THE CONSTRUCTION OF A RURAL-URBAN INDEX

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CHAPTER I

INTRODUCTION

Problem

In Europe and in the United States where an urban way of life seems to be spreading rapidly and dominating to a greater or lesser degree all areas, the interest in the processes of social and cultural change known as urbanization and the product or way of life known as urbanism has been an active one among sociologists and others. Some have passed value judgments upon this process. Some have seen in growing urbanism a threat to our family structure, to neighborhood and community life, to moral integration, and even to our civilization. Especially in the United States, where the shift from a primarily rural to a predominantly urban society has occurred within the span of a single lifetime, the phenomenon has been so dramatic as to command the attention of layman and social scientist alike, for it has profoundly influenced every phase of life.

> It is these changes and their ramifications that invite the attention of the sociologist to the study of the differences between the rural and the urban mode of living. The pursuit of this interest is an indispensable prerequisite for the comprehension and possible mastery of some of the most crucial contemporary problems of social life since it is likely to furnish one of the most revealing perspectives for the understanding of the ongoing changes in human nature and the social order.[1]

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[1] Louis Wirth, "Urbanism as a Way of Life," American Journal of Sociology, XLIV (July, 1938), 2.

Many sociologists have described in qualitative terms what they have observed to be the characteristic differences between a typically rural people and a typically urban population or between a rural and an urban way of life. Almost every textbook dealing with rural sociology, urban sociology, or general sociology devotes a section to describing in qualitative or demographic terms "rural-urban differences," usually employing the rural-urban dichotomy of the population used by the Bureau of the Census. A more recent practice, however, is to speak of rural-urban differences as forming a continuum of degrees of urbanness ranging from extreme urbanness in the large metropolis to extreme rurality in the most remote and least urbanized rural community.[2]

Loomis and Beegle have developed a 10-point Gemeinschaft-Gesellschaft scale to aid judges in rating social systems, such as the El Cerrito Ditch Association or a Division of the U. S. Department of Agriculture, with respect to a number of criteria.[3] Queen and Carpenter have developed an Index of Urbanism based upon the arithmetic average of the percentages of the population of a county living in places of a given size or larger. The Index is composed of ten place size categories ranging from "500 and over" to "500,000 and over." These investigators hypothesize a rural-urban continuum[4] and

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[2] E. Gordon Ericksen, Urban Behavior (1954), Chap. II. Charles P. Loomis and J. Allan Beegle, Rural Social Systems (1950), p. 20. Stuart A. Queen and David B. Carpenter, The American City (1953), Chap. III. Robert Redfield, "The Folk Society," American Journal of Sociology, LII (January 1947), 294. T. Lynn Smith, Sociology of Rural Life, 3rd ed. (1953), p. 17. Wirth, op. cit., p. 3.

[3] Loomis and Beegle, op. cit., Appendix A.

[4] Queen and Carpenter, op. cit., p. 28.

have made a useful contribution toward developing a research tool which is a great improvement over the Census Bureau's rural-urban dichotomy. The Queen and Carpenter Index will be discussed in Chapter V. Here it will simply be pointed out that the Index of Urbanism is based upon the single dimension of population concentration.

Shevsky and Williams constructed a composite index to measure the "degree of urbanization" of population aggregates found in census tracts in Los Angeles.[5] The index combines three variables: 1) fertility ratio: $\frac{\text{Number of children under five}}{\text{Number of women (15-44)}}$, 2) proportion of females 14 years old and over who are in the labor force, and 3) percentage of dwelling units which are single-family detached structures. These indices were based upon the assumptions that the lower the fertility ratio, the larger the proportion of women in the labor force, and the lower the proportion of single-family dwelling units, the greater the degree of urbanization. While the authors recognized that an index of urbanization must measure factors other than population size and density, they fail to report how they happened to select these particular indices for the purpose.

Miner states that lack of adequate scales for measuring the traits which define the folk-urban continuum was the most serious methodological limitation in his recent study of Timbuctoo.[6] A number of observers have pointed out that one of the needs of sociology as a science is the development of more objective measuring instruments. Dr. Margaret Hagood has this to say:

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[5] Eshref Shevsky and Marilyn Williams, The Social Areas of Los Angeles (1949), Chap. IV.

[6] Horace Miner, The Primitive City of Timbuctoo (1953), p. 267.

> It seems that through the careful construction and standardization of indexes, the sociologist will be able best to meet the challenge in the allegation that sociology can never become scientific because science demands measurement, while many of the phenomena of sociology are not the sort that can be counted or measured. By developing instruments for indirectly measuring these nonmeasurables, usually through measuring some of their more tangible correlatives, sociologists may be able to gain more precise and verifiable knowledge about them and their interrelations.[7]

It was with these two primary interests in mind that the problem of the present study was formulated, namely, 1) an interest in rural-urban differences and the theory of gradual urbanization, and 2) an interest in the development of more objective measuring instruments for the use of social investigators. A preliminary statement of the problem was: If there is a process of the gradual urbanization of a population, as many writers assume, then it should be possible to devise a scale or index by means of which degrees of this phenomenon could be detected and compared.

To narrow the scope of the problem, several limits were established for this study. 1) It was decided to limit the study to the population of the United States. It is not assumed that the index which was developed has any validity for populations outside the United States. It is now the judgment of the writer that the inquiry should have been limited to only one section of the United States in an attempt to bring greater socio-cultural homogeneity into the sample. However, this remains a matter of opinion until someone carries through a similar experiment with regional populations and compares the results with this and other studies of the United States

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[7] Margaret Jarman Hagood, Statistics for Sociologists (1941), p. 243.

as a whole. 2) It was decided to use 1950 Census tabulations as the primary source of data. This material was rapidly becoming available when the study was originally planned. One reason for using Census data instead of collecting original data by means of an interviewing program was the tremendous difference in cost. The Census data was recent and would permit of a sample drawn from a much wider geographic area than would an interviewing program. Moreover, the objective was the development of a research tool which could be used by investigators in widely separated parts of the country. Another criterion was that the instrument be relatively simple to administer. The Census material is readily available to anyone, and therefore, it has a distinct practical advantage over data privately collected. 3) From the outset it was obvious that the present study would have to be largely exploratory and methodological, that any indices of urbanism which were developed would be tentative, and that the scores arrived at could in no sense be considered norms but only first approximations. While it had originally been planned to work with larger samples, the number of units was reduced as the large amount of necessary computations became clear. It cannot be too strongly emphasized, therefore, that the specific results of this study should be viewed as extremely tentative until the method can be tested with larger samples, norms established, and the indices further validated.

A discussion of the choice of population units or segments for comparison will be given in Chapter II. After the advantages and disadvantages of various kinds of units had been weighed, it was decided to use the Census Bureau's unit, "standard metropolitan area"

(hereafter designated by the letters "SMA"), and "counties outside of SMA's."

The problem of the present study, then, within the limits just outlined, might be stated as follows: To construct a composite index which will help to answer the following question, namely, relatively how rural or how urban is the socio-cultural structure of the population of a given county or SMA in the United States?

Central Concepts and Assumptions

No attempt will be made to outline the author's entire frame of reference. However, a few key concepts will be defined and a few assumptions basic to the investigation will be made explicit. For the purposes of this study Wirth's definitions of city, urbanism and urbanization will be used. "For sociological purposes a city may be defined as a relatively large, dense, and permanent settlement of socially heterogeneous individuals." Urbanism is "that complex of traits which makes up the characteristic mode of life in cities." Urbanization is the development and extension of urbanism.[8] Then, by contrast, ruralism is that complex of traits which makes up the mode of life least like urbanism.

A few of the major assumptions upon which the present study is based are the following:

1) It was assumed that urbanism and ruralism in the United States are not completely different ways of life, that is, it was assumed that urbanism and ruralism constitute a continuum of varying degrees of urbanness and ruralness rather than a dichotomy.

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[8] Wirth, op. cit., pp. 7-8.

2) It was assumed that population size and concentration are inadequate measures of urbanism or ruralism, especially outside the larger SMA's.

3) It was assumed that rural-urban differences are differences in both ecological characteristics and socio-cultural characteristics, including social attitudes. It was further assumed that all aspects of human behavior are so interrelated that demographic and ecological characteristics of a population may be taken as indices of socio-cultural structure and of attitudes.

4) Since rural-urban differences are differences not only in ecological characteristics but are differences in a "way of life," including values and attitudes, it was assumed that indices constructed from Census data would eventually have to be validated by comparison with the actual values and attitudes of the people concerned.

5) Finally, it was assumed that socio-cultural structure everywhere is always changing, even though the change is so slow that the structure appears to be static. Hence, any generalizations made about socio-cultural structure as of April, 1950, will be only relatively or partially true, if not wholly untrue, at any later date.

The Constructed Type

As the problem of this study was approached, one of the first methodological considerations was that of identifying the phenomenon or set of conditions which was to be measured, that is, urbanism and ruralism. From the first assumption stated above it follows that some degree of urbanism may be found in every county and SMA in the United States. The same would be true for ruralism. It appeared advisable to set forth in greater detail than was done in the preliminary

definitions given above the "key" characteristics which seemed to the writer to distinguish urbanism as a way of life most clearly from ruralism as a way of life.[9] Such constructed types could then be used as sets of criteria for the selection of observational units to be included in a purposive sample. If it were possible to select a sample of extremely urban units on the one hand and a sample of extremely rural units on the other, a comparison of the Census data collected from these extreme samples might reveal consistent differences which, given a sufficiently large number of units, could be presumed to be indices of urbanism or ruralism. At any rate, this was the working hypothesis of the present study.

As a methodological tool, then, and as a means of clarifying the meaning of the important concepts of urbanism and ruralism, an attempt was made to formulate "constructed types" for 1) an extremely urban way of life, and 2) an extremely rural way of life, both in the United States today. These types were constructed after a manner similar to that followed by Redfield in his construction of the ideal "folk society."

> The ideal folk society could be defined through assembling, in the imagination, the characters which are logically opposite those which are to be found in the modern city, only if we had first some knowledge of nonurban peoples to permit us to determine what, indeed, are the characteristic features of modern city living. The complete procedure requires us to gain acquaintance with many folk societies in many parts of the world and to set down in words general enough to describe most of them those characteristics which they have in common with each other and which the modern city does not have.

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[9] The practical utility of such "sponge" types as urbanism and ruralism has been questioned. For example, see Loomis and Beegle, op. cit., pp. 9-10. It is believed that the methodological utility of these type constructs will become clear in the chapters which follow.

> In short we move from folk society to folk society, asking ourselves what it is about them that makes them like each other and different from the modern city....
>
> Anyone attempting to describe the ideal folk society must take account of and in large degree include certain characterizations which have been made by many students, each of whom has been attentive to some but not to all aspects of the contrast between folk and modern urban society.[10]

If the phrase "rural way of life" were substituted in the Redfield quotation for "folk society" and if the study were confined to the United States, one would have roughly the procedure used in constructing the urban and rural types of the present study.

Perhaps a brief discussion of the constructed type as a research tool is called for at this point.[11] It should be clear by this time that the type construct as it has been used here is different in some respects from the ideal type construct employed by Max Weber. Weber seems to have conceived the ideal type construct as an instrument primarily for laying bare and accentuating the important cultural motifs and ideals of a people during a given historical epoch. Perhaps the principal distinction lies in a difference in the purpose for which the construct was used. Weber recommended the use of the ideal type to get at the "significance" or meaning of cultural phenomena to the actors involved. This "significance" he felt could often be brought out most clearly by comparing empirical data with an ideal limiting case.[12] Furthermore, he seemed to be interested

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[10] Redfield, op. cit., p. 294.

[11] For a bibliography on the constructed type method, see Don Martindale and Elio D. Monachesi, Elements of Sociology (1951), p. 64n.

[12] Max Weber, The Methodology of the Social Sciences (trans. and ed. by Edward A. Shils and Henry A. Finch, 1949), p. 94.

chiefly in accentuating the rational aspects of social action and in the demonstration of causal relationships.[13]

With these exceptions the types which the present writer has constructed meet most of the criteria of Weber's ideal type. An operational definition of the ideal type as given by Weber will assist with the comparison.

> An ideal type is formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified analytical construct (Gedankenbild). In its conceptual purity, this mental construct (Gedankenbild) cannot be found empirically anywhere in reality.[14]

Our constructed type, like Weber's ideal type, is not a statistical average of the characteristics of urban or rural populations but rather accentuates those socio-cultural traits considered, for the purposes of the present study, to be typical of the extreme or limiting case. For similar reasons, our constructed type is more than a simple class or generic concept composed of traits common to many urban or rural populations. While the characteristics which make up our urban and rural types are undoubtedly possessed in common by a number of population units, those characteristics which were considered to be significant for the purposes of this study were accentuated, while other characteristics held in common by these population units but not considered significant for present purposes were omitted.[15]

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[13] Harry Elmer Barnes (ed.), An Introduction to the History of Sociology (1948), pp. 291-92. Martindale and Monachesi, op. cit., p. 37.

[14] Weber, op. cit., p. 90.

[15] Cf. ibid., p. 100.

Again, with Weber one should point out that no value-judgment is intended in our comparison of the urban and rural types and that these are "ideal types" only in the logical sense that they are mental constructs and do not correspond in detail to any empirical reality.

However, as it has been indicated, these type constructs are abstracted from empirical observations and must point back to concrete reality, that is, the existence of a population with characteristics closely approximating those of our type construct should be not only possible but highly probable. Since the term "ideal" has created considerable semantic and metaphysical confusion,[16] the term "constructed type" shall be used in lieu of "ideal type." Becker's term "constructed type" will serve our purpose nicely. "Such types are made of 'criteria' (so-called elements, traits, aspects, and so on) which have discoverable referents in the empirical world or can legitimately be inferred from empirical evidence, or both."[17] In another paper Becker makes the notion of a constructed type crystal-clear by means of the following illustration:

> It is perhaps permissible to liken this constructed type to the sort of image of the "pure type" Airedale or Percheron that a judge of dogs or of horses carries around in his head as the basis for his "objective" system of scoring for points. He has never seen a "pure type" Percheron or Airedale, but he has seen numerous close empirical approximations of his constructed types. In fact, he has built up these constructed types on the basis of numerous observations.[18]

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[16] Cf. Howard Becker, Through Values to Social Interpretation (1950), p. 107n.

[17] Ibid., p. 218.

[18] Ibid., p. 108.

Urbanism--A Constructed Type

We have adopted for our purposes Wirth's definition of the city and his "theory of urbanism" as set forth in his article "Urbanism as a Way of Life."[19] In this article Wirth brings together and integrates most of the generalizations about the distinctive features of urban living which had been made previously by Park, Simmel and others. For this reason, a number of the criteria for our constructed type for urbanism have been drawn from Wirth's article. The ideas borrowed will not be footnoted separately. In fact, most of these criteria are so much a part of the common store of sociological theory that it seems rather pointless to attempt to document them in detail.

"For sociological purposes a city may be defined as a relatively large, dense, and permanent settlement of socially heterogeneous individuals."[20] Wirth rightly points out that population size and density alone are not enough to account for the complex of characteristics which have come to be recognized as the urban way of life. Heterogeneity must also be included as a requirement. The kind and degree of heterogeneity found in large cities in the United States cannot be wholly accounted for by population size and density. Since the populations of large cities have not been reproducing themselves, replacements must be recruited from rural areas, other cities, or from other countries. With the ease of present-day transportation, these recruits who come from widely-scattered places, represent great diversity of biological and cultural characteristics. The complex

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[19] Wirth, op. cit., pp. 8-18.

[20] Ibid., p. 8.

division of labor and occupational specialization of the large city attracts persons who are different because their peculiarities make them useful.

The factors of population size, density, and heterogeneity are so interrelated that it seems rather fruitless to attempt to account for some of the features of urbanism by size of the population aggregate, other features by concentration of the population, and still others by the heterogeneity of the people, as Wirth has done. In setting up a constructed type for urbanism, the model used for our constructed type for ruralism, which had been formulated earlier, was roughly followed. In this way it was possible to contrast one type with the other as its logical opposite. It should be kept in mind, however, that these polar constructs, while they are intended to accentuate important distinguishing characteristics, are not intended to exaggerate those characteristics beyond what might be expected to be found in some city in the United States today. The writer has no rationale for the particular order in which the criteria were listed. Any other order would have served as well.

With respect to the criteria of size and concentration of the population aggregate, urbanism implies large numbers of people and high population density. However, it would not be accurate to say that the larger the size of a place or the higher the density of a population unit, the greater would be the degree of urbanness. Especially in more sparsely settled counties, urbanness would not necessarily vary directly with population size and density. In the larger cities, say those having a population of 100,000 and over, other things being equal, it is likely that there is a direct

association between urbanism and each of these two criteria, but this is only an untested hypothesis. Moreover, "other things" are never equal in population aggregates of this size, or any size.

On the whole there would be little physical isolation in our constructed-type-city (hereafter designated by "CT-city"). With the exception of a few "shut-ins" each individual has many physical contacts with others. He need only step outside his apartment or house and he cannot avoid physical proximity to others. The urban resident also has many social contacts when compared with those of a person in an extremely rural area.

An important complex of socio-cultural characteristics of urbanism have to do with the economic organization and the division of labor. In the United States the economy of the metropolis may be primarily industrial or primarily commercial. It will probably be a combination of both with a great many persons employed in personal, business, and public services. In any event, it will most certainly be non-agricultural, if we limit the meaning of the word agriculture to the raising of plants and animals. In the CT-city there is little direct contact with nature. The striking feature of the physical environment is its artificiality, that is, it is man-made.

Urbanism involves a very complex occupational structure and great specialization of labor. Durkheim saw this as a function of increased concentration of population. It is also associated with the development of a money economy and the measurement of everything in terms of its monetary value. The family rarely works as a unit in the CT-city. Each working member of the family is usually employed at

a different location at a different specialized job or profession, so that there is little sharing of vocational interests.

The outstanding feature of the urban family, when compared with the constructed type rural family, is the relative weakness of kinship ties beyond the immediate conjugal unit. Even members of the immediate family group frequently have very different interests, belong to different voluntary associations, and actually spend little time together. In the CT-city the aged rarely live with their children during their declining years but receive institutional care when they are no longer able to maintain a domicile of their own.

In many parts of the metropolis neighborhood relations can hardly be said to exist. Even if we grant that neighborhoods do exist in the large city,[21] certainly social relations between neighbors are less personal than those found in the extremely rural neighborhoods where almost everyone knows everyone else on a "first name" basis. There is little exchange of work and mutual aid in urban neighborhoods. There may be a sense of locality belonging on the part of relatively permanent residents, but certainly there cannot be said to be much homogeneity of attitudes and values.

Many observers have pointed out that the greater number of social contacts and the higher rate of social interaction in the larger city has had a profound influence on the way of life of urban people. Segmentation of social roles is the result, because persons do not have an opportunity to interact with their complete personalities. Social contacts are impersonal, superficial, transitory,

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[21] Cf. Robert E. Park, Ernest W. Burgess, and Roderick D. McKenzie, The City (1925), pp. 6-9.

segmental. Most contacts are with secondary groups rather than with primary groups. Patterns of social interaction are to a large extent "standardized." People cultivate stereotyped reactions to artificial symbols. They react to the "uniform" of a functionary and not to the man. Simmel suggested that it is by the maintenance of reserve in his contacts with others that the city dweller preserves the social distance and personal freedom that makes urban living with its multiplicity of nervous stimuli bearable.[22] Finally, business relations in the CT-city are predominantly formal, contractual, impersonal.

Social control in the large city depends more upon formal mechanisms, such as the police and court systems, than upon the informal community pressure emanating from a commonly accepted set of ends and values. Durkheim's insight to the effect that cities necessarily develop "organic solidarity" as a result of a complex division of labor with the resulting interdependence among the residents has been generally accepted in sociological theory.[23] It would seem that most observers have agreed that moral integration tends to become less as population size and density increase. However, Angell found that "once a population of 100,000 is passed, the size is not negatively related to moral integration."[24] Nevertheless, he did find a high correlation between moral integration and territorial mobility.

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[22] Georg Simmel, "The Metropolis and Mental Life," (trans. by Kurt H. Wolff) in Paul K. Hatt and Albert J. Reiss, Jr. (eds.), Reader in Urban Sociology (1951), p. 568.

[23] Émile Durkheim, The Division of Labor in Society (trans. by George Simpson 1933).

[24] Robert Cooley Angell, "The Moral Integration of American Cities," American Journal of Sociology, LVII (July, 1951), Part 2, p. 15.

Since heterogeneity is one of the chief criteria of urbanism in the present study, it has been assumed that our CT-city would have a much lower degree of moral integration than our CT-rural community. This relatively low degree of moral integration has usually been associated with various types of socially deviant behavior, such as crimes and suicide,[25] so one should expect to find higher rates of crime and juvenile delinquency, suicide, divorce, and so on, in the metropolis than in the extremely rural area. Moreover, there seems to be a greater moral tolerance and flexibility in the great city. This is an aspect of the whole complex of attitudes and values known as secularization.

Wirth and others have shown how socio-cultural differentiation is a function of crowding large numbers of people together in a limited space. Individual differences are encouraged and developed by an intricate division of labor. A high rate of social interaction stimulates intellectual development of some individuals to such an extent as further to set them apart from their fellows. The heterogeneity of recruits from the outside adds to the heterogeneity developing from those processes which are taking place within the large city. Along with the development of individual bio-social differences goes the widening of status differences. Persons of similar interests and abilities tend to "flock together." The class structure, while not as rigid in the CT-city as in the CT-rural community, reveals extreme strata which are more widely separated.

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[25] For example, see Austin L. Porterfield and Robert H. Talbert, Crime, Suicide and Social Well-Being in Your State and City (1948). Austin L. Porterfield, "Suicide and Crime in Folk and Secular Society," American Journal of Sociology, LVII (January, 1952), 331-38. Emile Durkheim, Suicide (trans. and ed. by George Simpson 1951).

Closely associated with the social and occupational differentiation of the urban population goes the proliferation of voluntary associations, corporations, and special interest groups, each organized in terms of explicitly formulated objectives and rules of procedure.[26]

The urban population has generally been thought of as both physically and socially mobile. Because of the high degree of occupational specialization workers are required to travel about a great deal to find jobs for which they are best qualified. Also, in a population of great heterogeneity of all kinds and considerable freedom for competition there is bound to be a constant shifting and sifting going on as individuals seek to adjust themselves to their physical and social environment. In our CT-city there would be a relatively high territorial mobility and, of greater significance, there would be high status mobility as individuals moved up and down the social ladder. Moreover, there would be much changing of jobs without necessarily a change in status. This might be called inter-occupational mobility.

Several observers have held that certain attitudes are characteristic of urban people. Only a few which were thought to be representative will be indicated. Simmel described, as characteristic of the urbanite, the "blase attitude," that is, a blunting of one's discriminability, which he believed to be partly the result of the multiplicity of stimuli to which the nervous system is daily exposed and partly to the leveling effect of the money economy. An attitude of "reserve" with an overtone of hidden aversion serves as a shield against unwanted stimuli and makes life in a crowded city bearable.

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[26] Martindale and Monachesi, op. cit., p. 402.

Related to these attitudes is that of impersonality or the absence of sentiment in dealing with most persons and things. Park pointed out that reflective thinking, as distinguished from the pre-logical thinking of pre-literate or illiterate peoples, is a product of urban living. The attitude of the residents of large cities is to view the relationship of means to ends largely in the rationalistic and deterministic terms of modern science.[27] Traditions are not sacred. Change is welcomed. Where all things are measured in terms of money and where so many people are dependent upon one another, attitudes of approval toward punctuality, precision, efficiency, and calculability are probably encouraged.[28] Other attitudes could be mentioned but perhaps these are enough for the present purpose.

Ruralism--A Constructed Type

While the extremely rural way of life in the United States today in its distinctive features would logically be the direct opposite to urbanism by definition, it was felt that there might be some heuristic advantage in describing in broad outline the salient features of the rural type separately. Actually, the criteria for this type were roughly formulated prior to the urbanism type. A great many sources were surveyed for criteria of ruralism. The writer drew so heavily upon several authors that he wishes to make special acknowledgment here. Separate footnotes will not be given for the ideas borrowed. Redfield's generalizations about the folk society were constantly kept in mind and used where it was believed they applied

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[27] Robert E. Park, "Magic, Mentality and City Life" in Park, et al., op. cit., pp. 123-41.

[28] Simmel, op. cit., pp. 563-74.

to our constructed type rural community in the United States today (hereafter designated the "CT-rural community").[29] Ferdinand Tönnies' characterization of Gemeinschaft was always in the background of our thinking.[30] Closely related to Tönnies' work and frequently suggestive were the components of the Familistic Gemeinschaft ideal type formulated by Loomis and Beegle.[31] Because the writer was privileged to have a course with Professor Howard Becker, he has drawn upon class notes and Becker's essays on the "sacred society" where possible. A list of characteristics which Sorokin and Zimmerman included a quarter century ago in their Principles of Rural-Urban Sociology as typical of rural life and rural people is still reflected in many textbooks on rural sociology. The writer has drawn heavily upon that list.[32] Nelson gives a somewhat different list of typically rural characteristics which was helpful throughout.[33]

While place of residence alone is not a sufficient criterion of ruralism, the degree of isolation from urban influences is certainly a major condition for the retention of a rural way of life. Consequently, our CT-rural community would be as isolated as it is possible to be in present day America from these influences. There would be a minimum of communication with urbanized people. In this country where it has been customary for farmers to live on the land

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[29] Redfield, op. cit., pp. 293-308.

[30] Ferdinand Tönnies, Fundamental Concepts of Sociology (trans. by C. P. Loomis 1940).

[31] Loomis and Beegle, op. cit., Appendix A.

[32] Pitirim A. Sorokin and Carle C. Zimmerman, Principles of Rural-Urban Sociology, 1929, p. 13-58.

[33] Lowry Nelson, Rural Sociology (1952), pp. 24 ff.

rather than in villages, it is likely that extreme ruralism would be found where a majority of the population lived on farms.

The occupational structure of a people is basically and reciprocally related to their way of life. While extreme ruralism might be associated with other occupations, such as fishing or forestry, it was assumed that the predominant occupation of the most extremely rural county in this country would probably be basic agriculture, that is, the raising of plants and animals. In any case, extreme ruralism involves direct contact with nature most of the time. The farmer spends a much larger percentage of his time interacting with nature than he does with people. It is true in modern America that he spends much of his time using artifacts, such as machines, but he uses them directly upon the soil, plants, or animals. Unlike many urban workers, the farmer is still close enough to nature that he must adapt his activities constantly to the raw biological and meteorological forces of nature. In the CT-rural community there is a relatively simple division of labor. Occupational activities and knowledge are diverse and relatively unspecialized. Most persons understand all phases of the farming enterprise and see it whole.

Moreover, all members of the family are involved in, and therefore interested in, the agricultural enterprise. For this reason and because of fewer social contacts outside the family, extremely rural people tend to be more family-centered than urbanites. This familism includes greater importance being attached to kinship relations beyond the immediate family and greater likelihood that the aged will be cared for in the homes of children or other kin than in institutions.

In our CT-rural community one would expect to find a rather strong sense of neighborhood belonging and a high degree of consensus. Many attitudes and sentiments would be held in common by a majority of members of the neighborhood. Social interaction with neighbors would be of the primary group type with mutual aid and exchange of work commonly practiced.[34]

As in the neighborhood, so throughout the extremely rural community, social contacts would be relatively fewer, more personal, and more durable than they would be in the CT-city. The lower rate of social interaction and the smaller number of social stimuli would permit and even encourage the rural resident to interact as an integrated personality rather than segmentally. Almost every person with whom the ruralite interacts has a well-recognized status in the community, a status toward which others can react with clear-cut sentiments. Considerable is known about the personal history of each member of the community, his function in the community, his strengths and his weaknesses. Uniforms and other standardized symbols are unnecessary. Patterns of social interaction are less "standardized" than they are in the city. Even business relations tend to be informal, relying to a great extent upon verbal contract and custom.

Tradition and informal community pressures are the predominant mechanisms of social control. Gossip and the fear of gossip is a more effective deterrent than laws and the courts. Here we would expect to find a relatively high degree of moral integration and a minimum of the types of socially deviant behavior frequently associated with

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[34] John H. Kolb and Edmund deS. Brunner, A Study of Rural Society (1952), pp. 173-76.

"social disorganization." The "ideal" moral norms and the "real" behavior patterns more nearly coincide than they do in the metropolis. Finally, the rural conception of morality tends to be inflexible. The moral traditions are sacred.[35]

It has been emphasized by many sociologists[36] that conditions of urban living stimulate social differentiation and encourage individuation. In the small, intimate rural community, on the other hand, behavior extremes of all kinds are discouraged and the individual who is "different" is not socially approved. While socio-cultural homogeneity in our CT-rural community would be far from complete, there would be a much weaker tendency toward social differentiation than in the city. With less specialization and intensification of interests, the number and variety of voluntary associations would be less.[37] Such institutionalized groups that do exist are small in size and relatively simple in structure. Their functions tend to be comparatively general and unspecialized, the general store being an example. In these associations formalized rules and regulations are stressed less than in their urban counterparts, while informal interpersonal relations play a more important role. Some kind of social class structure would undoubtedly be found to exist but it is likely that the range of class differences would be relatively less. At the

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[35] Paul H. Landis, Rural Life in Process (2d ed. 1948), p. 94.

[36] Wirth, op. cit., p. 14.

[37] Herbert Goldhamer, "Voluntary Associations in the United States," in Paul K. Hatt and Albert J. Reiss, Jr. (eds.), Reader in Urban Sociology (1951), pp. 505-11.

same time the status structure would be more stable. It would be more difficult for a person to move from one status group to another.[38]

One factor in the low status mobility is the fact that the simple division of labor does not provide an occupational ladder to higher status. There is little shifting of occupations for those who spend their entire lives in the CT-rural community. Likewise, it has generally been accepted that there is relatively less territorial mobility in the very rural area.

Attitudes which have been associated with extreme ruralism include resistance to change, independence, practicality, conservatism, and a fatalistic attitude. There is by no means agreement among observers as to rural attitudes. Compared to the attitudes of the majority of our CT-urban population, it was assumed that extremely rural people would be more tradition-oriented. They would exhibit a much greater resistance to changes of most kinds. The farming enterprise is somewhat more self-sufficient than most urban occupations and this might encourage an attitude of independence. The symbiotic relationships which exist between the farm family and others in the larger community are not daily quite as obvious nor quite as direct as they are for the city dweller. On the other hand, mutual aid is quite prevalent in extremely rural communities, indicating a cooperative attitude. Mutual aid in such cases may be largely a function of a situation in which needed help is not available for hire, and hence, services must be exchanged, as goods are exchanged, on a barter basis. While rural people are frequently believed to be more conservative with respect to politics, religion, education, foreign affairs, and so on,

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[38] Smith, op. cit., Chap. II.

this hypothesis has not been adequately tested. The farmer's dependence upon natural forces over which he has little control is probably associated with a tendency to take a fatalistic, if not a superstitious, attitude toward those forces.[39]

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[39] Carl C. Taylor, et al., Rural Life in the United States (1949), pp. 497-505. James Mickel Williams, Our Rural Heritage (1925) especially Chap. XXV.

CHAPTER II

PILOT STUDY

In Chapter I we stated that the problem of the study was to construct a composite index which would help to answer the question: Relatively how rural or how urban is the socio-cultural structure of the population of a given county or standard metropolitan area in the United States? To select the component indices of such a measure we proposed to compare the demographic and socio-cultural characteristics of a sample of extremely urban units with a sample of extremely rural units. To assist in the selection of these extreme samples, we set up in broad outline a constructed type of the most urban population which we could imagine existing in the United States today. This has been labeled the CT-city for brevity. In a similar manner we outlined the characteristics of the most rural population we could imagine in the United States today, the CT-rural community. With the aid of these constructed types a number of hypotheses were formulated with respect to the comparative demographic and socio-cultural characteristics of the urban and rural populations. The next task was to select a number of indices which would discriminate most efficiently between units of the urban sample and units of the rural sample. As a device for exploring sources of data and making a preliminary selection of indices, we developed the pilot study which will be described in the present chapter.

Observational Units

For reasons given in Chapter I, it was decided to utilize data already published instead of data collected for the express purpose of constructing the Index. Hence, the availability of suitable data became one of the principal criteria for the choice of population units. For instance, the township did not appear to be a satisfactory unit for our purpose, because many kinds of data were not tabulated for townships. For the rural sample the county seemed to be the population unit best suited to our study. However, at the extremely urban end of the rural-urban continuum the county as a unit had the disadvantage of being in many cases only a segment of the urban community, which we assume to be an organic whole. To use a census tract, a county, or even the incorporated part of a city as representative of the urban community as a whole would violate this assumption of organic unity. The new unit, the "urbanized area,"[1] was delineated by the Census Bureau to include the legal city plus its "urban fringe." This unit possessed the advantages 1) of perhaps being fairly representative of the urban community, and 2) of being more homogeneous with respect to some characteristics than the standard metropolitan area.

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[1] Each urbanized area contains one or more cities of 50,000 or more inhabitants, together with the following types of areas if they are contiguous to the central city or cities or if they are contiguous to any area already included in the urban fringe: 1) Incorporated places with 2,500 or more inhabitants. 2) Incorporated places with less than 2,500 inhabitants containing a concentration of 100 or more dwelling units with a density of 500 units or more per square mile. 3) Unincorporated territory with at least 500 dwelling units per square mile. 4) Territory devoted to commercial, industrial, transportational, recreational, and other purposes functionally related to the central city. Other noncontiguous areas having 500 dwelling units per square mile which lie within certain spatial limits beyond the contiguous urbanized part are also included. For complete definition, see U. S. Bureau of the Census, County and City Data Book, 1952, Appendix B, p. 552.

However, if data published by agencies other than the Bureau of the Census were to be utilized, we believed that it would be most difficult to assemble such data for "urbanized areas." On the other hand, since the boundaries of standard metropolitan areas[2] follow county lines, it would be simple to combine data tabulated on a county-wide basis to obtain enumerations for the larger urban unit. It was felt that the leveling effect obtained by the inclusion in the SMA of the relatively rural sections of the component counties outside the "urbanized area" would not seriously decrease the outstanding rural-urban differences which we believed to exist between populations at opposite poles of the continuum. After all, it seemed reasonable to assume that the way of life of even the "rural" residents of the larger SMA's would be rather highly urbanized. Consequently, we decided to use the county as the unit for the rural sample and the SMA for the urban sample. Parenthetically, we might say that we can see no reason why the "urbanized area" would not have served as well, as long as only 1950 Census data were used.

Universe

The next problem was to delimit the universe which was to be sampled. It has been stated that the study was to be limited to the United States. Of this territory we decided to eliminate the 29

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[2] Except in New England, a standard metropolitan area is a county or group of contiguous counties which contain at least one central city of 50,000 inhabitants or more. Contiguous counties are included in a SMA if according to certain criteria they are essentially metropolitan in character and sufficiently integrated with the central city. In New England SMA's have been delineated on a town rather than a county basis. For a more complete definition, see County and City Data Book, 1952, p. xi.

"independent" cities which are often included in Census Bureau tables for counties. We also eliminated the 4 federal areas, including the District of Columbia, because we did not consider them to be comparable to counties or SMA's elsewhere in the United States.[3] This left a universe of 3070 counties in the United States in 1950, 274 inside 167 SMA's and 2796 outside SMA's. For sampling purposes this universe was divided into two sub-universes as follows: a) 167 standard metropolitan areas, excluding Washington, D.C., and b) 2796 counties outside of standard metropolitan areas.

Selection of Pilot Sample

For the pilot study, as for the experimental study which was to follow, we wished to find a group of SMA's whose characteristics approximated as closely as possible those of the CT-city and a group of rural counties whose socio-cultural structure was similar to that of the CT-rural community. It was a simple task to select the urban part of this purposive sample. For the pilot study we simply used the 10 most populous SMA's from a list ranking the SMA's according to total population[4]. This urban sample included the following SMA's: New York--Northeast New Jersey, Chicago, Los Angeles, Philadelphia, Detroit, Boston, San Francisco--Oakland, Pittsburg, St. Louis, and Cleveland.

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[3] Our reason for doing this was that we did not consider these independent cities comparable in socio-cultural structure to counties and SMA's. For instance, 17 of the independent cities in Virginia each have less than 25,000 inhabitants. Seven of the 29 cities were included in our universe as parts of SMA's. Washington SMA was omitted because its demographic make-up and its socio-cultural structure was thought to be extremely unlike any other American SMA. The three federal areas excluded in addition to the District of Columbia were all within the boundaries of Yellowstone Park. See U. S. Bureau of the Census, County and City Data Book, 1952, Appendix B, p. 552.

[4] See Clarence E. Ridley, et al. (eds.), Municipal Yearbook (1952), Table 2, p. 27.

To select a sample of extremely rural units was not so simple. Criteria of population size and density, accessibility, proportion of the population engaged in agriculture, and percentage of rural farm residence were set up. It soon became obvious that population size and density were largely meaningless as indicators of degree of ruralness when applied to whole counties. For instance, the population per square mile was found to be less for most of the counties in the Mountain and Pacific States than for the most sparsely settled counties of the South Atlantic and East South Central States. We felt that physical and social isolation was an important criterion of rurality but we were not convinced that distance from urban places was an accurate index of accessibility. Accessibility is also limited by the number and condition of highways, railroads, and bus lines, by cultural factors, by topography, and by climatic conditions. For example, communities in the northern states are somewhat more isolated during winter when roads become blocked by snow. It seems reasonable that a community relatively isolated in the mountains somewhere by the absence of good roads might possess more of the characteristics of the CT-rural community than one equi-distant from a city of 50,000 population to which it was connected with a super-highway, fast trains, and frequent buses. Even a high percentage of rural farm residence and employment in agriculture do not seem adequate criteria. For example, a farm population in the dairy area or in the Corn Belt, especially if the county were close to a large city, might have attitudes and values which were quite urban.

After some experimentation we finally settled upon the following criteria for the selection of 10 counties to represent the CT-rural community for the pilot study:

1) Counties having the highest percentage of rural farm residence, provided:

2) Sixty-five per cent or more of the population were engaged in agriculture;

3) There were no places in the county with a population of 2,500 or more;

4) The county was 100 or more miles distant from any city of 100,000 or more population (Mountainous roads and other barriers to transportation might permit decreasing this distance requirement);

5) The county was 50 or more miles from any city of 50,000 or more, subject to the same qualification as the fourth criterion; and

6) Not over 10 per cent of the land area of the county was in public lands, such as national forests, parks, or reservations.

While these criteria were adhered to for the most part, a few counties ranking higher in percentage of rural farm residence were passed over to obtain a wider geographic distribution. There was likewise some effort made to obtain units in several of the type-farming areas as delineated by the Bureau of Agricultural Economics.[5] The data for the selection of the rural counties used in the pilot study were taken from 1940 Census tabulations in the County and City Data Book, 1949.[6] This source was used because the 1950 data were not yet available when the study was begun. When the 1950 Census data became available the pilot study was carried out with these more recent data but it was not felt that it would be necessary to repeat the work

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[5] See Carl C. Taylor, et al., Rural Life in the United States (1949), Fig. 35, p. 340.

[6] U. S. Bureau of the Census, County and City Data Book, 1949, Table 3, pp. 74-381.

involved in selecting the rural sample. Counties which were selected with 1940 data in accordance with the criteria given above were the following: Baker, Georgia; Elliott, Kentucky; Jefferson Davis, Mississippi; Hickory, Missouri; Garfield, Montana; McPherson and Banner, Nebraska; Ashe, North Carolina; Oliver, North Dakota; and Borden, Texas.

Hypotheses

Using the constructed type urban and rural communities described in Chapter I as reference points, hypotheses were formulated regarding the demographic and socio-cultural characteristics of communities distributed along the continuum: The more urban a population

1) The more its population will depend upon a money economy.

2) The more will commerce and industry predominate over agriculture.

3) The more complex and specialized will be the division of labor.

4) The greater will be the proportion of women employed outside the home.

5) The lower will be the sex ratio.

6) The less will be the emphasis placed upon family relations.

7) The higher will be its median age.

8) The lower will be the proportion of persons in the upper and lower age brackets.

9) The more complex will be the technology of the equipment with which the dwelling units are furnished.

10) The greater will be its territorial mobility.

11) The more indirect and impersonal will be its forms of communication.

12) The greater will be the complexity of its mechanized forms of communication and transportation.

13) The greater will be its biological and cultural heterogeneity.

14) The more will formal training of the young be stressed.

15) The more highly differentiated will be the structure of its institutions.

16) The greater will be the disparity between the ideal cultural norms and actual behavior.

17) The more concentrated will be its population.

18) The more complex and impersonal will be the forms of social control.

Other hypotheses might have been formulated. These were some for which we thought we might be able to find measures.

Sources of Data

For the pilot study the following sources of data were used to construct indices suggested by the above hypotheses, that is, indices which were believed to discriminate consistently between the urban and rural units of the pilot sample:

1) U. S. Census of Population: 1950. Preprints of Volume II, Characteristics of the Population.

2) U. S. Census of Housing: 1950. Preprints of Volume I, General Characteristics.

3) U. S. Census of Business: 1948, Volumes I, III, V, and VII.

Preprints for the U. S. Census of Agriculture: 1950 were examined but the kinds of data collected by the Census of Agriculture were judged unsuitable for comparing rural counties with standard metropolitan areas. The County and City Data Book, 1952 was not available at the time that the pilot study was made.

Indices

Out of this 1950 Census data we constructed 73 simple indices which we thought to be related to the hypotheses given above. These indices were mostly in the form of percentages or ratios. All are presented in Appendix B, where they are listed under the hypothesis to which we feel they most closely relate. The data required for each index were copied on work sheets for the 10 SMA's and the 10 rural counties of the pilot sample. The percentages and ratios were then computed.

After carefully comparing these relative values for the urban units with those of the rural units by visual inspection and after consulting several sociologists, we discarded 37 of the indices without further statistical analysis. We will not attempt to set forth our reasons for dropping each of the 37 but a few examples will be given. Many were discarded because they failed to discriminate clearly or consistently between the rural and urban samples. For example, the index designed to measure mobility, viz., "Per cent of persons one year old and over who were in the same house in 1949 and 1950," revealed no noticeable difference between the two samples. A ranking of the percentages for the 20 units showed a great deal of overlapping. While the size of the sample was much too small to test

the hypothesis of mobility as an urban characteristic, the index did not appear to discriminate consistently, if at all, between extremely urban and extremely rural units.

Other indices were discarded because distributions obtained with the pilot sample appeared to be unreliable. For instance, percentage of the population which was 65 years old and over was 14.4 per cent for Hickory County and only 4.3 per cent for Borden County, while percentages for the SMA's ranged from 5.4 to 9.7 per cent. This measure seemed to be unstable, especially among the rural units.

To be a satisfactory measure an index should be such that values of greater or lesser magnitude can be found in all units of the distribution. A few indices were dropped because too many cells of our tables were without data. For example, it was found that none of the rural counties in the pilot sample had multiple dwellings with 10 or more dwelling units. The absence of data for the rural counties was found to be very prevalent in the Census of Business, where volume of sales and other financial data were often withheld to avoid disclosure of the records of individual firms. Another reason that indices involving money values were avoided was based upon the difficulties involved in adjusting for the changing value of the dollar. Our constant aim was to keep the index as simple to apply as possible.

Some indices were discarded for logical considerations. For example, after trying out the index of heterogeneity, viz., "Per cent of population who are classified as nonwhite," we decided that this was more closely related to regional differences than to rural-urban differences. The units located in the North had a low proportion of nonwhite while the units in the South had a high proportion, whether urban or rural.

Still others were dropped because they seemed to be measuring roughly the same aspect of the socio-cultural structure as another index which appeared to be more reliable. For instance, "per cent of employed persons who are farm laborers, unpaid family workers" was discarded in favor of "per cent of employed persons who are unpaid family workers." There seemed to be much more consistency in the values obtained for the latter.

Thus, with the aid of the pilot study the number of indices was reduced from 73 to 36. The 36 which were retained for the more rigorous statistical analysis of the experimental study are followed by tau correlation coefficients in Appendix B.

CHAPTER III

EXPERIMENTAL STUDY

After the preliminary selection of indices by means of the pilot study, it was necessary to devise a more rigorous technique for the purpose of eliminating those measures which would not discriminate consistently between extremely urban and extremely rural population units. To accomplish this objective we selected a sample one half of the units of which were as urban as we could find and the other half of which were as rural as we could find. The power of each simple index to discriminate consistently between the two classes of units in the sample was then tested statistically.

Selection of the Experimental Sample

While we originally planned to experiment with a sample of approximately 50 urban units and 50 rural units, we decided that we would not have time to do the computations for so large a sample. Since the study was to be primarily exploratory and methodological and was not to be definitive in any sense, it was decided that a sample of 35 to 40 units in all would be adequate.

We had not been satisfied with our method of selecting the rural units of the pilot sample. For the experimental sample rural sociologists at 18 agricultural colleges were requested to help select the "most rural" counties in their respective states. We believed

that a rural sociologist who had been working at a state agricultural college for a number of years would be fairly competent to make a rough judgment, in accordance with a set of general criteria as to which of the counties of his state were "most rural." Fully realizing that such a sample would necessarily be rough and would probably omit some of the most rural counties in the country, we decided that it would be adequate for our purpose.

Since our aim was to secure counties which were as rural as we could find and still have a rather wide geographic distribution, we had to set up criteria for selecting the states to be represented in our sample. For example, it seemed rather unlikely that the "most rural" county in a state such as Connecticut would be as rural as the "most rural" counties in states with a large percentage of the population living on farms and engaged in basic agriculture. To solve this problem a table was compiled showing a) the percentage of the population classified as "rural farm" by states,[1] and b) per cent of employed persons who were farmers and farm managers, farm foremen, and farm laborers, paid and unpaid, by states.[2] Percentages from this table were plotted on an outline map of the United States and studied for distribution.

At that time we were thinking in terms of a sample of 50 rural counties. To secure such a sample which was both as rural as possible and rather widely distributed geographically we could either a) select

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[1] Computed from U. S. Bureau of the Census, U. S. Census of Population: 1950, preprint of Vol. I Number of Inhabitants, Part I. U. S. Summary, Chap. 1, Table 15.

[2] Ibid., Vol. II Characteristics of the Population, Part I U. S. Summary, Chap. B, Table 79.

two counties each from 24 states, or b) choose three counties each from 17 states. We could obtain a 24-state sample by selecting those states which were over 16 per cent rural farm and had over 14 per cent engaged in farming, or we could obtain an 18-state sample by selecting only those states having over 19 per cent rural farm residents and over 20 per cent engaged in farming. We decided in favor of the 18-state sample. Letters were sent to rural sociologists in those states asking each to name three of the "most rural" counties in his state.

In requesting rural sociologists to make these selections, the writer felt that the homogeneity of the sample could be increased by furnishing them with a set of rather general criteria derived from the constructed type rural community. Consequently, a list of 33 such criteria was enclosed with a form letter and a blank for the reply.[3] These letters were mailed in June of 1953. While some had to be forwarded to summer addresses, replies from 17 states were received almost immediately. The reply from Iowa was received too late to be included in the sample.

After we decided to reduce the size of the experimental sample to 40 or less, a selection had to be made from among the 51 counties named by the rural sociologists. Since we were not interested in obtaining a random sample at this stage, we chose the simplest procedure of using the first county listed by each sociologist.

For the urban part of the sample, the 18 SMA's having the most populous urbanized areas, excluding Washington, D.C., were chosen.[4]

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[3] See Appendix A for copies of these forms.

[4] Source: U. S. Bureau of the Census, op. cit., Vol. I, Part I, Chap. 1, Table 18.

It was thought that the population size of the urbanized area would be a better criterion for obtaining the "most urban" SMA's than the population size of the entire standard metropolitan area, the criterion used in the pilot study. Eighteen SMA's were used to balance the 18 counties which were planned for the rural sample. Urban and rural units which were selected for the experimental sample by the means just described were the following:

EXPERIMENTAL SAMPLE

Standard Metropolitan Areas	Rural Counties
1. New York--Northeast New Jersey	1. Coosa, Alabama
2. Chicago	2. Newton, Arkansas
3. Los Angeles	3. Fannin, Georgia
4. Philadelphia	4. Clark, Idaho
5. Detroit	5. Nemaha, Kansas
6. Boston	6. Wolfe, Kentucky
7. San Francisco--Oakland	7. Dodge, Minnesota
8. Pittsburgh	8. Perry, Mississippi
9. St. Louis	9. Lake, Montana
10. Cleveland	10. Perkins, Nebraska
11. Baltimore	11. Greene, North Carolina
12. Minneapolis--St. Paul	12. Billings, North Dakota
13. Milwaukee	13. Grant, Oklahoma
14. Cincinnati	14. Clarendon, South Carolina
15. Buffalo	15. Mellette, South Dakota
16. Houston	16. Hancock, Tennessee
17. Kansas City	17. Crook, Wyoming
18. New Orleans	

Method of Item Selection

Since the experimental design called for a purposive sample of two widely-separated classes of units, techniques of item selection based upon the assumption of a normal distribution could not be used. A statistical technique which would test the relative power of simple indices to discriminate clearly between the rural and urban units in the experimental sample was needed. Kendall's coefficient of rank correlation (tau) seemed best suited to the requirements of the present study.[5]

The tau coefficient is designed to measure the degree of agreement or correspondence between two rankings. The numerical value of this coefficient must range between +1, which would indicate perfect agreement, and -1, which would indicate complete disagreement. To employ this technique of rank correlation some rules of rank order had to be set up. With the quantitative variables, we decided to consider the largest quantity in a given series as occupying the first rank and the smallest quantity the last rank. The problem was to compare a ranking of quantitative values (percentages or ratios) with a ranking of population units which had been, for the purposes of this phase of the study, arbitrarily labeled "urban" or "rural." The SMA's in the experimental sample were treated as if they were all of equal rank. Likewise, the rural counties of the sample were treated as if they were all of equal rank. Then, for the purpose of computing the tau coefficients, a rule was adopted that the urban units of this rural-urban dichotomy would rank first and the rural units would rank last. This meant that a positive tau coefficient would be obtained for variables

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[5] Maurice G. Kendall, Rank Correlation Methods (1948), Chaps. 1 and 3.

having higher values (percentages and ratios) for SMA's than for rural counties. Conversely, a negative coefficient would be obtained for variables having higher values for the rural counties than for the SMA's.

The formula which was used for computing the tau coefficients between the ranking of a set of index values and the rural-urban dichotomy of the experimental sample was the following:

$$\tau_b = \frac{S}{\sqrt{xy\left[\frac{1}{2}n\,(n-1) - U\right]}}$$

where S represents the actual amount of agreement or disagreement in the two rankings,[6] x the number of SMA's, y the number of rural counties, n the total number of units in the sample ($x + y$), and U the sum of deductions for tied ranks among the index values.[7]

Tau coefficients for the 36 indices retained from the pilot study and for 8 new indices which were not examined in the pilot study, a total of 44 in all, were computed. These coefficients, together with the indices which they represent, are tabulated in Appendix B. They range from -.72 to +.73, 12 of them indicating a negative relationship and 32 a positive association. A few examples of a low degree of agreement were the following:[8]

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[6] For an explanation of the meaning of S and the method of computation, see Kendall, op. cit., pp. 4-5.

[7] Ibid., p. 34.

[8] Item numbers correspond to the classification system used in Appendix B. The value following each item is the tau coefficient obtained for that item with the experimental sample.

III-B-1 Marriage rate, +.28

III-C-1 Crude birth rate, -.39

III-D-1 Infant mortality rate, -.26

VI-A-1 $\frac{\text{Number of persons who lived in a different county or abroad in 1949}}{\text{Total population}} \times 1000$, -.35

IX-A-4 Persons 25 and over completing less than five grades, -.24

On the other hand, 18 of the 44 indices yielded tau coefficients of plus or minus .70 or more. Twelve others were between +.60 and +.69 or between -.60 and -.69, indicating a large number of indices with rather good discriminating power.

Next, an attempt was made to test the significance of these tau coefficients. Actually, the procedure is a test of the significance of the numerator "S" of the tau quotient.[9] The general formula for the significance test is: $\frac{S}{\sigma_S}$ where σ_S is the standard deviation of S. Because the "sampling distribution of Kendall's tau converges to normal very rapidly and can be considered normal whenever N is equal to or greater than 10,"[10] tables of areas under the normal curve can be used to estimate the probability that a given multiple of the standard deviation will be attained or exceeded.[11] The critical ratio (hereafter designated by "C.R.") obtained by dividing S by its

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[9] Kendall, op. cit., p. 40.

[10] Margaret Jarman Hagood and Daniel O. Price, Statistics for Sociologists (rev. ed., 1952), p. 470.

[11] Kendall, op. cit., p. 40.

standard deviation will be in standard deviation units, so that any C.R. over 1.96 will be significant at the 5 per cent level and a C.R. over 2.58 will be significant at the 1 per cent level.

The formula used for finding the standard deviation was:

$$\sigma_S = \sqrt{\frac{xy}{3n(n-1)}\left[n^3 - n - \sum_t (t^3 - t)\right]}$$

where x is the number of SMA's, y is the number of rural counties, n is the total number of units, and t is the number of members in any one set of tied ranks among the index values.[12] We computed the C.R.'s for all 44 indices of the experimental study. These have been tabulated along with the tau coefficients in Appendix B.

It was found that the tau coefficients for the following indices were not significant at the 5 per cent level:

III-B-1 Marriage rate

III-D-1 Infant mortality rate

IX-A-4 Persons 25 and over completing less than five grades

Two more were significant at the 5 per cent level but not at the 1 per cent level. They were:

III-C-1 Crude birth rate

VI-A-1 $\frac{\text{Number of persons who lived in a different county or abroad in 1949}}{\text{Total population}} \times 1000$

The tau coefficients of the remaining 39 indices were significant at the 1 per cent level. In fact, 16 were significant at the .000002 level, which was interpreted to mean that if an infinite number of

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[12] Ibid., p. 44.

samples were drawn from the universe, an agreement between the ranking of index values and that of the rural urban dichotomy of the degree found would have a probability of occurring by chance not more than two times out of a million.

Since the purpose of the experimental phase of the study was to select out of the 44 indices tested a considerably reduced number of items which discriminated most efficiently between the urban and rural units of the experimental sample, it was necessary to establish some criteria for making this selection. Because of the amount of work involved it was not feasible to compute a matrix of intercorrelations (tau coefficients) for each pair of the 44 items. It was noted that one half of the items tested against the experimental sample had tau coefficients greater than $\pm$.65, while one half were less than $\pm$.65. Consequently, the following criteria were arbitrarily established:

1) Attempt to measure as many aspects as possible of the socio-cultural structure of the community. Specifically, try to keep one or more indices in each of the broad categories under which our hypotheses had been classified.[13]

2) Retain only those indices with a tau coefficient of .66 or greater, positive or negative.

3) Retain only those indices with a C.R. of 4.0 or greater. That is, the probability (P) value should be equal to or greater than .0000634.

Several exceptions in the application of these critoria will have to be explained. The quantities which follow each index are the tau coefficient and the C.R., respectively.

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[13] See Appendix B.

III-A-1 Sex ratio: $\frac{\text{Total number of males}}{\text{Total number of females}} \times 100$ (-.64, 4.47)

While the tau coefficient was slightly under .66, we decided to retain the index at this stage of our study, because we had not been able to find a more useful measure for the whole area of the family. The item, "sex ratio of persons 14 years old and over who were single," tested out equally well but appeared to be measuring much the same aspect of the structure of the population. When the rankings obtained by the two different sex ratios were compared, a tau coefficient of /.78 resulted, so we decided to retain only the index for the sex ratio of the total population.

IV-B-1 Per cent of population which is under 5 years of age (-.62, 4.34) This was retained, because we could find no better index of "age composition," one of the broad categories of population structure. In accordance with the first criterion above, we felt an index of this aspect of the population was needed. The index "median age" tested equally well, so a tau coefficient was computed between the two. It turned out to be /.81, so we discarded the latter which had a slightly lower C.R. A further reason for this choice was that item IV-B-1 had appeared to be more discriminating on the pilot study.

V-A-1 Per cent of dwelling units with hot running water, private toilet and bath, and not dilapidated (/.72, 5.03)

V-A-2 Per cent of dwelling units having no piped running water (-.72, 5.00)

V-A-3 Per cent of dwelling units reporting a kitchen sink (/.72, 5.00) There seemed to be a great deal of overlapping among these three indices in the "home equipment" category. Tau coefficients for intercorrelations of these three indices are shown in Table 1.

Table 1

TAU COEFFICIENTS FOR INTERCORRELATIONS OF SELECTED INDICES OF HOME EQUIPMENT

	V-A-1	V-A-2	V-A-3
V-A-1		-.88	/.80
V-A-2	-.88		-.82
V-A-3	/.80	-.82	

Since the tau coefficients were all very high, we decided to retain only one of the three indices. V-A-3 had the disadvantages of being based on a 20 per cent sample, so we eliminated that index. We objected personally to V-A-1 as an index because of the rather subjective qualification "not dilapidated." Consequently, we chose rather arbitrarily to retain V-A-2 as an index of rurality.

We obtained a tau correlation coefficient of /.73 between V-A-4, "per cent of dwelling units reporting electric lighting," and V-A-5, "per cent of occupied dwelling units with mechanical refrigeration." Since V-A-4 was more discriminating than V-A-5 on the experimental sample, as measured by their tau coefficients (See Appendix B), we retained the former and discarded the latter.

V-A-6 Per cent of occupied dwelling units with central heating (/.67, 4.57) While this index met our criteria, we discarded it because a) it was marginal, b) we had two more efficient measures of degree of complexity of home equipment, and c) logically, central heating would vary with the coldness of the climate perhaps even more than with the degree of urbanness of the population.

VIII-A-1 Per cent of persons 21 years of age and over who were foreign born (/.60, 4.21) This index was retained because we

were unable to find a more efficient measure of the cultural heterogeneity of the population. Because of the emphasis which Wirth and others have placed upon heterogeneity as a basic characteristic of urbanism, we felt that we needed some index of this characteristic.

IX-A-1 Median school years completed (/.49, 3.62) We can perhaps be fairly criticised for retaining this index with its relatively low tau coefficient. However, it was felt by us and by our advisers that we should have a measure of the amount of formal education received by the population. This was the best index we were able to find, with the exception of IX-A-3, "Per cent of persons five and six years old who were enrolled in kindergarten," which we retained also. The latter measure has certain disadvantages which were evident on both the experimental and the random samples. For a number of counties there were no kindergarten enrollees enumerated. In a number of other counties not more than five or ten were tabulated. Because of the small numbers involved we had doubts about the reliability and discriminability of this index.

IX-B-1 Per cent of employed persons who are in public administration (/.57, 3.99)

IX-B-2 Per cent of employed persons in medical and other health services (/.73, 5.04) The tau correlation coefficient between these 2 indices was /.60, which seemed low enough to justify retaining both. However, our retaining IX-B-1 was probably not justifiable. At this stage in the research we were looking for at least one measure for the structure of each of the major social institutions. We retained IX-B-1 as a measure of governmental structure, while IX-B-2 was considered to be an index of health and

welfare institutions. Besides, we had a hunch that IX-B-1 ought to be an efficient index of the degree of urbanness. Our hunch was not substantiated and that index was dropped in the next phase of the study.

X-A-1 Per cent of the civilian labor force who were unemployed (/.50, 3.50) The only defense which we can offer for the retention of this index is the first criterion. We felt that we should have a measure of normative integration and this is the best we were able to discover. While unemployment does not necessarily indicate moral disintegration, it does indicate a disparity between the ideal norm of full employment for those who wish employment and the actual societal situation. Moreover, it was assumed that a person's occupational role and his role as earner of the family income are so basic and so intimately related to personal and social integration that the denial of the opportunity for employment would soon affect other aspects of the person's way of life.

It was suspected that the correlation between I-A-2, "per cent of employed persons who are private wage and salary workers," and VII-A-1, "per cent of persons who are clerical and kindred workers," might be high, so the tau coefficient was computed. It turned out to be /.58, which we did not think high enough to justify dropping either index, so both were retained.

When the experimental study was completed the 44 indices tested by the tau technique had been reduced to 25. The 25 indices which were retained are marked with an asterisk in Appendix B. These indices were then applied to the random sample of units used in the next phase of the study. This will be described in Chapter IV.

CHAPTER IV

ITEM REDUCTION

The next phase of our study involved the selection of a random sample of population units, the computation of composite scores with the 25 simple indices selected by means of the experimental study, and the correlation of each set of component index scores with the set of composite scores. The purpose of this step was three-fold, namely, 1) to check the validity of the items selected by means of the experimental sample, 2) to examine the nature of the relationship between each set of component item scores and the set of composite scores, and 3) further to reduce the number of indices by the elimination of those whose scores were not closely associated with the scores of the composite index. The assumption was made, rightly or wrongly, that the phenomenon which we were trying to measure would be self-consistent. Hence, the set of indices used to measure it should possess a rather high degree of self-consistency, that is, for population units having a relatively high composite urbanness score all of the component scores should be relatively high. If the scores of a given simple index did not vary concomitantly with the composite index scores, then it was assumed that the item was not an efficient indicator of the phenomenon which we were calling urbanness.[1]

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[1] The term "urbanness," as it is used in the present study, is

Selection of the Random Sample

Since this is in no sense a definitive study, we decided that a random sample of 40 units would be sufficient for our purpose of exploring a technique. We tried stratifying our universe in several different ways but finally chose simply to list the 167 SMA's and the 2796 counties outside of SMA's[2] together alphabetically by states and make a random selection from this list, so that each SMA and each county outside of the SMA's would have an equal chance of being drawn. The population units in this alphabetical list were numbered from 1 to 2963. Forty numbers within this range were obtained from a table of random numbers[3] and the units having the corresponding numbers were drawn from the alphabetical list. Units thus selected for the random sample were the following:

RANDOM SAMPLE

1. St. Clair County, Alabama
2. Del Norte County, California
3. Modoc County, California
4. Summit County, Colorado
5. Monroe County, Florida
6. Screven County, Georgia
7. Camas County, Idaho
8. Grant County, Indiana
9. Audubon County, Iowa
10. Clayton County, Iowa
11. Hardin County, Iowa
12. Ellsworth County, Kansas

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intended to mean resemblance to the 18 SMA's of the experimental sample, with respect to the characteristics being measured by the component indices employed. The term "urbanism," on the other hand, is used to refer to the mode of life in those cities. Urbanness refers to urban-like ecological and socio-cultural structure, while urbanism refers to a way of life, which we take to be a dynamic process.

[2] See "Universe" in Chapter II.

[3] R. A. Fisher and F. Yates, Statistical Tables for Biological, Agricultural, and Medical Research (3d ed., 1948), p. 93.

13. Stanton County, Kansas
14. Fleming County, Kentucky
15. Greenup County, Kentucky
16. Boston SMA, Massachusetts
17. Nantucket County, Massachusetts
18. Hillsdale County, Michigan
19. Chickasaw County, Mississippi
20. Howard County, Missouri
21. Howell County, Missouri
22. Jefferson County, Montana
23. Hunterdon County, New Jersey
24. Duchess County, New York
25. Yancey County, North Carolina
26. Eddy County, North Dakota
27. Bryan County, Oklahoma
28. Muskogee County, Oklahoma
29. Marion County, Tennessee
30. Sevier County, Tennessee
31. Hartley County, Texas
32. Kent County, Texas
33. Martin County, Texas
34. Midland County, Texas
35. Frederick County, Virginia
36. Okanogan County, Washington
37. San Juan County, Washington
38. Raleigh County, West Virginia
39. Pierce County, Wisconsin
40. Waupaca County, Wisconsin

Computation of Standard Scores

We evaluated for each of the units of the random sample the 25 simple indices which were retained in the experimental study. This resulted in 25 distributions of percentages and ratios, which we have treated as raw scores. Thinking of these as scores rather than percentages, we proceeded to compute the mean and standard deviation for each distribution. Then, the raw scores were converted to standard scores by means of the following formula:

$$z = \frac{X - M}{\sigma}$$

where z is the standard score, X is the raw score, M is the mean of the distribution, and σ is the standard deviation of the

distribution. The purpose of this step was, of course, to obtain relative index values which could be combined into a composite index score.[4] Combining standard scores in lieu of "relatives," created by dividing each index value by the United States average, has the advantage of giving equal weight to all of the component indices.[5]

Item Weighting

A system of weighting was employed based roughly on the C.R.'s obtained in the experimental study.[6] Sixteen of the 25 indices were found to have a C.R. of 4.75 or more. To simplify computations, a weight of 1.0 was assigned to those 16 items, while to the remaining 9 items were assigned weights which were fractions of 1.0 roughly proportional to the relative size of their C.R.'s. The C.R.'s were grouped into 5 classes and each index was weighted in accordance with the size of the midpoint of the class into which its C.R. fell. The class intervals used in determining item weights are shown in Table 2. An example may help to clarify the procedure of weighting. From Appendix B we find that a C.R. of 4.21 was obtained for the index, "per cent of persons 21 years old and over who were foreign born." Since this C.R. falls in the class interval 3.75-4.24, we assigned a weight of 0.8 to the item. A complete list of weights for the 25 items tested in this phase of the study is given in Appendix C. Time

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[4] E. F. Lindquist, A First Course in Statistics (1938), pp. 134-5.

[5] For a good description of the technique of combining "relatives," see Margaret J. Hagood, Statistics for Sociologists (1941), pp. 225-233.

[6] See Chapter III and Appendix B.

Table 2

CLASS INTERVALS USED IN GROUPING CRITICAL RATIOS FOR THE PURPOSE OF DETERMINING ITEM WEIGHTS

C.R.'s	Midpoint	Item Weight
2.75-3.24	3.00	.6
3.25-3.74	3.50	.7
3.75-4.24	4.00	.8
4.25-4.74	4.50	.9
4.75-5.24	5.00	1.0

limitations would not permit the more laborious technique of employing factor analysis to determine item weights. It was felt that the technique which we used was adequate for the small sample with which we were working in the present study.[7]

Composite Scores

Each of the standard scores was multiplied by the item's weight. The signs were reversed on 6 indices because we chose to let a high score represent a high degree of urbanness and a low score a low degree of urbanness. Indices for which the signs were reversed were the following:[8]

I-A-3. Per cent who are unpaid family workers

I-B-4. Per cent of population classified as "rural farm"

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[7] For a discussion of item weighting by means of factor analysis, see Hagood and Price, Statistics for Sociologists (rev. ed., 1952), Chap. XXVI. Also, see Margaret J. Hagood, Farm Operator Family Level of Living Indexes for Counties of the United States 1930, 1940, 1945, and 1950 (1952), pp. 76-79.

[8] Item numbers refer to classification system used in Appendix B.

III-A-1 Sex ratio

IV-B-1 Per cent of population under 5 years of age

V-A-2 Per cent of dwelling units with no piped running water

XI-A-2 Per cent classified as "one-dwelling-unit detached structures"

Next, a constant was added to all weighted standard scores to make all of them positive for easier arithmetic manipulation. It was noted that the standard scores for our sample ranged from -4.40 to +6.22, so the value 6 was chosen for the constant. We thought that it was large enough to counteract most extreme negative scores on any sample.

To combine the component scores for a given county or SMA into a composite score we simply calculated the arithmetic mean of the component weighted standard scores (plus 6) for that unit. For units which had data missing from one or more cells the composite score was obtained by using the arithmetic mean of those component scores which were available. No attempt was made to interpolate missing data. This was not a serious problem. Twenty-five component scores were available for 34 units, twenty-four scores for 5 units, and twenty-three scores for 1 unit.

Correlation of Component Scores With Composite Scores

The set of composite scores obtained by the procedure just described was used as an internal criterion for testing each of the 25 sets of component scores for concomitance of variation or, in other words, for consistency of measurement.[9] It was assumed that those

[9] For a discussion of some of the limitations of tests of internal consistency, see R. F. Sletto, The Construction of Personality Scales by the Criterion of Internal Consistency, (1937).

indices whose distribution of scores was most closely associated with the distribution of composite scores would be the most efficient indicators of urbanness, and therefore, should be retained in the final Rural-Urban Index.

Our first task was to check for linearity the relationship between each of the 25 sets of component scores and the set of composite scores. This we did by constructing a scatter diagram for each pair of distributions to be compared. In plotting these diagrams, the composite scores were used as the Y coordinate and the component scores being compared were used as the X coordinate.

For 15 of the items the relationship being examined appeared to be certainly linear. While we did not attempt any curve fitting, four of the scatter plots seemed roughly to approximate a modified exponential curve.[10] These were:

I-A-3 Per cent of employed persons who are unpaid family (reversed)

V-A-2 Dwelling units having no running water (reversed)

V-A-4 Dwelling units reporting electric lighting

VII-A-2 Dwelling units reporting radios

In these four cases the incidence of the characteristic seemed to increase at an increasing rate as one moved from the population units with a low composite score to those with a high composite score. Another way of describing the relationship might be by noting that once a certain degree of urbanness, that is, a composite score of a certain size, was reached there was little difference in the incidence of the trait.

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[10] See Hagood and Price, op. cit., pp. 446-7.

The following two indices produced a kind of fan-shaped configuration, indicating little variability in incidence of the trait in the more rural counties with a greater variability as the size of the composite score increased:

VII-B-1 In transportation, communication and other public utilities

IX-B-1 In public administration

With one or two exceptions in each case, the unweighted standard scores for these two indices were smaller than ±1.0, so it is evident that the variability among most of the units was not great. On the other hand, Greenup County, Kentucky, had a standard score of ±5.59 for VII-B-1 and Monroe County, Florida, had a standard score of ± 5.66 for IX-B-1.

Three scatter diagrams had a large proportion of the points grouped close to a vertical axis which would intersect the X-scale somewhere between 5.0 and 6.0. It will be recalled that a constant of 6.0 was added to all standard scores,[11] so 6.0 on the X-scale of the scatter diagrams represents the mean of a given set of component index scores. For the three following indices, a large proportion of units had equally low component scores, although their composite scores varied between 500 and 700:

VII-A-3 Dwelling units reporting television sets

IX-A-3 Per cent of persons 5 and 6 years old in kindergarten

XI-A-1 Population density ratio

In 5 counties no television sets were reported, while in 30 others 3 per cent or less of occupied dwellings answering this question

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[11] Cf. "Composite Scores" above.

reported television sets. In other words, only 12½ per cent of the units in the sample reported any substantial number of sets. This accounts for the bunching of points at the lower end of the X-scale with a few scattered points high on the scale.

A similar distribution was noted for the percentage of children 5 and 6 years of age who were enrolled in kindergarten. Nine counties reported none, while 14 others reported less than 5.2 per cent. There was considerable variability among the remaining 17 units, with higher incidence tending to be associated with larger composite scores. We suggest that this index be revised in future studies by using as a base "persons 5 and 6 years of age enrolled in school" in lieu of "total number of persons 5 and 6 years of age." We believe that the former base would make the index more discriminating between rural and urban units and would not be so subject to regional differences in educational opportunities as the present form.

The points on the scatter diagram for population density ratio were grouped much more compactly along a vertical axis than for the two indices just discussed. Ninety per cent of the points fell between 5.75 and 6.0 on the X-scale. This means that standard scores for 36 counties were between -.25 and zero, while the standard score for Boston SMA was +6.22. The positions on the diagram of a few points for units with a relatively high composite score suggest that a distribution for a larger sample might possibly form a curve. If so, it appears that this curve would have a very steep positive slope, a rather sharp bend to the right as medium-sized SMA's were plotted, and then a very mild positive slope as the larger SMA's were plotted. We have little evidence so far, however, upon which to base such a hypothesis.

Two scatter diagrams revealed no apparent pattern of association. They were:

III-A-1 Sex ratio

IV-B-1 Persons under 5 years of age (reversed)

Although the linearity of several of the relationships examined by means of scatter plots was somewhat doubtful, to save time we decided to proceed on the assumption that all relationships were linear and to compute simple linear correlation coefficients for all 25 sets of scores. In adopting this assumption we were mindful of the fact that the linear correlation coefficient is always smaller than the curvilinear coefficient, in cases which justify a curvilinear assumption.[12] For example, if we obtained a linear correlation coefficient for item V-A-2, "no piped running water," which was significant at the 1 per cent level, we would know that the curvilinear correlation coefficient (assuming that the relationship were curvilinear) would be even larger. A complete list of the correlation coefficients, together with their level of significance, is given in Appendix D.

In making this part-whole test of internal consistency it is customary to eliminate from the computation of composite scores the set of component scores to be tested, especially if the number of component items are few in number.[13] However, with 25 component indices, each item would account for only 4 per cent of the total variance in the set of composite scores. We did not believe that the

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[12] Hagood and Price, op. cit., pp. 443-4.

[13] Quinn McNemar, Psychological Statistics (1949), p. 139.

results of the test would be improved sufficiently to justify the additional labor involved in this step. Consequently, we simply computed product-moment correlation coefficients between each set of component scores and the set of composite scores constructed by combining the weighted standard scores of all 25 indices.

Only 3 correlation coefficients out of the 25 were not statistically significant at the 5 per cent level. These were:

III-A-1 Sex ratio (reversed) $r = \pm.09$

IV-B-1 Persons under 5 (reversed) $r = \pm.19$

VII-B-1 In transportation, communication and other public utilities $r = \pm.24$

The question may properly be asked: If these items are not indices of urbanness, why were they not eliminated by the experimental study? We were unable to explain the complete absence of association between the scores for sex ratio and the composite index scores except to guess that either the experimental sample or our random sample was atypical with respect to this particular characteristic. For instance, Screven County, Georgia, which is the "most rural" county in the random sample (according to composite score), had a sex ratio of 99.8. Chickasaw County, Mississippi, which ranked 38th from the top of the list of composite scores (See Table 3), had a sex ratio of 95.7, and Sevier County, Tennessee, which ranked 35th, had a sex ratio of 98.4. Boston SMA, Duchess County, New York, Nantucket County, Massachusetts, Midland County, Texas, and Muskogee County, Oklahoma, all had sex ratios below 100.0, as would have been expected from their high urbanness scores, but Monroe County, Florida, which ranked 5th on total urbanness, had a sex ratio of 148.9, the highest of all the

Table 3

COMPOSITE SCORES FOR THE FORTY UNITS OF THE RANDOM SAMPLE ARRANGED IN ORDER OF SCORE SIZE

County or SMA	Score with 12 indices	Score with 25 indices	Rank with 12 indices	Rank with 25 indices
Boston SMA	836	804	1	1
Duchess, N. Y.	763	719	2	2
Midland, Tex.	747	678	3	4
Nantucket, Mass.	716	707	4	3
Monroe, Fla.	710	662	5	5
Grant, Ind.	683	658	6	6
Muskogee, Okla.	678	656	7	8
Hunterdon, N. J.	672	657	8	7
Summit, Colo.	647	631	9	9
Del Norte, Calif.	634	615	10	13
Okanogan, Wash.	623	629	11	10
Hillsdale, Mich.	622	624	12	11
Modoc, Calif.	620	597	13	19
San Juan, Wash.	612	605	14.5	16
Waupaca, Wis.	612	607	14.5	15
Hardin, Iowa	611	619	16	12
Ellsworth, Kans.	610	602	17	18
Jefferson, Mont.	609	599	18.5	17
Hartley, Tex.	609	586	18.5	22
Raleigh, W. Va.	602	609	20	14
Bryan, Okla.	592	592	21	21
Camas, Idaho	581	582	22	24
Clayton, Iowa	579	580	23	26.5
Audubon, Iowa	577	583	24.5	23.5
Eddy, N. Dak.	577	573	24.5	28
Pierce, Wis.	576	580	26	26.5
Howard, Mo.	571	594	27	20
Greenup, Ky.	544	583	28	23.5
Stanton, Kans.	542	559	29	31
Marion, Tenn.	536	564	30	29
Frederick, Va.	533	562	31	30
Howell, Mo.	528	554	32.5	32.5
Martin, Tex.	528	536	32.5	36
St. Clair, Ala.	526	554	34	32.5
Kent, Tex.	514	547	35	34
Chickasaw, Miss.	505	520	36.5	38
Sevier, Tenn.	505	538	36.5	35
Fleming, Ky.	494	523	38	37
Yancey, N. Car.	490	510	39	39
Screven, Ga.	463	493	40	40

units in the sample. For some reason the relationship found for the random sample does not square with that found on the experimental sample where we obtained a tau coefficient of -.64 and a C.R. of 4.47, indicating considerable agreement between the size of sex ratios and our rural-urban dichotomy of units.

Again, the low degree of association between "per cent of persons under 5" and the composite scores for the random sample does not bear out the results of the experimental study, where a tau of -.62 and a C.R. of 4.34 were obtained. Theoretically, we would expect a larger percentage of persons under 5 in the more rural counties where fertility is supposed to be relatively high and where large families are not so much of an economic handicap. Our experimental study seemed to bear out this hypothesis. On the other hand, if the composite scores on the random sample can be taken as an index of the degree of urbanness, then doubt is thrown upon the hypothesis by the low correlation coefficient of +.19. Some units from the random sample which contributed to this low correlation coefficient were the following: Midland County, Texas, which ranked 4th from the top of the composite scores, had an unweighted standard score of -1.29, after signs had been reversed, while Kent County, Texas, which ranked 34th, had a standard score of +1.04, just the opposite of what would have been expected. Hunterdon County, New Jersey, which ranked 7th as to urbanness, had a standard score of -3.13, while Howard County, Missouri, which ranked 20th, had a standard score of +4.23. In a replication of this study the item IV-A-2, "median age," should be substituted for IV-B-1, "per cent of persons under five," and tested against the set of composite scores. "Median age" was just as discriminating on

the experimental study and might prove to be more reliable than IV-B-1.

The correlation coefficient between the scores for item VII-B-1, "persons in transportation, communication and other public utilities," and the composite scores was +.24. In the preceding section we have noted that the scatter diagram for this relationship was a peculiar configuration. All except two of the unweighted standard scores was smaller than ±1.0, while Greenup County, Kentucky, whose rank in the list of composite scores was 23.5, had a standard score of +5.59 for this item. When Greenup County was eliminated from the computations, a correlation coefficient of +.62 was obtained. This coefficient is significant at the 1 per cent level.

Two of the 25 correlation coefficients of the internal consistency test were significant at the 5 per cent level but not at the 1 per cent level. They were:

I-B-3 Paid wholesale employees $r = +.41$

IX-B-1 In public administration $r = +.37$

Item I-B-3 had a tau coefficient of +.70 and a C.R. of 4.43 on the experimental study. On the random sample data were missing on this item for 4 units. All except two of the unweighted standard scores were smaller than ±0.75, which indicates low variability. The score for Okanogan County, Washington, was extreme with a standard score of +5.16.

Item IX-B-1 was marginal in the experimental sample with a tau coefficient of +.57 and a C.R. of 3.99. It probably should have been dropped at that stage. The scatter diagram for this index has been briefly described earlier in this chapter.

The remaining 20 correlation coefficients were significant at the 1 per cent level. These coefficients are listed in Appendix D.

Final Item Selection

From the outset we had planned to include only 10 to 15 items in the final composite index. We felt that more than 15 items would make the use of the instrument by other investigators too time-consuming. With this in mind, together with a few considerations of availability and reliability of the data, we set as a criterion for the final selection of items a correlation coefficient of $\pm.70$ or more on the internal consistency test. We felt that this criterion was high enough to result in a set of indices each of which would contribute consistently to the total urbanness score. The 12 items which met this criterion became the components of our final Rural-Urban Index.

Rural-Urban Index

The composite Rural-Urban Index score is the arithmetic mean of the weighted standard scores of the following 12 component indices:

1. Per cent of employed persons in finance, insurance and real estate
2. Per cent of the population classified as "rural farm" (reversed)
3. Per cent of employed persons who are professional, technical and kindred workers
4. Per cent of employed persons who are service workers, except private household
5. Per cent of all dwelling units with no piped running water (reversed)

6. Per cent of occupied dwelling units reporting electricity
7. Per cent of employed persons who are clerical and kindred workers
8. Per cent of employed persons who are telecommunications workers
9. Per cent of persons 21 years of age and over who were foreign born
10. Median school years completed
11. Per cent of employed persons in medical and other health services
12. Per cent of all dwelling units which are one-dwelling unit detached structures (reversed)

Before the Rural-Urban Index can be used for research purposes norms will have to be established for the United States or for subregions for the means and standard deviations of item scores. A random sample of several hundred counties and SMA's should be used to establish these means and standard deviations.

After having selected the 12 items to be included in the Rural-Urban Index, we computed a new set of composite scores, using only these 12 items. A list of the Rural-Urban Index scores for the units of the random sample is given in Table 3 on page 61. The effect of eliminating 13 of the 25 items by means of the internal consistency test seems to be that of increasing the composite scores of the most urban units and decreasing the scores of the most rural. In other words, the final index with 12 component items is more discriminating than the composite index with 25 component items. This is brought out

by comparing composite scores at the upper and lower ends of the two lists in Table 3, where they are ranked in order of score size.

It should be kept in mind that the Rural-Urban Index has no zero-point. The Index scores are not additive and should be used to indicate the relative, and not the absolute, degree of urbanness of a population. In other words, an Index score of 800 cannot be interpreted to mean that the population unit is twice as urban as one having a score of 400. To aid in the interpretation of size of Rural-Urban Index scores it is suggested that empirical maximum and minimum scores be computed as anchor points or benchmarks against which Index scores may be compared.[14] Empirical maximum and minimum scores were computed for the random sample used in the present study by 1) selecting the highest and the lowest component scores (weighted standard scores plus six) for each of the 12 items of the Index, 2) obtaining a mean maximum score and a mean minimum score, and 3) multiplying these mean scores by 100 to clear them of decimals. The maximum and minimum component scores are shown in Table 4. The tentative maximum Rural-Urban Index score thus obtained was 900 and the minimum score was 430. These must be used merely as rough guideposts and never interpreted as absolute limits.

A frequency distribution of composite scores for units of the random sample is shown in Table 5 on page 68 and in Figure 1 on page 69. When the Index scores are thus grouped in intervals of 50 score points, the distribution appears to be bimodal with a "natural break" in the interval 550-599. The distribution is considerably skewed toward the more urban scores.

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[14] See E. L. Thorndike, Your City (1939), pp. 31-35.

Table 4

MAXIMUM AND MINIMUM COMPONENT SCORES FOR ITEMS INCLUDED IN THE RURAL-URBAN INDEX FOR UNITS OF THE RANDOM SAMPLE

Item	Max. Score	County or SMA	Min. Score	County or SMA
1. Finance, insurance, etc.	10.30	Boston	4.90	Yancey
2. Rural farm residence	7.90	Monroe	4.03	Yancey
3. Professional and technical	9.05	Midland	4.42	Martin
4. Service workers	8.52	Monroe	4.22	Several
5. No piped running water	7.56	Boston	3.88	Fleming
6. Reporting electricity	7.22	(Boston (Midland	2.44	Screven
7. Clerical and kindred	9.41	Boston	4.76	Yancey
8. Telecommunications workers	10.76	Summit	3.89	Fleming
9. Foreign born	8.72	Boston	5.11	Several
10. Median school years	7.76	(Midland (Nantucket	3.99	Screven
11. Medical and health services	10.41	Duchess	5.04	Kent
12. One-dwelling unit detached	10.42	Boston	4.93	Camas
Totals	108.03		51.61	
Means	9.00		4.30	

The cumulative frequency distribution of the 40 Rural-Urban Index scores of the random sample is shown in Figure 2 on page 70. If this sample were representative of the United States as a whole, there would appear to be "breaks" in the continuum of Rural-Urban Index scores somewhere between the following points: 550-570, 650-670, 720-740, 770-830, and possibly 580-600. Probably a larger sample would fail to verify these "breaks."

Table 5

FREQUENCY DISTRIBUTION OF RURAL-URBAN INDEX SCORES FOR UNITS OF THE RANDOM SAMPLE[15]

Class limits	Frequencies
450-499	3
500-549	10
550-599	7
600-649	12
650-699	3
700-749	3
750-799	1
800-849	1
Total	40

[15] Composite scores used in Table 5 consisted of the 12 items of the final Index.

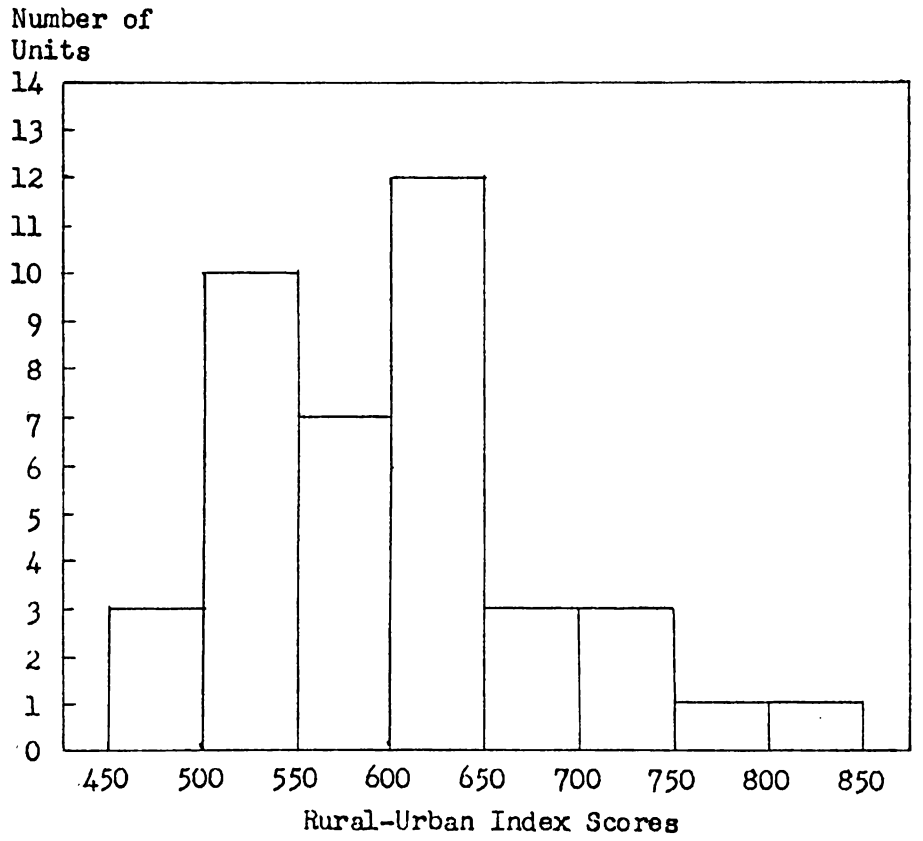

Figure 1

FREQUENCY DISTRIBUTION OF RURAL-URBAN INDEX SCORES FOR UNITS OF THE RANDOM SAMPLE

Source: Table 5

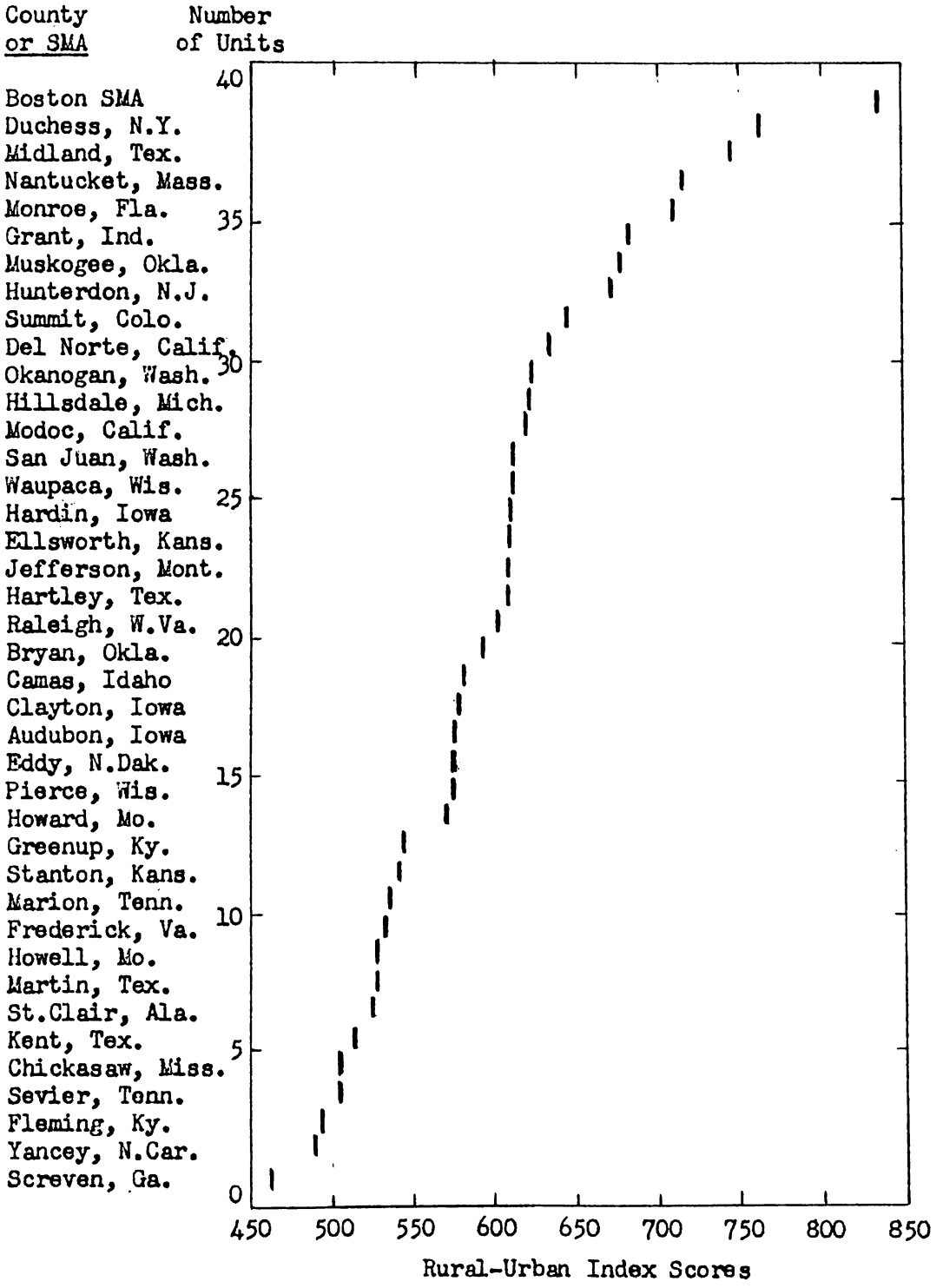

Figure 2

CUMULATIVE FREQUENCY DISTRIBUTION OF RURAL-URBAN INDEX SCORES FOR UNITS OF THE RANDOM SAMPLE.

CHAPTER V

VALIDATION OF THE INDEX

Criteria of Validity

The validity of a scale or index is determined by the extent to which it measures consistently that which it is supposed to measure. The Rural-Urban Index was designed to measure the degree of urbanness of a population.[1] Since there exists no completely satisfactory criterion of urbanness or urbanism, we propose to test the validity of our Index by several techniques. 1) We shall examine the experimental design, 2) we shall apply the test of internal consistency, 3) we shall use two well-known measures of urbanism as external criteria, and 4) we shall test the power of our Index to discriminate between units purposely selected because of their extremely urban or extremely rural characteristics.

Experimental Design

It will be recalled that the SMA's used in the experimental sample consisted of the 18 largest cities in the United States together with their fringe areas. Operationally, the way of life in these most populous SMA's *is* what we mean by urbanism. The characteristics of the socio-cultural structure of these SMA's *are* urban

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[1] For a definition of "urbanness," see footnote 1 of Chapter IV.

characteristics. Population units whose socio-cultural characteristics strongly resemble the socio-cultural characteristics of these 18 SMA's are ipso facto highly urban, that is, they possess a high degree of urbanness. Similarly, the 17 rural counties of the experimental sample were deliberately chosen in such a manner as to secure a relatively high degree of rurality. Operationally, the way of life found in these counties is what we mean by ruralism. Population units whose socio-cultural characteristics strongly resemble those of the 17 counties possess a high degree of rurality and a low degree of urbanness.

The procedures described in Chapter III were aimed at selecting a set of indices which would best discriminate between the urban and rural units of the experimental sample. If it is agreed that the SMA's of the experimental sample have a high degree of urbanness and that the rural counties of that sample have a low degree of urbanness, and if our technique of item selection is satisfactory, then it follows logically that the indices for which we obtained a tau coefficient of $\pm$.66 or higher must be measuring some aspects of urbanness or of rurality, whichever way one chooses to view the continuum.

Internal Consistency

In the phase of the study described in Chapter IV, an effort was made to discard those indices for which we did not find a high degree of association with an internal criterion, namely, the distribution of composite scores. It is recognized that this internal criterion is not wholly satisfactory as a criterion of validity, but lacking a satisfactory external criterion, the internal consistency test was employed to improve the validity of the items.

Correlation with the Queen-Carpenter Index

A technique frequently used to test the validity of a scale or index is to compare results obtained by it with results obtained by another scale or index which is believed to have some degree of validity. Queen and Carpenter have developed an Index of Urbanism based upon the concentration of the population within a county.[2] In an attempt to validate this index Queen and Carpenter obtained the following simple correlation coefficients between it and six other "commonly used measures of urbanism" for a random sample of 100 counties:[3]

Population of largest incorporated place lying wholly or partly in the county..... .86

Percentage of population residing in incorporated places of 2,500 or more population..... .86

Percentage of employed persons in industries other than agriculture, mining, fishing, forestry, or logging..... .84

Percentage of population with nonfarm residence..... .82

Population per square mile..... .78

Percentage of dwelling units in five or more unit structures..... .75

Three of these indices are measures of population size or density and would be expected to correlate strongly with the Queen-Carpenter Index, which is itself based entirely on these characteristics of the population. Our confidence in the validity of the Queen-Carpenter Index is increased by the relatively high correlations which were obtained with

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[2] Stuart A. Queen and David B. Carpenter, The American City (1953), pp. 28-33.

[3] Ibid., Table 2, p. 33.

the three indices which are not direct measures of population size and density.

We applied the Queen-Carpenter Index to the 40 units of our random sample and computed an Index score for each unit. In obtaining these scores we altered the procedure as follows to conform to the 1950 Census tabulations:

1) Places are defined as "urbanized areas," incorporated and unincorporated cities, towns (outside New England States, New York, and Wisconsin), boroughs, and villages which are listed in Table 6 of the U. S. Census of Population: 1950, Volume I, Number of Inhabitants.

2) For cases in which a part of a place was located in an adjacent county, the total population of the place was used for classification purposes, but the "part" of the population actually living in the sample county was used as the frequency or incidence value.

3) For Boston SMA, the boundaries of which are "town" lines instead of county lines, we recorded only one place, the Boston "urbanized area," which includes 94 per cent of the population of the SMA.

The Queen-Carpenter Index scores are shown in Table 6 along with the scores of the Rural-Urban Index. A scatter diagram of these two sets of scores revealed the existence of some association between them which appeared to be linear in nature. The simple correlation coefficient (r) turned out to be $\neq .57$, which is significant at the 1 per cent level. This was interpreted to mean that the factors of population size and concentration, which are the basis of the Queen-Carpenter Index scores, account for slightly less than one third

Table 6

COMPARISON OF THE RANKING OF THE UNITS OF THE RANDOM SAMPLE BY SIZE OF SCORES OF RURAL-URBAN INDEX AND BY SIZE OF SCORES OF QUEEN-CARPENTER INDEX

County or SMA	Rural-Urban Index Score	Queen Carpenter Index Score	Rural-Urban Index Rank	Queen Carpenter Index Rank
Boston SMA	836	94.2	1	1
Duchess, N. Y.	763	27.2	2	6
Midland, Tex.	747	42.1	3	3
Nantucket, Mass.	716	25.0	4	4
Monroe, Fla.	710	52.9	5	2
Grant, Ind.	683	35.5	6	4
Muskogee, Okla.	678	35.4	7	5
Hunterdon, N. J.	672	8.6	8	19.5
Summit, Colo.	647	0.0	9	40
Del Norte, Calif.	634	4.2	10	32
Okanogan, Wash.	623	10.4	11	14
Hillsdale, Mich.	622	11.1	12	13
Modoc, Calif.	620	8.7	13	18
San Juan, Wash.	612	2.4	14.5	37
Waupaca, Wis.	612	12.5	14.5	11
Hardin, Iowa	611	13.2	16	10
Ellsworth, Kans.	610	9.4	17	15
Jefferson, Mont.	609	7.4	18.5	23
Hartley, Tex.	609	9.0	18.5	17
Raleigh, W. Va.	602	13.6	20	9
Bryan, Okla.	592	19.2	21	8
Camas, Idaho	581	4.6	22	29
Clayton, Iowa	579	7.1	23	24
Audubon, Iowa	577	9.2	24.5	16
Eddy, N. D.	577	8.1	24.5	22
Pierce, Wis.	576	8.4	26	21
Howard, Mo.	571	12.2	27	12
Greenup, Ky.	544	5.9	28	26
Stanton, Kans.	542	4.4	29	30
Marion, Tenn.	536	6.5	30	25
Frederick, Va.	533	0.4	31	39
Howell, Mo.	528	8.6	32.5	19.5
Martin, Tex.	528	5.8	32.5	27
St. Clair, Ala.	526	2.9	34	33
Kent, Tex.	514	2.8	35	34
Chickasaw, Miss.	505	4.3	36.5	31
Sevier, Tenn.	505	2.5	36.5	35.5
Fleming, Ky.	494	2.5	38	35.5
Yancey, N. C.	490	1.6	39	38
Screven, Ga.	463	4.9	40	28

(r^2 = .3249) of the total variation in the Rural-Urban Index scores. This could be interpreted to mean that the remaining two thirds of the variation is to be accounted for by factors other than those closely associated with urbanism. On the other hand, it can be hypothesized that this proportion of the variation is to be accounted for by dimensions or aspects of urbanism which are not measured by the Queen-Carpenter Index. While the question as to which index is the more valid measure of urbanism must await further research, it is clear that both instruments are measuring to a considerable extent the same phenomenon.

A comparison of the ranking of the units of the random sample by size of Rural-Urban Index scores with the ranking of these units by size of Queen-Carpenter Index scores brings out some interesting differences (See Table 6). The tau coefficient of rank correlation for the two rankings is .53 with a C.R. of 4.80. This coefficient indicates a fair amount of agreement. On the other hand, inspection of Table 6 reveals important differences in the ranking of specific counties by the two indexes. For example, while the Queen-Carpenter Index scores are nearly the same for Hunterdon County, New Jersey (8.6), Modoc County, California (8.7), and Howell County, Missouri (8.6), the Rural-Urban Index differentiates widely among these counties with scores of 672, 620, and 528, respectively. The Rural-Urban Index assigns Hunterdon County rank 8, Modoc County rank 13, and Howell County rank 32.5 in order of urbanness. It is difficult for us to imagine that the way of life of the people of Howell County in south central Missouri is as much like the way of life of the people of the larger cities as that of the inhabitants of Hunterdon

County, New Jersey. By highway from approximately the center of Howell County the distance to the closest city of more than 10,000 inhabitants is 100 miles across the Ozark Mountains to Springfield or approximately the same distance east to Popler Bluffs (1950 population: 15,064). The second closest large city is Memphis, Tennessee, some 200 miles to the southeast. On the other hand, people living near the center of Hunterdon County can travel on a four-lane paved highway 50 miles east to New York City or 30 miles west to Bethlehem, Pennsylvania. Also, they may drive 25 miles south to Trenton and 25 miles farther to Philadelphia.

Other wide differences in ranking of units of the random sample by the two indexes under comparison are brought out by the selection of counties included in Table 7. Although Summit County,

Table 7

SELECTED UNITS FROM THE RANDOM SAMPLE AS RANKED BY THE RURAL-URBAN INDEX AND BY THE QUEEN-CARPENTER INDEX

County or SMA	Rural Urban Index Score	Queen Carpenter Index Score	Rural Urban Index Rank	Queen Carpenter Index Rank
Hunterdon, N. J.	672	8.6	8	19.5
Summit, Colo.	647	0.0	9	40
Del Norte, Calif.	634	4.2	10	32
San Juan, Wash.	612	2.4	14.5	37
Raleigh, W. Va.	602	13.6	20	9
Bryan, Okla.	592	19.2	21	8
Howard, Mo.	571	12.2	27	12
Howell, Mo.	528	8.6	32.5	19.5
Screven, Ga.	463	4.9	40	28

Colorado, has a relatively low degree of population concentration, as evidenced by a Queen-Carpenter Index score of zero, its Rural-Urban Index score ranked 9th among the scores of the random sample. Some

of the urban-like characteristics which help to account for its relatively high Rural-Urban Index score were: 1) Only 11.2 per cent of the population was classified as "rural-farm," giving a standard score for this item of +1.30. 2) The greatest contribution to the composite score was made by the high percentage of persons employed as telecommunications workers, 2.7 per cent, which was higher than any other unit in the sample. This produced an unweighted standard score of +5.29. 3) The standard score of this county for the item "median school years completed" was +1.42. Other characteristics measured by the Rural-Urban Index were within one standard deviation above or below the sample means.

Another example of a wide difference in ranking of a unit by the two indexes is that of Del Norte County, California. This county was ranked 32nd by the Queen Carpenter Index and 10th by the Rural-Urban Index. Some urban-like characteristics which help to account for Del Norte County's relatively high Rural-Urban Index score are the following: 1) Only 7 per cent of the population lived on farms. 2) Service workers other than private household accounted for 9.7 per cent of all employed persons, with a standard score of +1.36. 3) Only 10.7 per cent of all dwelling units were without piped running water, giving a standard score of +1.04. Other characteristics measured by the Rural-Urban Index were within one standard deviation, plus or minus, except the proportion of employed persons in telecommunications. Only 0.5 per cent were so engaged, with a standard score of -1.18.

Finally, Screven County, Georgia, which was ranked most rural by the Rural-Urban Index, was ranked only 28th by the Queen-Carpenter Index. Screven County had the lowest percentage of dwelling units

with electricity and the lowest median school years completed of all units in the random sample. On three other indices only one other county had more rural scores. On only three indices (service workers, foreign born, and percentage of dwelling units which are one-unit detached structures) were there more than three counties with more rural raw scores. In spite of this evidence of ruralism, the Queen-Carpenter Index would rank the following counties as more rural than Screven County, Georgia: Camas, Idaho; Stanton, Kansas; Chickasaw, Mississippi; Del Norte, California; St. Clair, Alabama; Kent, Texas; Sevier, Tennessee; Fleming, Kentucky; San Juan, Washington; Yancey, North Carolina; Frederick, Virginia; and Summit, Colorado.

Rural-Urban Classification of the Census Bureau

The criterion of urbanism which has been used most frequently is the rural-urban dichotomy employed by the Bureau of the Census. Differences in rural-urban characteristics have usually been discussed in terms of this arbitrary dichotomy. The Census Bureau classifies as urban all urbanized areas[4] and all places of 2,500 or more inhabitants outside urbanized areas. The remainder of the population is classified as rural.

The comparison of the rankings of the 40 units of the random sample by Rural-Urban Index scores and by percentage of the population which is classified as "urban" by the Census Bureau is shown in Table 8. A simple linear correlation coefficient of +.23 was obtained for the 39 units of the random sample for which scores were available.

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[4] See Footnote 1, Chapter II, for definition of "urbanized area."

Table 8

COMPARISON OF THE RANKING OF THE UNITS OF THE RANDOM SAMPLE BY SIZE OF SCORES OF RURAL-URBAN INDEX AND BY SIZE OF PERCENTAGES OF THE POPULATION CLASSIFIED AS URBAN BY THE BUREAU OF THE CENSUS

County or SMA	Rural Urban Index Score	Per Cent Urban Score	Rural Urban Index Rank	Per Cent Urban Rank
Boston SMA	836	n	1	1
Duchess, N. Y.	763	46.7	2	7
Midland, Tex.	747	84.2	3	3
Nantucket, Mass.	716	83.2	4	4
Monroe, Fla.	710	88.2	5	2
Grant, Ind.	683	65.1	6	5
Muskogee, Okla.	678	56.8	7	6
Hunterdon, N. J.	672	17.6	8	18
Summit, Colo.	647	0	9	32.5
Del Norte, Calif.	634	0	10	32.5
Okanogan, Wash.	623	22.0	11	16
Hillsdale, Mich.	622	22.9	12	13.5
Modoc, Calif.	620	29.1	13	11
San Juan, Wash.	612	0	14.5	32.5
Waupaca, Wis.	612	35.1	14.5	10
Hardin, Iowa	611	36.0	16	9
Ellsworth, Kans.	610	0	17	32.5
Jefferson, Mont.	609	0	18.5	32.5
Hartley, Tex.	609	22.6	18.5	15
Raleigh, W. Va.	602	22.9	20	13.5
Bryan, Okla.	592	36.3	21	8
Camas, Idaho	581	0	22	32.5
Clayton, Iowa	579	0	23	32.5
Audubon, Iowa	577	24.3	24.5	12
Eddy, N. Dak.	577	0	24.5	32.5
Pierce, Wis.	576	16.1	26	19
Howard, Mo.	571	13.8	27	22
Greenup, Ky.	544	14.8	28	21
Stanton, Kans.	542	0	29	32.5
Marion, Tenn.	536	12.5	30	23
Frederick, Va.	533	0	31	32.5
Howell, Mo.	528	21.6	32.5	17
Martin, Tex.	528	0	32.5	32.5
St. Clair, Ala.	526	0.3	34	24
Kent, Tex.	514	0	35	32.5
Chickasaw, Miss.	505	0	36.5	32.5
Sevier, Tenn.	505	0	36.5	32.5
Fleming, Ky.	494	0	38	32.5
Yancey, N. Car.	490	0	39	32.5
Screven, Ga.	463	15.5	40	20

"n" denotes statistics are not available.

This coefficient was not significant at the 5 per cent level. However, a tau coefficient of rank correlation of .49 and a C.R. of 4.22 was computed for the two rankings. We interpret this to mean that there is considerable agreement between the ranking of the units of this particular sample by the Rural-Urban Index and by the Census Bureau classification, again pointing up the importance of population size as a factor in the phenomenon of urbanism. However, we are inclined to interpret the fact that we did not obtain a higher rank correlation coefficient as due to the neglect of the Census Bureau classification to take into account characteristics of the population other than its size. As we have pointed out earlier, we feel that population size is only one, although an important one, of the variables which taken together constitute the rural-urban continuum.

To highlight some of the wide differences in ranking by the Rural-Urban Index and by the Census Bureau criterion we have listed selected units from the random sample in Table 9. It will be noted

Table 9

SELECTED UNITS FROM THE RANDOM SAMPLE AS RANKED BY THE RURAL-URBAN INDEX SCORES AND BY PERCENTAGES OF THE POPULATION CLASSIFIED AS URBAN BY THE BUREAU OF THE CENSUS

County or SMA	Rural Urban Index Score	Per Cent Urban Score	Rural Urban Index Rank	Per Cent Urban Rank
Summit, Colo.	647	0.0	9	32.5
Del Norte, Calif.	634	0.0	10	32.5
San Juan, Wash.	612	0.0	14.5	32.5
Ellsworth, Kans.	610	0.0	17	32.5
Jefferson, Mont.	609	0.0	18.5	32.5
Bryan, Okla.	592	36.3	21	8
Audubon, Iowa	577	24.3	24.5	12
Howell, Mo.	528	21.6	32.5	17
Screven, Ga.	463	15.5	40	20

that Summit, Del Norte, San Juan, Ellsworth, and Jefferson Counties all rank among the 19 most urban-like units, according to the Rural-Urban Index, while all are among those having no urban population, according to the Census Bureau classification. On the other hand, the Rural-Urban Index would rank Bryan, Audubon, Howell, and Screven Counties among the 20 most rural, while the Census Bureau would rank them among the 20 most urban units.

Inspection of the column headed "Per Cent Urban Score" in Table 8 above reveals differences in scores (percentages) of 10 to 20 percentage points between units of adjacent ranks at the urban end of the distribution, while there is no difference between units at the rural end. To be as discriminating as possible, an index should be so designed to assign a different score to each unit. The poor discriminability of the Census Bureau classification as a criterion of urbanism is demonstrated by the fact that 16 units of the random sample are classified as 100 per cent rural. Thus, no discrimination in the degree of urbanness is made among 40 per cent of the counties in this particular sample.

Validation Hypothesis

To check further the validity of the Rural-Urban Index we decided to test the hypothesis that the Index would not discriminate between extremely urban and extremely rural units. In other words, we hypothesized that the agreement between the dichotomous ranking of units as urban and rural and the ranking of the Rural-Urban Index scores of these units would be zero. We chose to use Kendall's tau coefficient of rank correlation to test this hypothesis. If the tau coefficient were not significant at the 1 per cent level, we would

interpret any agreement found between the rankings to be due to sampling error and would consider the null hypothesis confirmed. If, on the other hand, the tau coefficient turned out to be significant at the 1 per cent level, we would consider the null hypothesis rejected so far as this sample was concerned and consider the Rural-Urban Index valid to some extent.

To test the hypothesis, a purposive sample was selected in the same manner in which the experimental sample had been selected. From a list of standard metropolitan areas ranked according to population size of the "urbanized areas,"[5] after excluding Washington, D.C., and the 18 SMA's used in the experimental sample, we selected the 10 highest ranking SMA's for the urban part of our sample. We thought that 10 would be a sufficient number of SMA's to test the ability of the Index to discriminate between the more populous SMA's and extremely rural counties. For the rural units we used the second county listed by each of the rural sociologists--18 in all (See Chapter III). As with the experimental sample, the way of life in the 10 SMA's *is*, for the purposes of this study, what we mean by urbanism, while the way of life in the 18 rural counties *is* what we mean by ruralism.

Next, the Rural-Urban Index was applied to this sample, using as norms the means and standard deviations obtained for the random sample.[6] Since these tentative norms were established with a sample of only 40 units, great caution should be exercised in the interpretation of the results of this test. Until norms can be established

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[5] U. S. Bureau of the Census, *U. S. Census of Population: 1950, Vol. I, Number of Inhabitants*, Part I, U. S. Summary, Chap. I, Table 18.

[6] See Appendix C.

with a large, representative sample, the scores obtained for the Rural-Urban Index must remain highly tentative. Nevertheless, there seemed to be some methodological value in carrying out the proposed test, however tentative the results might be.

A list of the 28 units of the validation sample ranked according to size of Index scores is given in Table 10. Not only

Table 10

UNITS OF VALIDATION SAMPLE RANKED ACCORDING TO SIZE OF RURAL-URBAN INDEX SCORES

County and SMA	Score	Rank
Seattle SMA, Wash.	790	1
Denver SMA, Colo.	785	2
Dallas SMA, Texas	775	3
Miami SMA, Fla.	764	4
Atlanta SMA, Ga.	757	5
Providence SMA, R.I.	750	6
Portland SMA, Ore.	744	7
Indianapolis SMA, Ind.	743	8
San Antonio SMA, Texas	723	9
Louisville SMA, Ky.	714	10
Custer County, Ida.	575	11
Teton County, Mont.	571	12
Sublette County, Wy.	564	13
Ringold County, Iowa	557	14
Linn County, Kan.	543	15
Roseau County, Minn.	538	16.5
Greeley County, Nebr.	538	16.5
Horry County, S. C.	509	18
Clay County, Ala.	502	19
Sioux County, N. D.	497	20
Harding County, S. D.	495	21
Delaware County, Okla.	490	22
Ashe County, N. C.	475	23
Wilkinson County, Miss.	474	24
Scott County, Tenn.	473	25
Searcy County, Ark.	465	26
Echols County, Ga.	463	27
Menifee County, Ky.	449	28

was there no overlapping of Index scores for SMA's and for rural counties, but there was a gap of 139 score points between the lowest score for an SMA and the highest score for a rural county. The tau coefficient for the rank correlation of these scores and the rural-urban dichotomy of the sample is +.69 with a C.R. of 4.26 and a P of .0000178. This is interpreted to mean that an agreement in ranking of the extent found here would occur by chance less than two times in 100,000 samples of this size chosen at random. Consequently, the null hypothesis, so far as this sample is concerned, is definitely rejected. Stated positively, there is a fair amount of agreement between the size of the Rural-Urban Index scores and the categories into which we had classified the units of the validation sample.

Comparing the set of Index scores shown in Table 10 with those of the random sample shown in Table 3 on page 61, it will be noted that the scores for the 10 SMA's of the validation sample ranked among the upper one-eighth of the scores of the random sample, while the scores of the 18 rural counties of the validation sample ranked among the lower third of the scores of the random sample. This distribution would tend to indicate that the Rural-Urban Index is measuring what it is supposed to measure, although it could well be maintained that the Index scores for the extremely rural counties of the validation sample should logically have been lower than any of the scores of the random sample, provided that the rural counties selected by the rural sociologists are really among the "most rural" in the United States today. Perhaps they are not. It must be kept in mind that the selections of the rural sociologists were made with very general criteria.

Rural-Urban Index scores for the SMA's of the validation sample were well-distributed between 714 and 790, while the scores for the rural counties were well-distributed between 449 and 575. Such a distribution of scores tends to confirm our assumption of a rural-urban continuum (See Chapter I).

Further Validation Needed

As we have pointed out earlier, the size of the samples of the present study was too small for us to place much confidence in the validity of the Rural-Urban Index. An adequate test of the validity of the Index must await work with a much larger sample and one which can be shown to be representative.

Furthermore, since it was assumed that urbanism and ruralism are ways of life, and not merely different kinds of ecological structure, a complete test of the validity of this Index would include a correlation of Index scores with some measure of attitudes and values. A scale would have to be developed which would discriminate between different degrees of urbanness among attitudes and values. The problem of validating such an attitude scale would be as great as that of validating our Rural-Urban Index. It might be that the problem of validation would best be approached by a more clinical kind of cultural case study in which the degree of urbanness of two or more communities were assessed by a first-hand acquaintance with the way of life of the people. If the relative degree of urbanness of a few such populations could be agreed upon by a team of investigators, these populations could then be used as benchmarks for validating such measures as the Rural-Urban Index. Even if such studies were made, however, they would probably be too few in number and too limited in

geographic distribution to serve as a criterion for testing the validity of a Rural-Urban Index for the United States or any large region thereof.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary

The general theory out of which the problem for the present study grew might be briefly summarized as follows: The advance of industrialization and the growth of cities is accompanied by a way of life among urbanites which is relatively different in many respects from the way of life which is characteristic of persons living in rural areas, that is, in areas beyond the physical boundaries of cities and relatively beyond the socio-cultural dominance of cities. This urban mode of life is called urbanism. The assumption is made that nowhere in the United States in 1950, the time-space locus of the study, was any population completely isolated from urban influences. On the other hand, no urban population was completely cut off from rural influences. Rather there is a constant social interaction and a continual interchange of cultural elements between the populations of cities and those of rural areas so that the urban and the rural ways of life are not absolutely but only relatively different, that is, urbanism and ruralism do not form a dichotomy but a continuum from an extremely urban population with a minimum of rural characteristics to an extremely rural population having a minimum of urban characteristics. In fact, it might be useful to conceive the rural-urban

continuum to be a complex of many continuua, one for each identifiable socio-cultural characteristic. In comparing two communities it is assumed that one might be more urban in some respects while the other might be more urban in other respects. Hence, to conclude that one community or population is "more urban" than another must mean that on the average it is closer to the extreme urban end of the rural-urban continuum with respect to a greater number of socio-cultural characteristics.

The principal question with which the present study was concerned is: Relatively how rural or how urban is the socio-cultural structure of a given population in the United States today? The objective of the study was to construct a composite index which would help to answer that question. It was assumed that rural-urban differences are differences in both ecological characteristics and socio-cultural characteristics. While urbanism and ruralism, as differing ways of life, must be ultimately differentiated in terms of systems of social actions, attitudes, and values, it was assumed that demographic and ecological characteristics might be taken as valid indices of those socio-cultural characteristics.

The scope of the present study was limited to the methodological task of exploring one possible technique for developing a rural-urban index which would utilize as the primary source of data the 1950 Census tabulations. To help establish criteria by which to identify population units which approached the urban or rural poles of the rural-urban continuum, "constructed types" were set up for 1) an extremely urban way of life, and 2) an extremely rural way of life, as it was imagined they might possibly exist in the United States today.

With the aid of the constructed types a number of hypotheses were formulated with respect to the comparative demographic and socio-cultural characteristics of urban and rural populations. A number of items were selected from the Census tabulations which we believed would serve as indices of the characteristics named in the hypotheses. Using the constructed types as criteria, first a pilot sample, and later an experimental sample, of population units were chosen in such a manner as to secure a number of units as representative as possible of the constructed-type-city and a number of units as representative as possible of the constructed-type-rural-community. The purpose of this phase of the study was to eliminate those indices which did not discriminate consistently between the extreme urban and the extreme rural units. Out of the 73 indices examined in the pilot study 37 were discarded on the basis of inspection. Eight new indices were added during the experimental phase of the study. On the basis of Kendall's tau coefficient of rank correlation, 44 indices were tested for their discriminability and 19 were dropped. The next phase of the study involved the application of the remaining 25 indices to a random sample. The purpose was three-fold, namely, 1) to check the validity of the items selected, 2) to examine the nature of the relationship between the composite Index scores and each component variable, and 3) to reduce the number of indices and improve the internal consistency of the final composite Index. Composite scores were computed by combining the weighted standard scores of each component item. A system of weighting was used based roughly upon the critical ratio of each index as obtained in the experimental study. The amount of association between each component variable and the set

of composite scores was measured by simple correlation. On the basis of these correlation coefficients the final selection of the 12 indices of the Rural-Urban Index was made.

Validation of the Index was approached in several ways. 1) Examination of the experimental design indicated that, logically, indices which discriminated efficiently between a sample of population units which were operationally defined as "urban" and a sample of units operationally defined as "rural" would have a priori validity, assuming that all other population units were continuously distributed, with respect to the characteristics being measured, between the extreme samples. 2) Examination of the internal consistency of the Index indicated a fairly high degree of association between each component variable and the composite scores for the Index as a whole. 3) Comparison with two other measures of urbanism, the Queen-Carpenter Index of Urbanism and the Census Bureau's rural-urban classification, revealed only moderate correlation coefficients. 4) Finally, a new sample of extremely urban and extremely rural units was chosen in the same manner as the experimental sample. Index scores for this sample not only discriminated between the urban and rural units but were substantially larger for the urban than for the rural units.

Findings

We have repeatedly pointed out that our samples were too small to enable us to say that the hypotheses with which we began the study were adequately tested. Since the central purpose of the project was to develop a method for the construction of a rural-urban index, any light which was thrown upon the hypotheses was a secondary consideration. Nevertheless, as long as we keep in mind the limitations of the

samples, certain tentative conclusions can be stated. In other words, if similar results were obtained with an adequate sample the following conclusions could be drawn with regard to the hypotheses formulated in Chapter II.

1) The more urban an area the more its population will depend upon a money economy. The indications of our data are that this hypothesis would be confirmed. Highly significant correlation coefficients were obtained in both the experimental and random samples for all three indices tested (See Appendices B and D).

2) The more urban the economy of an area the more will commerce and industry predominate over agriculture. The hypothesis appears to be tentatively confirmed. Correlation coefficients for four indices are highly significant on the experimental sample and two on the random sample. The simple linear correlation coefficient of $\pm$.41 for "percentage of employed persons who were wholesale employees" was significant on the random sample at the 5 per cent but not at the 1 per cent level. The low correlation is partially explained by one extreme value. In Okanogan County, Washington, 16.3 per cent were wholesale employees, resulting in a standard score of $\pm$5.16 for that county.

3) The more urban a population the more complex and specialized will be its division of labor. Indications are that this would be confirmed. Coefficients were highly significant for the four indices used on the experimental sample and two used on the random sample.

4) The more urban an area the greater will be the proportion of women employed outside the home. Only one coefficient for a single index was computed. Percentage of females in the total labor force was highly significant for the experimental sample.

5) The more urban a population the lower will be the sex ratio. This hypothesis would tentatively be confirmed on the basis of the experimental sample but would be definitely rejected on the basis of the random sample where a correlation coefficient of only +.09 was obtained. It will be interesting to see if this hypothesis is confirmed with an adequate sample.

6) The more urban an area the less will be the emphasis placed upon family relations. As measured by the marriage rate, this hypothesis would be rejected on the basis of the experimental sample. Moreover, the marriage rate was found to be higher in the urban units of the sample than in the rural units. The doubt thrown upon this hypothesis was further substantiated by three other indices used only in the pilot study. These were: 1) Per cent of persons 14 years old and over who are single, 2) per cent of persons 14 years old and over who are classified as "unrelated individuals," and 3) per cent of all dwelling units occupied by only one person. All of these indices produced much overlapping of percentages among urban and rural units. From inspection of the pilot sample the indices did not appear to discriminate consistently between the extremely urban and extremely rural units.

7) The more urban a population the lower will be its fertility. As measured by the crude birth rate, doubt is thrown upon this hypothesis by the experimental sample where a tau coefficient of only -.39 was obtained. This is significant at the 5 per cent but not at the 1 per cent level. It would have been desirable to use fertility ratio or net reproduction rate as measures of fertility instead of the crude

birth rate but the necessary tabulations were not available at the time that the study was made.

8) The more urban an area the lower will be the infant mortality rate. This hypothesis would be rejected on the basis of the experimental sample. The tau coefficient of -.26 was not significant.

9) The more urban a population the higher will be its median age. This was confirmed by the experimental sample, although it was not as consistently discriminating between the urban and rural units as many other indices.

10) The more urban a population the lower will be the proportion of persons in the upper and lower age brackets. As measured by the percentage of the population which is under 5 years of age, this hypothesis was confirmed by the experimental sample but rejected on the basis of the random sample, where a correlation coefficient of only -.19 was obtained. For the pilot sample "per cent of the population which is 65 years old and over" and "per cent of the population which is 85 years old and over" both showed considerable overlapping among urban and rural units with a greater number of higher percentages among the urban. Thus, for that small sample a larger proportion of persons in the upper age brackets was to be found in the SMA's.

11) The more urban an area the more complex will be the technology of the equipment with which its dwelling units are furnished. Six measures were used on the experimental sample and two on the random sample. All coefficients were highly significant.

12) The more urban a population the greater will be its territorial mobility. Considerable doubt is thrown upon this

hypothesis. On the experimental sample the tau coefficient for the ratio of persons who lived in a different county or abroad in 1949 to the total population was significant at the 5 per cent but not at the 1 per cent level. Moreover, for the pilot sample the "per cent of persons one year old and over who were in the same house in 1949 and 1950" did not appear to discriminate between extremely urban and extremely rural units. Another index, "per cent of occupied units which are owner-occupied," was used on the pilot sample. While a majority of the rural units did have higher percentages than the urban, there was some overlapping. Besides, the wide variation in values among the rural units of the sample caused us to doubt the reliability of the index.

13) The more urban a population the more indirect and impersonal will be its forms of communication. This was confirmed by both the experimental and random samples for the three indices tested.

14) The more urban an area the greater will be the complexity of its mechanized forms of communication and transportation. As measured by "per cent of employed persons who are telecommunications workers," this hypothesis was confirmed by both samples. However, as measured by "per cent of employed persons in transportation, communication and other public utilities," the correlation coefficient of $\not.24$ for the random sample was not significant. One explanation of this low correlation might be that even in the more rural counties a minimum number of employees is required to operate and maintain these utilities and this minimum may be a relatively high proportion of all employed persons in a county in which the population density is relatively low. However, this low correlation coefficient is partially

accounted for by one extreme value in the random sample. In Greenup County, Kentucky, which ranks 23rd as to size of composite index score (for 25 items), 35.3 per cent of all employed persons are in transportation, communication and other public utilities, giving a standard score of +5.59. When Greenup County was eliminated, a correlation coefficient (r) of +.62 was obtained. This was significant at the 1 per cent level.

15) The more urban a population the greater will be its biological and cultural heterogeneity. This was confirmed by both samples as measured by "percentage of persons 21 years of age and over who were foreign born." We were unable to find other satisfactory measures of this characteristic. Two others which were used with the pilot sample were not discriminating.

16) The more urban a population the more will formal training of the young be stressed. This was confirmed by 4 indices tested with the experimental sample and 2 tested with the random sample. However, a tau coefficient of only -.24 was obtained for "percentage of persons 25 years old and over who completed less than 5 grades." This was not statistically significant.

17) The more urban a population the more highly differentiated will be the structure of its institutions. As measured by "percentage of employed persons in medical and other health services," this hypothesis was strongly confirmed by both samples. As measured by "percentage of employed persons who are in public administration," the hypothesis was confirmed by the experimental sample. However, the correlation coefficient (r) of +.37 for the random sample was significant at the 5 per cent but not at the 1 per cent level. A

similar explanation to the one given above for the low correlation for "percentage of persons in transportation, communication and other public utilities" is suggested, namely, a) a minimum number of public administration workers is required, regardless of the size of the population, and b) an extremely high value for one of the units. In Monroe County, Florida, 23 per cent of all employed persons are in public administration, which is 5.66 standard deviations above the mean.

18) The more urban the population the greater will be the disparity between the ideal cultural norms and actual behavior. This was confirmed by the only index which we were able to find which seemed to be a measure of the characteristic. Other indices of this trait would have been desirable. Another index, "per cent of persons not in the labor force who are 65 years old or over" was tried on the pilot sample and was rejected because both its discriminability and its reliability appeared doubtful.

19) The more urban an area the more concentrated will be its population. This was confirmed by three indices tested with the experimental sample and by two tested with the random sample. However, for a fourth index used with the experimental sample, "per cent of dwelling units with 1.01 or more persons per room," a highly significant tau coefficient of -.46 was obtained, indicating a negative relationship between crowding within dwelling units and urbanness.

Conclusions

As a result of the present study, a few conclusions may be stated in the form of tentative generalizations. The reader is

cautioned that what follows is in the nature of interpretation and not findings. Another investigator might well place a different interpretation upon the same data.

1) The assumption of a rural-urban continuum appears to be at least partially confirmed by our study. Rural-Urban Index scores vary gradually from 463 for Screven County, Georgia, to 836 for Boston SMA in the random sample. On the other hand, the scores are not evenly distributed between the lowest and the highest. There is a concentration of scores around 600, while the distribution is highly skewed toward the higher scores. There appears to be a "natural break" between Duchess County (763) and Boston SMA (836), although this might well be due to chance. While Queen and Carpenter interpret the distribution of their Index of Urbanism scores as manifesting a continuum,[1] we seem to note a discontinuity between counties having an Index score of 50.0 or less and those having a score of 70.0 or more. In a study of the correlation of city size with kinds of commercial establishments Keyes, using 1930 data, concluded that the distribution indicated a continuum with four "plateaus" with possible "natural breaks" between the plateaus. These "plateaus" included 1) cities under 25,000 population, 2) 25,000 to 100,000, 3) 100,000 to 500,000, and 4) 500,000 and over.[2] The question which we raise is: Is there some point on the rural-urban continuum at which the ecological structure and its accompanying way of life is so different as to be

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[1] Stuart A. Queen and David B. Carpenter, The American City (1953), p. 30.

[2] Fenton Keyes, "The Correlation of Social Phenomena With Community Size" (1942), unpublished Ph.D. thesis, p. 170.

manifested as a "break" in the continuity of scores of such indexes as those discussed in this paragraph?

2) Assuming that the Rural-Urban Index proves to have a rather high validity for counties and SMA's in the United States, we conclude that population concentration alone is not an adequate index of urbanism. Other characteristics of the population must also be measured. Some of those characteristics have been suggested by the present study.

3) We think that we have demonstrated the feasibility of employing constructed types as reference points and using extreme samples to select valid measures with which to rank populations with respect to a socio-cultural phenomenon such as urbanism.

4) Indications are that our constructed types may have to be revised in certain respects. Specifically, our hypotheses regarding the relationship of urbanism and ruralism to sex ratio, marriage rate, crude birth rate, infant mortality rate, age composition, mobility, and overcrowded housing might have to be revised.

5) Since the Rural-Urban Index has no zero-point, its composite scores are not additive, that is, a score of 800 cannot be taken to mean that the population is twice as urban as one with an Index score of 400, and so on. The Index score simply ranks the population unit in relation to other population units with respect to the characteristics measured by its 12 components. In Chapter IV we have constructed empirically polar type Rural-Urban Index scores which might serve as minimum and maximum reference points until better ones can be established.

6) Since it is assumed that socio-cultural structure is constantly changing, norms for computing the Index scores should be

revised regularly, as new data become available. A study similar to the present one should be carried out for each decennial Census to learn if perhaps there are other indices which will measure the changed socio-cultural structure more efficiently.

Possible Uses For the Index

Some of the tasks for which the Rural-Urban Index might be used would include the following: 1) Its most general function would be to indicate relatively how rural or how urban is the socio-cultural structure of the population of a given county or SMA. A yardstick of urbanism would be useful to men of science and to men of affairs alike. 2) No satisfactory criterion of urbanism or urbanization exists in terms of which the socio-cultural characteristics of a population may be analyzed and their interrelationships studied. If the validity of the Index can be so established that it might serve as such a criterion, a genuine need will have been served. 3) There has been much interest in this country in the process of urbanization, that is, in the development and extension of urbanism as a way of life. It is our hope that the Rural-Urban Index will become an instrument which is useful in studying changes which are associated with urbanization. 4) If the Index proves to be fairly valid, then it might be used by business and professional men in estimating the attitudes and values of a people. 5) Finally, we would like to believe that work with the Index by social scientists over the years will contribute a little to a clarification of the concepts of urbanism, ruralism, rural-urban continuum, and urbanization.

Suggestions For Needed Research

In earlier chapters we have from time to time indicated the need for future studies to answer questions which were left unanswered by the present study. We will summarize those suggestions here and add a few more.

1) One of the first tasks, of course, is to replicate the phase of the study described in Chapter IV with a large sample, which is both random and representative, to establish means and standard deviations which can be used as norms in the computation of Index scores for particular population units.

2) The problem of validation of the Index should be given further study. A scale to measure the urbanness of attitudes and values should be developed and validated. It could then be used to test the validity of the Rural-Urban Index. Carpenter has developed a composite "rurality scale" which might be suggestive.[3]

3) Construct a Rural-Urban Index for subregions of the United States. A separate Index might be constructed for each of Odum's six "Major Societal Group-of-States Regions"[4] or for each of Mangus' 34 "rural cultural regions."[5] The norms and demographic patterns found in these subregions could then be compared with those for the United States as a whole.

4) Repeat the present study from the beginning, using the "urbanized area" in lieu of the SMA as the urban unit. The study might

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[3] Queen and Carpenter, op. cit., pp. 33-37.

[4] Howard W. Odum and Harry E. Moore, American Regionalism (1938).

[5] Carl C. Taylor, et al., Rural Life in the United States (1949), pp. 190-230.

also be repeated with state economic areas as the observational unit. This would be done on the assumption that the socio-cultural structure of the state economic area is more homogeneous than that of the county or SMA.

5) A short but helpful study would be to work out a matrix of intercorrelations among all the 25 variables used with the random sample so that their interrelationships might be better understood.[6]

6) Apply factor analysis to the 25 items used with the random sample to learn what factors are actually being measured and then select the smallest possible number of indices capable of measuring those factors.[7]

7) We suggest that case studies be made of population units which deviate widely from the normal patterns revealed by the Rural-Urban Index. Those deviant cases may throw more light on the phenomenon of urbanism than do the typical cases. The question whether or not there are different types of urbanism and ruralism might be considered. Perhaps a small mining community or a small fishing village might be equally as rural as an agricultural community but in a different way.

8) Select two or more populations having equal Rural-Urban Index scores and make a cultural case study of these communities to determine if they are indeed approximately equally urban in their way of life.

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[6] See Virginia K. White, Measuring Social Need (1951), p. 34.

[7] See John C. Belcher and Emmit F. Sharp, A Short Scale for Measuring Farm Family Level of Living (1952).

9) Once the Index has been validated, studies of the rate of urbanization could be made by comparing Rural-Urban Index scores for the same population units for a series of decennial censuses. Experiments should then be made in prediction of urbanization.

10) Using Index scores as a measure of urbanization, studies of many kinds of phenomena associated with this process could be made.

11) The Index might be employed to test the hypothesis of a rural-urban continuum and the many hypotheses which have been advanced regarding rural-urban differences. The hypotheses proposed in this dissertation await careful testing.

12) The patterns of Rural-Urban Index scores within each of the 67 metropolitan communities delineated by Bogue[8] might be studied and related to his hypothesis of dominance and subdominance.

13) Eventually, a rural-urban index should be developed and validated for populations outside the United States. It should not be assumed that indices which are valid in one culture will be valid in another.

14) Finally, a cross-cultural study of urbanism and urbanization might be anticipated.

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[8] Donald J. Bogue, The Structure of the Metropolitan Community: A Study of Dominance and Subdominance (1950).

APPENDIX A

LETTER, LIST OF CRITERIA AND REPLY FORM MAILED TO SOCIOLOGISTS WHO SELECTED EXTREMELY RURAL COUNTIES

Dear Dr. _____:

Would you please indicate on the attached form what you believe, from your personal knowledge and without any researching, to be three of the "most rural" counties in your state? In this way I am attempting to get together a sample of the "most rural" counties in the U.S. which I plan to use in connection with my doctoral research on construction of some indices of the degree of "urbanness" of counties. I will be working with 1950 Census data and other published statistics.

I would like counties which, in terms of attitudes, would rank as near the rural end of the rural-urban continuum as I am able to find in the U.S. today. As an aid to communication and to bringing greater homogeneity into the sample, I have attached a list of criteria for an ideal-type construct of a "most rural" population. Please add others which occur to you and strike out those which you think inappropriate.

I prefer that you rely upon your past experience and "intuitive" judgment. No harm will be done if you should happen to miss a "more rural" county. All I want is simply as rural a sample as I can get without taking much of anyone's time.

Thank you very much for making these judgments for me. If I ever publish anything on my indices beyond the thesis, I will see that you get a copy.

Sincerely yours,

Orry C. Walz

Selected Criteria of "Rurality" [a]

1. Residence:
   a. Predominantly rural farm.
   b. Relatively isolated from urban influences.

2. Occupation:
   a. Primarily basic agriculture, i.e., raising plants and animals.
   b. Involves direct contact with nature most of the time.
   c. Occupational activities and knowledge are diverse and unspecialized.
   d. Entire family is involved in the farming enterprise.

3. Family relations:
   a. Relatively family-centered.
   b. Kinship relations beyond immediate family unit important.
   c. The aged cared for mostly by relatives.

4. Neighborhood relations:
   a. Social relations with neighbors fairly intimate with mutual aid common.
   b. Strong sense of neighborhood belonging.
   c. Common system of values and a rather homogeneous set of attitudes.

5. System of social interaction (neighborhood and beyond):
   a. Compared to "urban," contacts are fewer and less diverse.
   b. Business relations tend to be informal, i.e., noncontractual.
   c. Most interpersonal relations are face-to-face, personal, relatively durable.
   d. Patterns of social interaction are less "standardized."

6. Social control:
   a. Chiefly by means of informal community pressures of folkways and mores.
   b. Degree of moral integration tends to be high, i.e., the "ideal" and "real" are relatively close together.
   c. Conception of morality tends to be inflexible.

7. Social differentiation and stratification:
   a. Relative cultural homogeneity.
   b. Little specialization of voluntary associations.
   c. Range of class differences tends to be less than in the city.

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[a] Mimeographed and enclosed with letters to sociologists

8. Mobility:
   a. Territorial mobility much less than urban.
   b. Interoccupational mobility low.
   c. Vertical (status) mobility relatively low.

9. Attitudes:
   a. Tradition-oriented, i.e., resist most cultural changes.
   b. Relatively independent, self-reliant, and individualistic, or at most oriented to the local community.
   c. Tends to stress practicality and importance of work.
   d. Possibly fairly conservative with respect to politics, religion, education, etc.
   e. Possibly rather fatalistic, especially toward forces of nature.

10. Social institutions (other than the family):
   a. Usually small and relatively simple in structure.
   b. Functions tend to be comparatively general and unspecialized.
   c. Less emphasis upon rules and regulations; more emphasis upon interpersonal relations.

REPLY FORM[b]

STATE: _____

MOST RURAL COUNTIES, in terms of enclosed list of criteria or others noted. Rank order is not important.

1. _____

2. _____

3. _____

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[b]Mimeographed and enclosed with letters to sociologists

APPENDIX B

HYPOTHESES AND INDICES USED IN PILOT AND EXPERIMENTAL STUDIES SHOWING TAU COEFFICIENTS AND CRITICAL RATIOS

Item Number	Hypotheses and Indices	Tau	C.R.
I.	**Type of Economy**		
	A. The more urban an area the more its population will depend upon a money economy.		
	1. Per cent of employed persons in finance, insurance and real estate	.72	5.03 *
	2. Per cent of employed persons who are private wage and salary workers	.70	5.03 *
	3. Per cent of employed persons who are unpaid family workers (reversed)	-.72	5.03 *
	4. Per cent of employed persons who are "farm laborers, unpaid family workers" (reversed)		
	5. Ratio: $\frac{\text{Persons not in the labor force}}{\text{Persons in the labor force}} \times 100$		
	6. Per capita retail sales		
	7. Per capita retail food sales		
	B. The more urban the economy of an area the more will commerce and industry predominate over agriculture.		
	1. Per cent of employed persons in manufacturing	.64	4.47
	2. Per cent of employed persons who were paid retail employees, Nov. 15, 1948	.72	5.03 *
	3. Per cent of employed persons who were paid wholesale employees, Nov. 15, 1948	.70	4.43 *
	4. Per cent of the population which is classified as "rural farm" (reversed)	-.72	4.96 *

* Indicates item was selected by both the pilot and experimental studies. Items for which no tau coefficient is given were discarded on the basis of the pilot study alone.

Item Number	Hypotheses and Indices	Tau	C.R.
5.	Per cent of the population which is classified as "urban farm"		
6.	Per cent of employed males who are farmers and farm managers (reversed)		
7.	Per cent of employed males in agriculture (reversed)		
8.	Number of retail establishments per square mile in 1948		
9.	Number of square miles per wholesale establishment in 1948 (reversed)		
II.	Division of Labor		
A.	The more urban a population the more complex and specialized will be its division of labor.		
1.	Per cent of employed persons who are professional, technical and kindred	.67	4.67 *
2.	Per cent of employed persons who are operatives and kindred	.59	4.16
3.	Per cent of employed males who are laborers, except farm and mine	.43	3.00
4.	Per cent of employed persons who are service workers, except private household	.72	5.03 *
B.	The more urban an area the greater will be the proportion of women employed outside the home.		
1.	Per cent of females 14 years old and over who are in the labor force	.61	4.26
2.	Per cent of females 14 years old and over who are classified as keeping house (reversed)		

Item Number	Hypotheses and Indices	Tau	C.R.
III.	**The Family**		
	A. The more urban a population the lower will be its sex ratio.		
	1. $\frac{\text{Total number of males}}{\text{Total number of females}} \times 100$ (reversed)	-.64	4.47 *
	2. $\frac{\text{Males 14 and over, single}}{\text{Females 14 and over, single}} \times 100$ (reversed)	-.64	4.47
	B. The more urban an area the less will be the emphasis placed upon family relations.		
	1. Marriage rate: $\frac{\text{Marriages in 1950}}{\text{Total population}} \times 1000$	/.28	1.91
	2. Per cent of persons 14 years old and over who are single		
	3. Per cent of persons 14 years old and over who are classified as "unrelated individuals"		
	4. Per cent of all dwelling units occupied by only one person		
	C. The more urban a population the lower will be its fertility.		
	1. $\frac{\text{Number of live births in 1950}}{\text{Total population}} \times 1000$ (reversed)	-.39	2.26
	D. The more urban an area the lower will be the infant mortality rate.		
	1. $\frac{\text{Number of infant deaths in 1950}}{\text{Number of live births in 1950}} \times 1000$ (reversed)	-.26	1.75
	E. The more urban a population the smaller will be the size of families.		
	1. Average number of persons per household (reversed)		

Item Number	Hypotheses and Indices	Tau	C.R.
IV.	**Age Composition**		
	A. The more urban a population the higher will be its median age.		
	1. Median age	✓.62	4.31
	B. The more urban a population the lower will be the proportion of persons in the upper and lower age brackets.		
	1. Per cent of the population who are under 5 years of age (reversed)	-.62	4.34 *
	2. Per cent of the population who are 65 years old and over (reversed)		
	3. Per cent of the population who are 85 years old and over (reversed)		
V.	**Home Equipment**		
	A. The more urban an area the more complex will be the technology of the equipment with which its dwelling units are furnished.		
	1. Per cent of dwelling units reporting hot running water, private toilet and bath, and not dilapidated	✓.72	5.03
	2. Per cent of dwelling units having no piped running water (reversed)	-.72	5.00 *
	3. Per cent of dwelling units reporting a kitchen sink	✓.72	5.00
	4. Per cent of dwelling units reporting electric lighting	✓.72	5.00 *
	5. Per cent of occupied dwelling units with mechanical refrigeration	✓.63	4.27
	6. Per cent of occupied dwelling units with central heating	✓.67	4.57
	7. Per cent of dwelling units with no toilet (reversed)		

Item Number	Hypotheses and Indices	Tau	C.R.
VI.	**Mobility**		
	A. The more urban a population the greater will be its territorial mobility.		
	1. Number of persons who lived in a different county or abroad in 1949 / Total population x 1000	-.35	2.44
	2. Per cent of persons one year old and over who were in the same house in 1949 and 1950		
	3. Per cent of occupied dwelling units which are owner-occupied		
VII.	**Forms of Communication**		
	A. The more urban a population the more indirect and impersonal will be its forms of communication.		
	1. Per cent of employed persons who are clerical and kindred workers	/.72	5.03 *
	2. Per cent of dwelling units reporting radios	/.66	4.62 *
	3. Per cent of dwelling units reporting television	/.72	5.03 *
	4. Per cent of employed persons in printing, publishing and allied industries		
	B. The more urban an area the greater will be the elaboration of its mechanized forms of communication and transportation.		
	1. Per cent of employed persons in transportation, communication and other public utilities	/.67	4.67 *
	2. Per cent of employed persons who are telecommunications workers	/.70	4.60 *
	3. Per cent of employed males in railroads and railway express service		

Item Number	Hypotheses and Indices	Tau	C.R.
	4. Per cent of employed males in trucking service and warehousing		
VIII.	Heterogeneity		
	A. The more urban a population the greater will be its biological and cultural heterogeneity.		
	1. Per cent of persons 21 years of age and over who were foreign born	⁄.60	4.21 *
	2. Per cent of the population who are Indians, Japanese and Chinese		
	3. Per cent of the population who are classified as nonwhite		
IX.	Social Institutions		
	A. The more urban a population the more will formal training of the young be stressed.		
	1. Median school years completed	⁄.49	3.62 *
	2. Per cent of persons 14 to 17 years of age who are enrolled in school	⁄.42	2.67
	3. Per cent of persons 5 and 6 years of age who are enrolled in kindergarten	⁄.70	4.79 *
	4. Per cent of persons 25 years old and over who have completed less than 5 grades (reversed)	-.24	1.47
	5. Per cent of persons 25 years old and over who completed high school or more	⁄.50	3.40
	6. Per cent of males 25 years old and over who completed the 8th grade		
	7. Per cent of males 25 years old and over who completed 4 years of high school		
	8. Per cent of females 25 years old and over who completed the 8th grade		
	9. Per cent of females 25 years old and over who completed 4 years of high school		

Item Number	Hypotheses and Indices	Tau	C.R.
	B. The more urban a population the more highly elaborated will be the structure of its institutions.		
	1. Per cent of employed persons who are in public administration	/.57	3.99 *
	2. Per cent of employed persons who are in medical and other health services	/.73	5.04 *
	3. Per cent of employed males who are in utilities and sanitary services		
	4. Per cent of employed persons who are classified as government workers		
	5. $\frac{\text{Total population}}{\text{Number of amusement establishments in 1948}}$		
	X. Normative Integration		
	A. The more urban a population the greater will be the disparity between the ideal cultural norms and actual behavior.		
	1. Per cent of the civilian labor force who are unemployed	/.50	3.50 *
	2. Per cent of persons 65 years of age and over who are not in the labor force		
	XI. Population Concentration		
	A. The more urban an area the more concentrated will be its population.		
	1. Number of persons per square mile	/.72	5.03 *
	2. Per cent of dwelling units which are classified as "one-dwelling unit detached structures" (reversed)	-.72	5.03 *
	3. Per cent of dwelling units with 1.01 or more persons per room (reversed)	-.46	3.25
	4. Per cent of married couples without their own household	/.46	3.23

Item Number	Hypotheses and Indices	Tau	C.R.
	5. Per cent of dwelling units with flush toilet inside structure, shared by two or more households		
	6. Per cent of dwelling units with installed bathtub or shower, shared by two or more households		
	7. Per cent of dwelling units which are in structures of 3- and 4-dwelling units		
	8. Per cent of dwelling units which are in structures of 10 or more dwelling units		
XII.	Social Control		
	A. The more urban a population the more complex and impersonal will be the forms of social control.		
	1. Per cent of the population who are classified as "institutional"[a]		

[a] For definition of "institutional," see U. S. Bureau of the Census, County and City Data Book, 1952, p. xvii.

APPENDIX C

ITEM MEANS AND STANDARD DEVIATIONS FOR RANDOM SAMPLE AND ITEM WEIGHTS USED IN COMPUTING STANDARD SCORES

(Item numbers correspond to the classification system employed in Appendix B)

Item Number	Item	Item Mean	Item S.D.	Item Weight
I-A-1	Per cent of employed persons in finance, insurance and real estate	1.5	1.00	1.0
I-A-2	Per cent of employed persons who are private wage and salary workers	52.5	14.05	1.0
I-A-3	Per cent of employed persons who are unpaid family workers (reversed)	4.6	3.32	1.0
I-B-2	Per cent of employed persons who were paid retail employees, Nov. 15, 1948	8.9	4.75	1.0
I-B-3	Per cent of employed persons who were paid wholesale employees, Nov. 15, 1948	2.0	2.77	.9
I-B-4	Per cent of the population classified as "rural farm" (reversed)	35.9	18.92	1.0
II-A-1	Per cent of employed persons who are professional, technical and kindred	6.9	2.27	.9
II-A-4	Per cent of employed persons who are service workers except private household	5.5	3.09	1.0
III-A-1	Sex ratio: $\frac{\text{Number of males}}{\text{Number of females}} \times 100$ (reversed)	105.3	9.90	.9
IV-B-1	Per cent under five years of age (reversed)	11.3	1.63	.9
V-A-2	Per cent of dwelling units having no piped running water (reversed)	31.7	20.18	1.0
V-A-4	Per cent of dwelling units reporting electric lighting	87.6	9.82	1.0
VII-A-1	Per cent of employed persons who are clerical and kindred workers	6.3	3.40	1.0

Item Number	Item	Item Mean	Item S.D.	Item Weight
VII-A-2	Per cent of occupied dwelling units reporting radio sets	93.4	4.13	.9
VII-A-3	Per cent of dwelling units reporting television sets	2.8	5.64	1.0
VII-B-1	Per cent of employed persons in transportation, communication and other public utilities	6.5	5.15	.9
VII-B-2	Per cent of employed persons who are telecommunications workers	0.87	0.34	.9
VIII-A-1	Per cent of persons 21 years of age and over who were foreign born	3.2	3.79	.8
IX-A-1	Median school years completed	9.2	1.48	.9
IX-A-3	Per cent of persons 5 and 6 years of age who are enrolled in kindergarten	9.4	11.20	1.0
IX-B-1	Per cent of employed persons who are in public administration	3.7	3.41	.8
IX-B-2	Per cent of employed persons who are in medical and other health services	1.9	1.88	1.0
X-A-1	Per cent of the civilian labor force who are unemployed	3.4	2.03	.7
XI-A-1	Population density: Number of persons per square mile	116.4	475.97	1.0
XI-A-2	Per cent of dwelling units which are classified as "one-dwelling unit detached structures" (reversed)	85.6	11.91	1.0

APPENDIX D

SIMPLE LINEAR CORRELATIONS BETWEEN COMPOSITE SCORES AND EACH OF TWENTY-FIVE COMPONENT INDICES FOR THE RANDOM SAMPLE

(Item numbers correspond to the classification system employed in Appendix B)

Item Number	Item	N[a]	r	Significance level[b]
I-A-1	Per cent of employed persons in finance, insurance and real estate	40	+.84	1%
I-A-2	Per cent of employed persons who are private wage and salary workers	40	+.60	1%
I-A-3	Per cent of employed persons who are unpaid family workers (reversed)	40	+.61	1%
I-B-2	Per cent of employed persons who were paid retail employees, Nov. 15, 1948	40	+.68	1%
I-B-3	Per cent of employed persons who were paid wholesale employees, Nov. 15, 1948	36	+.41	5%
I-B-4	Per cent of the population classified as "rural farm" (reversed)	39	+.86	1%
II-A-1	Per cent of employed persons who are professional, technical and kindred	40	+.83	1%
II-A-4	Per cent of employed persons who are service workers except private household	40	+.71	1%
III-A-1	Sex ratio: $\frac{\text{Number of males}}{\text{Number of females}} \times 100$ (reversed)	40	+.09	
IV-B-1	Per cent who were under five years of age (reversed)	40	+.19	
V-A-2	Per cent of dwelling units having no piped running water (reversed)	40	+.80	1%

[a] Number of population units used in computing the coefficient.

[b] See Appendix Table VI in Allen L. Edwards, Experimental Design in Psychological Research, p. 408. This table is based on the t test of the hypothesis of zero correlation.

Item Number	Item	N	r	Significance level
V-A-4	Per cent of dwelling units reporting electric lighting	40	/.72	1%
VII-A-1	Per cent of employed persons who are clerical and kindred workers	40	/.79	1%
VII-A-2	Per cent of dwelling units reporting radio sets	38	/.63	1%
VII-A-3	Per cent of dwelling units reporting television sets	40	/.54	1%
VII-B-1	Per cent of employed persons in transportation, communication and other public utilities	40	/.24	
VII-B-2	Per cent of employed persons who are telecommunications workers	40	/.73	1%
VIII-A-1	Per cent of persons 21 years of age and over who were foreign born	40	/.74	1%
IX-A-1	Median school years completed	40	/.71	1%
IX-A-3	Per cent of persons 5 and 6 years of age who are enrolled in kindergarten	40	/.46	1%
IX-B-1	Per cent of employed persons who are in public administration	40	/.37	5%
IX-B-2	Per cent of employed persons who are in medical and other health services	40	/.70	1%
X-A-1	Per cent of the civilian labor force who are unemployed	40	/.49	1%
XI-A-1	Population density: Number of persons per square mile	40	/.57	1%
XI-A-2	Per cent of dwelling units which are classified as "one-dwelling unit detached structures" (reversed)	40	/.76	1%

APPENDIX E

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