation which Durkheim (15, pp. 252-253) offered for the relationship between suicide rates and fluctuations in the economy. Durkheim argued that in a time of change some units will experience change before others. Thus, in the case of changing income levels, the incomes of some members of the system will change before the incomes of others do and during the time of change greater income differentials will exist
than during the more stable periods preceding and following the change. Deprivation in a system, then, would be expected to be greater with larger and more frequent changes in average family income.

The index as employed here for measuring fluctuation is similar to the measure Nasrat (44, pp. 40-41) referred to as a coefficient of variation. The index has been computed as the mean of the three largest annual percentage changes in average family income. Each annual change was expressed as a percentage of the income figure at the start of the year. The three largest changes were used, irrespective of direction of the change, on the grounds that most counties experienced two fairly large annual changes in income during the 1950-1960 period, though a few had one and others three. Thus, an index based on the three largest changes would be fairly sensitive to both the size and number of changes in average income over the period.

The income data for the various indices were taken from the annual estimates of average effective buying income per family for counties of the United States published by Sales Management magazine. Their reports were the only available source for income data for Iowa counties for the years following the 1950 census report on income for 1949. The figures published by Sales Management were based on estimates of the total income for the county less all federal, state,
and local income taxes, and the resulting net effective buying income averaged over the estimated number of family units in the county (53).

Average family income figures used in the first two measures of deprivation were based on the mean of the averages for the ten years for each county. Change in income was computed as the ratio of the 1959 income to 1950 income.

Another possible index of deprivation relative to expectations set within the social system could have been based upon the extremeness of incomes within a county, using ratios of the percentage having high incomes to those having low. Because such an index correlated very highly with average income for Iowa, none was used.*

The first three indices have been expressed as negative measures of deprivation, actual income being expressed as a percentage of the income for the referent system. The fourth index, an index of variation in income, is a positive measure of deprivation.

**Measures of ambiguity**

Of the three general concepts, ambiguity, defined as the degree to which roles in the social system remain undefined,

*The ratio of the percentage of families earning over $5000 to those earning under $2000 per year correlates 0.94 with median family income using census data for 1949 for Iowa counties. The percentage of families earning over $7000 per year correlated 0.92 with average annual family income for the same counties using Sales Management data.*
has been the most difficult to operationalize in terms of measures based upon county data. Three indices have been selected, the percentage of the labor force self-employed, the percentage of farms which are tenant operated, and the density of the population. The indices were selected with regard for the economic measures developed for deprivation.

The correlation of self-employment to ambiguity is based on the more precisely defined roles and reward expectations that are likely to accompany the employment of one person by another or by a number of others as compared to the roles of the self-employed where the definition of each role ultimately falls back upon the person who fills that role. Insofar as the self-employed person is subject to influence from a variety of sources, the expectations he associates with his particular role are apt to involve inconsistencies and ambiguities.

Because the self-employed population of Iowa consists predominantly of farm operators, some comments made by Beal (3, p. 3) with reference to the Iowa farmer may give an indication of this ambiguity.

Our research shows that the farmers are maintaining their profits and are increasing the size of their units to nearer economic efficient farms and are becoming more and more oriented toward scientific agriculture. This sounds like an old truism. Yet, we find in our state-wide samples that many farmers still exist -- on the order of a third of the farmers -- that have serious questions about the value of the scientific approach to agriculture, even to
the extent of using the latest tested scientific findings. Over 20 percent have negative or antagonistic attitudes toward the scientist. They classify themselves and adoption of new practices validates their classification, as being slow to adopt new ideas, because they want to see them tried out and tested on a neighbor's farm.

Beal goes on to observe that the means a farmer uses may still be more important to him than the profit that he makes. The innovator who first adopts new ideas is less concerned with the methods he has used in the past, what his neighbors think, and has rejected some of the criteria of the "good" farmer "if he thinks the methods he is using are the proper combinations of land, labor, capital and management to give him the greatest marginal return on investment (3, p. 4)."

The traditional sources of information concerning the use of fertilizers, feeds, seeds, and other products instrumental in the farm operation are often inadequate. Beal predicts that dealer, local leaders, and other information sources will give way to specialists who will be judged on the basis of their contributions to goal attainment, not on the basis of how good friends they make. Among the conflicts faced by the farmer are the following, again noted by Beal (3, p. 5):

The farmer of the future will have to rationalize his value conflicts between frugality, hard work, farming every available acre, high production and basic individual independence—the work imperative on one side—and surpluses, over-supply, excess land in the total agricultural plant, and controls and protection on the other hand.
The present ambiguousness of the role of the farmer in Iowa with respect to profitable farm operation serves as the basis for using the percentage of total employed population which is self-employed as a positive measure of ambiguity.

The heavy representation of the farm population in the self-employed data suggests the use of an index for the "employed" farm operator population. For this index, the percentage of farms operated by tenants was used on the assumption that the role of a tenant operator would be better defined than that of the farmer who is an owner-operator because one or more others have an investment in the success of that tenant operator. Both the expectations associated with the role and those associated with the rewards for performing that role would be expected to be better defined for tenant operators than for the self-employed owner-operator. Thus, the percentage of farms which are tenant operated would be a negative measure of ambiguity.

The third measure of ambiguity used is the density of the population, a negative measure of ambiguity. Density of population is used as a rather crude index of Gesellschaft as defined by Loomis and Beegle (39, p. 784) who characterized groups with Gesellschaft-like features as having sharply differentiated means and ends with the means chosen "according to norms of efficiency, with a minimum of interference of the sacred, traditional, emotional, or personal involvement
resulting in such sentiments as loyalty." Insofar as increasing density of population is related to greater heterogeneity of that population, the less likely is that population to have the requisites for the sacred, traditional values which are basic to the Gemeinschaft-like society at the opposite pole of the continuum. The Gesellschaft-like society would be expected to have a social structure characterized by rather limited, but precisely defined, roles, while the Gemeinschaft-like system would be characterized by rather diffuse, broadly defined roles.

The application of the Gesellschaft-Gemeinschaft concept to this particular analysis is justifiable primarily on the basis that values in rural Iowa are tending to become more urban in character. If this were not the case, the two systems, rural and urban, might not have a common system of values, and if not, no basis would exist for applying the present framework to the total complex. The comments made by Beal suggest that the rural population of Iowa has taken on new values, but has also retained old ones with which the new ones are to some degree in conflict. Thus, the rural systems which still retain many Gemeinschaft-like characteristics have a social structure not functionally oriented toward the newer goals, and can be expected to show ambiguity relative to those goals.

With the development of these three measures for
ambiguity, a total of twelve measures have been established for the three general concepts, cohesion, deprivation, and ambiguity. Those measures are, in summary:

For cohesion:

(A) Net migration between 1950 and 1960 expressed as a percentage of the 1950 population, a positive measure (net migration).

(B) Total church membership, 1956, expressed as a percentage of the 1950 population, a positive measure (church membership).

(C) Total membership in fundamentalist churches, 1956, expressed as a percentage of the 1950 population, a negative measure (fundamentalism).

(D) Average annual criminal committals to state correctional institutions for the years 1950-1959 expressed as a percentage of the 1950 population, a negative measure (criminal committals).

(E) Average annual first committals to state mental institutions for the year 1950-1959 expressed as a percentage of the 1950 population, a negative measure (mental committals).

For deprivation:

(F) Mean of the annual average income per family, 1950-1959, a negative measure (average income).

(G) The average income, as above, expressed as a percentage of the mean of the average incomes for the bordering counties, a negative measure (relative income).

(H) Average annual income per family for 1959 expressed as a percentage of the corresponding figure for 1950, a negative measure (change in income).

(I) Average of the three largest percentage changes in average annual income per family during the 1950-1959 period, a positive measure (variation in income).
For ambiguity;

(J) Total self-employed, 1950, expressed as a percentage of the total employed, a positive measure (self-employed).

(K) Number of farms tenant operated, 1950, expressed as a percentage of total farms, a negative measure (tenant farms).

(L) Population density, 1950, a negative measure (population density).

All of the above indices are based on data for the counties. In parentheses following each index is the abbreviated phrase by which that index shall be identified in the statement of the empirical hypotheses, the presentation of the findings, and the ensuing discussion.

Empirical Hypotheses

With the development of the indices which are to be used as operations for the general concepts, the empirical hypotheses may now be stated parallel to the general theoretical relationship that cohesion varies inversely with deprivation which varies directly with ambiguity. Implicit in this general relationship are three hypotheses; cohesion varies inversely with deprivation; deprivation varies directly with ambiguity; and because of their common relationship to deprivation, cohesion varies inversely with ambiguity. Thus, alternative forms for stating the empirical hypotheses are available. The hypotheses may be offered relating combinations of variables measuring the three concepts at one time
or as statements relating pairs of variables. Because the relationship between a measure of ambiguity and a measure of cohesion is expected to be based upon common relationships to one or more measures of deprivation, the empirical hypotheses will be stated as expected relationships among sets of three empirical variables rather than between pairs.

The sixty empirical hypotheses relating the five indices of cohesion, four of deprivation, and three of ambiguity are presented in Table 1. The hypotheses have been grouped in sets of four which relate a given measure of cohesion to a given measure of ambiguity through each of the four measures of deprivation.

Method of Analysis

The purposes of the statistical analysis of the data with which the empirical hypotheses are to be tested are threefold; first to give an indication of the degree of relationship between the various pairs of indices within each hypothesis, second to give a basis for ascertaining the likelihood that such relationships that do appear to exist are in fact not due to chance occurrence, and third to give a description of the patterns of relationship among the indices that would offer a basis for a post factum interpretation and explanation of deviancies from the hypothesized relationships.

Similar analyses of migration have relied heavily upon
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Table 1. (Continued)

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<th>Measure of deprivation</th>
<th>Expected relation</th>
<th>Measure of ambiguity</th>
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<td>direct</td>
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<td>inverse</td>
<td>Population Density</td>
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two techniques, the application of zero-order product moment correlations and the use of multiple regression analyses. In analyses reported by Bogue, et al. (5), and by Nasrat (44), both were used. For an index of relationship between two variables, the product moment correlation is a widely accepted statistic. If the distributions are normal bivariates, the product moment correlation is an efficient estimate of the population parameter $\rho$, and will make maximum use of information from the sample (68, p. 420). For these reasons, the zero-order product moment correlation has been selected as the statistic to be used to estimate the degree of relationship within the various sets of variables. The ninety-nine counties of Iowa which are used as the units in this study are considered to represent a sample selected from a non-existent, conceptual universe of counties for which the parameters of relationship between pairs of variables are being estimated. This consideration also makes possible statements of statistical significance regarding the correlations which will be meaningful. An empirical hypothesis will be considered to be substantiated if all three correlations associated with the statement are significantly different from zero in the predicted direction.

The use of regression analysis yields a linear equation relating one or more independent variables to the dependent variable. The primary value of the technique lies in this
equation which will give a predictive estimate of the dependent variable as a linear function of the independent variables with the relative weight given to each variable taking into account the unique contribution of each to the determination of the dependent variable. The major limitation of this type of analysis as applied to studies such as the present one is that the technique does not give a basis for identifying the nature of that unique contribution which each variable makes. When the measures of the general concepts are somewhat ambiguous and not perfectly valid operations of the concepts or when the variables are used just as empirical variables in a relationship, few grounds exist for stating that the remaining relationship between a given predictor and the dependent variable, after the common variance of those variables and several other predictors has been removed, is due to any particular characteristic of the given predictor. For example, Bogue, et al. (5, p. 70), reported a multiple correlation of 0.84 for their set of thirteen predictors of out-migration from non-metropolitan subregions. But what is the nature of the unique contribution that the logarithm of the size in 1940 makes after the effects of percent urban, farm level of living, percent non-white, median age, percent in agricultural industries, etc., have been taken into consideration? The partialing out of these other influences reduces the number of possibilities, but strong intuition would seem
the best basis for pin-pointing the specific basis or bases for the remaining relationship.

This would suggest that the basis of a relationship between two variables is easier to establish through a consideration of the variables to which these two correlate in common rather than through a consideration of the variables to which they do not have a common correlation. Factor analysis offers the possibility for such an approach to the analysis, and for that reason it has been selected for use in describing the nature of the relationships among the various measures of the conceptual variables used in this study. As a descriptive tool, it will not be used to test the hypotheses of this study, but rather to offer a basis for interpretation and explanation which may provoke further investigation, a basis which the correlations alone may not offer.

With the hypotheses formulated as presented here, each hypothesis stating the relationship between three variables, factor analysis would be expected to yield factors having loadings from one or more variables representing each of the conceptual variables; that is, any factor involving measures of two conceptual variables would be expected to also have a loading from one or more measures of a third conceptual variable.

Factor analysis, as it will be employed here, involves
fundamentally the defining of a set of orthogonal factors which will account for the portion of the variance of each variable held in common with one or more other variables in the analysis. The model takes a form similar to several sets of regression equations where the "score" of a given unit on a given variable is expressed as a linear function of hypothetical factor scores for the unit and the weights that those factors are to receive. The general equation may be written

\[ z_{ij} = \sum_{k=1}^{N} \beta_{ik} z_{kj} \]

where \( z_{ij} \) is the score of the \( j \)th unit on the \( i \)th variable, \( \beta_{ik} \) is the weight that the \( k \)th factor receives for that \( i \)th variable, \( z_{kj} \) is the hypothetical score that the \( j \)th unit has for the \( k \)th factor, and \( N \) is the number of factors.

If the full set of equations is written for each variable and the correlations among the variables computed, then given that the \( z \)s are orthogonal, linearly independent factors, the relationship

\[ r_{ij} = \sum_{k=1}^{N} r_{ik} r_{jk} \]

can be derived where \( r_{ij} \) is the correlation between the \( i \)th and the \( j \)th variables and \( r_{ik} \) and \( r_{jk} \) are the correlations of the \( i \)th and \( j \)th variables, respectively, to the \( k \)th factor. When the correlations among the variables are known, an
infinite number of solutions for the values of the factor loadings, the correlations between the variables and the factors, are available. Several methods and variations of methods for factor analyzing matrices of correlations have been offered.

The method to be used here is that developed by Wherry (71) in which items are clustered on the basis of the appearance of common variance into two or more subtests. The correlations among the subtests are computed as well as the correlations between the subtests and the items not included in the clusters. The subtests are factor analyzed to yield a general factor over all the subtests and a specific factor for each subtest. The individual items are then correlated to the factors. Further factors may be pulled from the residuals by inspection if meaningful correlations remain. This is basically the method applied to the variables analyzed in the present study.

For the factor analysis, three variables have been added to the original twelve measures of the general conceptual variables developed earlier, those three being rate of unemployment, median education of persons over twenty-five years of age, and rural-farm male replacement ratios. They are variables which could be expected to be related to migration, but which were not included in the earlier analysis because they are not clearly related to any one of the
general concepts. Unemployment could be used as a measure of deprivation if the expectations of the individual include the presence of an accessible economic role in the social system. It could also be construed to represent a concomitant of a system which has defined some roles in such a way that they are not accessible to a portion of the population and that economic deprivation results from this.

Increasing education could be expected to both raise expectations and increase the abilities of the individual so that more roles are open to him. If these can occur differentially, education in one system might lead to less deprivation, in another to greater deprivation.

The rural-farm male replacement ratio, as with unemployment, could be related to deprivation in the sense that in a system characterized by a high replacement ratio, the young men in the system who expect to find economic roles will not find them. Because these men have not yet entered the labor force, their deprivation would not be reflected in the economic characteristics of the system.

Rate of unemployment has been based on the number of unemployed as reported for 1950 by the Bureau of the Census (66, pp. 64-68) expressed as a percentage of the total labor force. Education has been recorded as the median education in years of schooling for persons twenty-five years of age and older as reported for 1950 (66, pp. 100-105). Male farm
replacement ratios have been taken from the report compiled by Bowles and Taeuber (7) on the rural-farm males entering and leaving working ages during the 1950-1960 period. These variables will be referred to as unemployed, education and farm replacement ratios in the following sections.

Twelve empirical measures of cohesion, deprivation, and ambiguity have been related in sixty empirical hypotheses, each hypothesis stating the expected relationship among three variables, one a measure of cohesion, one of deprivation and one of ambiguity. The hypotheses are to be tested using data obtained between 1950 and 1960 for the counties of Iowa.

Two methods of analysis of the data will be employed. Zero-order correlations between pairs of variables in each set of three in the hypotheses will be used to test the hypotheses. Factor analysis of the measures of the conceptual variables will supplement the correlational analysis by offering a basis for describing the patterns of relationship among all of the variables. The findings from the two analyses are presented separately in the following chapter and will later be discussed together.
FINDINGS

With the statement of the empirical hypotheses and the selection of zero-order product moment correlations to test the hypothesized relationships, the findings with regard to those hypotheses may be presented. Following their presentation, the factor analysis of the indices used in the analysis will be considered.

In presenting the findings, the empirical hypotheses will be restated, and for each pair of variables in each statement of relationship will be given the zero-order correlation coefficient for the two variables. Where a direct relationship has been hypothesized, a positive correlation between the two variables is to be expected. A hypothesized inverse relationship is expected to yield a negative correlation between the variables.

The hypotheses have not been stated in null form; that is, stated so that a hypothesis states an expectation of no relationship between the variables which would be indicated by the absence of a correlation between the two variables. Indications of statistical significance will be given, however, as though the hypotheses were stated in null form, such significance being based on the probability of obtaining through chance variation a correlation as large as that found for a given pair of variables if in fact no relationship existed between those two variables. With the assumption that
the bivariate distributions involved here are normal bivariates, the zero-order correlations marking the start of the critical regions where the null hypotheses would be rejected are for the 0.05 and 0.01 levels of significance 0.17 and 0.23, respectively.* The caution should be mentioned that with a fairly large number of hypotheses being stated, the likelihood for errors increases. For a hypothesis to be supported, however, three significant correlations are necessary, greatly reducing the chances of rejecting a true null hypothesis.

As the empirical hypotheses are restated along with the correlation coefficients, the reader should remember that the stated hypotheses relate the abbreviated referents of the indices which are the measures of the general concepts related in the hypotheses.

The findings from the factor analysis along with a summary of the procedure will be presented after the findings from the correlational analysis.

Correlational Analysis

The empirical hypotheses are restated in Table 2 as they were first presented at the close of the preceding chapter.

*These figures have been rounded-off from values interpolated for ninety-seven degrees of freedom from Table XI, Walker and Lev (68, p. 470). Those values are 0.166 and 0.23 for the 0.05 and 0.01 levels of significance, respectively.
Table 2. Empirical hypotheses and correlations

<table>
<thead>
<tr>
<th>Measure of cohesion</th>
<th>Correlationa</th>
<th>Measure of deprivation</th>
<th>Correlation</th>
<th>Measure of ambiguity</th>
</tr>
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<td>Average Income</td>
<td>- 56**</td>
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<td>Relative Income</td>
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<td>- 30**</td>
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</table>

aFirst sign indicates predicted relationship; + indicates direct, - inverse. Decimals have been omitted. Level of significance is denoted by one and two asterisks for the 0.05 and 0.01 levels, respectively.

bCorrelations between measures of cohesion and ambiguity are in parentheses.
Table 2. (Continued)

<table>
<thead>
<tr>
<th>Measure of cohesion</th>
<th>Correlationa</th>
<th>Measure of deprivation</th>
<th>Correlation</th>
<th>Measure of ambiguity</th>
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<td>+ 52**</td>
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<td>Tenant Farms</td>
</tr>
<tr>
<td>Net Migration</td>
<td>+ 45**</td>
<td>Average Income</td>
<td>+ 50**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Net Migration</td>
<td>+ 32**</td>
<td>Relative Income</td>
<td>+ 56**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Net Migration</td>
<td>+ -23*</td>
<td>Change in Income</td>
<td>+ -27**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Net Migration</td>
<td>- -20</td>
<td>Variation in Income</td>
<td>- -25**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Church Membership</td>
<td>+ 26**</td>
<td>Average Income</td>
<td>+ 50**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Church Membership</td>
<td>+ -06</td>
<td>Relative Income</td>
<td>+ 56**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Church Membership</td>
<td>+ -08</td>
<td>Change in Income</td>
<td>+ -27**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Church Membership</td>
<td>- -24**</td>
<td>Variation in Income</td>
<td>- -25**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Fundamentalism</td>
<td>- -24**</td>
<td>Average Income</td>
<td>+ 50**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Fundamentalism</td>
<td>- 15</td>
<td>Relative Income</td>
<td>+ 56**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Fundamentalism</td>
<td>- 02</td>
<td>Change in Income</td>
<td>+ -27**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Fundamentalism</td>
<td>+ -15</td>
<td>Variation in Income</td>
<td>- -25**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Fundamentalism</td>
<td>+ -15</td>
<td>Variation in Income</td>
<td>- -25**</td>
<td>Population Density</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Table 2. (Continued)

<table>
<thead>
<tr>
<th>Measure of cohesion</th>
<th>Correlation(^a)</th>
<th>Measure of deprivation</th>
<th>Correlation</th>
<th>Measure of ambiguity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criminal Committals</td>
<td>-01</td>
<td>Average Income</td>
<td>+50**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Criminal Committals</td>
<td>-19(^*)</td>
<td>Relative Income</td>
<td>+56**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Criminal Committals</td>
<td>-07</td>
<td>Change in Income</td>
<td>+27**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Criminal Committals</td>
<td>-14</td>
<td>Variation in Income</td>
<td>-25**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Mental Committals</td>
<td>-15</td>
<td>Average Income</td>
<td>+50**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Mental Committals</td>
<td>-08</td>
<td>Relative Income</td>
<td>+56**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Mental Committals</td>
<td>-00</td>
<td>Change in Income</td>
<td>-27**</td>
<td>Population Density</td>
</tr>
<tr>
<td>Mental Committals</td>
<td>-04</td>
<td>Variation in Income</td>
<td>-25**</td>
<td>Population Density</td>
</tr>
</tbody>
</table>

\(^a\) Correlation coefficients
Between pairs of variables is the correlation between the two variables which existed for the counties of Iowa based on data reported for the 1950-1960 period. Given also are the correlations between the measures of cohesion and ambiguity. Correlations significant at the 0.05 level are designated by an asterisk; those significant at the 0.01 level are so designated by a double asterisk.

Nine of the sixty statements of hypothesized relationships with sets of three variables have been supported by significant correlations. Six of those nine relate net migration as a measure of cohesion to self-employed and population density, measures of ambiguity, through average income, relative income, and variation in income as measures of deprivation. Church membership is related to tenant farms both through average income and variation in income. The ninth hypothesis supported by the data relates fundamentalism to tenant farms through average income.

Although the data do not support every empirical hypothesis, most of the significant correlations have been predicted by the theory. The nine hypotheses supported by the data account for eighteen of the twenty-eight different significant correlations reported in Table 2. Six additional correlations can be accounted for by four other hypotheses, those relating net migration to self-employed and population density through relative income. Though the data do not support the
hypotheses, the correlations associated with each hypothesis are consistent with each other. Change in income, intended to be a negative measure of deprivation, appears to have acted as a positive measure. Criminal committals seems to have been an ambiguous measure of cohesion acting in the two hypotheses above as if a positive measure of cohesion while in others acting as the negative measure it was intended to be.

The four significant correlations that have not been accounted for by the hypotheses relate measures of cohesion and ambiguity. Of the four, the correlation of -0.29 between criminal committals and tenant farms is the most significant and in the hypothesized direction. In the factor analysis these two variables are shown to be meaningfully related through average income. The remaining three correlations are opposite to the directions hypothesized for them, but are of only slight significance.

Factor Analysis

Fifteen variables have been factor analyzed. In the process of factoring the variables, two clusters of variables were formed with the first composed of five variables; net migration, average income, self-employed, population density, and education. The second cluster contained fundamentalism, farm replacement ratios and church membership. The remaining seven variables were not clustered because they showed no large common correlation among themselves or with the other
Factor analysis of the two clusters yielded three factors—a general and one specific for each cluster. Rotation of the factors against each other led to the elimination of one factor as all loadings dropped from the factor except the loading for variation in income. The first factor which appears to be basically a rural-urban factor was rotated to the point where population density and self-employed, essentially an index of the size of the rural population, loaded maximally on that factor. This gives a factor characterized by high population density, high relative income, high education, high net migration, high average income, some unemployment, some criminal committals, relatively low income change and income variation, and low self-employed.

The second factor has high loadings for farm replacement ratios, church membership, tenant farms, and average income accompanied by fairly high negative loadings for variation in income, criminal committals, and fundamentalism.

Two other factors and three couplets have been taken from the remaining residuals in an attempt to reduce the residuals to zero. The loadings for all of the factors and couplets are presented in the appendix with the original correlation matrix, the residual matrix, and an interpretation of the factors. The loadings for the first two factors and the first couplet which are most relevant to the present study are
Table 3. Selected factor loadings for the fifteen variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factors I</th>
<th>Loadings*</th>
<th>Couplet</th>
<th>Loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Net migration</td>
<td>73</td>
<td>10</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>f Average income</td>
<td>66</td>
<td>69</td>
<td>-15</td>
<td></td>
</tr>
<tr>
<td>j Self-employed</td>
<td>-88</td>
<td>-03</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>l Population density</td>
<td>80</td>
<td>01</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>m Education</td>
<td>70</td>
<td>-10</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>c Fundamentalism</td>
<td>18</td>
<td>-51</td>
<td>-20</td>
<td></td>
</tr>
<tr>
<td>n Farm replacement ratios</td>
<td>-20</td>
<td>78</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>b Church membership</td>
<td>-23</td>
<td>66</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>o Unemployed</td>
<td>42</td>
<td>-14</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>k Tenant farms</td>
<td>-12</td>
<td>65</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>h Change in income</td>
<td>-29</td>
<td>-14</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>i Variation in income</td>
<td>-30</td>
<td>-26</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>g Relative income</td>
<td>70</td>
<td>15</td>
<td>-40</td>
<td></td>
</tr>
<tr>
<td>d Criminal committals</td>
<td>45</td>
<td>-39</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>e Mental committals</td>
<td>-15</td>
<td>-04</td>
<td>00</td>
<td></td>
</tr>
</tbody>
</table>

*Decimal points omitted.

presented in Table 3.

The variables loading on the first two factors have been briefly noted. Relatively high loadings for tenant farms, education, and self-employed accompanied by relatively low unemployment characterize the third factor. The fourth factor brings back the relatively high loading for variation in income which was left isolated when the original factors were rotated. Other loadings on the factor are low and would appear to account for a small portion of variance common to
the variables which were not clustered.

The three couplets account for relatively high residuals left between relative income and net migration, income change and income variation, and criminal committals and mental committals. The first relationship is negative, the following two positive. The factors of particular relevance to the further consideration of the findings of this study are the first two and the first couplet since each encompasses two or more of the variables which have been related in the empirical hypotheses.

The loadings of net migration, average income, relative income, self-employed, and population density on the first factor are such that the hypotheses relating those variables have been supported. The loading of variation in income, though lesser than those of the other variables, is strong enough in a direction consistent with the other loadings to also yield significant correlations with those variables.

The second factor has loadings from church membership, fundamentalism, criminal committals, average income, and tenant farms which are consistent with the general hypotheses so that the empirical hypotheses relating these variables have been supported. The hypothesis relating criminal committals, average income, and tenant farms is not supported by the zero-order correlations, however, because of the direct relationship between criminal committals and average income on the
first factor which balances their predicted inverse relationship on the second factor. Variation in income loads strongly enough so that significant correlations of variation in income with average income and tenant farms are accounted for by the factor.

The first couplet relates net migration inversely with relative income with no common relationship of the variables to a measure of ambiguity. None of the other factors or couplets bear significant loadings from more than one of the general conceptual variables.
DISCUSSION

This discussion will be directed toward two ends; a further consideration of the empirical hypotheses in the light of the correlational analysis and the factor analysis, and an evaluation of the applicability of the theoretical and methodological approach to the analysis of migration.

The Empirical Hypotheses

The relationships among the measures of the general conceptual variables suggest that several variables, notably change in income, criminal committals, and mental committals and to a lesser extent church membership and fundamentalism, are either invalid, ambiguous, or insensitive measures of the general concepts.

The empirical hypotheses yielded no significant correlations between mental committals and any other variable. Both criminal committals and change in income are related to other variables in directions opposite to those predicted, two of those other variables being self-employed and population density. Fundamentalism and church membership also tended toward correlations with self-employed and population density opposite to the expected. Relatively high criminal committals low income change, low church membership, and high fundamentalism tend to be associated with high population density and low self-employed which characterize the urban pole of the
first factor.

Though these relationships are not consistent with the theoretical framework, they may not be totally unexpected. The problem of the definition and reporting of crime has often been noted (12, p. 161; 31, p. 115). While urban areas are generally characterized by higher crime rates than are rural, no evidence has been published which would conclusively demonstrate that actual violations of the law are greater in number in either environment. If a difference in the rates of actual violations does exist, a theory such as that offered by Sutherland (58) may account for more criminal deviancy in a system characterized by a lower level of deprivation when that system is large enough to maintain a permanent criminal population which may serve as a reference for behavior.

Fundamentalism, as indicated by the presence of religious sects, is only weakly associated with urbanism, if at all. If it is related to urbanism, the positive relationship may follow in part as a reaction to less fundamentalism in the established urban church as compared to the traditional rural church. The answer to deprivation which in the city may be offered only by the sect, may be offered in the rural community by the established church. Insofar as this is true, the slight relationship between church membership and self-employed may represent a religious response to deprivation in the rural community.
Change in income during the 1950-1960 decade tended to be greater for the more rural counties. This suggests that some narrowing of the gap between rural and urban incomes did occur. The loss of population through migration has been interpreted by some as an adaptive mechanism for the social system which presumably will result in larger shares of the rewards being available for the population that remains. Migration losses as a rural phenomenon do appear related to a slight tendency toward income gains for the rural Iowa counties. Because income change will likely follow attempts to adapt to deprivation, its use here as a measure of deprivation itself seems inappropriate. Income change during the preceding 1940-1950 decade might offer a better measure of deprivation in the 1950-1960 decade. The use of the 1950 average family income data as the base for computing the percentage change in income tends, also, to magnify the gains of the poorer counties, equal increases in income for low and high income counties giving higher rates of change for the lower income county when the rates are based on incomes at the start of the period of change.

Mental committals failed to correlate significantly with any other variable in a hypothesized relationship. Because mental committals from any given county in a year are very few in number and the numbers vary greatly from year to year, the major portion of the variance among the counties in rates of
mental committals is likely due to random variation such as differences in administrative and court decisions. More reliable indices of mental illness would be expected to show higher correlations with the other variables used in this study. The basing of the index on committals to state institutions ignores committals to private institutions and non-committals which may reflect a major portion of mental illness.

The suggested idiosyncracies of the variables noted here, criminal committals, fundamentalism, church membership, change in income, and mental committals, would account for most of the failures of the hypotheses to predict the empirical relationships.

Evaluation and Suggestions for Further Research

With the empirical relationships among the variables clarified, attention may now appropriately be directed to a consideration and evaluation of the usefulness of this approach to the analysis of migration and to suggestions for further research.

Theory and methodology

The findings of the present study can be meaningfully interpreted in terms of the theoretical framework. An extension of the present theory and some changes in the methodology could improve the effectiveness of the approach as an
analytical tool.

The present theory should be extended to make possible the prediction of the selectivity of ambiguity and deprivation with respect to the mode or modes of adaptation used in adjusting to deprivation. The findings indicate that net migration as indicative of a mechanism of adjustment is related to a different set of variables than are church membership, fundamentalism, and criminal committals. While net migration exhibits a county-to-county variation which accompanies the rural-urban characteristics of the county, the other measures of cohesion appear to vary more by area of the state than by county. This difference may reflect a relationship between particular modes of adaptation and particular structural characteristics of social systems. The findings suggest that migration as a between systems adjustment may serve as an alternative to the internal adjustments indicated by the other measures of cohesion.

Several methodological problems are apparent. Fundamentalism, criminal committals, and mental committals are based on data taken from the extremes of the modes of adaptation Merton refers to as rebellion, innovation, and retreatism. Because the actual number of persons displaying behavior that would be recorded as one of these three is small, the measures may be relatively insensitive and consequently include a relatively large degree of error in their variation from
county-to-county. Only the most gross relationships will be apparent under such circumstances.

The common loadings of church membership, fundamentalism, and criminal committals on the second factor in contrast to the loading of net migration on the first factor suggest the possibility of combining the measures of internal adaptation to deprivation in one index.

Change in income, developed as a negative measure of deprivation, is in fact for Iowa over the ten year period studied correlated negatively with the urban characteristics of the first factor, and thus, behaves as if it were a positive measure of deprivation rather than negative. On the other hand, variation in income also correlates negatively with the urban characteristics and thus, correlates as predicted with several measures of cohesion and ambiguity. Those correlations are now, however, independent of fairly large common correlations with average income, so the relationship of variation in income to other variables is probably spurious.

The proportions of the total variance accounted for in each measure of cohesion varies considerably from essentially none in mental committals to perhaps three-fourths in net migration. (See the communalities for the variables in the appendix.) The failure to account for larger proportions can be expected to stem from many sources. Besides inadequacies of the variables themselves as measures of the conceptual
variables, other value systems may be involved than the economic. Modes of adaptation other than those included in this analysis may offer important alternatives to those considered.

The findings of the study suggest four steps that might be taken to increase the effectiveness of the present approach to the analysis of the social system. The theoretical framework needs to be extended to permit the prediction of the selectivity of particular modes of adaptation. More sensitive measures of the general conceptual variables would make the application of controls, both in design and in analysis, to the data fruitful. Other systems of values in addition to the economic values might be used to advantage if adequate measures of deprivation within those systems can be developed. Finally, indices of other types of conforming of non-conforming behavior might be developed as measures of cohesion. Using Merton's typology again would make a measure of ritualism desirable. The extension of that typology by Dubin offers a number of additional types of non-conforming patterns for which measures might be developed.

**Analysis of migration**

Factor analysis of the variables used as measures of the general concepts indicates that all of the significant correlations for hypotheses involving migration, including the two correlations not consistent with the hypotheses, may
be accounted for on the basis of the loadings of the variables on one common factor, the first, which is the rural-urban factor. Net migration and tenant farms, related in the remaining hypotheses not accounted for by the first factor, do not load on a common factor, and thus, no significant zero-order correlations are reported for them.

In addition to the heavy loading toward the urban pole of the first factor, net migration also loads on a couplet involving relative income. The communality for net migration is 0.79, indicating that the factors and couplets drawn from the analysis account for seventy-nine percent of the variance in net migration among the counties of Iowa between 1950 and 1960. Thus, if perfect correlates of the factor and couplet on which net migration loads most heavily were available, approximately three-fourths of the variance in net migration could be accounted for using those measures as predictors.

The factor involved is the rural-urban factor, and as has been noted, the variables generally load on the factor in a pattern consistent with the theoretical framework. The couplet relates net migration and relative income inversely, contrary to their expected relationship and contrary to their relationship on the first factor. This indicates that if the general theoretical relationships still hold true, relative income is not a pure negative index of deprivation as loading on this couplet, or that net migration is not a positive index
of deprivation as loading on this couplet, or that net migra-
tion is not a positive index of cohesion. The former seems
more tenable.

The couplet has been interpreted as distinguishing
between the counties bordering the densely populated, indus-
trial, metropolitan counties of the state and those counties
relatively isolated from the metropolitan areas. While such
proximity would be expected to raise expectations, it may at
the same time offer the economic opportunity to fulfill those
expectations, negating the deprivation that would be expected
to follow increased expectations. Insofar as this is true,
predictions of net migration based solely on the first factor
will tend to under-estimate net migration for those counties
which border the more urban counties of Iowa.

The various measures of deprivation did not make inde-
pendent contributions to the determination of net migration.
The relationships of average income, relative income, change
in income, and variation in income to net migration can all
be accounted for in terms of their common loading on the
rural-urban factor. Only relative income was related to net
migration independently of the first factor, and that relation-
ship was apparently not due to low relative income serving as
an indicator of deprivation. The loadings of the measures of
deprivation on the first factor indicate that economic
variables were related to migration. These variables do not
fully account for the loading of net migration on the rural-urban factor, however. More refined indices of economic deprivation might increase the loading of economic deprivation in general on that factor. The possibility also exists that the loading of net migration on the factor reflects other deprivation than a purely economic variety. A more precise definition of the factor and the relationships among the variables loading on it would depend upon a more intensive analysis of correlates of the factor determined from a larger number of variables than were included in the present study.

If migration from a system depends upon the perception of greater opportunity somewhere outside the system, then the failure to migrate could reflect the lack of perceived opportunities. This lack of perceived opportunities may result when areas of the state, rather than scattered counties, are characterized by deprivation, so that opportunities are farther away than the neighboring counties. In order that deprivation may occur without migration, cultural goals and expectations must be transmitted more effectively to those areas than information concerning opportunities elsewhere. The present study has not attempted to predict the differential use of various modes of adaptation to deprivation, but the findings indicate that such differentials exist.

The findings of the present study suggest several immediate steps that might be taken in an effort to predict
net migration for Iowa counties between 1950 and 1960. The communality for net migration indicates that given strong correlates for the first factor and the couplet, a fair proportion of the variance among the counties may be explained. The selection of good indices would depend in part upon a clearer definition of the couplet. This could be the object of a replication of the present factor analysis, but with the inclusion of a number of selected variables in the matrix which could be expected to better define the factor and couplet.

If the couplet does discriminate on the basis of proximity to large urban centers, then self-employed might be used as the best index for the rural-urban factor, and the average self-employed of the counties bordering the system might conceivably be used as an index of the couplet, both being related inversely to net migration. Of the two predictors might be replaced by one based upon an index which combines urbanization and distance, reducing to a P/D migration relationship. If such is possible, the present study may serve as a step toward bridging the gap between those studies that have emphasized the socio-economic correlates of migration and those that have searched for empirical laws relating migration to such variables as population and distance.

For the factor analysis, three variables were added to
the original twelve measures of the general conceptual variables. Education and unemployed both correlate positively with net migration in the present study, the correlations being accounted for by the common loading of the variables on the rural-urban factor. Farm replacement ratio loaded on the second factor which is free of net migration, so no correlation is found between net migration and farm replacement ratio. Though the three variables contributed to the interpretation of the factors, they make little contribution to the analysis independent of the variables used as measures of the general concepts.
The preceding chapters have reviewed the previous research from which the present study has developed, presented the theoretical framework for the analysis of migration, described the methodology used in the analysis, and presented and discussed the findings of that analysis. Migration and related phenomena have been popular subjects of sociological and demographic inquiry. Research has been directed toward the delineation of migration streams. Researchers have shown interest in the selectivity of migration with respect to a variety of social and economic characteristics of migrants. More recently concern has been shown for the consequences of migration for the migrants and for the systems which experience major losses and gains in populations because of the movement. A fourth direction of interest has led to attempts to establish empirical laws relating migration to variables such as population size and distance.

Though these studies have all made contributions to the present understanding of migration as a social phenomenon, the studies have generally failed to make any contributions to the development of a theory which would systematically account for migration as one among many social phenomena. The analysis by Nasrat from which the present study takes its direction, is an exception to those in that the analysis demonstrated the application of a systematic theory relating
two general social system concepts to migration. The present study has elaborated upon that work by Nasrat.

Three general concepts have been defined as variables and inter-related through three general hypotheses. Cohesion has been defined as the degree to which units of a social system accept the roles prescribed by the system; deprivation as the degree to which achievement expectations exceed the achievement actualities; and ambiguity as the degree to which roles in the system remain undefined.

The concepts are social system concepts. The social system has been defined as a population of units cooperating to solve a problem. Units participate in the social system, conforming to the social structure, with the expectation of being rewarded for their efforts. The qualitative aspects of the reward expectations are defined by the cultural values; the quantitative aspects of the expectations are defined by a variety of determinants which include; the definition of the social position itself, the experiences of others within and outside the system, and the past experience of the unit. The quantity of rewards actually available to the units of a system depends in part upon how appropriately the social structure is defined with respect to the problems it faces given the characteristics of the units in the system. The role structure of the system must bring the abilities of the units within the system to bear in a coordinated effort upon
the problem.

The general hypothesis relating the three general conceptual variables is stated: cohesion varies inversely with deprivation which varies directly with ambiguity. The first part of the general hypothesis, cohesion varies inversely with deprivation, is based on the premise that if participation in a system results in smaller rewards than were anticipated, the units are less likely to continue to conform to the prescribed roles. The second part of the hypothesis, deprivation varies directly with ambiguity, is based on the premise that a system that is characterized by inadequately defined roles relative to other systems will not as effectively bring the abilities of the units to bear on the problems, resulting in a smaller portion of rewards actually being obtained and deprivation relative to those other systems.

Deviancy in response to deprivation may manifest itself in several forms which basically involve rejection of the cultural values or of the prescribed means for obtaining those goals. The present definition of cohesion does not encompass a mode of adaptation which has been referred to as "ritualism" which involves a rejection of the cultural goals, but not of the means. Cohesion does encompass those modes of adaptation which involve rejection of or substitution for the means prescribed by the system.
The ninety-nine Iowa counties were selected as social system to be analyzed in this study. Twelve indices were developed as empirical measures of the three general concepts. The indices include five for cohesion; net migration, church membership, fundamentalism, criminal committals, and mental committals. The first two are positive measures of cohesion, the last three negative. All five indices are expressed as rates based on the 1950 population of the counties. Data are for the period between 1950 and 1960.

Four indices measure deprivation; average family income, relative income, change in income, and variation in income. The first three are negative measures of deprivation, variation in income is a positive measure. Relative income was calculated as the ratio of average family income to the average income for the bordering counties. Change in income was calculated as the percentage change in average income between 1950 and 1960. Variation in income was calculated as the average of the three largest percentage annual changes in income between 1950 and 1960.

Three indices measure ambiguity; the percentage of employed who are self-employed, the percentage of farms that are tenant operated, and the population density. Self-employed is a negative measure of ambiguity while the last two are positive measures.

Sixty empirical hypotheses have been stated, each
hypothesis relating three indices in a statement parallel to the general hypothesis whose concepts they measure. Two techniques have been used to analyze the data. Zero-order product moment correlations were obtained for the various pairs of related variables, and these correlations were used to test the empirical hypotheses. The second technique involved the factor analyzing of the variables to obtain patterns of common loadings of the variables on factors that could be used to interpret the relationships among the variables.

Of the sixty empirical hypotheses stated, nine have been supported by statistically significant correlations. The factor analysis indicates that another can also be supported if other variables are controlled. Empirical hypotheses involving net migration as a measure of cohesion, average income as a measure of deprivation, and self-employed or population density as a measure of ambiguity have generally been supported. Eighteen of twenty-eight significant correlations have been predicted by the theory.

The factor analysis of the variables offers a general picture of the relationships among the variables related in the hypotheses. Three variables, median education, unemployed and rural-farm male replacement ratios were added to the twelve indices of general concepts for the factor analysis. Four factors and three couplets have been drawn from the
correlation matrix in an attempt to reduce the correlation residuals to zero. Two factors and one couplet are particularly relevant to the interpretation of the relationships among the variables related in the hypotheses.

The first factor has high positive loadings from net migration, average income, population density, education, and relative income, and a fairly high loading from criminal committals. Self-employed has a high negative loading, and change in income and variation in income have slight negative loadings. The factor has been interpreted as a bipolar rural-urban factor.

A slight loading of church membership toward the rural pole of the factor, a slight loading of fundamentalism toward the urban pole of the factor, and a fairly strong loading of criminal committals toward the urban pole explain the failure of several hypotheses to be supported by the zero-order correlations, since all three variables load opposite to those expected from the theoretical framework.

The second factor has high positive loadings for average income, farm replacement ratios, church membership, and tenant farms accompanied by fairly high negative loadings for criminal committals and fundamentalism. It has been interpreted as dichotomizing populations in northern and southern Iowa which reflect different cultural heritages.

One couplet relates relative income and net migration
inversely, contrary to the hypothesized relationship between
the two. The factor appears related to the presence of
commuting populations developing in the counties bordering
the large metropolitan counties. Better definition of the
couplet depends upon finding other correlates of the factor.

The factor analysis indicates that net migration loads on
two factors, the rural-urban factor and a couplet interpreted
as related to proximity to metropolitan counties. Approxim­
mately three-fourths of the variation of net migration among
the counties of Iowa between 1950 and 1960 can be accounted
for by these two factors.

The interpretation of the factors from the factor
analysis has tended to be speculative since the variables
selected for analysis were not selected with factor analysis
in mind, but rather to serve as measures of the general
concepts. The inclusion of a larger number of relevant
variables in a re-analysis of the indices analyzed here
would aid in defining those factors.

The findings of the study suggest several areas where
refinements in the approach are necessary if the type of
analysis used is to prove fruitful for the prediction of
various types of adaptation, including migration, to depriv­
ation. The theoretical framework must be further developed
to permit the prediction of selectivity in the use of adaptive
mechanisms relative to value configurations and structural
characteristics. More valid and more sensitive measures of the conceptual variables are necessary if any relationships other than the strongest are to be detected. Other value systems may require consideration in the development of measures of deprivation. More refined typologies of adaptation may be used as a basis for selecting measures of cohesion. The concept of ambiguity might be more precisely defined or perhaps replaced by a number of more specific structural concepts. In general, the problems associated with the general approach to analysis are more in the realm of methodology than of theory.

Thus, the present study suggests the possibility that an extension of the analysis started here may lead to an integration of the research findings of the sociologist who correlates migration to other socio-economic variables and the demographer who prefers to search for empirical laws relating migration to population and distance.


42. Mauldin, W. Parker. Selective migration from small towns. Amer. Soc. Rev. 5: 748-758. 1940.


47. The social system. Glencoe, Ill., Free Press. 1951.


50. Sanford, Gilbert A. Selective migration in a rural Alabama community. Amer. Soc. Rev. 5: 759-766. 1940.


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APPENDIX
Table 4. Correlation matrix and residual matrix*

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*Decimals have been omitted.
Table 5. Factor loadings for the fifteen variables

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*Decimals have been omitted.
Interpretation of Factors

The first factor, characterized by high population density, high education, high relative income, high average income, high net migration, relatively high criminal committals, relatively high unemployed, low self-employed, and relatively low income change and income variation, is a bipolar rural-urban factor. The loadings for population density and self-employed, 0.80 and -0.88, respectively, identify it as such. Polk, Scott, Linn, and Woodbury counties are strongly characterized by the variables associated with the urban pole of the factor with Black Hawk, Cerro Gordo, Clinton, Marshall, and Webster only slightly so. Pure examples of the rural pole of the factor are not as readily identified, apparently because the rural counties tend to be characterized by one or more of the other factors, also. Adams, Wayne, and Worth counties best represent the rural pole of the factor in that they combine characteristics which tend toward the rural extreme for each of the variables loading on the factor.

The second factor may also be bipolar. Several of the variables loading on the factor appear related to a general value configuration. Average income, church membership, tenant farms, fundamentalism, and criminal rates, which load on the factor, may be interpreted in terms of a general bipolar value system emphasizing on eht one hand monetary
success and conformity in terms of church participation accompanied by non-deviancy as indicated by low fundamentalism and criminal committals. The values of the opposite pole would center around the ownership of land as indicated by low proportions of farms tenant operated.

The counties that are characterized by high average income, high farm replacement ratios, high church membership, high tenant farms, and relatively low fundamentalism and criminal committals include a large number of northwest Iowa counties, almost all of those having no urban center, and a scattering of north central, northeast, and west central counties. Representative of these counties are: Ida, Lyon, Sioux, and Pocahontas in the northwest; Hancock, Winnebago, and Wright in the north central; Bremer, Butler, and Delaware in the northeast; and Carroll, Crawford, and Shelby in the west central area.

The opposite end of the same factor, characterized by low farm tenants, low average income, low farm replacement ratios, and low church membership accompanied by higher criminal committals and fundamentalism, appears concentrated in a group of south central Iowa counties which include Clarke, Decatur, Lucas, Wayne, and Warren and spread east and west from those so that the most southern Iowa counties show the general characteristics of this pole of the factor.

The factor would appear to be related to a distinct
dichotomy between north and south Iowa. Historically, this dichotomization may be related to the general pattern of settlement in Iowa. Bauder (2) has noted that the eastern and southern counties of the state were settled first and were settled predominantly by native born populations moving from the east central states. Northern Iowa was settled later in the nineteenth century by populations which included large numbers of migrants from northern Europe. The two migrant streams could be expected to have different systems of values, though as Bauder has indicated, little is known about the value systems held by these two populations in Iowa. The factor defined here would support the thesis that there is a difference between the two sections of the state, but offers only a few clues as to the nature of the difference.

If the difference in proportions of tenant farms reflects a difference in general orientations to the land, low tenant farms indicating a high value placed on the ownership of land and high tenant farms an orientation toward the use of land for the attainment of other goals, then the value system found in the northern counties could be construed as oriented toward monetary success within the limitations of a system of moral values which encourage church membership, and perhaps parenthood, and restrict fundamentalism and criminal committals. The use of land rather than the ownership of
land would contribute more directly to monetary success within the system. This pole of the factor would then suggest some manifestations of the "Protestant Ethic" as the concept was developed by Weber (69). Insofar as high average income can be taken to represent worldly success and insofar as high church membership accompanied by low fundamentalism and criminal committals can be taken to indicate the presence of an ethical system, a system of regulatory norms, that sanctions the attainment of worldly success, the ethical system would bear some resemblance to the Protestant ethic.

If the factor is bipolar, the one end of the factor would be expected to exhibit the presence of some characteristics rather than the absence of the characteristics of the other end. The low proportion of tenant farms has been offered here as indicating the presence of a positive value placed on the ownership of land. If such a value is associated with behavior that is dysfunctional with respect to other cultural goals, so that average income may be low as a result of the maintenance of owner-operated farms that are smaller than can be efficiently and profitably operated, then the relatively high fundamentalism and criminal committals and low church membership would be expected responses to deprivation, insofar as the culturally defined goals include monetary success. Net migration as an indication of out-
migration might also be expected to load on the factor. Its failure to do suggests that information that would influence expectations may travel more readily than information concerning opportunities outside of the area.

The topography and generally less productive soils of southern Iowa are also likely to have consequences for the effectiveness of farming operations in that area. Economically rewarding farming as it occurs in northern Iowa may be an impossibility on a widespread basis in southern Iowa, given the present agricultural technology.

The third factor would appear to involve the combination of relatively high unemployment with few tenant farms in systems where education and self-employed tend to be low. Inspection of the original data for the counties of Iowa indicates that such a pattern characterizes some of the more industrialized counties of southeast and east Iowa, notably Wapello, Lee, Des Moines, Muscatine, and Dubuque counties. A few less industrialized counties are also similar with respect to those characteristics, including Lucas, Appanoose, and Jackson. The pattern would appear to represent a combination of relatively high value placed on ownership of land, as opposed to tenancy, with the relatively high unemployment and low self-employment of industrial areas. Past migration has left an older residual population which is characterized by less education.
Conversely, a number of northwest Iowa counties tend to balance these southern and eastern counties, having relatively high farm tenancy, low unemployment, high education, and high self-employed. These counties are predominantly rural, do not have extensive industry, and are characterized by higher education than would be expected for rural populations. Among the counties with these characteristics are Calhoun, Clay, Dickenson, Emmet, Greene, Hamilton, and Sac.

The variance held in common by the variables loading on this third factor would appear to be situational and not the result of any inherent relationship among the variables.

The relatively high loading of income variation on the fourth factor suggests that this factor may be more related to the procedures involved in the year to year adjustments of income data made by the research staff of Sales Management magazine from which the income data were taken than to any intrinsic characteristic of income variation itself. The factor does account for a small portion of common variance among the variables not included in the original clusters of variables.

In addition to the four factors, three couplets have been taken from the residuals. The first couplet results from a negative relationship between relative income and net migration. Two types of counties appear to be characterized by such a relationship between the two variables. A number of
counties, particularly a few in eastern Iowa, are characterized by low relative income and high net migration. Representative of these are Bremer, Cedar, Grundy, Jackson, and Jones, all of which are counties bordering on at least one and in most cases two or more of the metropolitan counties of Iowa. Their income is low relative to that of their metropolitan neighbors. The higher net migration would seem readily explained as a function of the attraction of the metropolitan areas for commuting populations, the metropolitan counties offering sources of employment that could support commuting workers from the neighboring counties, thus reducing migration losses for those neighboring counties. If such is the case, the percentage of workers self-employed in those counties would be expected to have declined during the 1950-1960 decade.

A scattering of western Iowa counties, counties which are relatively isolated from the larger urban centers of the state yet which have urban centers that are large relative to their neighbors, are characterized by high relative incomes combined with low net migration. Thus, the factor suggests that a number of Iowa counties have been able to retain their population size because of their nearness to the large metropolitan center of the state. Other counties have suffered greater population losses than would be predicted on the basis of their other characteristics because of their
relative isolation from those metropolitan areas.

A couplet between income change and income variation results from the accumulation of large variations in income, which generally represented increases in income, into large income changes over the ten year period. A final couplet between criminal committals and mental committals may be the result of one or more sources of common variation. The most likely source would be in the reporting and committal practices of the various counties with respect to criminal and mental cases. Because both involve court procedures, the common variance may be due to similarities in the handling of the cases within a given county or court, and differentials among those counties and courts throughout the state.

Particularly relevant to the present study are the first two factors and the first couplet, each of which involves two or more of the measures related in the empirical hypotheses.