

THE USE OF GUTTMAN SCALING TO MEASURE
"SOCIAL DIFFERENTIATION"

by

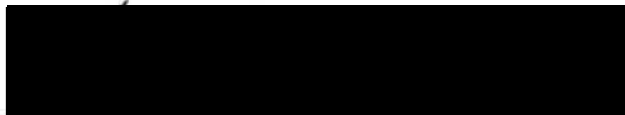
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INTRODUCTION

In 1965 the author received a Ford Foundation grant to accompany a Latin American studies project. In this connection he attended an interdisciplinary seminar with the six other students who were also project members. The purpose of this seminar was to provide an opportunity for members to survey the literature in their fields, and from it draw a problem amenable to a summer's study. Each member was to design and implement his own study rather than work on a facet of a more general plan since all members were from different disciplines.

The author, in his survey of the sociological literature, was guided by the belief that knowledge is more rapidly accumulated when sustained effort is built on a common problem, and thus felt that a maximal contribution would be made by working within an existing research tradition. Three traditions, each involving more than ten to fifteen studies were found and examined: work in rural sociology examining Lipset's argument that one effect of rural socialization is an inability to compete economically in urban areas,¹ studies of innovation in rural areas which

¹An extensive literature developed on this problem and a thorough discussion of it and an excellent bibliography

focused on rates of adoption, characteristics of adopters, etc.,² and, applications of Guttman scaling to the study of "urbanization", "the division of labor" and related concepts. After each was examined it was felt that the third would be the most suitable given the constraints of: the short, three month period allowed for field work, the difficulties of working within an unfamiliar culture, and a previously existing interest in scaling procedures on the part of the author.

This Master's thesis is the report of that study. It is divided into three chapters: The first presents the theoretical background. The second describes the site of the research, important recent social events in the area, and how the field work was carried out. Chapter Three gives the results and comments upon them.

I am greatly indebted to a number of people and wish

on it is given in Lee G. Burchinal, Career Choices of Rural Youth in a Changing Society, Agricultural Experiment Station Bulletin 458, Agricultural Experiment Station, University of Minnesota, November 1962.

²The literature on this is voluminous and most of it is summarized in Everett M. Rogers, Diffusion of Innovations, New York: The Free Press of Glencoe, 1962. This chain was especially appealing since Everett Rogers supervised a series of studies in Colombia. A bibliography of this series is available in Everett M. Rogers with Ralph E. Neill, Achievement Motivation among Colombian Peasants, Diffusion of Innovations Research Report 5, Department of Communications, Michigan State University, East Lansing, Michigan, July 1966.

to especially thank Prof. William McGreevey, project director and then member of the Economics Faculty of the University of Oregon; Dr. Anacleto Apodaca, head of the United Nation's Food and Agricultural Mission in Cali, Colombia; Dr. Thomas Schorr then head of the Anthropology and Mapping Section of Tulane University's medical project at the University of Valle in Cali, Colombia; Mr. Miguel Arce, then research assistant in the Anthropology and Mapping Section; and Mr. Charles Martinson of the Geography Department at the University of Oregon. Without their help and cooperation this project would not have been possible.

CHAPTER ONE

THE THEORETICAL HISTORY OF "SOCIAL DIFFERENTIATION"

In the systematic observation of regularity that we call science, concepts synonymous with or related to "division of labor" have been used recurrently in the analysis of social events. The observations that men habitually perform diverse social tasks and that meaningful consequences follow from their performances are important parts of theories that try to describe or account for social behavior. A casual browsing through reference works which purport to describe social theories¹ leads to the quick conclusion that the problems of what "social diversity" is, how it arises, and what consequences it has, are old in the history of social thought² and common to all social theorists. The concepts of "social class", "stratification", "urbanization" and "status-role", to name a few, are vital elements in today's social theories and all are related to the "division of labor". The sheer

¹For example, see Don Martindale, The Nature and Types of Sociological Theory, Boston: Houghton Mufflin, 1960.

²For example, in Plato's Republic the description of his utopia is crucially concerned with the composition of social roles and their effects on the whole.

number of these relations is prohibitive of a complete general review of the concepts, but we can briefly examine some pertinent references of a few prominent sociological thinkers: Emile Durkheim, Max Weber, Karl Marx, and Talcott Parsons.

Emile Durkheim

The Division of Labor in Society

Emile Durkheim's doctoral dissertation,³ has had a decisive historical impact on the contemporary discussion of the concept. It is probably not an exaggeration to say that three generations later his theoretical views are still generally accepted. Following an analysis of change common to the nineteenth century, Durkheim distinguished two kinds of societies and built a theory of social change out of their differences.⁴ The traditional society, with its low social diversity, has existed throughout most of our history. Social order is not a problematic issue within it since socialization in these small communities has the effect of maximizing the amount of similarity that the

³Emile Durkheim, The Division of Labor in Society, Translated by George Simpson, Glencoe: Free Press, 1964. This was originally published in 1893.

⁴Robert A. Nisbet, The Sociological Tradition, New York: Basic Books Inc., 1966, pp. 47-106.

community members share in common. A constancy of belief and action, especially when formalized as religion and group ritual are effective deterrents to social deviancy. In contrast, the modern secular society, with its high degree of social differentiation, has rapid rates of innovative technology, high population growth, and complex socialization experiences. Since social order becomes problematic within it and is not guaranteed by "shared values" or the possession of a common outlook, how then is it maintained?

It is interesting and important to note that Durkheim's initial interest in the metaphysical properties of society began with his effort to prove the irrelevance to modern life of the constraints and disciplines embodied in traditional, historical types of social organization. The Division of Labor was conceived, quite literally, to prove that the function of the division of labor in modern society is the integration of individuals through their pursuit of complementary and symbiotic specializations, thus making possible--for the first time in history--the termination of traditional mechanisms of social constraint. The function of the division of labor is social: that is, integration. With integration must come new relationships and new laws. The traditional types of relationship and law--based upon repression, mores, and communal sanctions--are gradually expelled. This was the motivation of the book. It was not, however, the conclusion.⁵

After describing Durkheim's treatment of "organic solidarity", Nisbet goes on to explain why he backed away

⁵Nisbet, Emile Durkheim, op. cit., p. 34.

from his initial propositions.

The distinctive contribution of The Division of Labor lies in the fact that, even in the process of arguing what he had conceived as the initial thesis of this work, he saw the inherent weaknesses of that argument when pushed to its logical conclusion and, seeing them, subtly but powerfully altered his thesis. Like Weber, Durkheim could see that, although the conceptual distinction between the two types of solidarity or association was a real one, the institutional stability of the second had to be deeply rooted in the continuation--in one form or another--of the first.⁶

Regardless of the accuracy of this analysis, The Division of Labor set forth an influential view. It described both a theory of change in which the concept of "the division of labor" figured prominently and established the scope of significance of the concept. As we shall later see, much of the early applied work on Guttman scaling were attempts to provide a "better" empirical foundation to Durkheim's ideas.

Karl Marx

The treatment of Karl Marx and those of his successors emphasizes the social fact that men have different relations to the means of production. Some men own them and other men are exploited by the owners. These relations and the awareness of them become the conditions necessary

⁶Ibid., p. 36.

for the formation of social classes.⁷ The division of labor is both a form of social differentiation and the basis for future differentiation.

Just as the core of Marxian analysis has embedded in it the concept of social differentiation so does a very strong critique of Marxian thought. Dahrendorf suggests that if we change our conception of "division of labor" then we change our conception of "class".

For Marx, the determinant of social classes was effective private property in the means of production. In all essential elements, his theory of class is based on this definition of the concept of class. We have seen, meanwhile, that precisely this tie between the concept of class and the possession of, or exclusion from, effective private property limits the applicability of class theory to a relatively short period of European social history. A theory of class based on the division of society into owners and nonowners of means of production loses its analytical value as soon as legal ownership and factual control are separated. For this reason, any effective supersedure of Marx's theory of class has to start at this point. Now, it is one of the central theses of this study that such a supersedure is possible if we replace the possession, or nonpossession, of effective private property by the exercise of, or exclusion from, authority as the criterion of class formation. Renner, Schumpeter, Burnham, Djilas, and others have prepared the ground for this decision; by contrast to most of these we shall not confine the notion of authority to the control of the means of production, but consider it as a type of social relations analytically independent of economic conditions.⁸

⁷Nisbet, The Sociological Tradition, op. cit., p. 205.

⁸Ralf Dahrendorf, Class and Class Conflict in Industrial Society, Stanford: Stanford University Press, 1959,

The introduction of control without ownership was a major shift in the division of industrial labor and, according to Dahrendorf, necessitates a corresponding shift in our analysis of class and stratification. Now it is the control of the means of the production and the authority stemming from that control that is important not the mere ownership of them. Our purpose in citing Dahrendorf is not to perpetuate the cliché that "Well, Marx had some good ideas, but...", rather our purpose is to show the relevance of the concept of social differentiation and indicate its central position in the core of Marxian thought.

Max Weber

Max Weber's analysis of bureaucracy illustrates another referent of the concept by describing the division of labor within a rationalized organization. "Weber's analysis of bureaucracy, including its role in non-governmental spheres of society and culture, is not merely the point of departure of present inquiries; it is, with the rarest and most minute exceptions, still the sum of them. No one has yet added to Weber's theory (vision is the most accurate word) of bureaucracy any theoretical element that is not at

p. 136. This is an expanded and revised edition of the original version published in 1957 in Germany.

least implicit in his own statements on the subject."⁹ The following picture is familiar and is one of the most important stereotypes in contemporary social thought.

From the basic principle of fixed and official jurisdiction flow such vital practices and criteria as the regularization of channels of communication, authority, and appeal; the functional priority of the office to the person occupying it; the emphasis upon written and recorded orders, in place of random, merely personal, commands or wishes; the sharp separation of official from personal identity in the management of affairs and the superintending of finances; the identification of, and provision for the training of "expertness" in a given office or function; the rigorous priority of official to merely personal business in the governing of an enterprise; and, finally the conversion of as many activities and functions as possible to clear and specifiable rules;...¹⁰

Talcott Parsons

It is impossible to neatly summarize the work of Talcott Parsons¹¹ and it would be presumptuous to attempt it in a few paragraphs. The observation that social roles differ in form and purpose is repeatedly made throughout his theoretical career. From his early essays,¹² through

⁹Nisbet, op. cit., p. 142.

¹⁰Ibid., pp. 145-146.

¹¹A very good review of Parson's work with "grand theory" is that of Max Black, (ed.) The Social Theories of Talcott Parsons, Englewood Cliffs: Prentice-Hall Inc., 1961.

¹²Talcott Parsons, Essays in Sociological Theory, (Rev. ed.) Glencoe: Free Press, 1954.

his work on macroscopic systems,¹³ to his later work on evolution,¹⁴ he is systematically concerned with parts of the social system, how they are organized, what they do, and how they are interrelated. The plasticity and creativity of his concepts, e.g., the AGIL schema and its variants, the pattern variables, and distinction like instrumental-expressive, represent proposed solutions to difficult problems. Many of these concepts are directly linked to the concept of division of labor.

As shown by this very brief consideration of a few selected theorists, by the range of its referents, and the number of concepts related to it, the "division of labor" is a broad and multi-faceted idea. However, despite the richness of its theoretical treatment a corresponding empirical richness is conspicuous by its absence. Few social thinkers, regardless of the level that they worked at, be it the dyad or the nation-state, have attempted to describe empirically the division of labor and social diversity extant at their level. (It should be emphasized that we need to have a clear specification of level since

¹³Black, op. cit., contains a bibliography of this period.

¹⁴Talcott Parsons, "Evolutionary Universals in Society," American Sociological Review, 29 (June, 1964), 339-357. See also Talcott Parsons, Societies: Evolutionary and Comparative Perspectives, Englewood Cliffs: Prentice Hall Inc., 1966.

our concept will involve different factors and therefore be measured differently depending upon the level we work at.)

The concept of division of labor has had a somewhat strange career in the history of sociology. On the one hand, the concept has achieved wide acceptance, particularly since Durkheim's classic treatment. On the other hand, it is rarely employed in the generation of testable hypotheses. This is even true for the field of human ecology where, like competition, the concept is often invoked in pure theory but remains in the background as far as research is concerned.

The empirical referents of the division of labor have yet to be specified in any rigorous fashion, but there are two general ideas associated with the concept. First, there is the suggestion of occupational differentiation. However, more is involved than individuals "doing different things". In addition to differentiation there is functional interdependence. Occupational groups do something more than produce different goods and services. They also exchange goods and services and it is this exchange which underlies occupational differentiation.¹⁵

One exception to this comment is the chain of studies systematically exploring the practical utility and theoretical relevance of Guttman scaling. Before describing this chain several points must be clearly stated. First, in Gibbs and Martin's terminology scaling is not a measure of functional interdependence. Rather it is a measure of

¹⁵Jack P. Gibbs and Walter T. Martin, "Urbanization, Technology, and the Division of Labor: International Patterns," American Sociological Review, 27 (October, 1962), p. 669.

differentiation per se and does not necessarily make reference to solidarity or other important variables. Secondly, no one in the chain of studies on this measure claims that it is a be-all or end-all which will cure all sociological ailments. It is one of many measures available to social scientists and the limits of its applicability and utility need to be established so that it can be used in a complementary design with other measures. The purpose of this thesis is to evaluate and contribute to our knowledge of this approach.

Guttman Scaling

Guttman scaling, as it is commonly called now, or "scalogram analysis", as it once was commonly called, was introduced and repeatedly used in the American Soldier studies in World War Two.¹⁶ Scalogram analysis was developed, primarily by Louis Guttman, as a solution to two recurrent problems in the measurement of attitudes:¹⁷ (a) How do we know that any two questions, i.e., items, make

¹⁶ Samuel Stouffer, et al., The American Soldier, Vol. I-IV, Princeton: Princeton University Press, 1949. The first nine chapters of Vol. 4, Measurement and Prediction discuss "scale analysis".

¹⁷ Louis Guttman, "The Problem of Attitude and Opinion Measurement", in Samuel Stouffer, et al., Measurement and Prediction, Princeton: Princeton University Press, 1949.

reference to the same variable, and (b) when can it be said that one item is more "favorable" than another, i.e., reflects a higher or lower value on the variable.

Guttman's analysis is corroborated by McNemar's critique of "opinion-attitude methodologies".¹⁸ Both men point out that these were recurrent problems in polling and attitude measurement and no adequate solutions for them had been found during the 1930's.

Guttman's solution was to build a check for unidimensionality into the scale procedure. He claimed that if more than one variable is operating a set of items will not scale because the responses would be inconsistent. In effect, the scale provides evidence that the concept actually refers to a real, extant variable that has real, extant consequences. If we attempted to scale a set of items which had been successfully scaled before, (or items "similar" to them), and found that they did not scale, this would be a sufficient formal basis for questioning the generality and importance of the variable that these items supposedly represented.

Although scalogram analysis was developed in response to problems of attitude measurement it soon became used for

¹⁸Quinn McNemar, "Opinion-Attitude Methodology," Psychological Bulletin, 43 (July, 1946), 289-374.

other kinds of data. Shapiro,¹⁹ in 1948, observed that the literature on discrimination used only intuitive criteria to classify states into regions, e.g., the "south", the "border states". He scaled states on a set of items he called "Institutionalized Segregation and Discrimination", and found that the states clustered into groups. Because they scaled he argued: that segregation can be thought of as a variable with greater and lesser amounts, and that it is meaningful to speak of states possessing different degrees of the variable. Schmid used scale analysis in his study of the ecology of the American city, and after comparing a number of techniques, concluded that it was a valuable tool and should be explored further.²⁰ Smith used it to classify enumeration districts into homogeneous sub-units by treating scale-type as the criterion and demographic variables as the scale items.²¹ Green, in a study of Birmingham, Alabama scaled a physical dimension called "residential desirability" and a social dimension

¹⁹Gilbert Shapiro, "Myrdal's Definitions of the 'South': A Methodological Note," American Sociological Review, 13 (October, 1948), 619-621.

²⁰Calvin F. Schmid, "Generalizations Concerning the Ecology of the American City," 15 (April, 1950), 264-281.

²¹Joel Smith, "A Method for the Classification of Areas on the Basis of Demographically Homogeneous Populations," American Sociological Review, 19 (April, 1954), 201-207.

called "social desirability" and compared the rankings of census tracts on each dimension, finding that the two dimensions had a high inter-correlation.²²

After this flurry of ecological studies, the majority of work has been on variables similar to the "division of labor." The names of these variables may differ but their contents have a high degree of overlap with each other and with "division of labor." The following chain of studies, occurring over the last ten years, are an interlinked progression which is "probably" studying the same "basic" variable, but at different levels of generality. The work reported in this thesis is part of this flow of thought and the focus will be on how interpretations of the variable and the utility of the technique have changed over time.

Aurbach, in 1955, suggested the use of scales in Kentucky "both for testing the general usefulness of the folk-urban continuum in the sociological classification of counties and for developing a measure of isolation which might be useful elsewhere."²³ First, Aurbach cites the extensive proliferation of rural-urban dichotomies and

²²Norman E. Green, "Scale Analysis of Urban Structures: A Study of Birmingham, Alabama," American Sociological Review, 21 (February, 1956), 8-13.

²³Herbert A. Aurbach, "A Guttman Scale for Measuring Isolation," Rural Sociology, 20 (June, 1955), 142-145.

models,²⁴ and then observes that scaling may be a useful way to check empirically their utility. After showing that a social isolation scale can be developed on Kentucky counties he concludes,

Since isolation is a characteristic of folk society, it seems probable that Guttman scales can be developed to measure other aspects of the folk-urban continuum. Moreover, if the folk-urban continuum is of a single dimension, it should be possible to develop a single scale to measure the degree of folkness or urbanity of the counties. With such a scale or scales, a meaningful and useful classification of counties, based on the theory of the folk-urban continuum, should be possible.²⁵

Freeman and Winch, in their study of a dimension called "societal complexity", present the relation between scaling and the rural-urban models more specifically than Aurbach.

Societal typologies involve the assumption of systematic differences among societies in a number of variables and thus of systematic variation among the variables themselves. In the language of factor analysis, their inter-relationship is described by the single-factor model; in scale analysis by the model of unidimensionality. Here, then, is a proposition amenable to empirical test: To what degree, if any, can the typology of societal complexity be shown to be a single dimension? If the model is consistent with the data, a set of cultural variables should vary systematically together as a continuum of a single underlying attribute. If, on the other hand, the model does not apply, then no empirical basis can be provided for the

²⁴Ibid., p. 142.

²⁵Ibid., p. 145.

typology in question; it is a concept without a referent.

The aim of the present study is to select a set of societal variables regarded as registering societal complexity, to determine whether or not they constitute a single dimension, and hence to ascertain whether there is empirical evidence of a unitary attribute, societal complexity.²⁶

Although two of their eight items did not scale, Freeman and Winch found:

...the demonstration of unidimensionality among six characteristics is evident that the items constitute a scale. Since these qualities are all subsumable under folk-urbanism, Gemeinschaft-Gesellschaft, and the other polar constructs of that order, the conclusion is that Redfield, Tonnies, et al. have indeed been describing a unidimensional phenomenon-societal complexity. Furthermore, this analysis has established a series of scale types or positions of societal complexity...which may be used to describe and arrange societies, ...The types characterize each culture as to the given variables; moreover, they allow comparison of one culture with another. The result not only indicates the generalizability of cultural phenomena but provides suggestive material for constructing further theories of cultural form and process.²⁷

Hassinger's study of retail-service trade patterns in the midwest in 1957²⁸ is a direct successor of attempts in

²⁶Linton C. Freeman and Robert F. Winch, "Societal Complexity: An Empirical Test of a Typology of Societies," American Journal of Sociology, 62 (March, 1957), p. 462.

²⁷Ibid., p. 464.

²⁸Edward Hassinger, "The Relationship of Retail-Service Patterns to Trade-Center Population Change", Rural Sociology, 22 (September, 1957), 235-240.

the 1930's and 1940's to classify rural centers according to the services that the center provided. He scaled agricultural trade centers in Minnesota on a "complexity of types of retail services available" variable, and found his 351 centers scaled and that "The pattern itself suggests an interdependence among centers, with places at the lower end of the scale providing everyday goods while centers with high scores provide more specialized and more infrequently used services, not only to farmers from a wider area but also to residents of surrounding, less specialized trade centers."²⁹ He also found that correlating the 1939 scale type, (constructed ex post facto) with the population change between 1939 and 1950 showed that communities which were more specialized and varied tended to increase in population. In addition, at each level of complexity those centers which gained the most in services also gained the most in population. Hassinger showed that predictions about future population growth could be made on the basis of scale type.

Rose and Willoughby, using the Human Relations Area File,³⁰ scaled twenty selected cultures on a modern-

²⁹ Ibid., pp. 237-238.

³⁰ Edward Rose and Gary Willoughby, "Culture Profiles and Emphases," American Journal of Sociology, 63 (March, 1958), 476-490.

primitive dimension using the seventy-six cultural activities that the File collates material on. Sixteen of the seventy-six were scalable at or beyond the ninety per cent level of reproducibility.

A consistent distinction can be drawn between the twenty cultures only in terms of these sixteen activities. Other activities displayed in the twenty records erratic distributions that failed to fit any general pattern at a reliable level of reproducibility. Thus such features as social stratification and communication are not safe to use in classifying cultures because their distribution are peculiar. Non-scalable features, since they represent the idiosyncracies of cultures may be remarkable and yet not helpful in general, systematic comparisons.³¹

In other words, it is not the case that a set of ethnographic information can be automatically scaled every time, regardless of what the information is. Even though a set of their activities scaled, Freeman and Winch provide the useful reminder that some sort of theoretical selection must precede the scaling effort. Having scaled twenty cultures, they then choose an additional fifteen and found a high reliability in predicting the activities that these cultures would have. They concluded that "If we are to explain the interaction of cultures, it is useful to know in what respects cultures are similar or different. As we view them, culture scales and rankings are no more than assessments of similarities and differences, hinting in

³¹Ibid., pp. 482-483.

some instances at cultural processes."³²

Ramsey and Collazo tried to build a "scale" whose items would measure the level of living in two different culture areas, Puerto Rico and upstate New York.³³ For items they used material possessions such as pressure cooker, toilet, sewing machine, etc., and built a "linear progress scale" by beginning with a large number of items and then slowly culling the list. They retained only those items which were common to each culture and correlated positively with occupation when culture was controlled. Ten items met these conditions and they formed the "scale". Strictly speaking they used an index rather than a scale, since a scale is an index which contains a check on the unidimensionality of the items. Ramsey and Collazo merely assumed unidimensionality by assuming a notion of "linear progress". Nevertheless, their work is useful because it is a "good" case study of the problems of item selection, and they ended up with a workable "scale".

Carneiro's article was written as an introduction to scaling procedures for anthropologists.³⁴ After scaling

³²Ibid., p. 490.

³³Charles E. Ramsey and Jenaro Collazo, "Some Problems of Cross-cultural Measurement," Rural Sociology, 25 (March, 1960), 91-106.

³⁴Robert L. Carneiro, "Scale Analysis as an Instrument for the Study of Cultural Evolution", Southwestern Journal

selected tribal cultures in Latin America as examples of the technique, Carneiro discusses the theoretical utility, as he sees it, of scaling.

The view with which scaling confronts us is this: cultural evolution is essentially a single grand process in which all societies partake in much the same way, but in which they have partaken to various degrees. The analogy of a series of stair-steps suggested earlier, is particularly useful here. From the point of view of scaling, cultural evolution appears to be a process in which mankind, in the form of individual societies, ascends a flight of stairs the steps of which correspond to a series of ranked culture traits. The order of the steps is fairly well fixed and is essentially the same for all. One must begin with Step 1 before he can proceed to Step 2..., and must attain Step 9 before advancing to Step 10. Although everyone ascends in the same manner not everyone proceeds at the same rate. Accordingly, at any point in time individuals (societies) may be seen standing on almost every step, and several on the same step.³⁵

And,

It should be added though that unilinear evolution in the form in which scale analysis might reveal it would not be the same thing as unilinear evolution in the "classical" sense. The traditional conception of unilinear evolution (or at least that imputed to it by its critics) is that in their development all societies go through the same stages. Going through stages, however, means transcending or outgrowing one stage in the process of attaining the next. Thus in classical unilinear evolution there is supersedence of earlier forms instead of retention of them. This conception is clearly at variance with that which underlies scaling, namely that along with the development of new forms there is retention of old ones. But despite this formal

of Anthropology, 18 (Spring, 1962), 149-169.

³⁵ Ibid., p. 158.

difference, the two concepts have a core of important similarities. Both hold that there is a discernable order to the way in which all societies develop, and that this order is substantially duplicated by all societies if and as they evolve.³⁶

Carneiro thus raises the possibility that there may be a "main line" of development, a "normal course" equivalent to the concept of a main sequence in stellar evolution, and that scale analysis, possibly through its scale types, may help to determine it. He goes on to discuss the items and the concepts of "cumulativeness" and "functional prerequisite". Hassinger implicitly used these concepts but Carneiro uses them explicitly. In Gibbs and Martin's terminology, Carneiro raises the question of whether or not the items are functionally interdependent. If you can establish that they are, then you have a technique that "measures" both differentiation per se and functional interdependence. Without holding to it firmly, Carneiro suggests that since the items are cumulative some sort of necessity exists. Perhaps one item is a "functional prerequisite" for another? From this it is an easy step to interdependence, for if one item is a "functional prerequisite" of another then does it not follow that the items are interdependent? This question cannot be resolved by the scaling literature since it states that if the items

³⁶Ibid., p. 159.

scale then they are from the same universe, but it does not say what that universe is or what interaction exists among the items.

Frank and Ruth Young's study of Mexican communities is reported on in a series of four articles. In their first study,³⁷ building on the work of Aurbach, they constructed two scales, the first ranking twenty-four Mexican communities by their amount of "economic contact" with an "industrial city" and the second ranking the communities on their "institutional level". As did Freeman and Winch, Hassinger, and Carneiro, the Youngs speculated theoretically about the sequence, i.e., the interdependence, of the scale items. To them, the "economic contact" scale seemed to show that "the first contact with the center was on an individual basis, as labor for the factories or in private houses,"³⁸ and that as a whole the underlying dimension of the first scale was that of the "economic exploitation" by the communities of the city.

Certainly more than one informant referred to the factory center as a 'mine', perhaps implying that this was the modern version of the mines that had been worked out. Stated negatively, the scale does not tap consumption. The villagers do shop

³⁷Frank W. Young and Ruth C. Young, "Two Determinants of Community Reaction to Industrialization in Rural Mexico," Economic Development and Cultural Change, 8 (April, 1960), 257-264.

³⁸Ibid., p. 258.

in the industrial center, as well as attend movies and ball games there, but these items did not scale. Similarly, other types of contact, like religious, familial and certain perception items did not scale, and appeared not to form any other basic variable.³⁹

They also speculated that the items in their "institutional level" scale moved from least to more "institutionalized". "...the sequence clearly indicates the levels of institutionalization, beginning with the communities that were no more than neighborhoods with little or no formal structure, through the middle-level communities with the traditional contact with the outside world embodied in the railroad and the village school, to the communities that have direct access to the national communication level by way of the doctor, telephone, radios, and a secondary school."⁴⁰ They then showed that the functional distance of the community from the city and the institutional level were sufficient, taken together, to account for the community's level of economic contact.

Their second article focused on the determinants of absolute and relative change of the community,⁴¹ (by

³⁹Ibid., p. 259.

⁴⁰Ibid., p. 261.

⁴¹Frank W. Young and Ruth C. Young, "Social Integration and Change in Twenty-Four Mexican Villages," Economic Development and Cultural Change, 8 (July, 1960), 366-377.

"absolute change" we mean the total number of group level changes in a period and by "relative change" we mean the change of the community vis a vis other communities).

"Relative change" was found to be primarily due to "cohesiveness", i.e., solidarity and it was explicitly proposed that the amount of primary group interaction in a community was directly related to its ability to change relative to other communities. "Absolute change" was found to be related to three variables, "institutional level", "urban orientation" and "cohesion"; "it was a surprise to find that all three factors...combined to affect absolute change. We must conclude that the organization of communities is not exhausted by any one concept of integration, at least as they are operationalized here. Moreover, there are three separate factors which act independently of each other, and not one single concept, "integration", indexed in three ways."⁴²

The concept of "institutional level" is important and merits an extended comment.⁴³

As a first determinant of such absolute change we turned to the scale of institutional level based on items known to be present or absent in 1950. We follow Chapin's definition of a nucleated institution: "...common reciprocating attitudes of individuals and their con-

⁴²Ibid., p. 374.

⁴³Ibid., p. 369.

ventionalized behavior patterns.' We make a second assumption, borne out by previous findings in New York State communities that the various nucleated institutions of a community are related in a single community social system. This has also been the assumption of theorists like Parsons and Williams who have been concerned with the larger, national social system. Thus an addition of an institutional role, a meeting place, or the like is an increment to the level of institutional functioning, and to the level of functioning of the community institutional system as a whole. It has also been shown previously that an important function of the community institutions is to maintain relations with the wider regional and national institutional systems. Each item in the scale is not an entire institution, but rather represents an increment to the level of functioning of the community institutional system.

The Youngs make the point that too often "industrialization" is viewed as an outside factor which thrusts itself upon a passive rural area, and that social theorists habitually ask "What is the impact of industrialization, or urbanization, on the rural community?" Instead, they point out that the properties of the community, especially its institutional level, have an important influence on the "impact" of industrialization. They reasoned that if the phrase "contact leads to change" has any utility then contact per se should be a predictor of change, but when they controlled for the institutional level of the community there was no relation between their economic contact score and their rates of change. The internal characteristics of the community are important factors and a community will not change until it has the institutional

capacity to change. The Youngs concluded that this capacity included an urban orientation, a high amount of solidarity, and a relatively high institutional level.

In their third article the Youngs elaborated this perspective⁴⁴ and stated the following generalization:

All recent human communities develop according to a unidimensional sequence in the direction of greater articulation with what may be called the emerging urban-industrial structure. Three main emphases characterize the growth-sequence: a stage of local autonomy, a stage of representative group-level contacts, and a third phase in which the community and national systems interpenetrate.⁴⁵

To restate the finding, it appears that in this area of rural Mexico there is a single sequence and direction of community articulation in which "inner" or institutional growth is on one side of the coin and "outer" communications is on the other. Although the component items have, to our knowledge, never been thought to form a variable, they now appear to have a single underlying dimension in that they represent different scale positions in a measure of community development, growth, or as we prefer to call it, articulation.⁴⁶

The idea of a "growth sequence" through stages is based on an intuitive classification of the items in the institutional level scale. Since this scale was based on only Mexican communities generalizations from it are limited.

⁴⁴Frank W. Young and Ruth C. Young, "The Sequence and Direction of Community Growth: A Cross-Cultural Generalization," Rural Sociology, 27 (December, 1962), 374-386.

⁴⁵Ibid., pp. 374-375.

⁴⁶Ibid., p. 377.

Fortunately, data for a world sample of fifty-four communities became available and, following Freeman and Winch, these were scaled on a "social complexity" dimension. However, the Youngs called their dimension "community articulation" and found that its items could also be intuitively interpreted as showing a three stage sequence. The two scales together provide the empirical justification for their theoretical generalization. Supplementary data showed that the higher the scale position the greater the population size and the greater the rate of expansion. Weakly "articulated" communities are small and declining and strongly "articulated" communities are large and expanding.

The cumulativeness of science on a common problem is illustrated with this scale. Some of the initial inspiration comes from Freeman and Winch, the scale items were very similar to Aurbach's, and the relation between scale position and expansion is similar to Hassinger's finding. Any work in a series of studies contributes to the validation, (or non-validation) of earlier studies.

The Youngs end their third article by making a general theoretical statement as to what "modernization" is. They say, (a) it is a continuum, i.e., it is unidimensional, (b) scale items are close to being functional prerequisites (this is an implicit claim), and (c) development is recip-

rocal. To be a city the city must expand into other areas⁴⁷ and other areas must be complex enough to interlink with that expansion. The city and the rural communities around it develop together since the development of one is dependent upon the other.

John H. Kunkel, an economist, made an implicit rebuttal of the Youngs' findings. The rebuttal was both limited in scope and not supported by his evidence but it nevertheless raises a plausible argument.⁴⁸

Table 1 supports the hypothesis that, as small agricultural, economically autonomous communities begin to participate in the economic system of the nation, their social organization becomes consistent with that of the nation. The villages which are autonomous economically have, on the whole, a social organization which is quite inconsistent with that of the nation. On the other hand, those communities which are economically dependent on the outside have a social organization which is, on the whole, quite consistent with the nation's.⁴⁹

The result of this study indicates at least the general nature of the answer to a question raised by the Youngs: "What are the characteristics of a community which enables it to achieve incorporation in the urban system?" The greater the vital necessity of economic contact; and the

⁴⁷This point is developed in Jack P. Gibbs and Walter T. Martin, "Urbanization and Natural Resources: A Study in Organizational Ecology," American Sociological Review, 23 (June, 1958), 266ff.

⁴⁸John H. Kunkel, "Economic Autonomy and Social Change in Mexican Villages," Economic Development and Cultural Change, 10 (October, 1961), 51-63.

⁴⁹Ibid., p. 58.

greater a village's economic autonomy, the greater its resistance to change.⁵⁰

Kunkel surveyed the anthropological literature on Mexican communities and scaled fifteen on a variable of "economic dependency". Concomitantly, he constructed an Index of National Elements and found a close correlation between scale position and index position. Kunkel has only this correlational data and no information about the community's change over time, thus the evidence does not support his economic bias of the primacy of the community's economy. That the "causal" connection was overstated should not detract from the fact that a very strong association was shown to exist between the kind of social organization a community has and the amount of trade they have with the outside. A plausible alternative accounting would be to regard these two factors as part of a feedback loop between two interconnected behavior patterns.

The initial series of articles of Frank and Ruth Young were followed by a 1965 article by Frank Young and Isao Fujimoto. They surveyed all ethnographic studies done on Latin America and scaled fifty-four communities on a "social differentiation" variable.⁵¹

⁵⁰Ibid., p. 61.

⁵¹Frank W. Young and Isao Fujimoto, "Social Differentiation in Latin American Communities," Economic Development and Cultural Change, 13, (April, 1965), 344-352.

In this study Young modifies his theoretical views in two ways: First, he changes his interpretation of what a scale is:

This scale is only an index of differentiation, and therefore it should be possible to find other sets of items either of general differentiation, or of the differentiation of particular sectors, such as religious, political, or economic. The conclusion follows from the well-known fact of interchangeable indices and from the abstract nature of differentiation. This concept may be defined as the degree to which diverse areas of social meaning are publicly discriminated. That is, to the degree that separate sectors of the structure of meanings maintained by the community are institutionalized and made visible by symbol or artifact, there is social differentiation. This formulation is structural in the sense that it applies to the unit as a whole. Consequently, group-level indices must be sought; statistical aggregations of individuals or of families are either misleading or totally erroneous as indices.

A further implication of this scale is that it is incorrect to theorize about the concrete sequence. Interpretations along the lines of the need for a doctor to care for the wounds from fighting in a newly built pool hall are irrelevant, [in Young and Fujimoto's scale the presence of a resident doctor is the next item after the presence of a pool hall], because all the items are simple indicators of differentiation. The real issue is what are the pre-conditions of high and low differentiation, but that question is beyond the scope of the present research.⁵²

And secondly, he now discusses community development in a more problematic manner: "...does the scale indicate

⁵²Ibid., pp. 346-347.

that communities actually develop in this cumulative manner?"⁵³ He no longer accepts the cumulativeness of the items as given, but he treats it as a speculative assumption by examining alternative interpretations. Communities may fluctuate by developing and then regressing, and repeating this cycle. However, this does not contradict the belief that when they do develop they pass through a sequence. Or, a community might have developed all at once. The creation of "new towns" is frequent. However, it is not that frequent and had these towns developed differently we would have much more scale error.

Still another possibility is that there are waves of social change and that at any one time the institutions form a cumulative sequence, interpretable, however, only as a measure of complexity and not of actual change over time. This view reminds us that the actual items of the scale are simply indicators of levels of complexity and are not necessarily the actual components of change. Therefore, at best the scale suggests a rather abstract sequence of differentiation levels through which communities pass over time, but once the variable is seen in this light, it is equally easy to see it more conservatively, as simply a measure of complexity at any one time. It is true that this conservative view of the meaning of the scale implies a more radical interpretation of social change: evidently it is possible to reshuffle the concrete indicators of differentiation without changing the fact that communities may always be ranked on such a dimension. That is, major jumps in development may completely reorganize the concrete indicators

⁵³Ibid., p. 351.

of differentiation without altering their underlying cumulative patterning.⁵⁴

These changing interpretations of what the scale represents and how the items are to be understood are major modifications of his earlier theoretical perspective. In this study the items are not analyzed and it is not asserted that the scale types are phases through which the communities advance. Rather the more conservative interpretation, that the scale ranks communities on the amount of differentiation that they have at that time, is suggested.

Correspondent to this problematic approach, Young and Fujimoto list a number of scale correlates.

A number of variables are correlated with the scale and serve to validate it. Population size correlates .44, using Kendall's measure of rank correlation. The number of grades in the school bears a relationship of .62 and the number of stores, .60. The estimated proportion of adults in non-agricultural work correlates .41 with differentiation. The proportion of Indians in the community correlates -.24 and is significant at the five per cent level, although this measure is only tenuously interpretable as differentiation.⁵⁵

In addition, Young and Fujimoto suggest that a longitudinal study of a single community would be very useful in resolving the origin and decline of institutions.

⁵⁴Ibid., p. 351.

⁵⁵Ibid., p. 349.

Summary

This series of studies is not exhaustive of the applications of Guttman scaling. It is, however, a self-contained, inter-linked line using the same technique to order "approximately similar" data, and as shown by the very brief survey of sociological theorists, the observation that social behavior is diverse, is old and recurs in many contexts. As shown by the survey of studies certain features of these older conceptions seem to be interpretable in terms of Guttman scaling. Scaling seemed to be a natural, unstrained way of conceptualizing and measuring a continuum, or process, or the description of a series of phases through which social objects would move over time.

From similar ethnographic reports, Freeman and Winch scaled "societal complexity", Rose and Willoughby scaled "primitive-modern emphases", Carneiro scaled "social evolution", Kunkel scaled "economic autonomy" and Young and Fujimoto scaled "social differentiation". The primary differences among these studies is in their degree of specificity. When scaling "large" units such as culture areas, regions, or states, "large" clumps of behavior-value are needed, e.g., presence or absence of economic activity. (If smaller items were used all of these "large" units would have them and no scale would result.) When scaling "small" units such as communities, smaller clumps must be

used, e.g., presence or absence of doctor. (If larger items were used all communities would have them and no scale would result.)

The clear shift in Young's interpretation of scaled data is interesting to speculate about and, in part, may be attributable to some central non-formal elements in scaling techniques. As a formal technique, Guttman scaling makes no reference to the substantive content of the universe or the inter-relationships among the items. The method tells whether or not a single dimension is existent among the variables, but it, like factor analysis, does not tell what the dimension's content is. Nor can it tell whether the items are from a given universe since the only constraint on item selection is the experience of the researcher. Scaling presupposes that the items have been picked and then it operates on them. As a formal technique, it gains its formality and generality by making no reference to the substantive content of the items. Since the substantive interpretation of what the items are is a product of the researcher's experience it is not surprising that Young's thoughts changed between 1958 and 1965. Moreover, since the identification of a dimension is a non-formal decision, as it is in factor analysis, it is not surprising to find different researchers labeling "similar" items differently.

Early interpretations of process and evolution were offered because they were intuitively plausible. Intuitively, we would expect that "primitive", less populated areas were lower on the scale and "advanced", more populated areas would be higher on the scale. It was also intuitively plausible that the scale types represented steps or phases through which areas "progressed". When Young first scaled communities he worked within the context of these earlier interpretations of process and phases, and with them he constructed his theory of "community articulation". However, in his later work he adopts a more problematic stance and renders more conservative interpretations. The resulting scales are treated as descriptions of diversity as that diversity exists at a single time.

The research that this thesis reports on enters at this point in the chain and addresses itself to multiple questions. The most important question is, can the findings be replicated? The importance of this question has not received an appropriate recognition in sociology. "A content analysis of all issues of four of the leading sociological journals for the most recent five-year period indicates a lack of agreement and research continuity with respect to the use of measurement procedures. Of the 986 different scales and indices found, fewer than one-fourth

were used more than once, and only 1.6 per cent were used or cited more than five times."⁵⁶

Replication is especially important in Guttman scaling since the method generates non-obvious results, i.e., the existence of an underlying dimension is not always apparent. If "similar" sets of items can be scaled in different cultures at different times, then the dimension and variable which these items represent is of general applicability. If a variable does not scale, then there are unknown limits to it which restrict its application to a particular culture or a particular time. This has important implications for theory building since if we fail to demonstrate the existence of a variable its presence cannot be assumed, it cannot be used in a theory and propositions with it cannot be proposed. On the other hand, if a set of items does scale then a general contribution is made to theory by demonstrating the successful measurement of a concept and a specific contribution is made to the substantive knowledge of the area studied since social objects in that area were found to be ranked in some meaningful way.

Secondly, following Young's pragmatic emphasis, scale correlates will be carefully examined. If this procedure

⁵⁶Charles M. Bonjean, Richard J. Hill, and S. Dale McLemore, "Continuities in Measurement, 1959-1963," Social Forces, 43 (May, 1965), p. 532.

is an adequate way to conceptualize "urbanization", "the rural-urban continuum", etc., then we should expect variables which are traditionally associated with these concepts to vary systematically with scale position. The theoretical claims made about the variables imply a method of analyzing scale results. The existing literature on the rural-urban continuum presents several tactics for examining continuum correlates, and, analogously, this study will use the same tactics to examine scale correlates.

Finally, the history of social inquiry shows that no one technique per se fully "accounts for" or "explains" the social experience of a people. In the long run, the utility of scaling is only going to be as theoretically useful as are the concepts which it can measure. It seems intuitively clear that "differentiation" is only one of a set of potentially important variables, (and no contributor has claimed it is more than that). Thus the most appropriate perspective from which to evaluate these studies would not rely on absolute criteria, but rather, would consider the relative utility of the approach and how it may complement a more general design.

CHAPTER TWO

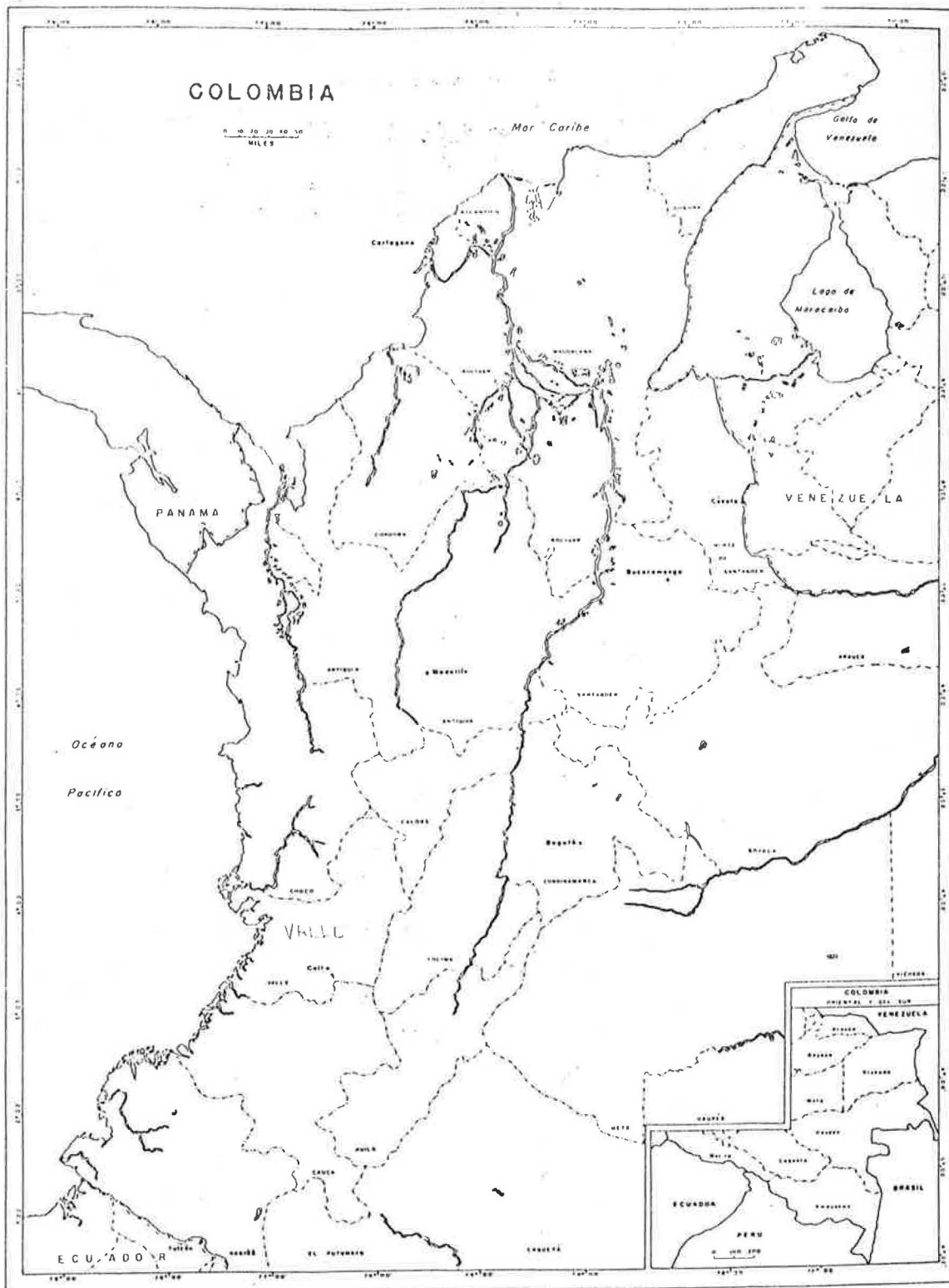
A DESCRIPTION OF THE RESEARCH SITE AND FIELD PROCEDURE

This chapter is composed of two parts: The first is a description of the site of the field work and some important social trends that are operating within it. The second is a description of the field work.

The Research Site

Once the general problem area has been selected, a major constraint on the quality and quantity of the obtained results is the site chosen for study. This is especially true for the turbulent and difficult land that is the Departamento del Valle in south-western Colombia. (See Map A).

Colombia, as a nation, is administratively divided into seventeen departamentos, corresponding to North American states, and each departamento is composed of municipios, or counties. There are approximately 850 municipios in Colombia and usually the largest town in each is the cabecera, or county seat. In addition to being the local administrative center of the municipio, it also contains the market, a detachment of police, local political headquarters, bus lines, and a large church. All of these

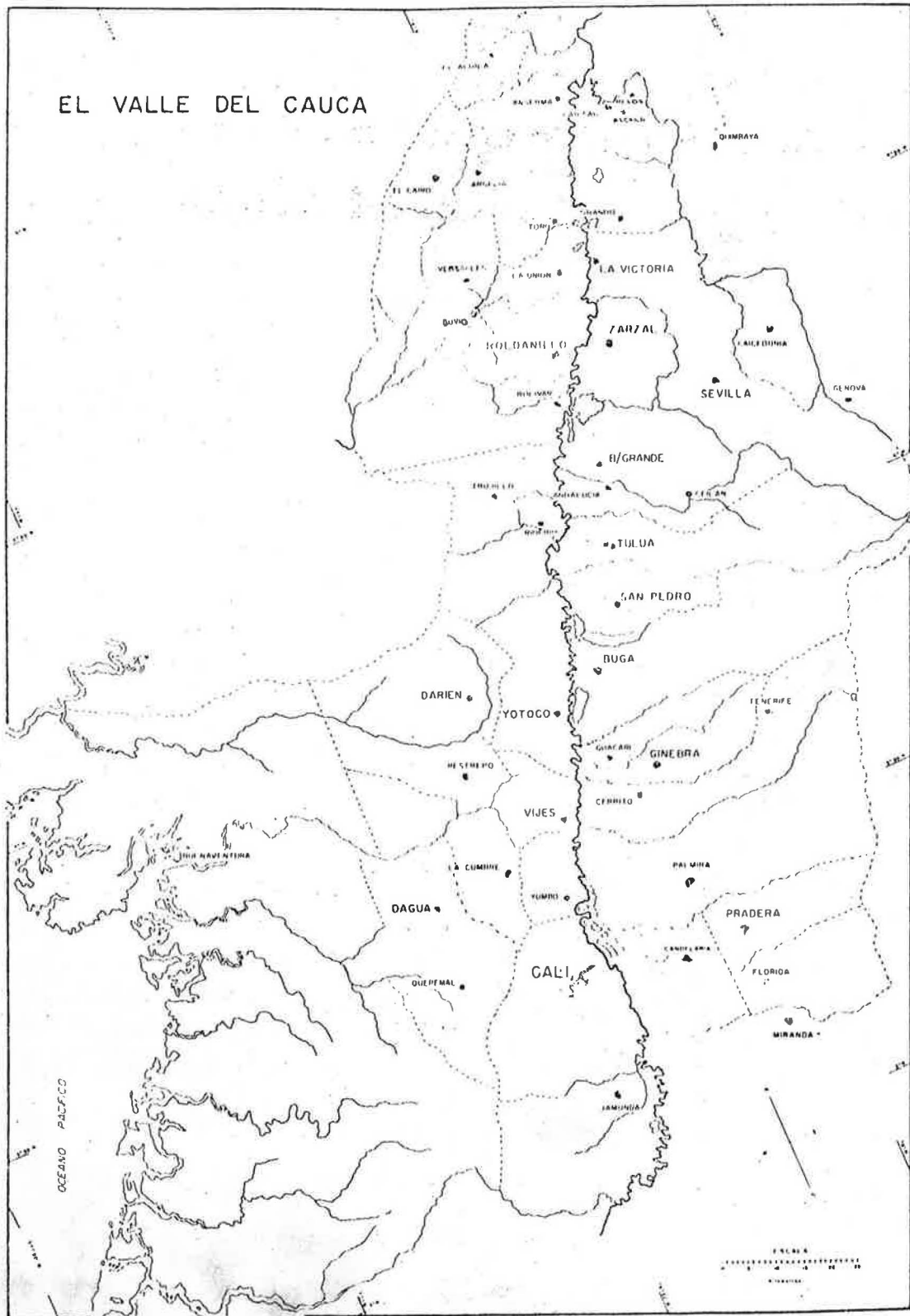


Map A

characteristics are tangible and prominent signs of the cabecera's importance to the surrounding region.

The site of the research, the Departamento del Valle, as its Spanish name indicates, is a valley approximately 200 meters long by 25 in width. It lies at a little more than 1000 meters above sea level. Geologically, it is a structural rather than a river-formed valley even though the large Cauca River meanders across the flat valley floor northward. The valley floor is flanked and boxed on both sides by the large Andean hill chains which run the length of Colombia and render its topography so formidable. On the east is the western arm of the Cordillera Central rising over 3,000 meters, and on the west side of the valley is the Cordillera Occidental, 2,000 to 3,000 meters, which separates the valley proper from the tropical jungles near the coast.

Administratively, the Departamento del Valle consists of 42 municipios. Cali, its state capitol, is Colombia's second largest city, at about 750,000 people, and is a rapidly expanding industrial center. (In addition to being the state capitol, Cali is also the cabecera of the municipio of Cali.) Five of cabeceras are over 50,000 in population and the Valle as a whole has about 2,250,000 people. A map of the Valle, (see Map B), shows the location of the towns in the sample. Fifteen of them are



Map B

in the cordilleras and the rest are irregularly strung like beads on the roads that run parallel to the river along the length of the valley floor.

Social Trends

In a very strict sense this paper is a report of the field test of a concept and its measurement, but in a more general sense it is also an attempt to understand the shape of the social lives of a particular people. Thus both as an indispensable backdrop to the more technical effort and as a scholarly obligation, several historical trends in the history of the area should be commented upon.

First, geography is a distinctive and influential factor in the social history of the area. Not only does nature affect potential economies, e.g., coffee is best grown above 1500 meters and sugar cane below 1500 meters,¹ but it also channels the social migration of peoples. Sparse roads and steep hills effectively divide the valley into two parts, the cordilleras and the valley floor. It is the cordilleras which have been the major routes of migration into Valle from the Northern states of Antioquia and Caldas. A combination of large population

¹James J. Parsons, Antioqueño Colonization in Western Colombia, Berkeley: University of California Press, 1949, p. 24.

increases, an entrepreneurial economic philosophy, superior soil and access to trade routes, have created the impetus for the sustained southward migration down the cordilleras since the 1800's.² By 1900, Caldas, immediately north of Valle, and the northern ash slopes of the Cordillera Central, were predominantly occupied by Antioqueño settlers from the north. Since 1900 they have migrated deeper into Valle, especially along the Cordillera Occidental and their presence is reflected in the eighteen new municipios that have been created since 1900.

Secondly, the very old and recurring conflict between political parties is another historical trend which must seriously affect the distribution of people living in these areas. The political history of Colombia has been etched by recurrent civil wars:³ 1839, 1860, 1899, and 1946. The last, beginning in approximately 1946, is simply called La Violencia and is described by Holt.

As the government took more drastic steps to keep order after the riots, (the riots in Bogota following the assassination of Jorge Gaitan) the violence grew. One of the peculiar aspects of the violence was that it was largely a rural phenomenon; Colombia's cities remained comparatively tranquil throughout. But in the countryside, there was stark, savage terror. Village armed itself against village, and many

²Ibid., pp. 69-95.

³Pat. M. Holt, Colombia: Today and Tomorrow, New York: Praeger, 1964, pp. 26-30, 36-45.

villages were literally wiped out. Nobody knows how much the damage to crops amounted to, how many homes were burned, and how many men, women, and children died. The most careful estimates are that 150,000 to 200,000 were killed in the twelve year period from 1946 to 1958. In the beginning, the violence was largely political in its motivation: Liberals were fighting against Conservatives and against the troops of a Conservative government whose repressive measures were growing intolerable. In parts of the country, the situation went beyond all control, and the fighting took on the character not of a rebellion, but of a private war between rival groups. The violence was notable for its savagery, cruelty, and the tortures to which captives were subjected.⁴

Although the apex of the violence is usually regarded as having been dissipated by 1958, the violence lingers on. The most comprehensive analysis of it, by Guzman and Fals-Borda, lists seven pages of incidents occurring in Valle from 1958 to 1963,⁵ and when the author was in Cali in 1965 the newspapers commonly carried accounts of robberies and mass murders. Both the memory and present threat of force influence the lives of the rural population and form part of the background of the region's growth.⁶

⁴Ibid., p. 41.

⁵German Guzman-Campos and Orlando Fals-Borda, La Violencia en Colombia, Bogotá: Ediciones Tercer Mundo, Volume II., 1964, pp. 319-326.

⁶Robert C. Williamson, "Toward a Theory of Political Violence: The Case of Rural Colombia," Western Political Quarterly, 18 (March, 1965), p. 39.

Statistics reveal the degree to which violence has affected the country. While the larger part of country has at one time or another been affected, in recent years four departamentos have had the most severe losses: Tolima, Caldas, Valle, and Huila. In Tolima, for example, 42 per cent of the roughly 750,000 inhabitants have been forced to migrate from their homes, for most of the decade ending in 1958. Not less than 17,000 were killed of whom 80 per cent were males between fifteen and forty years old. In an intensive study of one refugee-crowded barrio, 37 per cent of the families had lost an average of two close relatives. It may be added that the over-all loss to the country is not as tremendous as often calculated. Instead of the conventional 300,000 figure, it is reasonable to consider a maximum of 180,000 deaths to 1958, with possibly some 20,000 since that date, or a total of between 1 and 2 per cent of country's population.

The relation between these two social trends is not immediately clear. The simplistic belief that migration adds people and violence takes them away is not appropriate. A tentative, speculative hypothesis is that the migration was a major factor in producing the violence. The settlers, predominantly conservative, Catholic antioqueños, pushed south and meeting resistance from liberals who were living there, engaged in open warfare. What data support this? Some data are present and some are missing. We know that when the fighting ended the liberals had been driven out of the hills. Of the thirteen hill cabeceras that the author visited eight of them had no liberal parties and the rest all had strong conservative majorities of eighty per cent or better. Towns near the

foothills of the Cordillera Occidental also had strong conservative majorities. However, the key data needed are difficult to get hold of. What is needed to confirm this hypothesis is a before and after comparison of the number and location of liberals in the cordillera, and a county-by-county estimate of the density of antioqueño settlements.

Speculations aside, these trends are interrelated and together they have deeply affected the social distribution of people living in the area.

The Field Work

The three and a half months spent in the field can be roughly divided into three phases: An initial phase of designing the study, a period of travel during which the interviewing took place, and a follow-up phase. The design of the study took about a month and a half and centered on the solution to two problems: the selection of a sample and the construction of a questionnaire. The primary parameter affecting the selection of a sample was the amount of information available about the towns and villages of Valle. The sampling of towns in the United States is relatively easy. Volume One of the United States Census⁷ lists each village by population, and the U. S.

⁷For example see, U. S. Bureau of the Census, Census of the Population: 1960, Volume One, Characteristics of

Geological Survey can provide detailed maps of most areas of interest. The Colombian demographic situation is quite different. The census of 1928 was not accepted because of "serious errors" and those of 1918, 1912, and 1905 did not distinguish between the county and county seat. Population growth of the county seats can only, with difficulty, be traced from the 1938 census. Also, neither the 1951 census nor the 1964 census provides information on villages outside the cabecera. Unlike the United States census the Colombian census does not include lists of villages and their population sizes, although maps by county can be gotten from the Departamento Administrativo Nacional de Estadística, or borrowed from the Map Division of the Library of Congress.

In addition to demographic limitations a secondary problem was transportation. Since roughly one-third of the cabeceras are in the hills, a random sample of villages would find roughly one-third to be in the hills. Most cabeceras have bus service and all have roads leading to them, but many smaller villages can only be reached by horseback or foot. Thus the gathering of a random sample of towns in the state would be both time consuming and expensive.

In view of these technical and pragmatic limitations it seemed wisest to study only the cabeceras. They had the dual advantages of being recorded in the census and accessible by "jeep." Although Young and Fujimoto⁸ studied villages under 10,000, a cutting point of 17,000 was chosen for Valle because this seemed a natural and unstrained point. Thirty-four of the cabeceras were below this point, according to information available at the time, and they were chosen as the sample.

The second problem encountered was the construction of a questionnaire. This is a crucial and often irrevocable step in any research design since it is equivalent to deciding what information is necessary to answer the theoretical problem. This study is one of a series and thus the general nature of the questions is already preselected. The focus has not been on attitude questions such as "How many people here are authoritative?", or, "Are you happy with your job?". Rather the information sought is tangible, public facts that all adults and most children would be expected to know, e.g., "Is there a lawyer in town?", or, "Is there a bakery in town?". All of Young and Fujimoto's items were included as well as others that seemed feasible.

⁸Young and Fujimoto, op. cit., p. 344.

The author consulted with other researchers who were working out of the Universidad del Valle and all agreed that as many checks as possible should be built into the items. For example, it is not sufficient to ask, "Does the community have a church?", rather a "better" question is "Does a priest live in the community?"

The second "phase" consisted of visiting the thirty-four cabeceras. The interviewing format that evolved was to go to the alcalde's office, (the mayor's office), introduce myself using a letter of introduction, and give the questionnaire to any official that had the time to fill it out (usually I first asked the Oficina de Estadísticas). This procedure is justified in that any person familiar with the community should be able to fill out the questions and very often a group of people in the office would fill it out together. The questionnaire was revised after visiting six to seven communities as it became apparent which questions were "good" and which were not. Also, the items of Young and Fujimoto were not discriminating and more items were added to the list. In a month and a half of traveling more than 2000 kilometers, all of the thirty-four were visited at least once.

The last phase of the field work was spent in Cali in an effort to "check out" the responses obtained in the cabeceras. The state headquarters of each political party

was visited, the major banks that had branches in the cabeceras were visited, Protestant missionaries were talked with, the governor's office was visited, etc. As much cross-checking as possible was done to guarantee the reliability of the responses.

CHAPTER THREE

REPORT OF RESULTS

Analysis and Discussion

This chapter is divided into two parts: The first part is a description of how a selected set of variables is associated with the scale ranking of the county seats. Essentially, this description is offered as "proof" or "validation" that the scale variable, social differentiation, is a meaningful variable and shows systematic variation with known variables. The standard method of correlating known demographic data against a rank ordering by size of locations usually relies on the extensive demographic information contained in the United States Census. For example, Duncan's¹ rank variable was an ordering of American places by population. For his independent variables he took census information on percent white collar workers, median income, intra-county mobility rate, percent of females in labor force, average size of primary families,

¹Otis Dudley Duncan, "Community Size and the Rural-Urban Continuum," in Paul K. Hatt and Albert J. Reiss Jr., (eds.), Cities and Society: The Revised Reader in Urban Sociology, Glencoe: Free Press, 1957, pp. 35-45.

etc. The absence of adequate demographic data for Colombia² makes this approach more difficult but it is still feasible. The last published census for Valle, taken in 1951 and published in 1958, gives only age and sex pyramids by county. All other information is recorded for the entire state only and no county breakdowns are possible. Nevertheless it is possible to choose a set of variables that have clear intuitive relationships with one another,³ and correlate them against the scale variable. When these correlations are interpreted with the background material in Chapter II (a) substantively, a reasonably clear picture of the valley emerges and (b) formally, the scale variable is shown to co-vary meaningfully with other variables.

Second, having "validated" the scale and discussed the

²For example see the report of Inter-American Committee for Agricultural Development, Inventory of Information Basic to the Planning of Agricultural Development in Latin America: Colombia, Pan American Union, Organization of American States, Washington, D. C., 1964.

³In the literature on the rural-urban continuum the usual practice is to take any set of convenient variables and examine their variation across population size. This practice should be approached with caution since it is usually completely atheoretical: the only rationale for selecting variables appears to be convenience, i.e., no universe of variables is sampled from, no theoretical account is given of why variables should or should not be expected to vary by population size, and no theoretical account is given of the relationships between the variables. Usually it is considered sufficient to show that some variables do or do not vary by population size.

substantive findings the theoretical implication are considered in the second part of this chapter.

The First Part

In the chain of studies considered in Chapter I the concept of a "rural-urban continuum" frequently appears. For example, Aurbach suggested that scaling technique may be one way of empirically checking the continuum and in his own analysis concluded that his "social isolation" scale was such a check. The concept of "social differentiation" is a derivative of "division of labor" and intuitively we would expect it to vary systematically with a "rural-urban continuum". The greater the urbanity the higher the social differentiation. We would therefore also expect that a paradigm for analyzing the continuum would provide a model for analyzing the scale variable. The literature on the continuum⁴ does provide a model and Yuan's work illustrates it.⁵

⁴For example, Fenton Keyes, "The Correlation of Social Phenomena with Community Size," Social Forces, 36 (1958), 311-15. Neal Gross, "Sociological Variation in Contemporary Rural Life," Rural Sociology, 13 (September, 1948), 256-273. Duncan, op. cit., Stuart A. Queen and David B. Carpenter, The American City, New York: McGraw-Hill, 1953. D. Y. Yuan, "The Rural-Urban Continuum: A Case Study of Taiwan," Rural Sociology, 29 (September, 1964), 247-260. Leo F. Schnore, "The Rural-Urban Variable: An Urbanite's Perspective," Rural Sociology, 31 (June, 1966), 131-155.

⁵Yuan, op. cit.

Yuan ranked Taiwan places by their size and administrative type.

Village

0. under 5,000
1. 5,000 to 10,000
2. 10,000 to 25,000
3. 25,000 to 50,000

Townships

4. 10,000 to 25,000
5. 25,000 to 50,000
6. 50,000 to 100,000

Municipalities

7. 50,000 to 100,000
8. 100,000 to 500,000
9. 500,000 and greater

With this ten step ranking he RHO correlated eight variables: population density, dependence on agriculture, percent Chinese, percent non-mobile, percent illiterate, percent over 65, percent employed males in white collar occupations, and percent of employed males in farm occupation. He found that all of his independent variables except percent illiterate correlated significantly with the type size ranking.

This same algorithm can be used here but with one important change. The scale variable is the ranking we wish to validate and population size is one of the checks. After a consideration of the literature on the rural-urban continuum and a search of what was available, eleven variables were chosen. (The raw data and rankings for all

twelve variables are given in the appendix along with the RHO correlation matrix for all twelve variables.)

Variable one is the scale variable. Variables two, three, four, and five are estimates of the population size of the county seats. Two reasons justify the use of multiple indicators: first, population size is a very important variable; it is commonly regarded as an empirical substitute for the theoretical idea of a continuum. Second, the use of multiple indicators is an excellent way of handling unreliability problems in the demographic data of underdeveloped countries. Variable two is the official census for 1964. Gross population figures for the county, county seat and state are all that have been published. However, these figures were not available in the summer of 1965 when the field research was being carried out, and the writer visited a number of government and private agencies to get estimates in lieu of the census. He also asked the county officials for an estimate when he interviewed them. Variable three is an extrapolation by the census department of what the population is expected to be in 1964. Variable four is the self-report of the county officials, and variable five is an extrapolation by the Secretary of Agriculture's department of what the population is expected to be in 1964.

The "real" and "true" size of the county seats is

unknown. In effect, we have an official estimate, of unknown reliability, and three unofficial estimates, also of unknown reliability. It is more realistic and more informative to examine all four rather than assume that the official estimate is the "best" approximation to the "real" size. The unreliability of information is a recurrent and vexing problem when working in underdeveloped countries. The internal comparison and cross-checking of multiple indicators is an efficient prophylactic to the premature acceptance of any one list as being the "most accurate". The intercorrelations among the first five variables are given in Table 1.

Table 1. Rho correlations among scale rank and four measures of population size for 34 county seats in the Departamento del Valle, Colombia.

	1	2	3	4	5
1	-	.229	.734*	.750*	.796*
2		--	.513*	.473*	.515*
3			--	.707*	.794*
4				--	.847*
5					--

*Significant at the .01 level.

1: scale rank.

2: official 1964 Census of population (published October, 1965).

3: estimate of 1964 population from the Census Department.

4: estimate by county officials of 1964 population size.

5: estimate of 1964 population size by Agriculture Department.

The lowest and only non-significant correlation, .229, is between the scale rank and the official estimate. The scale strongly and significantly correlates with the three unofficial estimates and the official estimate also correlates with them but at a lower level. It is informative to note that the three unofficial estimates have a high inter-correlation even though one, variable three, is a self-report and the other two are statistical extrapolations. (It should be remembered that rho, as a measure of correlation, takes into account neither the absolute nor proportional differences in the values of the scores. It is only concerned with the rank order of the magnitude of the scores and the degree to which the two rank orderings are discrepant. Table IV shows that the column totals for the population estimates vary considerably.)

Variable six is the year the town was founded and this was included because there is a commonplace proposition that the older the town the more developed it will be. Table 2 shows that this is operating in Valle. The correlations are effectively zero but a negative tendency is evident.

Variable seven is the year the town became a county seat. This is highly and significantly correlated (.634) with the data of the town's founding and thus we would expect that a similar theoretical interpretation can be given to seven. As Table 3 shows the negative tendency of

Table 2. Rho correlations of year founded with scale rank and four measures of population size in the Departamento del Valle.

	1	2	3	4	5
6	.020	-.301	-.038	-.257	-.153

1-5: See Table 1 for description.

6: Year the town was founded.

Table 3. Rho correlations of date became a county seat with scale rank and four measures of population size in the Departamento del Valle.

	1	2	3	4	5
7	-.253	-.695*	-.297	-.454*	-.555*

* Significant at the .01 level.

1-5: See Table 1 for description.

7: Year town became a county seat.

Table 2 reappears but is much stronger. The sooner, or earlier, that the town becomes a county seat the higher its social differentiation score and the greater its population size. Three of the four population estimates correlate significantly with date became a county seat.

Variable eight is the size of the county's budget. Among other implications, it represents the ability of the community to collect, apportion and distribute scarce

resources. We would expect the budget's size to reflect the complexity of the social structure and the size of the population, and as Table 4 shows this is the case. It also shows that the older seats have significantly higher budgets.

Table 4. Rho correlations of budget size with scale rank, four measures of population size and date became a county seat.

	1	2	3	4	5	7
8	.450*	.140	.532*	.636*	.633*	-.493*

*Significant at .01 level.

1-7: See preceding tables for description.

8: Budget size of county.

Variables nine and ten are two measures of distance. Nine is the distance of the county seat to Cali, the state capitol, and ten is the distance of the county seat to a large city (50,000 or over). It is a commonplace proposition in the social sciences that, in general, the closer a place to an urban center, the more "urbanized" that place is. The data from Valle, as Table 5 shows, do not support this proposition.

The association between scale rank, population size, and budget size with distance is in the expected direction but very low. Distance is not an important factor. Another way of expressing the same finding is to look at

Table 5. Rho correlations of distance from Cali and distance from a large city with scale rank, four measures of population size, age town was founded, date became a county seat and budget size.

	1	2	3	4	5	6	7	8
9	-.131	-.332	-.152	-.162	-.227	.251	.398	-.423
10	-.022	-.398	-.034	-.136	-.187	.313	.277	-.402

1-8: See preceding tables for description.

9 : Distance to Cali.

10 : Distance to a city with 50,000 or greater population size.

the four-fold table between social differentiation and distance to a large city with both variables dichotomized. Social differentiation was dichotomized at the halfway point in the scale, at rank 17, and the mean distance to a large city, 34.7 kilometers, was used to dichotomize distance to a large city.

Social Differentiation

		1-17	18-34	
Distance to a large city	under 34.7	10	12	22
	over 34.7	7	5	12
		17	17	34

$$\text{phi} = -.12$$

This result holds up when geographic region is controlled for. A similar result is obtained for the zero order phi relationship between differentiation and the other distance variable, distance to Cali. Neither the zero order relationship nor the partials, controlling for hill-valley differences, show a correlation between differentiation and distance.

Variables eleven and twelve are two rough measures of "urbanization". Each are ratios of the rural population to the urban population, e.g.,

$$\frac{\text{the county's rural population}}{\text{the county's urban population}}$$

Presumably, the lower the ratio the higher the "urbanization" of the county. In assigning ranks to the counties the highest ratio received rank one and so on through the ratios until the lowest ratio, i.e., most urbanized, received rank thirty-four. Thus the rank variable of "urbanization" varies from least urban to most urban. Variable eleven was taken from the Secretary of Agriculture's estimate and variable twelve was taken from the official 1964 census. Table 6 shows the results.

Variable eleven is consistently higher than twelve. Both correlate significantly with social differentiation, the three unofficial estimates of population size and the date the town became a county seat. Neither correlates well

Table 6. Rho correlations of two measures of "urbanization" with scale rank, population size, age measures, distance measures and budget size for county seats in the Departamento del Valle.

	1	2	3	4	5
11	.699*	.302	.689*	.693*	.852*
12	.634*	.130	.543*	.586*	.752*
	6	7	8	9	10
11	-.118	-.490*	.405	-.251	-.198
12	.007	-.454*	.208	-.161	-.110

*Significant at .01 level.

1-10: See preceding tables for description.

11: Measure of urbanization based on 1964 census.

12: Measure of urbanization based on population estimate by Secretary of Agriculture.

with the official census. The correlations between the "urbanization" measures and the age measures are negative indicating that the older towns are also more modernized. (The higher the score on the urbanization variables the more urbanized the town, and the higher the score on the age measures the younger the town, therefore a negative correlation implies that the older the town the higher its urbanization value.) None of the correlations between "urbanization" and distance are even moderately high. There is a slight tendency for places closer to urban areas to be more "urbanized" but the tendency is not very strong.

In summary, the scale variable systematically varies in expected ways. It correlates significantly with three out of four measures of population size, the budget size and the two "urbanization" measures. As a group, these six vary together. In contrast, the official census correlates significantly, but much lower than the scale variable, with the other three population estimates, and does not correlate well with budget size or "urbanization". Social differentiation does not correlate well with distance to urban centers, but none of the variables do. This is sufficient evidence to put the burden of proof on those who would claim that the scale variable cannot or has not been validated.

A thorough and complete substantive picture of Valle cannot be given with these data but several propositions are apparent. The newer towns in the hills have lower rates of social differentiation, lower population sizes and lower "urbanization" scores. The older, more established towns on the valley floor have higher differentiation and "urbanization" scores and higher population sizes. In neither the hills nor the valley does distance to an urban center seem related to variables traditionally associated with "urbanism". Except for the variation in distance, these results are "normal" and expected. This is the kind of pattern we would expect to be operating

given the historical information in Chapter II.

The Second Part

The first part of this chapter presented the evidence "validating" the scale and showed its substantive relevance. In this part the focus is on its theoretical relevance. The end of Chapter I raised the theoretical issues which arose out of our examination of the literature. The first and most important issue is whether or not previous work can be replicated. Tables I and II in the appendix give the scale items and the scalogram, and show that the county seats form a Guttman scale within acceptable limits of scalability. Thus the major theoretical conclusion of this research is its support of the concept "social differentiation." In this study the application of Guttman scaling has resulted in a meaningful, unidimensional variable. In a very strict sense these results apply only to the Departamento del Valle, but in a larger sense they have a greater generality because they are part of a series of studies. It is reasonable to suggest that enough evidence has been accumulated, at least for Latin America, to place the burden of proof on those who would deny the variable's generality or claim that scaling the concept is not a meaningful procedure.

The major ambiguity in the literature is on what should

be the appropriate theoretical interpretation to place upon the concept. It is not original to suggest that little difference exists between theory and methodology, but that observation is especially pertinent here. At least three possible, interrelated ways of interpreting it exist: First, as Chapter I indicated, the evolutionary interpretation has been an implicit and pervasive possibility and has been explicitly argued by Carneiro.⁶ Carneiro's most impressive empirical evidence appears in an article by Carneiro and Tobias.⁷ A sample of 100 societies, selected for cultural diversity and geographic distribution, was scaled against 354 traits. A set of 90 traits was eventually retained. On this basis they say:⁸

We may speak of the order of traits in Figure 3, [Figure 3 is the scalogram], as constituting a main sequence of cultural evolution. We have borrowed this term from astronomy, where it is used in discussions of stellar evolution to indicate the existence of a normal pattern despite the occurrence of deviations (Coleman, 1963, pp. 116-121).

The idea of a main sequence of cultural development is closely akin to the familiar notion of unilinear evolution. According to

⁶Carneiro, op. cit.

⁷Robert L. Carneiro and Stephen F. Tobias, "The Application of Scale Analysis to the Study of Cultural Evolution," Transactions of the New York Academy of Sciences, Ser. II, 26 (December, 1963), 196-207.

⁸Ibid., p. 203.

both, there is a discernible order to the way in which societies develop, and this order is substantially duplicated by all societies if and as they evolve. But there is also a difference: instead of saying that societies tend to go through the same stages, we would say that societies tend to evolve traits in the same order.

This is difficult to evaluate. Since the evolution of traits over time is the keypin of this perspective it would seem that data collected over time would be the most appropriate evidence to support the interpretation. Carneiro and Tobias's use of scaling provides only a picture at a time not a longitudinal analysis because no time elements are built into their scale items. Until a group of societies are studied over time and the actual appearance of traits is recorded it seems premature to accept ideas which assume such evidence has been recorded.

The second possible interpretation, as exemplified in Chapter I by Frank Young's work, is the use of scale ranks as a picture at that time of the relative amounts of differentiation held by the objects scaled. Like Young and Fujimoto's scale,⁹ the items in Table I do fit easily into a sequence of phases and it is difficult to see how they could evolve after one another in time. Young and Fujimoto's more conservative interpretation has been

⁹Young and Fujimoto, op. cit.

implicitly used in the first part of this chapter and provides a plausible, strainfree interpretation of scale results.

A third alternative has been offered by A. David Hill, a geographer.¹⁰ Hill also worked with the Young-Fujimoto scale in Colombia and his results in the Sabana de Bogotá are very similar to the results this author obtained in Valle. Both used the Young-Fujimoto scale in different parts of Colombia and the comparative results are described in Table 7.

As the similarity of the results indicate the two Colombian samples are much more differentiated than the sample chosen from the ethnographic literature. That literature is probably biased toward small communities. Both Hill and this writer also developed their own scales which scaled better than the Young-Fujimoto scale. (These scales cannot be compared since this field work was completed before Hill published his article.)

The Colombian results also agree in showing that distance per se is not correlated with social differentiation. Hill used the more sophisticated distance variables of functional distance and volume of motor traffic but still

¹⁰A. David Hill, "Spatial Relations and Socioeconomic Change: A Preliminary Study of Differentiation of Places in the Sabana de Bogotá, Colombia," The Professional Geographer, 19 (May, 1967), 136-143.

Table 7. 34 Valle places and 40 Sabana places compared on Young and Fujimoto's social differentiation scale for 54 Latin American communities.

(1) Attributes of Places	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Scale Step			Proportion of Sample			Scale Error for Attributes		
	L.A. Places	Sabana Places	Valle Places	L.A. Places	Sabana Places	Valle Places	L.A. Places	Sabana Places	Valle Places
Autonomous, named place	1	1	1	100	100	100	0	0	0
Elementary school	2	1	2	93	100	100	0	0	0
Plaza	3	1	3	85	100	100	1	0	0
Government organization	4	1	4	83	100	100	2	0	0
Bar or Cantina	5	5	5	78	45	100	5	7	0
Bakery	6	9	6	72	45	88	5	6	2
Barber shop	7	3	7	59	75	100	4	1	0
Butcher shop	8	2	8	44	80	88	2	2	0
Resident priest	9	1	9	41	100	76	6	0	1
Hotel, pension	10	7	10	37	45	58	2	13	4
Pool hall	11	6	11	24	40	100	3	10	3
Resident doctor	12	10	12	15	12.5	70	3	0	2
Movie Theater	13	8	13	13	35	70	1	6	0
Gas station	14	4	14	9	45	52	0	5	0

Coefficient of Scalability for 54 places = .82

Coefficient of Scalability for Sabana places = .60

Coefficient of Scalability for Valle places = .63

found a low correlation.

On the basis of his geographical training Hill says "...the Sabana data suggests that general characteristics of a central place heirarchy are present."¹¹

The central place theory does not imply a temporal socioeconomic development of places. Rather, the model assumes a uniform culture distributed over the spatial area in question. The more sophisticated and specialized functions performed by the larger places are known to and accessible to the populations of the smaller places. Information passes to all places within the system, and even if it is transmitted more slowly to the smaller places, this does not imply great cultural gaps in the system. In this model, the differences in city-town-village ways of life do not connote radically different cultures in the anthropological sense--the "folk-urban continuum" is not applicable here. A homogeneous culture area is not characterized by the equal differentiation of all its settlements, i.e., all institutions of the culture area are not located in every community. It is unlikely that the latter would ever obtain, given the facts of locational and comparative advantage.¹²

A central place interpretation seems especially apropos in the Sabana and Valle. These are not surveys of the ethnographic literature, rather they are studies of geographic regions and we would expect central place concepts to be operative in them.

¹¹Ibid., p. 140.

¹²Ibid., pp. 142-143.

In Conclusion

These three interpretations, each stemming from different experiences, (Carneiro in anthropology, Young in sociology, and Hill in geography) are not necessarily incompatible or mutually exclusive. Guttman claimed that scaling techniques had a general applicability since they were formal methods and not inherently restricted to a particular problem or discipline, and the variety of interpretations that have been placed upon the scaling of "social differentiation" would bear this claim out.

However, these interpretations are different and their differences should not be minimized. As Chapters I and III indicated, the existence of differentiation and the demonstration that variables systematically change by population size has traditionally been used as evidence to support propositions about the importance of "modernization" and the "rural-urban continuum". Hill, a geographer, points out that such evidence does not necessarily indicate that "modernization is an important factor in the socio-economic development of an underdeveloped area" or support any of the other countless propositions that social science is so familiar with. The same evidence used to support them is also derivable from a central place context.

For future research, it would seem feasible to treat both modernization and the existence of a central place

heirarchy as independent variables and examine their relations. Once this theoretical step has been made a number of propositions seem plausible: the two can be examined for their effects on one another, towns which are isolated and can be compared with towns which are centrally located, and other variables can be judged according to the influence on the main ones. From this perspective, "social differentiation" is not a panacea or "fundamental explanatory principle". However, it is an important variable to be able to measure and should play an influential role in any large scale study of an area.

APPENDIX

TABLE I

Scale of Differentiation for 34 cabeceras in the
Departamento del Valle

Step #	Item Content	Proportion of Sample	Scale Error for Items
1	There is a high school	.97	2
2	There is a bakery	.91	0
3	There is meat market open at least three day a week	.88	1
4	There is a theater	.82	0
5	There is a red light section	.82	2
6	There is a gasoline pump	.76	0
7	There are volunteer firemen	.61	1
8	There is a private bank, (this excludes <u>Caja Agrario</u>)	.52	1
9	There is a licensed dentist	.38	4
10	There is a man who primarily buys and sells real estate	.26	4
11	There is a lawyer	.11	0
12	There is a factory	.03	1

Coefficient of Scalability = .845

TABLE III

Rho Correlation matrix for the twelve variables studied in Valle.[†]

	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000	.229	.734*	.750*	.796*	.020	-.253	.450*	-.131	-.022	.699*	.634*
2		1.000	.513*	.473*	.515*	-.301	-.695*	.140	-.332	-.398	.302	.634
3			1.000	.707*	.794*	-.038	-.297	.532*	-.152	-.034	.689*	.543*
4				1.000	.847*	-.257	-.454*	.636*	-.162	-.136	.693*	.586*
5					1.000	-.153	-.555*	.633*	-.227	-.187	.852*	.752*
6						1.000	.634*	-.438*	.251	.313	-.118	.007
7							1.000	-.493*	.398	.277	-.490	-.454*
8								1.000	-.423	-.402	.405	.208
9									1.000	.466*	-.251	-.161
10										1.000	-.198	-.110
11											1.000	.925*
12												1.000

*Significant at the .01 level

[†]See the text and tables of Chapter III for a description of the variables. Tables IV, V, and VI of the Appendix contain the raw data for them.

TABLE IV

Raw data and ranks for the four population estimates of the county seats in the Departamento del Valle.*

Scale Rank	1964 Census		Census estimate [†]		Self-report		Agriculture estimate ^{††}	
	data	rank	data	rank	data	rank	data	rank
1. San Pedro	1,527	2	1,450	1	301	1	1,539	2
2. Andalucia	5,775	21	2,090	7	5,000	12	5,810	22
3. Vijes	2,047	4	2,200	8	3,300	4	2,163	4
4. Yotoco	2,430	6	2,201	9	5,000	13	2,281	5
5. Ulloa	1,407	1	1,540	2	2,000	2	1,373	1
6. La Cumbre	2,357	5	1,950	6	4,000	8	2,282	6
7. El Cairo	3,267	9	6,620	27	7,000	18	4,390	14
8. El Aguila	2,477	7	1,800	4	2,326	3	2,359	7
9. Riofrío	1,646	3	2,540	12	4,500	10	1,677	3
10. Bolívar	3,224	8	2,320	11	7,000	19	3,305	8
11. Obando	3,921	12	2,300	10	3,896	7	3,882	13
12. Argelia	3,339	10	1,780	3	7,000	20	3,343	9
13. El Dovio	4,460	14	1,880	5	3,700	6	3,522	11
14. Dagua	4,635	16	4,810	22	5,000	14	4,591	16
15. Candalaria	5,417	18	2,550	13	5,331	16	5,317	18
16. Alcalá	4,196	13	3,260	15	4,600	11	3,598	12
17. Guacarí	6,447	23	5,420	24	11,000	29	6,076	25
18. Toro	8,812	27	4,540	21	7,000	21	8,741	28
19. Versalles	4,528	15	7,550	29	4,360	9	4,566	15
20. Ginebra	3,416	11	4,530	20	3,546	5	3,385	10
21. Yumbo	15,270	32	5,660	25	11,900	31	15,631	33
22. Bugalagrande	16,327	33	3,700	18	12,000	32	6,011	23
23. Ansermanuevo	5,510	19	5,220	23	10,000	27	5,641	20

TABLE IV Cont.

Raw data and ranks for the four population estimates of the county seats in the Departamento del Valle.*

Scale Rank	1964 Census		Census estimate [†]		Self-report		Agriculture estimate ^{††}	
	data	rank	data	rank	data	rank	data	rank
24. Restrepo	4,966	17	4,370	19	6,000	17	4,878	17
25. La Unión	8,223	26	8,270	31	8,081	25	8,069	27
26. Trujillo	6,793	24	9,460	33	7,000	22	6,806	26
27. Jamundí	5,693	20	3,510	17	5,000	15	5,691	21
28. Florida	12,875	31	8,050	30	8,000	24	12,572	32
29. Pradera	11,223	29	8,840	32	11,545	30	11,341	30
30. El Cerrito	12,200	30	7,120	28	15,000	33	12,138	31
31. La Victoria	7,236	25	2,930	14	7,000	23	6,027	24
32. Darién	6,117	22	3,340	16	8,600	26	5,393	19
33. Rodanillo	9,212	28	5,900	26	10,000	28	9,130	29
34. Zarzal	<u>17,768</u>	34	<u>11,810</u>	34	<u>18,000</u>	34	<u>17,529</u>	34
	265,851		151,511		224,086		201,057	

*Caicedonia, on the central cordillera, should have been included in this sample but was not.

[†]This is a projection by the Census Department as to what the 1964 population is expected to be. In terms of actual numbers, not ranks, it is the least accurate of the four.

^{††}This is a projection obtained from the Secretary of Agriculture's office in Cali, and is much better than the projection of the census department.

TABLE V

Raw data and scale rank for year founded as a town, the year became a county seat, and the budget size for 34 county seats in Valle.

Scale Rank	Year* founded		Year became cabecera [†]		Budget Size ^{††} (in Pesos)		
	data	rank	data	rank	data	rank	
1.	San Pedro	1795	15	1888	17	363,144	14
2.	Andalucia	1836	21	1851	6	361,100	12
3.	Vijes	1539	3	1864	9	268,650	3
4.	Yotoco	1632	9	1876	13	379,846	15
5.	Ylloa	1922	32	1928	26	155,000	1
6.	La Cumbre	1913	28	1913	20	350,000	10
7.	El Cairo	1920	31	1947	30	361,300	13
8.	El Aguila	1899	24	1950	31	330,000	6
9.	Riofrio	1657	10	1923	23	510,326	21
10.	Bolivar	1536	1	1884	14	424,620	18
11.	Obando	1760	13	1928	27	480,000	20
12.	Argelia	1904	25	1956	34	413,389	16
13.	El Dovio	1936	34	1956	33	308,528	5
14.	Dagua	1909	26	1918	21	603,750	25
15.	Candelaria	1545	5	1854	7	1,736,417	26
16.	Alcala	1791	14	1919	22	305,004	4
17.	Guacari	1570	6	1863	8	529,465	23
18.	Toro	1573	7	1632	1	522,017	22
19.	Versalles	1887	23	1909	19	342,103	9
20.	Ginebra	1910	27	1954	32	414,760	17
21.	Yumbo	1536	2	1834	4	2,534,280	34
22.	Bugalagrande	1662	11	1886	16	1,327,000	29
23.	Ansermanuevo	1539	4	1925	24	563,820	24
24.	Restrepo	1913	29	1925	25	317,100	7
25.	La Union	1800	16	1890	18	320,000	8
26.	Trujillo	1924	33	1930	28	454,050	19
27.	Jamundi	1725	12	1885	15	1,420,032	30
28.	Florida	1825	18	1864	10	1,020,000	28
29.	Pradera	1866	22	1870	12	2,114,839	33
30.	El Cerrito	1825	19	1864	11	2,111,406	32
31.	La Victoria	1835	20	1850	5	350,221	11
32.	Darien	1913	30	1936	29	233,946	2
33.	Rodanillo	1576	8	1785	2	920,252	27
34.	Zarzal	1809	17	1809	3	1,737,200	31

*These dates were collected from diverse sources.

[†]These were taken from Raul Silva Holquin, Valle del Cauca, Tierra de Promision, Tomo Primero, Segunda Edicion, Cali: Imp. Deptal., 1965.

^{††}These are also taken from Holquin.

TABLE VI

Raw data and ranks of distance from Cali, distance from large city, and two measures of "urbanization" for 34 county seats in Valle.

Scale Rank	Distance from Cali*		Distance from city		Agriclt. ratio		Census ratio		
	data	rank	data	rank	data	rank	data	rank	
1.	San Pedro	89	15	11	2	2.992	8	4.928	4
2.	Andalucia	101	16	10	1	1.147	22	1.070	27
3.	Vijes	32	5	32	19	1.786	17	1.982	19
4.	Yotoco	59	12	59	30	3.165	7	3.031	10
5.	Ulloa	225	34	32	18	5.037	2	2.454	12
6.	La Cumbre	31	4	31	17	3.180	6	3.535	9
7.	El Cairo	222	33	52	28	2.578	10	4.209	6
8.	El Aguila	222	32	45	25	4.194	3	5.483	3
9.	Riofrio	104	17	20	8	5.833	1	8.280	1
10.	Bolivar	137	21	50	27	4.044	4	5.491	2
11.	Obando	171	25	20	10	2.018	15	2.215	14
12.	Argelia	221	31	89	34	2.019	14	2.083	16
13.	El Dovio	176	26	68	33	2.980	9	2.104	15
14.	Dagua	46	7	46	26	3.818	5	4.503	5
15.	Candelaria	28	3	15	4	2.043	13	4.064	7
16.	Alcala	221	30	28	15	1.285	19	1.936	20
17.	Guacari	58	10	15	5	.983	26	1.494	23
18.	Toro	178	27	67	32	.748	29	1.215	25
19.	Versalles	192	28	57	29	1.883	16	1.989	18
20.	Ginebra	58	11	26	13	1.127	24	1.905	21
21.	Yumbo	16	1	16	7	.255	34	.422	34
22.	Bugalagrande	115	18	15	6	1.586	18	3.013	11
23.	Ansermanuevo	204	29	21	11	2.047	12	2.450	13
24.	Restrepo	62	13	62	31	1.189	21	1.547	22

TABLE VI Cont.

Raw data and ranks of distance from Cali, distance from large city, and two measures of "urbanization" for 34 county seats in Valle.

Scale Rank	Distance from Cali*		Distance from city		Agriclt. ratio		Census ratio	
	data	rank	data	rank	data	rank	data	rank
25. La Union	127	20	40	23	.787	28	.894	28
26. Trujillo	116	19	32	20	1.139	23	2.015	17
27. Jamundi	24	2	24	12	2.299	11	2.949	8
28. Florida	42	6	26	14	.525	31	.849	30
29. Pradera	47	8	15	3	.579	30	.760	31
30. El Cerrito	48	9	20	9	.500	32	.707	32
31. La Victoria	160	24	33	22	1.272	20	.876	29
32. Darien	80	14	30	16	1.010	25	1.072	26
33. Rodanillo	149	23	42	24	.931	27	1.287	24
34. Zarzal	143	22	32	21	.279	33	.578	33

*The two distances measures are taken from Holguin (see Table V). The two "urbanization" measures are ratios, $\frac{\text{rural population of the county}}{\text{urban population of the county}}$. They were suggested to the author by Prof. William P. McGreevey of the Latin American Center of the University of California, Berkeley. Presumably, the lower the ratio the more urbanized the county.

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This bibliography will be in three parts: The first part will list applied work in Guttman scaling relevant to "division of labor". (No references will be given to formal articles on Guttman scaling per se beyond what is given in Chapter I.) Secondly, a list of studies on La Violencia and the Valle will be included, (although no references will be made to works on Colombia as a country since these are not directly relevant to our interests here). Third, pertinent rural-urban studies will be listed. These three separate sets of references reflect the three sets of ideas that converge together in this paper.

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