THE QUALITY OF LIFE IN
THE MOUNTAIN COUNTIES OF NORTH CAROLINA:
A SPATIAL ANALYTIC INTERPRETATION

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by
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ABSTRACT

The objective of this thesis is to investigate cer-
tain factors which contribute to the quality of life as it
is spatially distributed throughout the Appalachian Region
of North Carolina. Attention will be directed toward formu-
lating a quantification procedure from which a comparative
basis for geographical analysis can be established.

The study is designed to create a set of regional
social indicators to function as an aid to the decision-
making and planning processes. With such indicators,
discriminatory practices can be formulated to direct reha-
bilitating programs into the areas of greatest need.

In summary, the better life styles are found in the
more densely populated counties of the region reflecting
the greater social opportunities afforded by the concen-
tration of people, goods, and services in the sparsely
settled and isolated mountainous portion of the State.

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CHAPTER I

AN INTRODUCTION TO THE QUALITY OF LIFE

Introduction

The economic, environmental, psychological, and social forces which contribute to the quality of life of each individual vary in impact, resulting in a diverse range of lifestyles.[1] It is the intent of this thesis to define the components of quality living and to organize them into a system of spatial social indicators by which the relative level of satisfaction of life experienced by the inhabitants of an area can be quantified.[2]

Delineation of the Study Area

The regional focus for this study is the twenty-nine county area of North Carolina classified as the mountainous portion of the State by the Appalachian Regional Development Act of 1965 (see Figure 1.1)[3] This location was selected for its relative, internal homogeneity and geographical uniqueness as compared to the Piedmont of the State which bounds it. The mountainous terrain has promoted a transportation and communication isolation of the inhabitants who are further handicapped by the shift away from occupations in agriculture without a corresponding increase in alter-
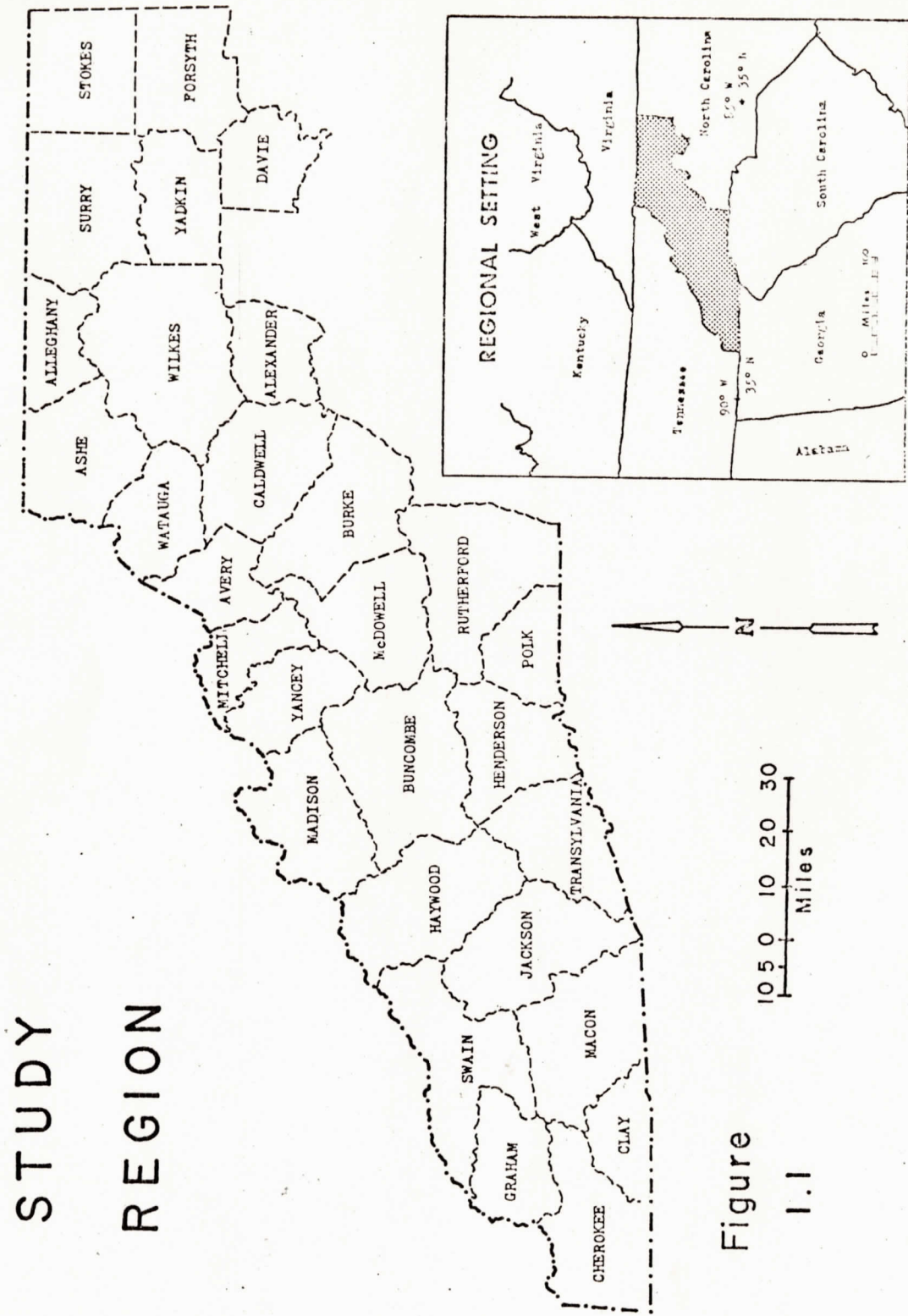
STUDY REGION

Figure 1.1

native employment opportunities.[4] The net result is that not only do the rural areas of the study region lag behind national rural averages in nearly all social and economic comparisons, but its metropolitan centers are also below national urban levels.[5]

Review of the Literature

Geographers have long studied the dynamics of distribution of phenomena, including the components of the quality of life though they have tended to emphasize the distribution of the individual components of an overall life style than to synthesize the factors into a quantitative areal investigation of the regional quality of living conditions.[6] Recently, however, there has been increased interest on the part of geographers to expand their spatial-analytical perspective to provide a more holistic interpretation of the factors of living.

Wilson devised a system whereby he ranked each state in regard to the individual qualities of his index.[7] Liu also attempted to expose states of deviation from his system of indicators. He, however, felt that it was sounder to use each of several indices separately for an overall, social-economic-political-environmental index based on the assumption of congruent importance of the individual components in determining the quality of life rather than to aggregate findings into one master indicator.[8]

Flax defined fourteen facets of life which through

analysis will aid the planning and decision-making processes
by providing a more quantifiable picture of many complex
functions. These indicators were applied to eighteen of the
nation's largest metropolitan centers for comparison with the
past conditions of each city, for comparison with the other
urban regions, and for comparison of the rates of change
occuring in each area.[9]

Dickinson, Gray, and Smith studied the levels of
living in Gainesville, Florida, with social well-being in-
vestigated as a spatial phenomenon. Bederman compiled a
corresponding assessment of Atlanta, Georgia. In each case
information at the census block level was spatially analyzed
by component and then synthesized to reveal intraurban
disparities in living conditions.[10]

These geographical efforts gained theoretical sub-
stance within their own discipline with the aid of Smith who
created a spatial model for quality-life assessment on a
regional basis.[11]

However, even with these contributions to the field
of spatial social indicators, there are many aspects ne-
glected by geographers. The most apparent of these has been
noted in the primarily individual-component focus of quality
of life investigation followed by most geographers. Of those
who have adopted the all-encompassing style of research, the
tendency has been to work at the macrolevel (the individual
state) or the microlevel (the individual city) and to

neglect the regional model expounded by Smith. It is to
this regional plane left void by other spatial scientists
that this comprehensive study will be directed.

Research Methodology

The technique which will be incorporated for the
development of an overall, areally-based, quality of life
index is four-fold: 1) selection of quality of life var-
iables, 2) classification of the variables into component
subsystems, 3) quantification to emphasize the relationships
among the variables and to provide a medium of comparison,
and 4) synthesis of the weighted components into a single
index for geographical analysis and application.[12]

Selection of Variables

Little consensus exists among social scientists as
to specific variables to be employed in a quality of life
survey. Of general agreement, however, is that the var-
iables must be appropriate to their designated task and
that sufficient, reliable data are readily obtainable.[13]
These factors will govern the selection of variables in
this study in addition to the applicability of indicators
used previously in other geographical investigations.

Variable Components

The purpose of grouping the variables into indica-
tors is to allow for component analysis of the overall
quality of life. Combining the variables will rely on the

appropriateness of the agglomeration to the analytical purpose of this inquiry and on spatial social indicator precedents. In addition, the components of this study will be further grouped, for the purpose of assessment, in terms of specific types of human needs: physical needs, social needs, and higher order needs.[14]

Quantification

There will be two mathematical processes required to establish a comparative, areal, quality of life index and to analyze it: factor analysis and regression analysis.

Numerical value will be assigned to each variable by county according to the formula

$$I_j = \sum_{i=1}^{n} ba_i Z_i$$

where

I = the index for category j

Z = the standard score on X

X = the individual variable

a = the assigned weighting value

b = 100, a constant to eliminate small decimal numbers.[15]

Scores for each county will be standardized, multiplied by an assigned weight to note the relative importance of the variable, and finally multiplied by a constant of 100.

Weighting of the variables will be accomplished by factor analysis. Factor analysis mathematically reduces a

number of variables into "factors" which are assumed to account for the major consistencies of the system (these proportions are known as "factor loadings").[16] In all methods of factor analysis the first factor for which loadings are obtained is the most important--

maximum homogeneity in 'n' characteristics, x_1, x_2, x_3, . . . x_i, . . . x_n, can be secured by grouping units according to the values of their measures on a composite index S_i defined by the equation

$$S = a_1 Z_1 + a_2 Z_2 + a_3 Z_3 + ... a_i Z_i + ... a_n Z_n$$

where

$$Z_i = \frac{x_i - M_i}{S_i}, \text{ the standard score on } x_i$$

and

a_i = the first factor loading for the characteristic i.[17]

It will be the first factor loadings, then, derived from a matrix of the statistical components that will serve as means to denote the relative importance (weight) among the variables.

Once variable scores of component indicators have been standardized and weighted, they will be summed to reveal a total score for each category of quality of life. The aggregate scores, then, will be restandardized to note the relative performance of each county which will be mapped accordingly for analysis on the scale: 1) excellent, greater than +1.5 standard deviations; 2) above average, +0.5 to +1.5 deviations; 3) average, -0.5 to +0.5 deviations; 4) below average, -1.5 to -0.5 deviations, and 5) poor,

less than -1.5 standard deviations. Components of the
designated categories of human needs will also be handled
and mapped in this fashion.[18]

Regression analysis will be used after the derivation
of an overall index. This technique measures the strength
of linear relationships between variables and will employ
the factor matrix of the relationships of the variables and
the correlation matrix of the interplay of the quality of
life variables.[19] Correlations of ±0.35 will be designated
as the critical points of meaningful correlation at the 0.05
level of significance for the purpose of geographically
assessing the distribution of the quality of life.[20]

Unification of Components into an Overall, Quality of Life
Index and Final Analysis

Once each component has been mathematically deter-
mined and appraised, a final amalgamation of all variables
will result in an overall, quality of life index which in
turn is to be mapped and given analytical consideration.
This step is to be followed by the regression procedure,
mentioned previously, for final, geographical analysis of
the spatial relationships of the variables employed in the
study. Ultimately, thoughts on the application of this
study will be presented.

FOOTNOTES

[1]Quality of life is a measure of the personal sense
of well-being, a level of satisfaction of both physical and
psychological needs.

[2]Spatial social indicators form a statistical index
of a social event which will allow temporal and/or areal
comparison and analysis, viewed geographically to answer
how and why one portion of the earth's surface deviates
from another in terms of select conditions.

[3]Appalachian Regional Commission, The Appalachian
Region, (Washington, D. C.: Appalachian Regional Commission,
1968): Section 2-2.2.

[4]Appalachian Regional Commission, Annual Report,
1965, (Washington, D. C.: Appalachian Regional Commission,
1965): 1.

[5]Appalachian Regional Commission, Appalachia: A
Report by the President's Appalachian Regional Commission,
1964, (Washington, D. C.: Appalachian Regional Commission,
1964): xviii.

[6]Norton Ginsburg, ed., Essays on Geography and
Economic Development, (Chicago: The University of Chicago,
1960); Richard L. Morrill and Ernest H. Wohlenberg, The
Geography of Poverty in the United States, (New York:
McGraw-Hill Book Co., 1971); L. Dudley Stamp, The Geography
of Life and Death, (Ithica, N. Y.: Cornell University
Press, 1964); Isobel Cosgrove and Richard Jackson, The
Geography of Recreation and Leisure, (London: Hutchinson
University Press, 1972); David R. Meyer, "Interurban
Differences in Black Housing Quality," Annals of the Associ-
ation of American Geographers 63 (September, 1973): 347-52.

[7]John Oliver Wilson, Quality of Life in the United
States, (Kansas City: Midwest Research Institute, 1969).

[8]Ben-Chien Liu, The Quality of Life in the United
States, (Kansas City: Midwest Research Institute, 1973).

[9]Michael J. Flax, A Study in Comparative Urban
Indicators: Conditions in 18 Large Metropolitan Areas,
(Washington, D. C.: The Urban Institute, 1972).

[10]Joshua C. Dickinson, III, Robert J. Gray, and David M. Smith, "The 'Quality of Life' in Gainesville, Florida: An Application of Territorial Scoial Indicators," Southeastern Geographer 12 (November, 1972): 121-32, and Sanford H. Bederman, "The Stratification of 'Quality of Life' in the Black Community of Atlanta, Georgia," Southeastern Geographer 14 (May, 1974): 26-37.

[11]David M. Smith, The Geography of Social Well-Being in the United States: An Introduction to Territorial Social Indicators, (New York: McGraw-Hill Book Co., 1973).

[12]Of the five quality studies cited (Wilson; Liu; Flax; Dickinson, Gray, and Smith; and Bederman) all make selection of variables, combine them into component indicators, and arrive at an overall assessment, with the exception of Wilson. Each report, however, employs a different quantitative technique. Wilson, Quality of Life, analyzes the product of the standard scores of his variables and a weighting component arrived at through factor analysis (much like the procedure to be followed in this study). Liu, The Quality of Life, concurs with Wilson in terms of value assessment by standard score but assumes the equal status of the component indicators as opposed to weighting. Flax, A Study in Comparative Urban Indicators, merely notes a relative ranking via raw scores. Dickinson, Gray, and Smith, "Gainesville, Florida," convert their raw data to a scale of from 0 to 100 with the lowest score assigned a rating of 0 and the highest 100. Bederman, "Atlanta, Georgia," follows the model of Wilson with the exception that his weighting technique is arbitrarily dependent upon the number of variables per component.

[13]Amitai Etzioni and Edward W. Lehman, "Some Dangers in 'Valid' Social Measurement," Annals of the American Academy of Political and Social Science 373 (September, 1967): 2-4.

[14]Jan Drewnowski and Wolf Scott, "The Level of Living Index," Ekistics 25 (April, 1968): 266-8.

[15]Bederman, "Atlanta, Georgia": 31.

[16]R. J. Rummel, "Understanding Factor Analysis," Conflict Resolution 11 (1967): 444-6.

[17]Margaret Jarman Hagood, Nadia Danilevsky, and Corlin O. Beum, "An Explanation of the Use of Factor Analysis in the Problem of Subregional Delineation," Rural Sociology 6 (September, 1941): 222.

[18]Again, of the five cited works, Wilson, Quality of Life, uses no mapping procedure, rather the states are relatively ranked according to the component indicators arrived at through quantification. Liu, The Quality of Life, most resembles the procedure to be employed in this study as each component and the overall index are plotted in terms of their standard deviation, albeit only three divisions (excellent, greater than $\bar{x} + s$; average, $\bar{x} \pm s$; and substandard, smaller than $\bar{x} - s$) are used compared to the five of this work. Flax, A Study in Comparative Urban Indicators, as Wilson, employs only relative rankings and does not map the comparisons. Dickinson, Gray, and Smith, "Gainesville, Florida," chart each indicator and the index but on somewhat of an arbitrary basis, quartering the 0 to 100 scale employed in their analysis. Bederman, "Atlanta, Georgia," graphically displays only the overall index which also is arbitrary in nature, establishing six categories on a percentage of occurrence basis.

[19]Maurice Yeats, An Introduction to Quantitative Analysis in Human Geography, (New York: McGraw-Hill Book Company, 1974): 86.

[20]Robert Hammond and Patrick McCullagh, Quantitative Techniques in Geography: An Introduction, (Oxford, England; Clarendon Press, 1974): 212.

CHAPTER II

QUALITY OF LIFE INDICATORS

Selection and Classification of Variables

The selection and classification of quality of life
variables is dependent primarily upon the appropriateness
of the variable to meet the requirements of this research
and the availability of pertinent data. Some guidance is
also obtained from the lists of variables used in previous,
similar efforts. The variables chosen do not represent all
categories which are essential to a quality life but rather
have been selected to limit the scope of investigation.

Physical Needs Variables

For people to realize a truly satisfactory life,
their physical needs for survival must adequately be met.
Man's primary, physical requirements include health and
shelter, which are to be considered as component indicators
of the overall, physical quality of life.[1]

Health Indicator

Health quality is represented by two variables: 1)
perinatal mortality and 2) medical personnel per 1,000 pop-
ulation.[2]

The perinatal mortality rate is the total of regis-
tered fetal deaths and neonatal (under 28 days from birth)
deaths per 1,000 deliveries.[3] This quantity reflects health
quality in terms of prenatal care, medical facilities, and
mdeical personnel available. In order to reduce the pos-
sibility of chance influencing the perinatal mortality rate
of any county for a single-year period, a three-year average
has been compiled. This safeguard seems reasonable when
one notes the variation in rate of from 73.2 in 1969 in Clay
County to a rate of only 25.0 for the County two years
later. The average perinatal mortality rates of the twenty-
nine counties under study range from a maximum of 49.8 in
Clay County to a minimum of 14.2 in Graham County with only
seven counties outside of a midrange of from 20 to 40 (see
Table 2.1). It would be expected that perinatal mortality
is inversely correlated with quality of life.

Medical personnel include physicians, dentists,
related practitioners, and health workers. The proportion
of health personnel per 1,000 population varies from slight-
ly more than 11 in Buncombe County to less than 1 in Madison
County which notes only 6 practitioners and 6 associated
health employees for mor than 16,000 inhabitants. There are
6 additional instances of more than 6 personnel per 1,000
population while only 2 additional of less than 2, the
majority ranging between these extremes (see Table 2.2).
This variable is perceived to relate to the quality of

TABLE 2.1

PERINATAL MORTALITY

County	1969*	1970*	1971*	Average**
Alexander	44.8	43.6	47.0	45.1
Alleghany	21.3	38.2	16.4	25.3
Ashe	18.3	28.8	33.1	26.7
Avery	37.7	41.9	49.2	42.9
Buncombe	29.8	33.5	35.6	33.0
Burke	31.3	34.6	29.0	31.6
Caldwell	37.9	29.4	22.3	29.9
Cherokee	25.7	32.2	35.8	31.2
Clay	73.2	51.3	25.0	49.8
Davie	33.1	34.2	26.4	31.2
Forsyth	37.9	34.5	23.6	32.0
Graham	8.8	15.9	17.9	14.2
Haywood	30.5	37.8	30.0	32.8
Henderson	35.5	33.1	28.6	32.4
Jackson	19.8	35.8	26.3	27.3
McDowell	40.6	36.8	22.7	33.3
Macon	28.0	23.7	18.3	23.3
Madison	34.8	33.2	54.9	41.0
Mitchell	20.2	31.8	27.1	26.4
Polk	32.5	58.1	17.2	35.9
Rutherford	31.5	29.3	35.7	32.2
Stokes	32.4	25.9	23.1	27.1
Surry	40.8	28.0	37.1	35.3
Swain	18.0	34.1	5.4	19.2
Transylvania	43.2	39.8	42.8	41.9
Watauga	34.0	46.6	33.0	37.9
Wilkes	28.3	38.5	38.3	35.0
Yadkin	21.1	35.2	25.5	27.3
Yancey	28.3	38.0	20.0	28.8

*North Carolina State Board of Health, North Carolina Communicable Disease Morbidity Statistics 1969, 1970, 1971: Population, Cases, Rates, (Raleigh: North Carolina State Board of Health, 1970, 1971, 1972).

**Compiled by author.

TABLE 2.2

MEDICAL PERSONNEL PER 1,000 POPULATION

County	Physicians, Dentists, and Related Practitioners*	Health Workers, Except Practitioners*	Total Population*	Medical Personnel per 1,000 Population**
Alexander	10	41	19,466	2.61
Alleghany	10	26	8,134	4.42
Ashe	16	9	19,571	1.12
Avery	4	42	12,655	3.63
Buncombe	404	1,204	145,056	11.08
Burke	126	443	60,364	9.42
Caldwell	47	144	56,699	3.36
Cherokee	28	90	16,330	7.22
Clay	5	19	5,180	4.63
Davie	30	86	18,855	6.52
Forsyth	620	1,677	214,348	10.71
Graham	0	8	6,562	1.21
Haywood	68	204	41,710	6.52
Henderson	66	278	42,804	8.03
Jackson	12	85	21,593	4.49
McDowell	39	115	30,648	5.02
Macon	32	60	15,788	5.82
Madison	6	6	16,003	0.74
Mitchell	33	24	13,447	4.23
Polk	24	50	11,735	6.30
Rutherford	53	111	47,337	3.46
Stokes	20	63	23,782	3.49
Surry	66	168	51,415	4.55
Swain	10	27	7,861	4.70
Transylvania	11	83	19,713	4.76
Watauga	20	87	23,404	4.57
Wilkes	28	77	49,524	2.12
Yadkin	29	71	24,599	4.06
Yancey	20	11	12,629	2.45

*United States Department of Commerce, Bureau of Census, United States Census of the Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

**Compiled by author.

health care in that the greater the proportion of medical

personnel, the more individualized and specialized the

treatment. It would be expected that higher proportions

of medical personnel are positively associated with the

quality of life.

Housing Indicator

Housing quality is composed of four variables: (1

median housing value, 2) median contract rent, 3) percentage

of homes with all plumbing facilities, and 4) percentage of

housing units with less than one person per room.[4]

Median housing value and contract rent are chosen on

the assumption that housing quality is reflected in the

value of the unit or the amount of rent which it will bring.[5]

The highest average worth of a home is found in Forsyth

County ($16,500) while the least expensive is in Madison

County ($8,000). The majority of counties tend to lie in

a span from $9,000 to $12,000 (see Table 2.3).

Median rent is found to vary from $83 in Watauga

County to $34 in Clay and Mitchell Counties with the major-

its of the remaining county units receiving an average of

from $40 to $60 per rental unit (see Table 2.3). It is

expected that both housing value and median rent will cor-

relate positively with quality of life.

The percentage of homes with all plumbing facilities

assumes that units lacking some basic portion, such as

plumbing, are of lower quality than complete units.[6]

TABLE 2.3

MEDIAN HOUSING AND CONTRACT RENT

County	Median Dollar Value of Owner Occupied Housing Units*	Median Dollar Value of Contract Rent of Renter Occupied Housing Units*
Alexander	11,800	46
Alleghany	11,000	45
Ashe	11,600	41
Avery	8,300	44
Buncombe	13,500	63
Burke	11,500	54
Caldwell	10,700	49
Cherokee	8,800	42
Clay	8,600	34
Davie	11,100	47
Forsyth	16,500	70
Graham	8,500	35
Haywood	13,200	49
Henderson	13,600	59
Jackson	10,700	62
McDowell	9,700	42
Macon	11,500	49
Madison	8,000	36
Mitchell	8,400	34
Polk	12,200	44
Rutherford	9,600	42
Stokes	12,700	39
Surry	11,900	50
Swain	9,500	44
Transylvania	14,100	60
Watauga	14,100	83
Wilkes	11,200	43
Yadkin	11,700	43
Yancey	8,900	36

*United States Department of Commerce, Bureau of Census, United States Census of Housing: 1970, Vol. I, Housing Characteristics for States, Cities, and Counties, pt. 35, North Carolina.

Forsyth County lists more than 96 percent of its homes with complete plumbing. The lower limit of the range is occupied by Madison County with only 56 percent of the homes with all plumbing facilities. These extremes are filled by counties reporting primarily between 70 and 90 percent (see Table 2.4). It is expected that there will be a positive relationship between the percentage of housing units with all plumbing facilities and the quality of life.

The percentage of housing units with less than one person per room variable defines the amount of individual privacy which may be experienced.[7] The distribution of scores for family density is narrowly confined between 94 percent of the housing units with an average of no more than one person per room in Alleghany County and 87 percent in Swain County (see Table 2.5). It would be expected that a positive correlation exists between this variable and the quality of life.

Social Needs Variables

There are certain skills and qualities which man must possess to enable him to interact within his society. These social requirements include an education, to enable man to communicate his ideas; recreation, to occupy beneficially leisure time; security, to ensure that a style of life can continue regardless of setbacks; and the distribution of the population in such a manner that certain segments do not impose a burden on productive sectors. These component

TABLE 2.4

PERCENTAGE OF HOMES WITH ALL PLUMBING FACILITIES

County	All, Year Round Housing Units (Excludes Vacant, Seasonal, and Migratory)*	Units Lacking Some or All Plumbing Facilities*	Percentage of Homes with All Plumbing Facilities**
Alexander	6,262	1,050	83.23
Alleghany	3,028	814	73.11
Ashe	6,834	2,250	67.07
Avery	4,274	1,075	74.84
Buncombe	50,507	4,302	91.48
Burke	18,642	2,628	85.90
Caldwell	17,977	2,998	83.32
Cherokee	5,829	1,380	76.32
Clay	1,918	527	72.52
Davie	6,186	1,097	82.26
Forsyth	70,592	2,633	96.27
Graham	2,266	616	72.81
Haywood	14,418	1,737	87.95
Henderson	16,269	1,503	90.76
Jackson	6,663	1,483	77.74
McDowell	10,140	1,828	81.97
Macon	6,386	1,343	78.96
Madison	5,555	2,406	56.68
Mitchell	4,891	1,059	78.34
Polk	4,494	907	79.81
Rutherford	15,915	2,548	83.98
Stokes	7,967	2,383	70.08
Surry	17,296	3,278	81.04
Swain	2,842	704	75.22
Transylvania	6,581	851	87.06
Watauga	7,704	1,191	84.54
Wilkes	15,887	3,773	76.23
Yadkin	8,296	1,638	80.25
Yancey	4,400	1,502	65.86

*United States Department of Commerce, Bureau of Census, United States Census of Housing: 1970, Vol. I, Housing Characteristics for States, Cities, and Counties, Pt. 35, North Carolina.

**Compiled by author.

TABLE 2.5

PERCENTAGE OF HOUSING WITH LESS THAN ONE
PERSON PER ROOM

County	All Occupied Housing Units*	Units with one or less Persons per Room*	Percentage**
Alexander	5,796	5,215	89.97
Alleghany	2,677	2,519	94.09
Ashe	6,039	5,506	91.17
Avery	3,667	3,231	88.11
Buncombe	47,248	43,871	92.85
Burke	17,645	16,170	91.64
Caldwell	16,833	14,976	88.96
Cherokee	5,195	4,666	89.81
Clay	1,688	1,523	90.22
Davie	5,870	5,417	92.28
Forsyth	67,502	62,771	92.99
Graham	1,956	1,743	89.11
Haywood	13,228	12,150	91.85
Henderson	14,195	13,099	92.85
Jackson	6,056	5,366	88.60
McDowell	9,412	8,389	89.13
Macon	5,197	4,773	91.84
Madison	4,960	4,442	89.55
Mitchell	4,248	3,864	90.96
Polk	3,955	3,614	91.37
Rutherford	14,993	13,708	91.42
Stokes	7,221	6,483	89.77
Surry	16,332	14,759	90.36
Swain	2,394	2,102	87.80
Transylvania	5,906	5,374	90.99
Watauga	6,525	6,092	93.36
Wilkes	14,960	13,362	89.13
Yadkin	7,881	7,384	93.69
Yancey	3,876	3,461	89.29

*United States Department of Commerce, Bureau of Census, United States Census of Housing: 1970, Vol. I, Housing Characteristics for States, Cities, and Counties, pt. 35, North Carolina.

**Compiled by author.

indicators (education, recreation, security of life style, and demographic composition) that will be used to assess the overall, social quality of life.[8]

Education Indicator

Education quality is defined in terms of two variables: 1) instructional personnel per 100 students and 2) median school years completed by males 25 years old and over.[9]

Instructional personnel per 100 students is intended to reflect quality education as the greater the proportion of teachers, the greater the individual attention that can be bestowed upon each pupil. The range of instructional personnel per 100 students is only slight, from somewhat greater than 5 in Jackson County to 3.8 in several locations (see Table 2.6). It is believed that a positive relation will be found between this variable and the quality of life.

The median school years completed by males 25 years old and over is a measure of the output of the educational system. It also connotes a generalized level of economic and social expectations which can be obtained by the inhabitants of an area. Scores for this variable reach a maximum in Forsyth County, 11.4 years, and a minimum in Ashe County, 8.2 years, with the majority totaling between 8.5 and 10.5 years (see Table 2.7). A positive correlation is believed to exist between this variable and the quality of life.

TABLE 2.6

INSTRUCTIONAL PERSONNEL PER 100 STUDENTS

County	Instructional Personnel*	Final Enrollment*	Instructional Personnel per 100 Students**
Alexander	182	4,682	3.88
Alleghany	74	1,862	3.97
Ashe	193	4,461	4.32
Avery	129	3,117	4.13
Buncombe	1,211	30,684	3.94
Burke	614	13,710	4.47
Caldwell	564	14,416	3.91
Cherokee	162	3,832	4.22
Clay	52	1,181	4.40
Davie	170	4,408	3.85
Forsyth	2,104	48,616	4.32
Graham	65	1,545	4.20
Haywood	382	9,252	4.12
Henderson	361	9,286	3.88
Jackson	184	3,594	5.11
McDowell	274	6,855	3.99
Macon	143	3,480	4.10
Madison	143	3,023	4.73
Mitchell	117	2,931	3.99
Polk	112	2,612	4.28
Rutherford	448	10,919	4.10
Stokes	246	5,851	4.20
Surry	490	12,032	4.07
Swain	74	1,773	4.17
Transylvania	196	4,591	4.26
Watauga	196	4,449	4.40
Wilkes	483	11,886	4.06
Yadkin	216	5,567	3.88
Yancey	118	2,824	4.17

*North Carolina Department of Administration, North Carolina State Government Statistical Abstract, (Raleigh: North Carolina Department of Administration, 1973).

**Compiled by author.

TABLE 2.7

MEDIAN SCHOOL YEARS COMPLETED BY MALES 25 YEARS OLD AND OVER

County	Median School Years Completed by Males 25 Years Old and Over*
Alexander	8.8
Alleghany	8.4
Ashe	8.2
Avery	8.9
Buncombe	11.3
Burke	9.3
Caldwell	9.2
Cherokee	8.6
Clay	8.8
Davie	9.0
Forsyth	11.4
Graham	8.0
Haywood	10.1
Henderson	10.8
Jackson	9.0
McDowell	9.0
Macon	8.4
Madison	8.3
Mitchell	8.8
Polk	10.1
Rutherford	9.5
Stokes	8.6
Surry	8.8
Swain	8.8
Transylvania	11.2
Watauga	9.6
Wilkes	8.7
Yadkin	8.7
Yancey	8.4

*United States Department of Commerce, Bureau of Census, United States Census of the Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

Recreation Indicator

Recreation quality is determined by two variables: 1) second homes per 1,000 population and 2) percentage of outdoor recreation acreage.[10]

The second homes variable is to note the desire and ability of the population to beneficially recreate. Data reveal that more than 20 second homes are owned per 1,000 citizens of Alexander County, whereas in Stokes County the figure is less than 2 per 1,000 inhabitants. Most counties fall within a range of from 7 to 13 second homes (see Table 2.8). It is assumed that a positive relationship will be expressed between second homes and quality of life.

Outdoor recreation acreage denotes the availability of space for the enjoyment of leisure opportunities and varies from nearly 67 percent of the total area of Swain County to less than 1 percent of Alexander County (see Table 2.9). It would be expected that a positive correlation exists between recreation acreage and the quality of life.

Security Indicator

The security of a way of life is to be represented by the sole variable, the percentage of workers with employment insurance, which provides a source of income to maintain a lifestyle in the event of some adversity.[11] The largest proportion of workers insured is found in Caldwell County, 74.9 percent, while the fewest insured are in Madison County, 20.4 percent (see Table 2.10). It is

TABLE 2.8

SECOND HOMES PER 1,000 POPULATION

County	Second Homes Owned*	Total Population**	Second Homes per 1,000 Population***
Alexander	400	19,466	20.54
Alleghany	60	8,134	7.37
Ashe	112	19,571	5.72
Avery	140	12,655	11.06
Buncombe	1,538	145,056	10.60
Burke	756	60,364	12.52
Caldwell	647	56,699	11.41
Cherokee	108	16,330	6.61
Clay	97	5,180	18.72
Davie	131	18,855	6.94
Forsyth	2,459	214,348	11.47
Graham	30	6,562	4.57
Haywood	592	41,710	14.19
Henderson	574	42,804	13.40
Jackson	349	21,593	16.16
McDowell	413	30,648	13.47
Macon	201	15,788	12.73
Madison	106	16,003	6.62
Mitchell	101	13,447	7.51
Polk	118	11,735	10.05
Rutherford	532	47,337	11.23
Stokes	45	23,782	1.89
Surry	422	51,415	8.20
Swain	133	7,861	16.91
Transylvania	243	19,713	12.32
Watauga	297	23,404	12.69
Wilkes	626	49,524	12.64
Yadkin	243	24,599	9.87
Yancey	153	12,629	12.11

*United States Department of Commerce, Bureau of Census, United States Census of Housing: 1970, Vol. I, Housing Characteristics for States, Cities, and Counties, pt. 35, North Carolina.

**United States Department of Commerce, Bureau of Census, United States Census of the Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

***Compiled by author.

TABLE 2.9

PERCENTAGE OF OUTDOOR RECREATION ACREAGE

County	Recreation Acreage*	Total Acres**	Percentage of Outdoor Recreation Acreage***
Alexander	735	166,208	0.44
Alleghany	8,632	147,200	5.86
Ashe	2,923	273,208	1.06
Avery	40,952	158,080	25.90
Buncombe	53,981	412,992	13.07
Burke	48,735	330,688	14.73
Caldwell	52,473	306,752	17.10
Cherokee	82,576	300,096	27.51
Clay	60,172	140,544	42.81
Davie	4,484	168,960	2.65
Forsyth	7,465	271,665	2.74
Graham	16,664	193,216	8.62
Haywood	149,685	347,564	43.06
Henderson	25,276	244,736	10.32
Jackson	38,648	319,744	12.08
McDowell	69,399	286,400	24.23
Macon	150,811	332,736	45.32
Madison	46,898	291,840	16.06
Mitchell	17,271	140,800	12.26
Polk	6,380	149,888	4.25
Rutherford	3,735	363,392	1.02
Stokes	5,660	293,760	1.92
Surry	16,514	343,680	4.80
Swain	230,907	348,288	66.29
Transylvania	104,993	242,153	43.35
Watauga	19,530	204,800	9.53
Wilkes	14,311	492,198	2.90
Yadkin	2,394	215,680	1.10
Yancey	46,707	199,040	23.46

*North Carolina Department of Administration, North Carolina State Government Statistical Abstract, (Raleigh: North Carolina Department of Administration, 1973).

**United States Department of Commerce, Bureau of Census, United States Census of the Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

***Compiled by author.

TABLE 2.10

PERCENTAGE OF WORKERS WITH EMPLOYMENT INSURANCE

County	Monthly Average Insured Workers*	Civilian Work Force**	Percentage of Workers with Employment Insurance***
Alexander	4,561	7,240	62.99
Alleghany	1,860	3,570	52.10
Ashe	2,909	6,520	44.16
Avery	1,834	4,220	43.45
Buncombe	41,103	64,400	63.82
Burke	20,423	28,910	70.64
Caldwell	17,497	23,360	74.90
Cherokee	4,259	7,480	56.93
Clay	292	1,510	19.33
Davie	3,424	6,310	54.26
Forsyth	78,334	108,320	72.31
Graham	869	1,850	46.97
Haywood	9,073	14,380	63.09
Henderson	8,892	15,250	58.30
Jackson	2,402	6,440	37.29
McDowell	8,576	11,720	73.17
Macon	2,365	5,250	45.04
Madison	856	4,180	20.47
Mitchell	2,650	5,040	52.57
Polk	1,883	3,950	47.67
Rutherford	12,325	18,330	67.23
Stokes	1,764	6,480	27.22
Surry	18,717	28,860	64.85
Swain	2,084	4,060	51.33
Transylvania	5,461	7,950	68.69
Watauga	3,861	8,810	43.82
Wilkes	10,640	17,540	60.66
Yadkin	1,459	5,950	24.52
Yancey	1,180	3,140	37.57

*North Carolina Employment Security Commission, Biennial Report of the Employment Security Commission of North Carolina: July 1, 1969 to June 30, 1970, (Raleigh: North Carolina Employment Security Commission, 1970).

**North Carolina Employment Security Commission, North Carolina Labor Force Estimates by County, Area, and State, (Raleigh: North Carolina Employment Security Commission, 1974).

***Compiled by author.

believed that a positive correlation exists between this variable and the qulaity of life.

Demography Indicator

Demographic quality is defined in terms of two variables: 1) the percentage of families with a female as head of household and 2) the percentage of population over 65 or under 18 years of age.[12]

A high percentage of females heading households is assumed to reflect low socio-economic conditions since family abandonment is uncommonly high in poverty areas.[13] This proportion shows 13.8 percent of the families of Polk County are headed by a female whereas only 6.3 percent of the families of Forsyth County are. The norm runs between 7 and 10 percent (see Table 2.11). A negative correlation is postulated between the percentage of families with a female as head and the quality of life.

The percentage of population over 65 or under 18 years of age is used as a demographic indicator on the assumption that these are dependency-age categories and as the proportion increases, the poorer will be the social conditions.[14] The greatest portion of the population included in these age categories is to be found in Polk County, 46.8 percent, while the least is in Watauga County, 34.5 percent (see Table 2.12). A negative relationship between this variable and the quality of life is expected.

TABLE 2.11

PERCENTAGE OF FAMILIES WITH FEMALE AS HEAD

County	Number of Families*	Families with Female as Head*	Percentage of Families with Female as Head**
Alexander	4,463	367	8.22
Alleghany	1,522	189	12.41
Ashe	3,477	287	8.25
Avery	2,779	304	10.93
Buncombe	15,617	1,124	7.19
Burke	10,740	976	9.08
Caldwell	9,580	864	9.01
Cherokee	4,099	456	11.12
Clay	1,091	136	12.46
Davie	3,604	363	10.07
Forsyth	16,448	1,047	6.36
Graham	1,365	144	10.54
Haywood	7,156	572	7.99
Henderson	7,954	657	8.26
Jackson	4,576	437	9.54
McDowell	5,475	345	6.30
Macon	3,996	386	9.65
Madison	2,061	173	8.39
Mitchell	3,193	350	10.96
Polk	2,819	390	13.83
Rutherford	8,555	712	8.32
Stokes	4,133	396	9.58
Surry	8,463	662	7.82
Swain	1,633	178	10.90
Transylvania	3,613	295	8.16
Watauga	2,882	276	9.57
Wilkes	10,365	1,036	9.99
Yadkin	4,885	341	6.98
Yancey	2,271	233	10.25

*United States Department of Commerce, Bureau of Census, United States Census of Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

**Compiled by author.

TABLE 2.12

PERCENTAGE OF POPULATION OVER 65 OR UNDER 18 YEARS OF AGE

County	Population Over 65*	Population Under 18*	Total Population*	Percentage of Population Over 65 or Under 18 Years of Age**
Alexander	1,640	6,809	19,466	43.40
Alleghany	1,156	2,477	8,134	44.66
Ashe	2,366	6,471	19,571	45.15
Avery	1,258	4,092	12,655	42.27
Buncombe	17,096	45,405	145,056	43.08
Burke	4,858	20,459	60,364	41.94
Caldwell	3,936	20,757	56,699	43.55
Cherokee	1,940	5,347	16,330	44.62
Clay	718	1,642	5,180	45.55
Davie	1,883	6,312	18,855	43.46
Forsyth	17,031	72,664	214,358	41.84
Graham	712	2,303	6,562	45.93
Haywood	4,563	13,305	41,710	42.83
Henderson	5,761	13,508	42,804	45.01
Jackson	2,007	6,080	21,593	37.45
McDowell	2,860	10,519	30,648	43.65
Macon	2,262	4,762	15,788	44.48
Madison	2,097	4,604	16,003	41.87
Mitchell	1,693	4,223	13,447	43.99
Polk	1,893	3,609	11,735	46.88
Rutherford	5,065	15,625	47,337	43.70
Stokes	2,262	8,091	23,782	43.53
Surry	4,884	16,937	51,415	42.44
Swain	925	2,629	7,861	45.21
Transylvania	1,583	6,318	19,713	40.08
Watauga	1,979	6,112	23,404	34.57
Wilkes	4,346	17,040	49,524	43.18
Yadkin	2,493	7,803	24,599	41.85
Yancey	1,492	4,055	12,629	43.92

*United States Department of Commerce, Bureau of Census, United States Census of Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

**Compiled by author.

Higher Order Needs Variables

Higher order needs are of a psychological nature; amenities beyond physical and social necessities. Only one variable, median income, is to act as indicator for the higher order needs of life.[15] This is based on the assumption that income above the poverty level is the best estimation of the ability of an individual to possess higher order goods and services.[16] The highest median income is noted in Forsyth County, $9,286, and the lowest in Madison County, $4,652. Only in three additional instances do median incomes not fall between $5,000 and $8,000 (see Table 2.13). It would be expected that a positive relationship exists between median income and the quality of life.

TABLE 2.13

MEDIAN INCOME

County	Median Income*
Alexander	$7,885
Alleghany	5,644
Ashe	5,241
Avery	5,526
Buncombe	7,742
Burke	8,441
Caldwell	7,955
Cherokee	5,660
Clay	4,750
Davie	7,669
Forsyth	9,286
Graham	5,750
Haywood	7,189
Henderson	6,828
Jackson	5,934
McDowell	7,281
Macon	5,666
Madison	4,652
Mitchell	5,307
Polk	6,618
Rutherford	7,318
Stokes	7,057
Surry	7,134
Swain	5,189
Transylvania	8,048
Watauga	6,149
Wilkes	6,564
Yadkin	7,403
Yancey	5,318

*United States Department of Commerce, Bureau of Census, United States Census of Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.

FOOTNOTES

[1] The indicators selected to represent physical needs in this study compare with those of the studies cited as follows: John Oliver Wilson, Quality of Life in the United States, (Kansas City: Midwest Research Institute, 1969), health and welfare and living conditions; Ben-Chien Liu, The Quality of Life in the United States, (Kansas City: Midwest Research Institute, 1973), health and welfare and living conditions; Michael J. Flax, A Study in Comparative Urban Indicators: Conditions in 18 Large Metropolitan Areas, (Washington, D. C.: The Urban Institute, 1972), health, mental health, air quality, and housing; Joshua C. Dickinson, III, Robert J. Gray, and David M. Smith, "The 'Quality of Life' in Gainesville, Florida: An Application of Territorial Social Indicators," Southeastern Geographer 12 (November, 1972), health, housing, and home and family; and Sanford H. Bederman, "The Stratification of 'Quality of Life' in the Black Community of Atlanta, Georgia," Southeastern Geographer 14 (May, 1974), health and housing quality.

[2] These variables of health compare: Wilson, Quality of Life, doctors, dentists, and nurses per 100,000 population, general and mental hospital beds per 1,000 population, infant deaths per 1,000 live births, and percent of population served by flourinated water; Liu, The Quality of Life, physicians, dentists, and nurses per 100,000 population, nonwhite infant death rate, death rates of heart diseases, patients admitted to general and mental hospitals per 1,000 population; Flax, A Study in Comparative Urban Indicators, infant mortality rate, reported suicide rate; Dickinson, Gray, and Smith, "Gainesville, Florida," tuberculosis, venereal disease, enteric diseases, and infant mortality; and Bederman, "Atlanta, Georgia," infant mortality.

[3] North Carolina State Board of Health, North Carolina Vital Statistics, 1970: Population, Births, Deaths, Marriages, Divorces, (Raleigh: North Carolina State Board of Health, 1971): xix-xxi.

[4] These variables of housing compare: Wilson, Quality of Life, percent of sound housing units with plumbing facilities, per capita expenditure for housing and urban renewal, urban housing density as measured by the ratio of white to nonwhite percent of occupied units with 1.01 or more persons per room, and segregation of urban housing as measured by a

weighted index of the extent of segregation by census block;
Liu, The Quality of Life, percent of occupied housing units
with plumbing facilities, fair housing issues involved per
100,000 population, and percent of urban households with
income less than poverty level in rental occupied housing
units for nonwhites; Flax, A Study in Comparative Urban
Indicators, cost of housing; Dickinson, Gray, and Smith,
"Gainesville, Florida," owner-occupied units valued at less
than $10,000, rented units with monthly rents less than $60,
units without complete kitchen equipment, units without all
plumbing facilities, and housing units with more than one
person per room; and Bederman, "Atlanta, Georgia," percent
of housing units lacking all or some plumbing, median rent
of specified renter occupied units, and percent of occupied
units in which the average room occupance is greater than
1.0 persons.

[5]Bederman, "Atlanta, Georgia": 29.

[6]Ibid.

[7]Ibid.

[8]The indicators selected to represent social needs in
this study compare with those of the studies cited as fol-
lows: Wilson, Quality of Life, status of the individual,
individual equality, state and local government, education,
and technological change; Liu, The Quality of Life, indi-
vidual equality, technology, education, and state and local
government; Flax, A Study in Comparative Urban Indicators,
unemployment, educational attainment, racial equality,
transportation, public order, community concern, social
disintegration, and citizen participation; Dickinson, Gray,
and Smith, "Gainesville, Florida," home and family, crime,
and poverty and welfare; and Bederman, "Atlanta, Georgia,"
public order, socioeconomics, and density.

[9]These variables of education are comparable to Wilson,
Quality of Life, high school dropout rate, percent passing
preinduction Army mental examination, and percent of popu-
lation ages 5-20 enrolled in school; Liu, The Quality of
Life, public school pupil to teacher ratio, percent of males
(16-21) not high school graduates, percent of persons 25
years old and above completed median school years, and cost
adjusted public school expenditure to personal income per
capita ratio; Flax, A Study in Comparative Urban Indicators,
median school years completed.

[10]These variables of recreation compare: Wilson,
Quality of Life, per capita recreation area, Liu, The

Quality of Life, acres of state and local parks and recre-
ational areas per 100,000 population and normal average sun
shine days.

[11]This variable of security is comparable to: Wilson,
Quality of Life, old-age assistance, aid to families with
dependent children, social security payments, percent of
full-time employees under state or local retirement system,
and percent of full-time employees under contributory life
insurance, health, or hospital coverage; Liu, The Quality of
Life, per capita assets of insured commercial banks, cost
adjusted public assistance for old age, family with depen-
dent children, and veterans, and percent coverage of full-
time employees by contributory system: retirement, health,
hospital, and disability; and Bederman, "Atlanta, Georgia,"
aid to families with dependent children, the aged, and the
disabled.

[12]These variables of demography are comparable to:
Liu, The Quality of Life, mean number of children under 18;
and Bederman, "Atlanta, Georgia," percent of families with a
female as head of household and percent of total population
under 15 years and over 65 years of age.

[13]Bederman, "Atlanta, Georgia": 29.

[14]Ibid.

[15]The indicator selected to represent higher order
needs in this study compares with those of the studies cited
as follows: Wilson, Quality of Life, economic growth and
status of the individual; Liu, The Quality of Life, indi-
vidual status and economic status; Flax, A Study in
Comparative Urban Indicators, poverty and income level;
Dickinson, Gray, and Smith, "Gainesville, Florida," poverty
and welfare; and Bederman, "Atlanta, Georgia," socio-
economics.

[16]This variable of higher order needs compares with:
Wilson, Quality of Life, ratio of nonwhite to white per
capita median income adjusted for urban-rural differences in
population distribution and percentage increase in per
capita personal income; Liu, The Quality of Life, cost ad-
justed mean family income per member and ratio of nonwhite
to white median family income adjusted for weeks worked;
Flax, A Study in Comparative Urban Indicators, per capita
income adjusted for cost of living differences; and
Bederman, "Atlanta, Georgia," median family income.

CHAPTER III

QUANTIFICATION

The Mathematical Process

Quantification makes possible a mode of mathematical comparison among the twenty-nine counties of this study. The figures to be used for this purpose are arrived at through the formula $Ij = \sum\limits_{i=1}^{n} ba_i z_i$ where the indicator, Ij, is found by summing the product of the standard score of each component variable, z_i, its assigned weighting value, a_i, and a constant of 100, b.

It is the function of the weighting component to scale the scores in consideration of the strength that each variable contributes to the indicator. Weights have been compiled for each varibale by computer factor analysis (see Table 3.1).

Once the treated scores of the individual indicators have been summed, they are to be restandardized for the purpose of cartographic analysis.

Physical Quality of Life

Health Indicator

The two variables of health, perinatal mortality and

TABLE 3.1

FACTOR LOADINGS

Variable Code*	First Factor Loading**
INMOR	- 0.01725
DOCTS	0.87848
VALHZ	0.77539
MERNT	0.51844
NOPLM	0.78406
RMDEN	0.70449
TEACH	0.09230
YRSED	0.80415
2HOME	0.12040
ACRES	0.03088
SECUR	0.37745
%FEHD	- 0.14285
OV&UN	- 0.18400
MEDIN	0.51855

*For an explanation of the variable codes used, see the Appendix.

**Compiled by BMD Factor Analysis, Computer Program.

medical personnel per 1,000 population, are assigned factor weights of -0.01725 and 0.87848 respectively. The weight for perinatal mortality, being negative, will reverse the sign of standard scores causing lower, original standard values to be more desirable. The value ascribed to medical personnel per 1,000 population denotes the strongly surperior emphasis that it will carry compared to perinatal mortality.

Totaling of the weighted scores of the health variables reveals that Buncombe County rates highest with a raw score of 210 and a restandardized score of 2.4 standard deviations. At the other extreme is Madison County with a raw score of -141 and a relative score of -1.6 standard deviations (see Table 3.2). Plotting this information on a scale of greater than 1.5 standard deviations as excellent; 0.5 to 1.5, above average; -0.5 to 0.5, average; -1.5 to -0.5, below average; and less than -1.5 standard deviations as poor, three of the twenty-nine counties of the North Carolina mountains rate as superior in terms of health, five as above average, eleven as average, nine as below average, and only one as poor (see Figure 3.1).

Housing Indicator

The four variables of housing quality, median dollar value of owner occupied housing units, median dollar value of contract rent of renter occupied housing units, percentage of homes with all plumbing facilities, and percentage of housing units with less than one person per room, possess

TABLE 3.2
HEALTH INDICATOR

County	INMOR Standard Score	INMOR Weighted Score	DOCTS Standard Score	DOCTS Weighted Score	Total Weighted Score	Standard Total Weighted Score	Standard Total Weighted Score Rank
Alexander	-1.72	-2.96	0.86	76.31	79.28	-0.91	24
Alleghany	-0.89	-1.54	0.17	15.01	13.46	-0.15	17
Ashe	-0.70	-1.22	0.38	121.88	120.66	1.39	28
Avery	-1.54	-2.46	1.38	41.85	44.32	0.51	20
Buncombe	-1.22	-2.47	2.40	211.84	210.84	2.44	1
Burke	-1.43	0.21	1.76	154.73	154.83	1.79	4
Caldwell	-0.06	-0.10	0.57	50.89	50.40	0.58	
Cherokee	-0.28	-0.49	0.91	80.24	80.04	0.93	23
Clay	-0.11	-0.19	0.09	7.97	12.01	-0.13	
Davie	-2.36	-4.04	0.49	43.59	43.79	0.30	8
Forsyth	-0.11	-0.19	2.25	198.52	198.53	2.30	2
Graham	-2.36	-4.01	1.41	123.86	119.72	1.38	
Haywood	-0.09	-0.16	0.64	56.11	55.95	0.64	27
Henderson	-0.04	-0.07	1.22	107.56	107.48	1.24	6
Jackson	-0.62	-1.07	0.14	12.76	11.67	-0.05	4
McDowell	-0.16	-0.28	0.06	5.32	5.04	-0.05	15
Macon	-1.15	-1.99	0.37	32.56	34.55	0.40	9
Madison	-1.17	-2.03	1.59	139.79	141.83	1.64	
Mitchell	-0.74	-1.29	0.24	21.35	20.06	0.23	18
Polk	-0.02	-0.02	0.55	48.81	47.93	0.55	22
Rutherford	0.01	-0.01	0.54	47.67	47.67	0.52	21
Stokes	-0.50	-1.13	0.12	46.77	45.64	-0.55	14
Surry	-0.65	-0.73	0.06	5.47	2.54	-0.02	11
Swain	-0.42	-2.93	0.06	3.38	1.49	-0.06	12
Transylvania	-1.69	-2.24	0.11	5.62	5.62	-0.06	14
Watauga	-1.29	-1.32	0.10	10.05	11.38	-0.12	16
Wilkes	-0.77	-0.66	0.11	93.94	93.27	1.03	26
Yadkin	-0.38	-1.08	1.06	27.16	26.16	1.08	19
Yancey	-0.62	-0.74	0.93	81.92	81.17	0.94	29

HEALTH
INDICATOR

STANDARD DEVIATION | Over 1.5 | .5 to 1.5 | -.5 to .5 | -1.5 to -.5 | Under -1.5

Superior | Above Average | Average | Below Average | Poor

RAW SCORE | Over 129 | 43 to 129 | -43 to 43 | -129 to -43 | Under -129

N

30
20
10
5 0
Miles

10 5 0

Figure 3.1

weights of 0.77539, 0.51844, 0.78406, and 0. 70449 respectively. These loadings attest to the near equality of all of these variables for assessing housing quality.

Totaling of the weighted scores of the housing variable indicates Forsyth County as the site of the highest quality of homes with a raw score of 590 and a standard score of 2.3 deviations and Madison County with the poorest quality with a raw score of -451 and a standard score of -1.8 deviations (see Table 3.3). With this range of scores displayed graphically, three counties attain a superior mark, four above average, twelve average, nine below average, and one poor (see Figure 3.2).

Overall, Physical Quality of Life Indicator

With the relative importance of all component, physical quality of life variables noted by the weighting process, it is possible to define the overall, physical quality of life by using the quantification formula for indicators and the raw scores of the health and housing indicators.

Forsyth County is the most desirable of the counties of the study area in meeting the physical, human needs of health and housing and Madison County as least desirable. The raw scores of these two counties range between 788 and -593 with corresponding standard scores at 2.5 and -1.8 deviations respectively (see Table 3.4). When mapped, this information reveals three counties with superior marks,
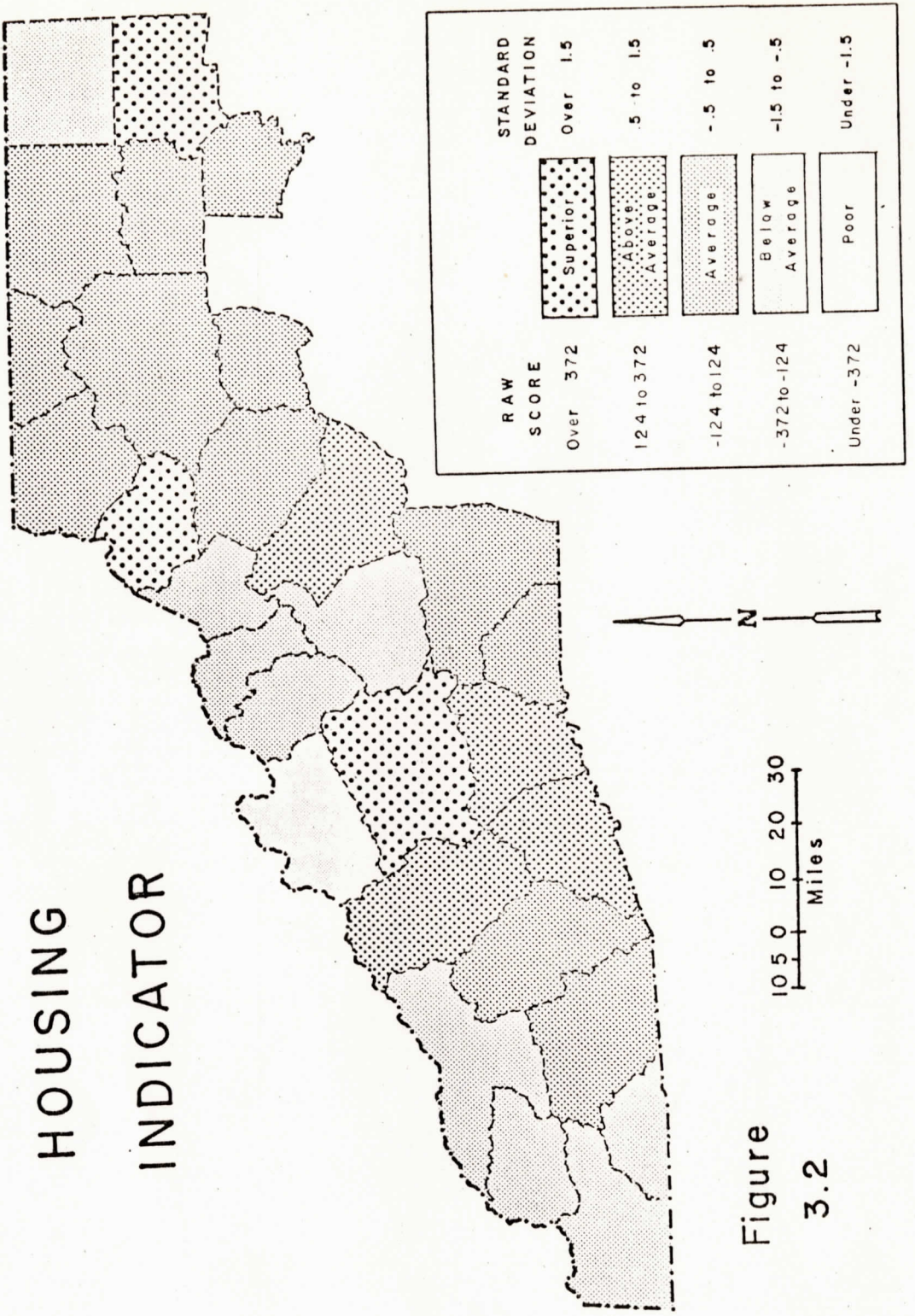
TABLE 3.3

HOUSING INDICATOR

County	VALHZ Weighted Score	MERNT Weighted Score	NOFLM Weighted Score	RMDEN Weighted Score	Total Weighted Score	Standard Total Weighted Score	Rank
Alexander	24.48	11.23	38.14	33.42	17.97	0.07	14
Alleghany	4.94	24.62	56.69	49.70	135.96	0.20	11
Ashe	17.12	43.17	113.34	15.81	123.57	0.49	19
Avery	104.28	24.00	40.26	110.09	278.65	1.12	26
Buncombe	87.03	29.36	115.50	84.79	384.69	1.55	3
Burke	13.44	39.86	63.19	34.99	151.50	0.61	17
Caldwell	15.93	7.93	39.00	74.83	143.88	0.17	9
Cherokee	85.88	36.78	26.51	39.94	189.23	0.76	23
Clay	93.24	87.88	62.26	23.18	266.57	1.07	25
Davie	1.26	4.84	29.09	61.37	84.35	0.34	9
Forsyth	197.40	142.07	160.40	90.49	590.37	2.38	27
Graham	96.92	81.49	59.52	68.98	306.93	1.23	6
Haywood	75.99	7.93	82.41	43.61	209.95	0.84	4
Henderson	90.71	71.80	108.74	61.22	332.49	1.34	27
Jackson	11.98	90.97	13.32	89.70	28.03	0.11	16
Macon	52.77	36.28	26.33	68.14	131.37	0.53	21
Madison	13.44	7.93	1.82	43.24	62.79	0.25	10
McDowell	115.32	75.11	210.75	50.65	451.84	1.82	29
Mitchell	100.60	82.88	7.64	6.98	189.16	0.76	12
Polk	39.20	24.00	45.25	24.19	145.52	0.18	22
Rutherford	56.45	36.78	85.09	26.30	124.92	0.08	15
Stokes	57.59	14.31	17.66	41.48	21.67	0.08	20
Surry	28.16	24.00	36.89	122.49	42.86	0.50	13
Swain	60.13	36.89	74.12	105.80	243.53	0.17	24
Transylvania	109.10	78.19	8.34	8.34	269.77	1.08	5
Watauga	109.10	225.11	50.41	105.80	490.44	1.97	2
Wilkes	2.41	30.39	27.45	60.45	115.88	0.46	7
Yadkin	20.80	30.39	19.35	119.35	120.00	0.48	18
Yancey	82.20	75.11	124.71	61.48	343.51	1.38	28

*For an explanation of the variable codes used, see the Appendix.

Compiled by author.

HOUSING INDICATOR

N

10 5 0 10 20 30
Miles

RAW SCORE		STANDARD DEVIATION
Over 372	Superior	Over 1.5
124 to 372	Above Average	.5 to 1.5
-124 to 124	Average	-.5 to .5
-372 to -124	Below Average	-1.5 to -.5
Under -372	Poor	Under -1.5

Figure 3.2

TABLE 3.4

OVERALL, PHYSICAL QUALITY OF LIFE INDICATOR

County	Total Health and Housing Scores	Standard Total Score	Rank
Alexander	- 61.30	- 0.19	15
Alleghany	36.23	0.11	12
Ashe	- 244.23	- 0.77	23
Avery	- 323.18	- 1.02	26
Buncombe	595.53	1.89	2
Burke	306.33	0.97	5
Caldwell	- 94.29	- 0.30	17
Cherokee	- 108.99	- 0.34	18
Clay	- 278.59	- 0.88	25
Davie	128.14	0.40	8
Forsyth	788.91	2.51	1
Graham	- 426.73	- 1.35	28
Haywood	265.90	0.84	6
Henderson	439.97	1.40	4
Jackson	- 39.71	- 0.12	14
McDowell	- 126.33	- 0.40	19
Macon	97.35	0.30	9
Madison	- 593.67	- 1.89	29
Mitchell	- 209.22	- 0.66	21
Polk	93.45	0.29	11
Rutherford	- 69.35	- 0.22	16
Stokes	- 170.56	- 0.54	20
Surry	31.37	0.09	13
Swain	- 246.07	- 0.78	24
Transylvania	264.14	0.84	7
Watauga	479.06	1.52	3
Wilkes	- 209.83	- 0.66	22
Yadkin	93.83	0.29	10
Yancey	- 424.69	- 1.35	27

Compiled by author.

four with above average, twelve with average, nine with below average, and one with a poor mark (see Figure 3.3).

Social Quality of Life

Education Indicator

The variables of education, instructional personnel per 100 students and median school years completed by males 25 years or over, possess factor weightings of 0.09230 and 0.80415 respectively. The latter therefore will have influence nearly nine times greater than the former.

Forsyth County again leads all units with a raw score of 191 and a standard score of 2.4 deviations for education. Graham County fared worst with a raw score of -101 and a standard score of -1.2 deviations (see Table 3.5). Plotting this range of scores finds four superior counties, three above average, ten average, twelve below average, and none poor (see Figure 3.4).

Recreation Indicator

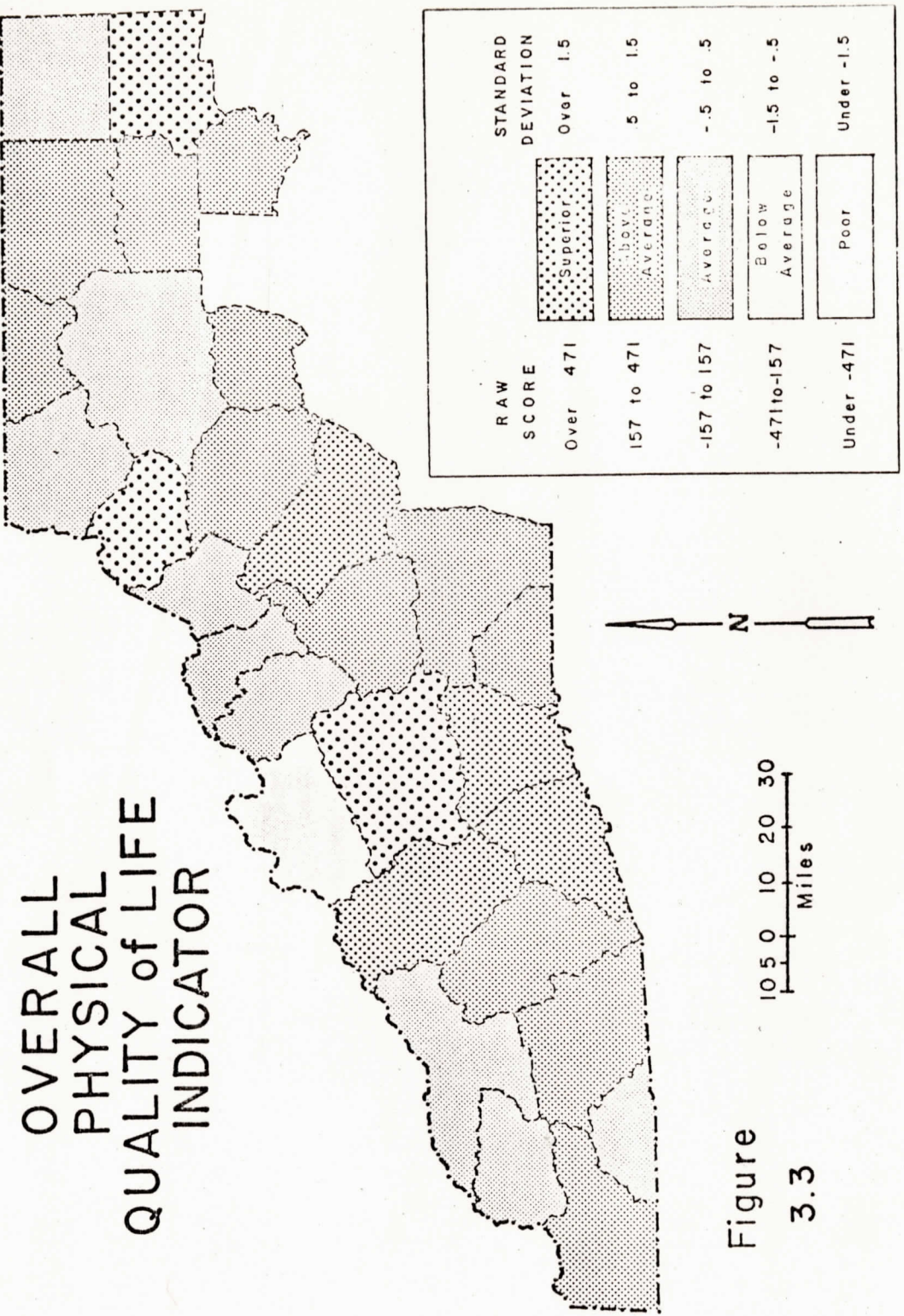Recreation variables, second homes per 1,000 population and percentage of outdoor recreation acreage, are weighted at 0.12040 and 0.03088 respectively. These low loadings note the minor, relative contribution that these variables will make toward the overall index but at the same time, the greater importance of second homes per 1,000 population between the two themselves.

Combining the variable scores leaves Clay County as

OVERALL
PHYSICAL
QUALITY of LIFE
INDICATOR

Figure
3.3

TABLE 3.5

EDUCATION INDICATOR

County	Variable Code* TEACH Standard Weighted Score	TEACH Weighted Score	YRSED Standard Weighted Score	YRSED Weighted Score	Total Weighted Score	Standard Total Weighted Score	Rank
Alexander	−1.08	9.98	−0.42	43.95	43.94	−0.55	19
Alleghany	−0.76	7.04	−0.94	67.91	74.95	−0.94	27
Ashe	−0.52	4.87	−1.05	84.89	80.02	−1.01	28
Avery	−0.15	1.48	−0.31	25.46	26.95	−0.34	14
Buncombe	−0.96	7.97	2.21	178.29	170.32	2.15	3
Burke	−1.08	10.01	0.21	16.98	26.99	0.34	8
Caldwell	−0.98	9.13	0.00	0.00	9.13	0.11	11
Cherokee	−0.16	1.52	−0.63	50.93	49.41	−0.62	21
Clay	−0.80	7.46	0.42	33.95	26.49	−0.11	13
Davie	−1.19	11.01	0.21	16.97	27.97	0.35	15
Forsyth	−0.53	4.91	2.32	186.78	191.69	2.42	1
Graham	−0.09	0.83	1.26	101.87	101.04	1.28	29
Haywood	−0.19	1.81	0.95	76.41	74.60	0.94	6
Henderson	−1.08	9.97	1.68	135.84	125.87	1.59	4
Jackson	−1.43	11.69	0.21	16.97	14.71	0.18	10
McDowell	−0.67	6.26	0.84	67.91	70.39	0.89	12
Macon	−0.26	2.47	0.95	76.91	23.24	0.29	26
Madison	−2.00	18.51	0.95	76.40	57.87	0.73	24
Mitchell	−0.69	6.44	0.42	33.95	40.40	0.51	18
Polk	−0.38	3.56	0.95	76.41	79.97	1.01	5
Rutherford	−0.29	2.68	0.31	25.47	22.78	0.28	9
Stokes	−0.08	0.74	0.63	50.93	50.19	0.63	22
Surry	−0.40	3.71	0.42	33.95	37.67	0.47	17
Swain	−0.03	0.29	0.42	33.95	34.25	0.43	16
Transylvania	−0.31	2.93	2.11	169.80	172.73	2.18	2
Watauga	−0.81	7.54	0.42	33.96	42.50	0.52	7
Wilkes	−0.43	4.01	0.52	42.44	46.46	0.58	20
Yadkin	−1.10	10.22	0.52	42.44	52.67	0.66	23
Yancey	−0.01	0.13	0.84	67.91	68.05	0.86	25

*For an explanation of the variable codes used, see the Appendix.

Compiled by author.

EDUCATION
INDICATOR

STANDARD DEVIATION	RAW SCORE
Over 1.5 — Superior	Over 117
.5 to 1.5 — Above Average	39 to 117
-.5 to .5 — Average	-39 to 39
-1.5 to -.5 — Below Average	-117 to -39
Under -1.5 — Poor	Under -117

—N⟶

10 5 0   10   20   30
Miles
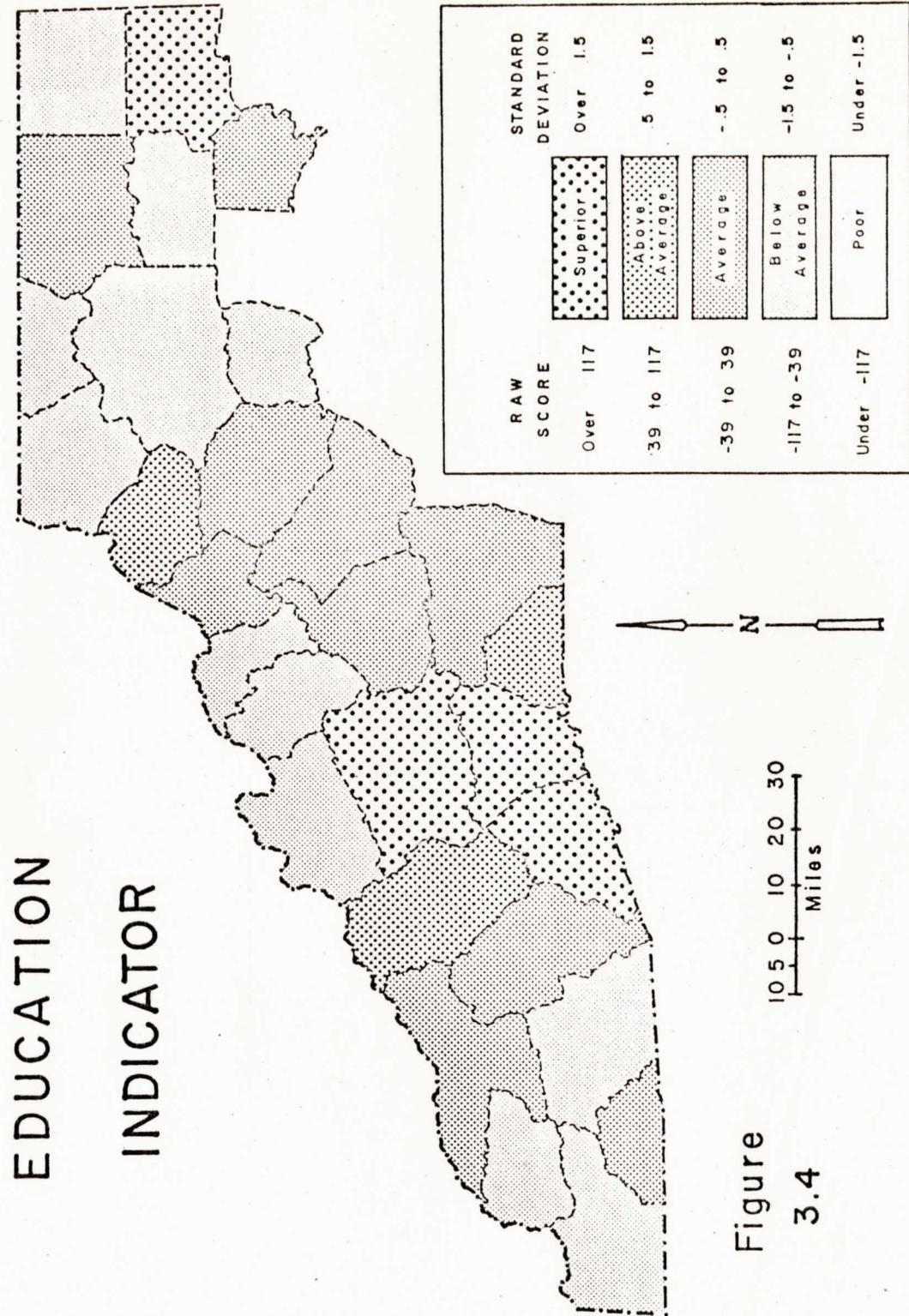
Figure
3.4

leader in terms of recreation with a raw score of 26 and a standard score of 2.2 and Stokes County in last place with a raw score of -28 and a standard score of -2.4 deviations (see Table 3.6). When noted geographically, this set of scores defines three superior counties, five above average, eleven average, seven below average, and three poor counties (see Figure 3.5).

Security Indicator

The line variable of security of life style, percentage of workers with employment insurance, has a weight of 0.37745.

This lone variable expresses a weighted range of from 54 (1.4 standard deviations) in Caldwell County to -77 (-2.0 standard deviations) in Clay County (see Table 3.7). A map of scores for the security indicator finds no superior counties, eleven above average, ten average, four below average, and four poor (see Figure 3.6).

Demography Indicator

The variables of demography, percentage of families with a female as head of household and percentage of the population over 65 or under 18 years of age, possess negative weights, -0.14285 and -0.18400 respectively. This will cause low standard scores for each of these categories to be desirable when multiplied by its negative coefficient.

Demography is a rather compact indicator varying from 62 (2.2 standard deviations) in Watauga County to -62 (-2.2
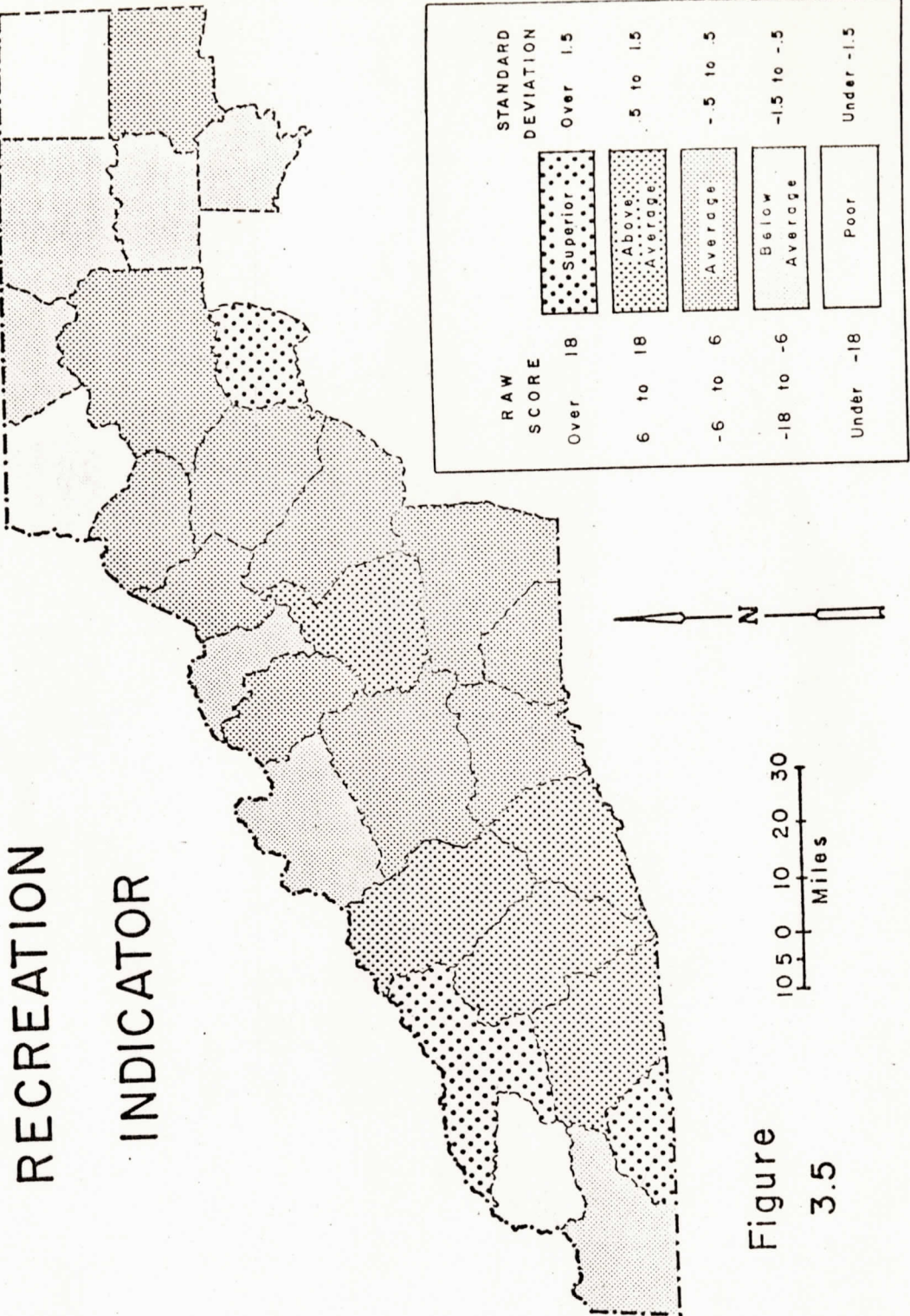
TABLE 3.6
RECREATION INDICATOR

County	Variable Code* 2HOME Standard Score	2HOME Weighted Score	ACRES Standard Score	ACRES Weighted Score	Total Weighted Score	Standard Total Weighted Score	Rank
Alexander	- 2.27	27.38	- 0.95	2.95	24.42	2.04	3
Alleghany	- 0.87	10.47	- 0.63	1.96	12.04	1.51	24
Ashe	- 1.25	15.23	- 0.91	2.84	18.07	1.51	27
Avery	- 0.00	0.11	- 0.54	1.66	1.78	0.14	14
Buncombe	- 0.10	1.20	- 0.21	0.66	1.86	0.15	17
Burke	- 0.35	4.31	- 0.11	0.35	3.95	0.33	15
Caldwell	- 0.09	1.11	- 0.02	0.07	1.18	0.09	16
Cherokee	- 1.05	12.67	- 0.63	1.96	10.70	0.89	22
Clay	- 1.83	22.14	- 1.53	4.73	26.88	2.24	1
Davie	- 0.97	11.71	- 0.82	2.55	14.26	1.19	26
Forsyth	- 0.10	1.29	- 0.82	2.53	1.24	0.10	16
Graham	- 1.53	18.54	- 0.47	1.46	20.00	1.67	28
Haywood	- 0.75	9.11	- 1.54	4.78	13.89	1.67	5
Henderson	- 0.56	6.86	- 0.37	1.15	5.72	0.47	9
Jackson	- 1.22	14.77	- 0.27	0.83	13.93	1.16	4
Macon	- 0.58	7.05	- 0.44	1.36	8.41	0.70	8
Madison	- 0.40	4.91	- 0.03	0.11	5.19	1.04	6
McDowell	- 1.05	12.64	- 1.68	5.19	10.52	0.84	25
Mitchell	- 0.83	10.09	- 0.26	0.80	12.52	0.91	23
Polk	- 0.23	2.77	- 0.73	2.26	10.98	0.42	19
Putherford	- 0.05	0.62	- 0.92	2.84	5.04	0.18	18
Stokes	- 2.17	26.24	- 0.86	2.68	28.92	2.41	29
Surry	- 0.67	8.08	- 0.70	2.16	10.25	0.85	2
Swain	- 1.40	16.94	- 2.91	9.00	25.95	2.17	7
Transylvania	- 0.31	3.74	1.56	4.83	3.49	0.29	11
Watauga	- 0.39	4.79	0.42	1.30	8.58	0.71	12
Wilkes	- 0.38	4.65	0.81	2.50	2.14	0.17	13
Yadkin	- 0.27	3.28	0.91	2.83	6.12	0.51	20
Yancey	0.26	3.14	0.39	1.22	4.36	0.36	10

*For an explanation of the variable codes used, see the Appendix.

Compiled by author.

RECREATION INDICATOR

STANDARD DEVIATION	RAW SCORE	
Over 1.5	Over 18	Superior
.5 to 1.5	6 to 18	Above Average
- .5 to .5	- 6 to 6	Average
-1.5 to -.5	-18 to -6	Below Average
Under -1.5	Under -18	Poor

N

10 5 0   10   20   30
Miles

Figure
3.5

TABLE 3.7

SECURITY INDICATOR

| County	Weighted Score	Standard Weighted Score	Rank
Alexander	26.27	0.69	10
Alleghany	0.40	0.01	16
Ashe	- 17.35	- 0.45	21
Avery	- 20.10	- 0.53	23
Buncombe	28.23	0.74	8
Burke	44.42	1.17	4
Caldwell	54.53	1.44	1
Cherokee	11.89	0.31	13
Clay	- 77.37	- 2.01	29
Davie	5.54	0.14	14
Forsyth	48.40	1.28	3
Graham	- 11.76	- 0.31	19
Haywood	26.50	0.70	9
Henderson	15.14	0.40	12
Jackson	- 34.76	- 0.92	25
McDowell	50.43	1.33	2
Macon	- 16.33	- 0.43	20
Madison	- 74.66	- 1.97	28
Mitchell	1.54	0.04	15
Polk	- 10.10	- 0.26	18
Rutherford	36.34	0.96	6
Stokes	- 58.65	- 1.55	26
Surry	30.68	0.81	7
Swain	- 1.42	- 0.03	17
Transylvania	39.79	1.05	5
Watauga	- 19.23	- 0.50	22
Wilkes	20.73	0.54	11
Yadkin	- 65.06	- 1.72	27
Yancey	- 34.06	- 0.90	24

Compiled by author.

SECURITY INDICATOR
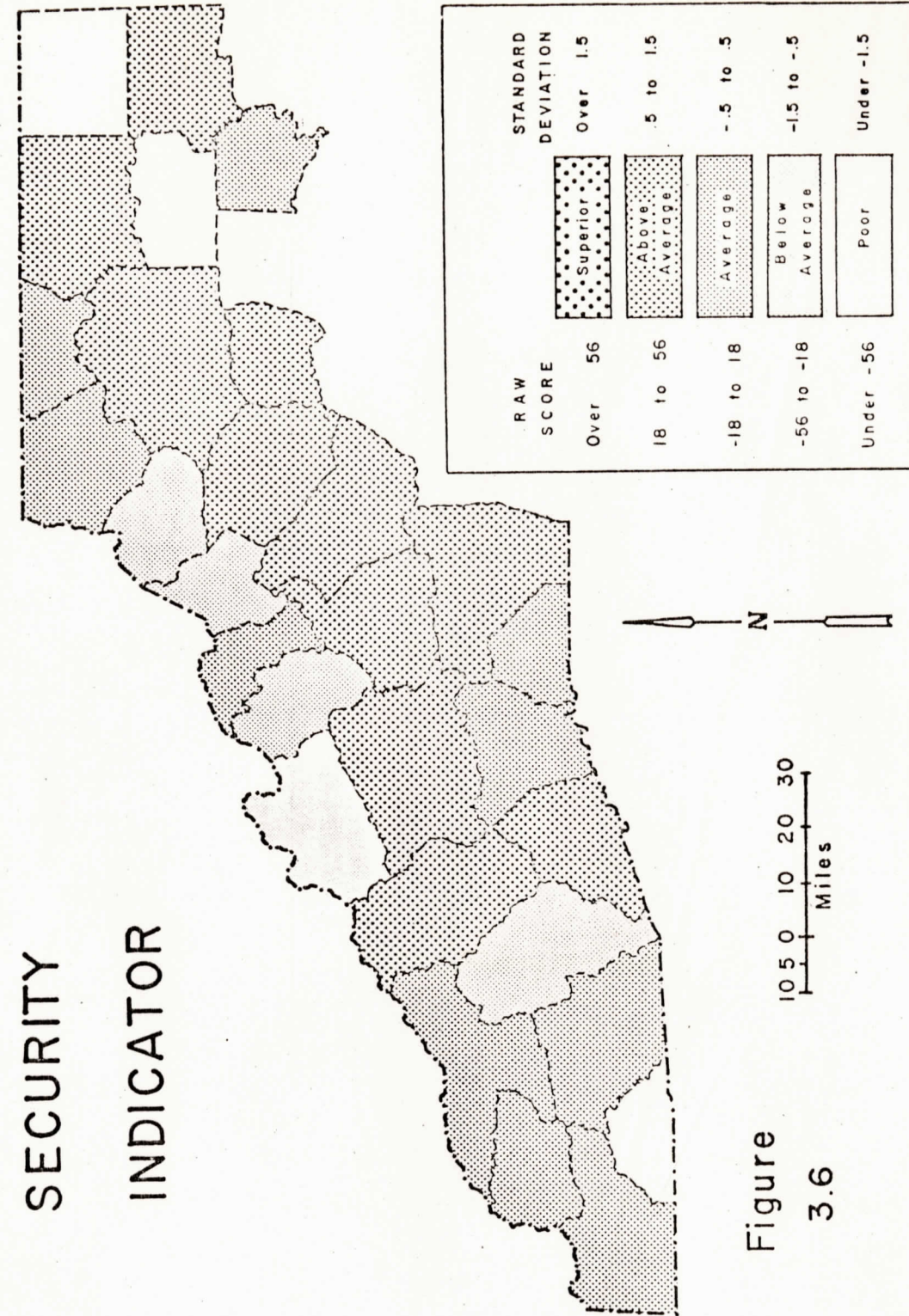
Figure 3.6

deviations) in Polk County (see Table 3.8). When these
figures are mapped, only Watauga County scores a superior
score, eight counties are above average, thirteen average,
five below average, and two poor (see Figure 3.7).

Overall, Social Quality of Life Indicator

As was done with the overall, physical quality of
life, the overall, social quality of life can be found by
summing and scaling the education, recreation, security, and
demography indicators.

Forsyth County possesses the highest social quality
of life, 271 as a raw score and 2.3 as standard, while
Graham County rated last in this category, -162 for its raw
score and -1.3 as standard score (see Table 3.9). Three
counties rank superior, five above average, ten average, and
eleven below average. No county received a poor mark for
this indicator (see Figure 3.8).

Higher Order Needs Quality of Life

Higher Needs Indicator

The only variable for this component section of qual-
ity of life is median family income which possesses a weight
of 0.51844. When weighted, the county scores range between
a raw score of 115 in Forsyth County, which converts to a
standard score of 2.2, and a raw score of -83 in Madison
County, -1.6 on a standard level (see Table 3.10). When
mapped, the county scores indicate two as superior for

TABLE 3.8

DEMOGRAPHY INDICATOR

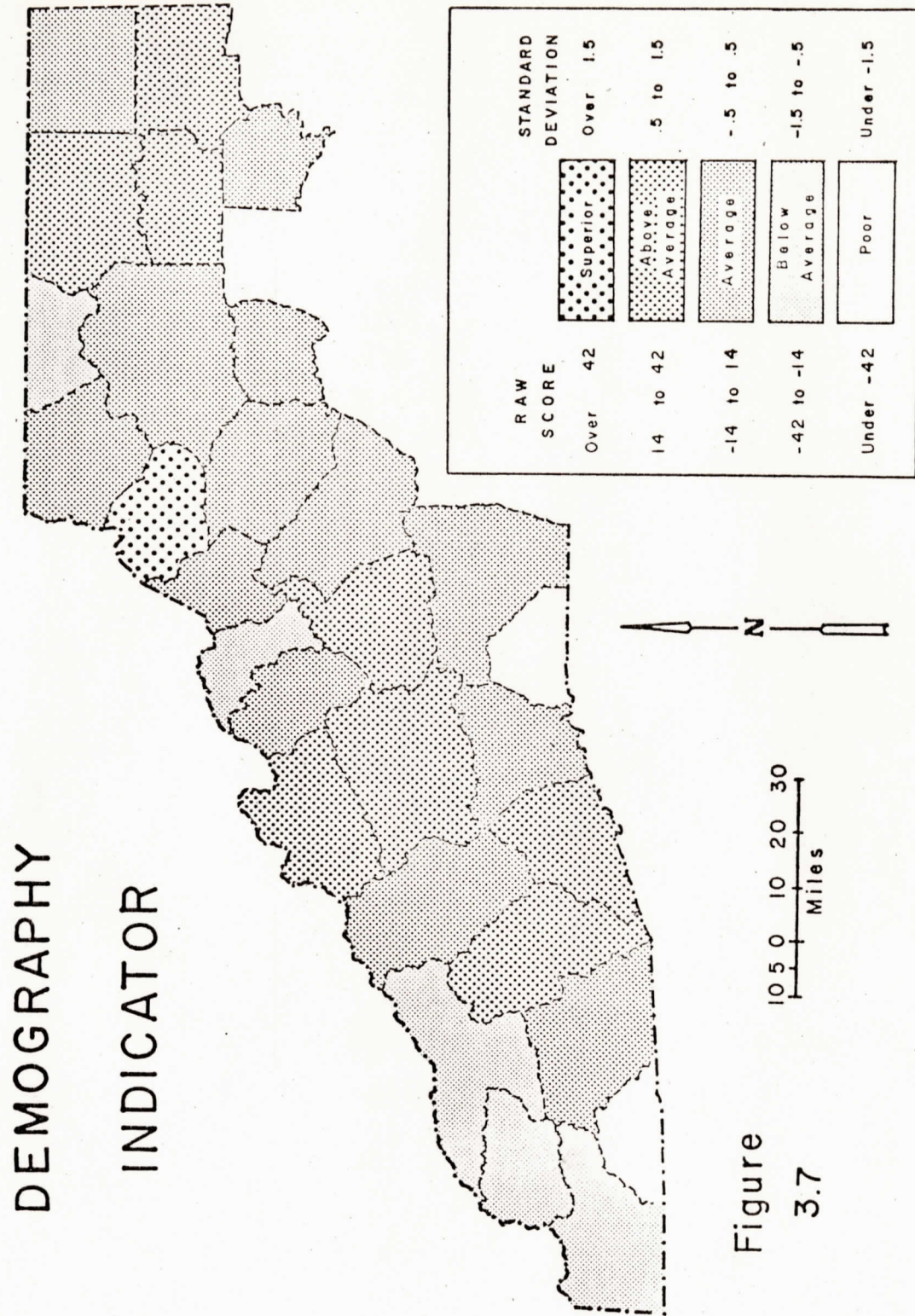| County	Variable Code*				Total Weighted Score	Standard Total Weighted Score	Standard Total Weighted Score Rank
	%FaHD		O%&UN				
	Standard Weighted Score		Standard Weighted Score				
Alexander	– 0.63		– 0.11		6.97	– 0.25	20
Alleghany	– 1.66		– 0.82		35.38	– 1.27	27
Ashe	1.62		– 0.62		6.32	– 0.22	19
Avery	– 0.85		0.33		5.93	– 0.21	18
Buncombe	1.20		0.00		17.33	– 0.62	7
Burke	0.16		– 0.47		11.06	– 0.39	11
Caldwell	0.20		– 0.61		0.38	0.01	13
Cherokee	– 0.95		– 0.99		24.85	– 0.89	24
Clay	1.68		0.14		42.32	– 1.52	28
Davie	0.37		0.51		7.97	0.28	21
Forsyth	1.65		1.14		33.09	1.19	26
Graham	0.63		1.10		30.08	– 1.08	10
Haywood	0.76		– 0.46		12.95	0.46	17
Henderson	0.61		2.02		20.99	0.19	8
Jackson	0.08		2.28		42.11	1.46	17
McDowell	– 1.69		– 0.21		24.18	– 0.72	14
Macon	0.54		0.05		4.04	0.11	8
Madison	0.86		0.50		9.20	0.31	23
Mitchell	2.43		– 0.55		28.09	– 0.68	29
Polk	0.58		– 0.24		62.91	2.26	12
Rutherford	0.10		0.17		4.65	– 0.14	9
Stokes	0.85		0.20		15.98	0.57	21
Surry	0.10		0.84		27.46	0.98	25
Swain	0.85		– 1.22		15.62	0.57	13
Transylvania	0.67		3.45		62.08	2.23	1
Watauga	0.10		0.02		32.13	1.15	4
Wilkes	0.33		– 0.50		5.29	0.02	15
Yadkin	1.32		0.19		28.20	1.01	16
Yancey	0.47		0.32		12.86	0.46	22

DEMOGRAPHY INDICATOR

Figure 3.7

TABLE 3.9

OVERALL, SOCIAL, QUALITY OF LIFE INDICATOR

Score	Total Education, Recreation, Security, and Demography Score	Standard Total Score	Rank
Alexander	− 0.21	− 0.00	13
Alleghany	− 122.38	− 1.04	26
Ashe	− 121.78	− 1.04	25
Avery	− 51.20	− 0.43	18
Buncombe	214.02	1.82	3
Burke	86.44	0.73	7
Caldwell	46.21	0.39	10
Cherokee	− 73.08	− 0.62	20
Clay	− 119.31	− 1.01	24
Davie	− 44.69	− 0.38	17
Forsyth	271.95	2.32	1
Graham	− 162.90	− 1.39	29
Haywood	127.95	1.09	5
Henderson	141.38	1.20	4
Jackson	34.74	0.29	11
McDowell	55.74	0.47	9
Macon	− 79.77	− 0.68	21
Madison	− 128.06	− 1.09	27
Mitchell	− 68.66	− 0.58	19
Polk	1.91	0.01	12
Rutherford	60.80	0.51	8
Stokes	− 142.42	− 1.21	28
Surry	− 1.26	− 0.01	14
Swain	− 37.19	− 0.31	16
Transylvania	253.26	2.16	2
Watauga	87.84	0.75	6
Wilkes	− 28.88	− 0.24	15
Yadkin	− 95.65	− 0.81	22
Yancey	− 110.61	− 0.94	23

Compiled by author.

OVERALL SOCIAL QUALITY of LIFE INDICATOR

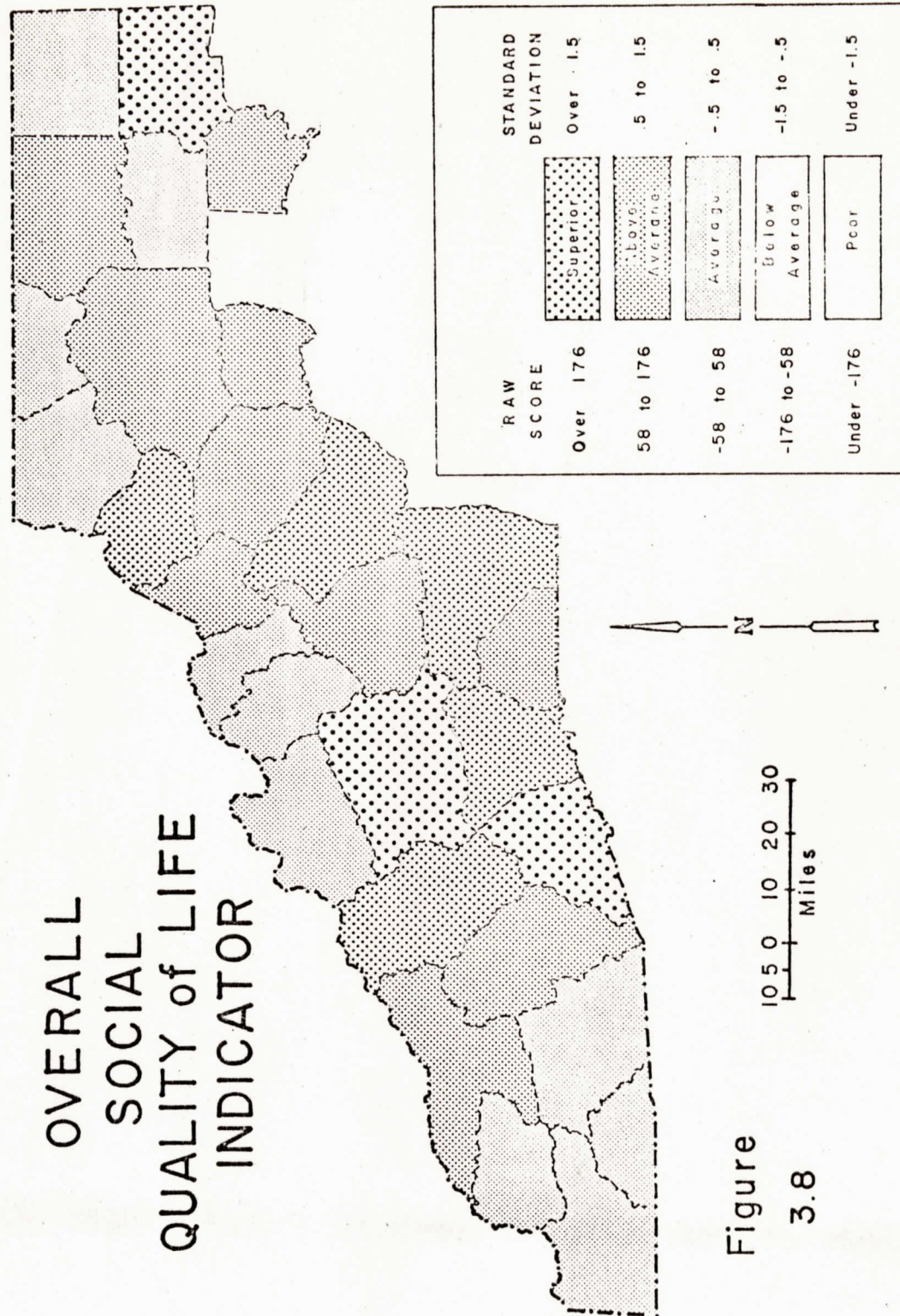| RAW SCORE		STANDARD DEVIATION
Over 176	Superior	Over 1.5
58 to 176	Above Average	.5 to 1.5
-58 to 58	Average	-.5 to .5
-176 to -58	Below Average	-1.5 to -.5
Under -176	Poor	Under -1.5

N

Miles

Figure 3.8

TABLE 3.10

HIGHER ORDER NEEDS QUALITY OF LIFE INDICATOR

County	Weighted Median Income Score	Standard Median Income Score	Rank
Alexander	55.53	1.07	5
Alleghany	- 40.80	- 0.78	22
Ashe	- 58.13	- 1.12	26
Avery	- 45.88	- 0.88	23
Buncombe	49.38	0.95	6
Burke	79.44	1.53	2
Caldwell	58.54	1.12	4
Cherokee	- 40.12	- 0.77	21
Clay	- 79.24	- 1.52	28
Davie	46.25	0.89	7
Forsyth	115.77	2.23	1
Graham	- 36.25	- 0.69	19
Haywood	25.61	0.49	11
Henderson	10.09	0.19	14
Jackson	- 28.34	- 0.54	18
McDowell	29.57	0.57	10
Macon	- 39.86	- 0.76	20
Madison	- 83.45	- 1.60	29
Mitchell	- 55.29	- 1.06	25
Polk	1.06	0.02	16
Rutherford	31.16	0.60	9
Stokes	19.93	0.38	13
Surry	23.25	0.44	12
Swain	- 60.37	- 1.16	27
Transylvania	62.54	1.20	3
Watauga	- 19.09	- 0.36	17
Wilkes	1.25	0.02	15
Yadkin	34.81	0.67	8
Yancey	- 54.82	- 1.05	24

Compiled by author.

higher needs, eight as above average, seven as average, nine
as below average, and two as poor (see Figure 3.9).
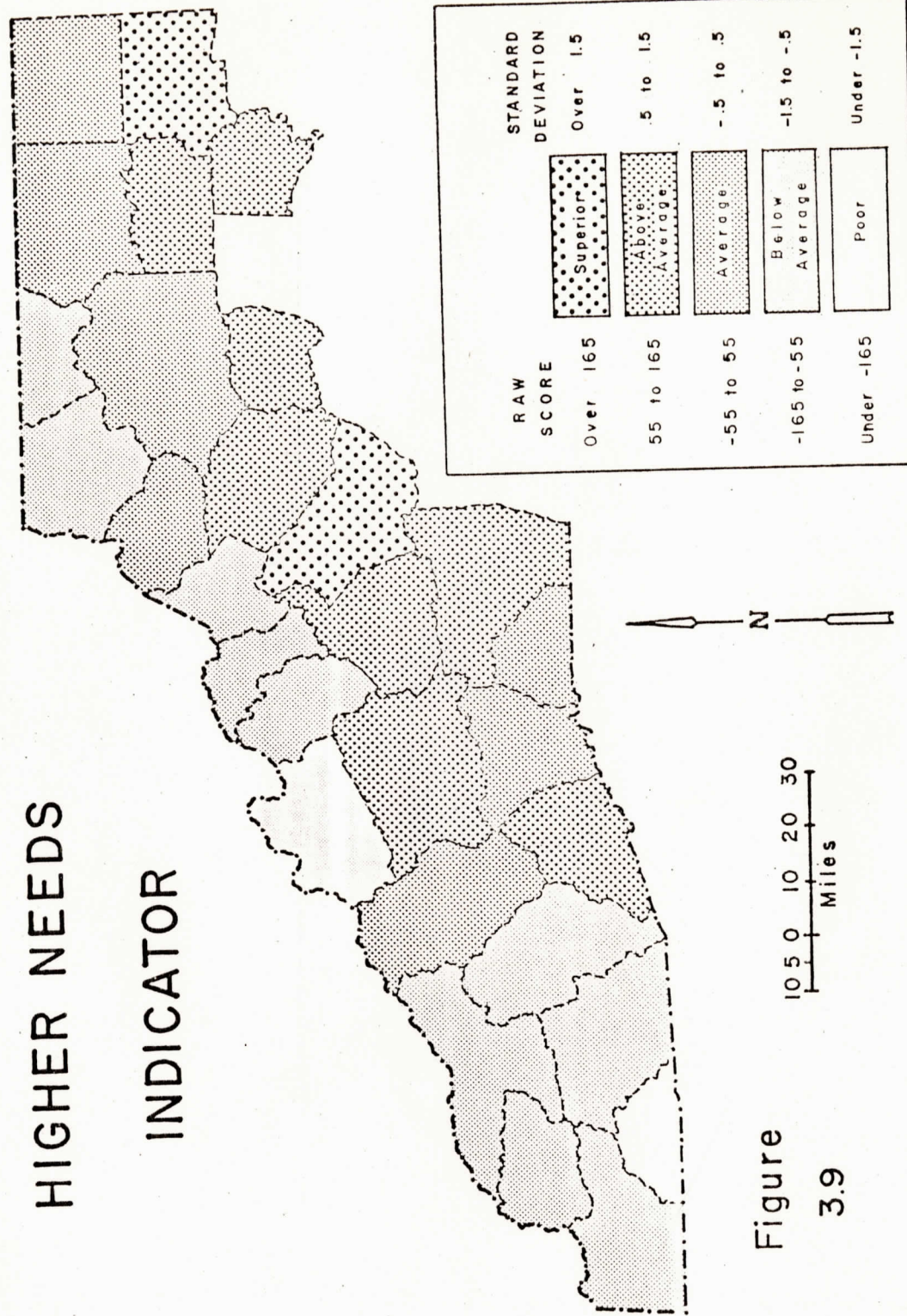
HIGHER NEEDS
INDICATOR

Figure
3.9

CHAPTER IV

THE OVERALL, QUALITY OF LIFE INDEX AND SPATIAL ASSESSMENT

The Overall, Quality of Life Index

The quantification model being used permits synthesizing all of the variables to arrive at an overall, quality of life index based upon the physical, social, and higher order components of life quality.

Such a summation finds Forsyth County ranking first in overall quality of life with a raw score of 1,176 and a standard score of 2.9 and Madison County last with a raw score of -805 and a standard score of -1.9 (see Table 4.1). When areally distributed, these figures show two counties as superior, five as above average, eleven as average, nine as below average, and two as poor (see Figure 4.1).

Spatial Analysis

Effort is now to be turned toward geographically assessing the distribution of this quality of life index within the study area. This will be done on three levels: 1) the relationship between the individual variables and the quality of life, 2) the appropriateness of the individual variable to this quality of life study, and 3) the geographical implications of the quality of life index.

TABLE 4.1

OVERALL, QUALITY OF LIFE INDEX

County	Total Physical, Social, and Higher Order Needs Scores	Standard Total Score	Rank
Alexander	- 5.98	- 0.01	14
Alleghany	- 126.96	- 0.31	18
Ashe	- 424.15	- 1.05	25
Avery	- 420.26	- 1.04	24
Buncombe	858.95	2.13	2
Burke	472.22	1.17	6
Caldwell	10.46	0.02	13
Cherokee	- 222.20	- 0.55	19
Clay	- 477.15	- 1.18	26
Davie	129.70	0.32	8
Forsyth	1,176.64	2.92	1
Graham	- 625.88	- 1.55	28
Haywood	419.47	1.04	7
Henderson	591.45	1.46	3
Jackson	- 33.30	- 0.08	16
McDowell	- 41.01	- 0.10	17
Macon	- 22.27	- 0.05	15
Madison	- 805.20	- 1.99	29
Mitchell	- 333.18	- 0.82	22
Polk	96.43	0.23	9
Rutherford	22.61	0.05	12
Stokes	- 293.05	- 0.72	21
Surry	53.35	0.13	10
Swain	- 343.63	- 0.85	23
Transylvania	579.95	1.43	4
Watauga	547.81	1.36	5
Wilkes	- 237.46	- 0.58	20
Yadkin	32.99	0.08	11
Yancey	- 590.13	- 1.46	27

Compiled by author.

OVERALL QUALITY of LIFE INDEX

Figure 4.1

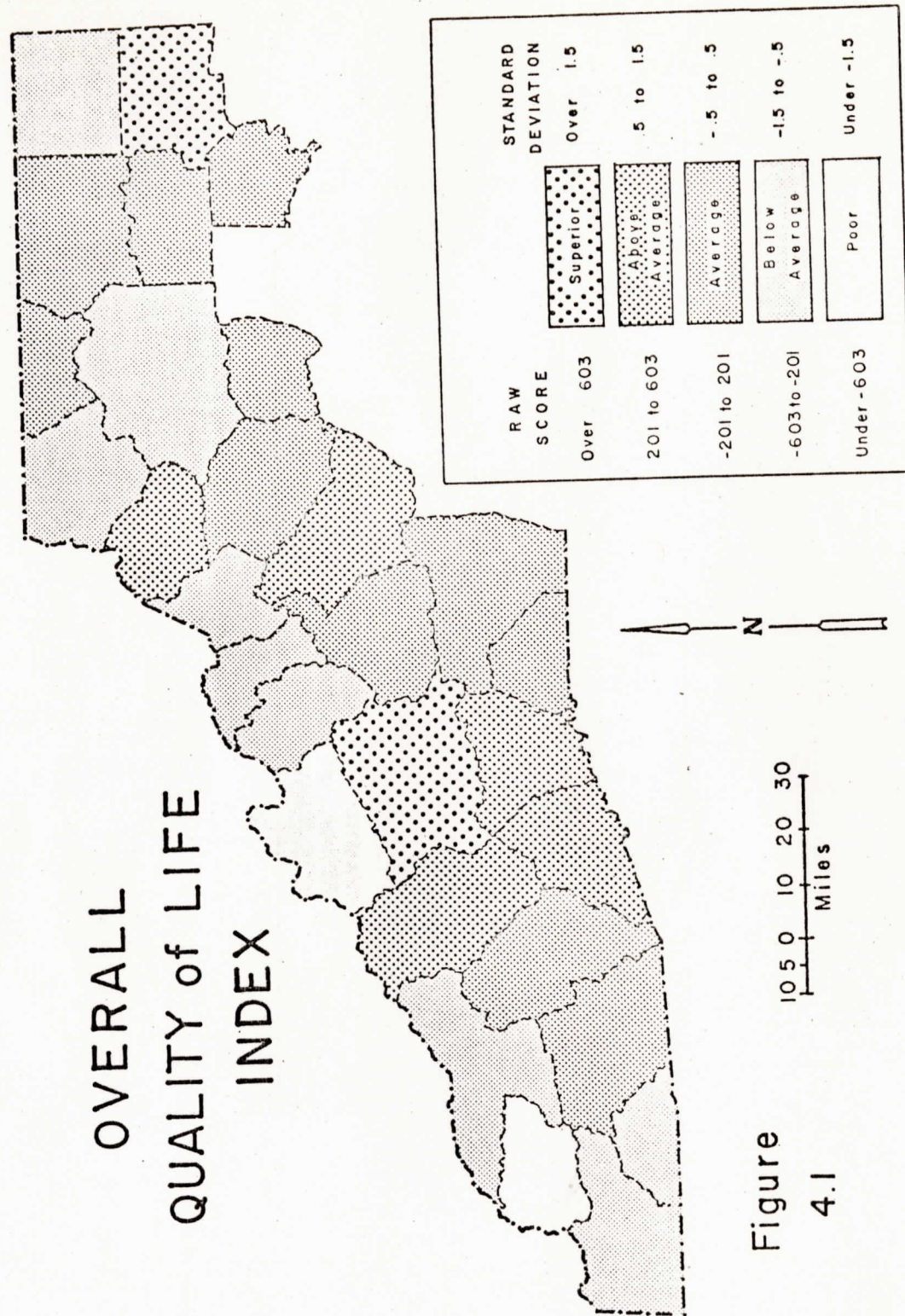| STANDARD DEVIATION	RAW SCORE	
Over 1.5	Over 603	Superior
.5 to 1.5	201 to 603	Above Average
-.5 to .5	-201 to 201	Average
-1.5 to -.5	-603 to -201	Below Average
Under -1.5	Under -603	Poor

10 5 0 10 20 30
Miles

N

Relationship Between the Individual Variables and the Quality of Life

All predicted relationships between the individual variables and the quality of life are found to correlate as hypothesized, as reflected by their factor weightings (see Table 3.1). Only three of the variables, perinatal mortality, percentage of families with female as head, and percentage of population over 65 or under 18 years of age, were found to be inversely correlated with quality of life while the other eleven noted a positive relationship.

The Appropriateness of the Individual Variable to This Quality of Life Study

The applicability of a variable for use in a quality of life study is dependent upon the degree to which it is capable of contributing to the overall index. For this study that degree has been set at a correlation of ±0.35. Six of the fourteen components of this study fail to reach this cutoff point: perinatal mortality, instructional personnel per 100 students, second homes per 1,000 population, percentage of outdoor recreation acreage, percentage of families with female as head, and percentage of population over 65 or under 18 years of age (see Table 3.1).

The internal functionings of the variables to themselves reveal that second homes per 1,000 population correlates at above the critical level only with perinatal mortality and percentage of outdoor recreation acreage and they alone with it, percentage of population over 65 or

under 18 years of age and instructional personnel per 100
students are interrelated with the former also joined to
median contract rent and the latter to the percentage of
workers with empolyment insurance, and the percentage of
families with a female as head of household is highly
correlated with median housing and rent value, percentage of
homes with all plumbing facilities, median years of education
of males over 25, and percentage of workers with employment
insurance. Of the remaining eight variables, all are
highly interrelated with at least the other seven in all
instances but one (see Table 4.2).

The low loadings of the six variables are not to
imply that they are not pertinent to quality of life assess-
ment, but merely that they are not as suited to the task of
reflecting the satisfaction of living in the mountainous
counties of North Carolina as they would be for some other
region or as a different set of variables would be for this
study area.[1] The inadequacy of these six variables stems
primarily from the high degree of internal homogeneity of
the study region as expressed by the narrow range of vari-
ance exhibited among the counties in their recorded values
(see Tables 2.1, 2.6, 2.11, and 2.12).

Geographical Implications of the Quality of Life Index

Forsyth and Buncombe Counties, which rank as the only
counties rated superior on the overall quality of life

TABLE 4.2

CORRELATION COEFFICIENT MATRIX

Variable Codes*	INMOR	DOCTS	VALHZ	MERNT	NOPLM	RMDEN	TEACH	YRSED	2HOME	ACRES	SECUR	%FEHD	OV&UN	MEDIN
INMOR	1.00000	.03791	.09172	.13944	.09900	-.00721	-.09917	.28924	.41458	.01356	.02771	-.04454	-.24523	.11937
DOCTS		1.00000	.55483	.55554	.74949	.48298	.09230	.72725	.16084	.09424	.42586	-.19387	-.04920	.53304
VALHZ			1.00000	.26762	.69761	.60674	.08945	.73265	.09317	-.21102	.36468	-.44707	-.34663	.68426
MERNT				1.00000	.67810	.44627	-.16828	.67309	.26395	-.07599	.35135	-.36181	-.71076	.48293
NOPLM					1.00000	.46210	.33055	.80050	.34532	-.05191	.70742	-.42081	-.22254	.78782
RMDEN						1.00000	.26193	.41532	-.14296	-.33576	.09190	-.18750	-.15186	.35275
TEACH							1.00000	.06429	-.05966	-.13427	.32556	-.14150	.42165	.31040
YRSED								1.00000	.24914	.03303	.49474	-.35924	-.22666	.64455
2HOME									1.00000	.42547	.16989	-.07219	-.17776	.10604
ACRES										1.00000	.03693	.17260	.09580	-.31590
SECUR											1.00000	-.36884	.01849	.67019
%FEHD												1.00000	.34421	-.58312
OV&UN													1.00000	-.20093
MEDIN														1.00000

*For an explanation of the variable codes used, see the Appendix.
Compiled by BMD Factor Analysis, Computer Program.
(Correlations of greater than 0.35000 or less than -0.35000 are underlined.)

index, are also included in the only two SMSA's within the study region, Forsyth along with Yadkin County in the Greensboro-Winston-Salem-High Point SMSA and Buncombe County in the Asheville SMSA. Additional relationships of overall quality and human concentrations can be noted by comparing the index rank of each county to its population density rank (see Table 4.3). Of the eighteen counties to score at least average on the scale (-0.5 standard deviations or above), fourteen of these are also among the eighteen most densely populated (see Figure 4.2).

To further emphasize the relationship between the quality of life in the mountainous counties of North Carolina and their population densities, a comparison of the correlations of the variables to the index, the factor loadings, and the correlations of the variables to population densities shows striking similarities (see Table 4.4). Only in the instances of the room density, recreation acreage, and female heads of households variables are there major, proportional discrepancies in the two indices and only in the case of female household heads would there be a change in the defined appropriateness of the variable (a correlation of ±0.35). This then would lead to the conclusion that there is a strong relationship between the quality of life as calculated by the variables selected for this study and the population density of the mountainous counties of North Carolina which would be due primarily to the greater

TABLE 4.3

QUALITY OF LIFE INDEX AND POPULATION DENSITY COMPARISON

County	Population Density per Square Mile*	Density Rank**	Quality of Life Index Rank**
Alexander	75.2	9	14
Alleghany	36.2	23	18
Ashe	45.9	20	25
Avery	51.7	17	24
Buncombe	220.8	2	2
Burke	118.1	4	6
Caldwell	120.9	3	13
Cherokee	36.1	24	19
Clay	24.8	27	26
Davie	71.2	12	8
Forsyth	513.4	1	1
Graham	22.5	28	28
Haywood	75.7	8	7
Henderson	113.2	5	3
Jackson	44.0	21	16
McDowell	70.3	13	17
Macon	30.8	26	15
Madison	35.6	25	29
Mitchell	62.5	15	22
Polk	49.1	19	9
Rutherford	84.1	7	12
Stokes	52.0	16	21
Surry	95.9	6	10
Swain	16.7	29	23
Transylvania	51.6	18	4
Watauga	73.8	10	5
Wilkes	65.4	14	20
Yadkin	73.2	11	11
Yancey	40.5	22	27

*United States Department of Commerce, Bureau of Census, United States Census of the Population: 1970, Vol. I, Characteristics of the Population, pt. 35, North Carolina.
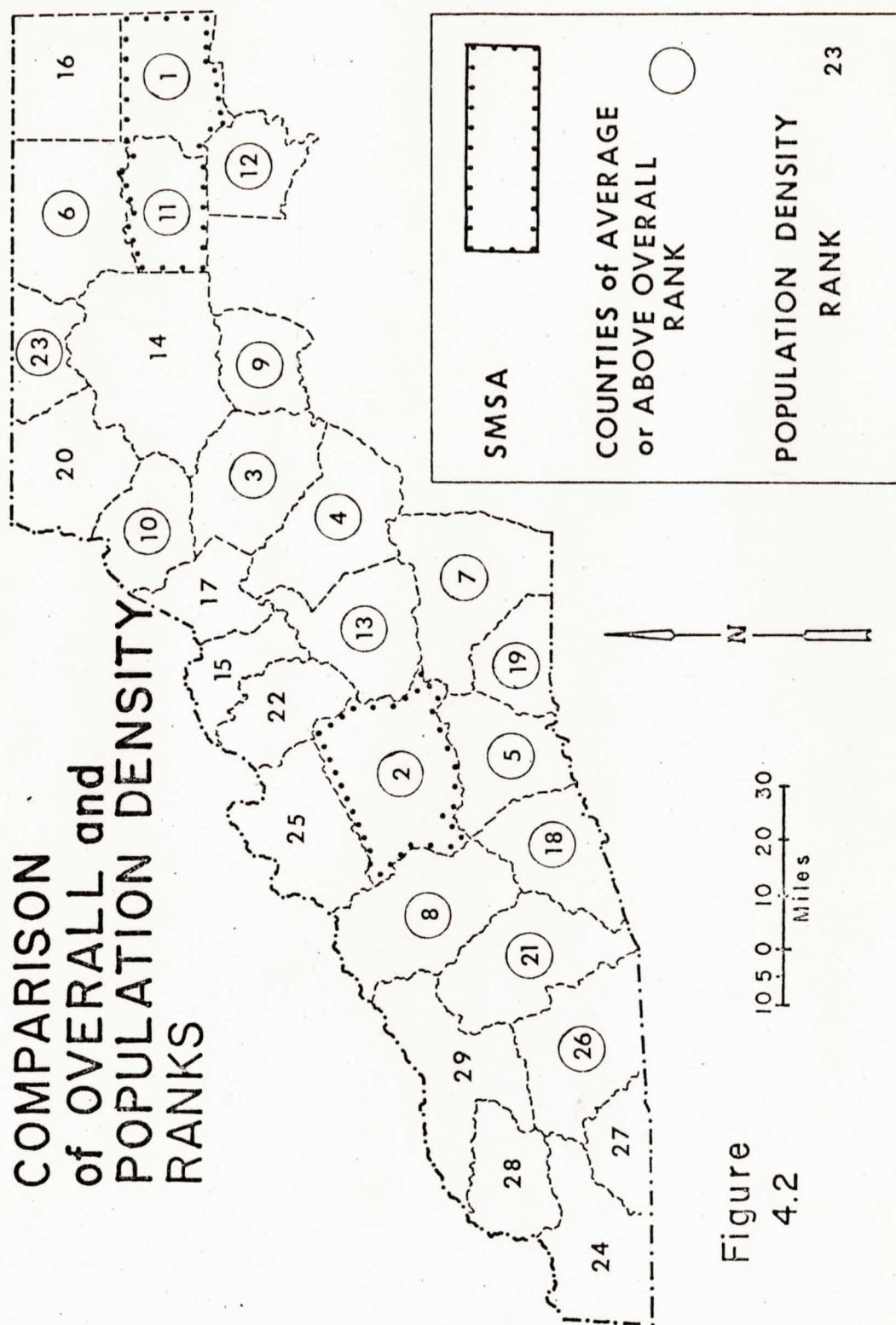
**Compiled by author.

COMPARISON of OVERALL and POPULATION DENSITY RANKS

Figure 4.2

TABLE 4.4

FACTOR LOADINGS AND DENSITY COEFFICIENTS COMPARISON

Variable Codes*	Factor Loading**	Correlation with Population Density**
INMOR	- 0.01725	0.06218
DOCTS	0.87848	0.62985
VALHZ	0.77539	0.62446
MERNT	0.51844	0.52692
NOPLM	0.78406	0.62086
RMDEN	0.70449	0.37469
TEACH	0.09230	0.05338
YRSED	0.80415	0.65058
2HOME	0.12040	0.04241
ACRES	0.03088	- 0.27317
SECUR	0.37745	0.43747
%FEHD	- 0.14285	- 0.50147
OV&UN	- 0.18400	- 0.15411
MEDIN	0.51844	0.64825

*For an explanation of the variable codes used, see the Appendix.

**Compiled by BMD Factor Analysis, Computer Program.

opportunities available in centers of concentration.

Applications of the Quality of Life Index

The overall quality of life index and its component

indicators hold much promise for decision-makers. They can

point to areas possessing a desired quality into which an

appropriate activity can be directed, or they can expose

places which are lagging behind in certain categories of

regional development. In either case, they imply the need

for regional planning as a method to help distribute the

potentials of a satisfactory life to all inhabitants. It

would be the aim of such a planning body to formulate prac-

tices of discrimination in order to channel resources into

locations of need.

A second manner in which this report could be uti-

lized would be in a comparative effort to analyze the North

Carolina Appalachian area and a similar, mountainous

location. Such an examination would be of mutual benefit

as each region could draw upon the knowledge and findings of

the other in an effort to solve its own problems.

An additional use of this study would be in a dupli-

cate search in the future to assess the various programs

initiated to alleviate problems since this paper was prepared

and to note how and why change has come about.

FOOTNOTES

[1]Infant mortality is proposed for use by each of the
five authors of reference, John Oliver Wilson, Quality of
Life in the United States, (Kansas City: Midwest Research
Institute, 1969), Ben-Chien Liu, The Quality of Life in the
United States, (Kansas City: Midwest Research Institute,
1973), Michael J. Flax, A Study in Comparative Urban
Indicators: Conditions in 18 Large Metropolitan Areas,
(Washington, D. C.: The Urban Institute, 1972), Joshua C.
Dickinson, III, Robert J. Gray, and David M. Smith, "The
'Quality of Life' in Gainesville, Florida: An Application
of Territorial Social Indicators," Southeastern Geographer
12 (November, 1972), and Sanford H. Bederman, "The
Stratification of 'Quality of Life' in the Black Community
of Atlanta, Georgia," Southeastern Geographer 14 (May, 1974);
teacher-pupil ratio is chosen only by Liu, The Quality of
Life; second homes is not used by any of the authors;
outdoor recreation acreage is cited by Wilson, Quality of
Life and Liu, The Quality of Life; the female heads of house-
holds is called for only by Bederman, "Atlanta, Georgia;"
and Liu, The Quality of Life and Bederman, "Atlanta,
Georgia," alone, make use of an age factor variable.

CHAPTER V

CONCLUSIONS

Conclusions

It is becoming increasingly the responsibility of
policy-makers to promote conditions that will give each
citizen the opportunity to live as satisfying a life as
possible and to provide evidence as to whether the appro-
priate actions to ensure this are being taken.[1] Decisions
of such overall social impact require a system of indicators;
measured regularly, watched constantly, and readily avail-
able for guidance.[2] Indicators appropriate to the task must
assess priorities in relation to goals, resources, demands,
and preferences as they are areally distributed throughout
the region of analysis.[3] It is therefore of primary concern
to compose a comprehensive index capable of monitoring
social well-being spatially.[4]

This field of concern is yet new to geographers who
have tended to concentrate on assessing individual compon-
ents of such an index, but it is nevertheless being probed
by a few spatial scientists.[5] As more and more research is
completed and the techniques become more generally known,
territorial social indicators will come to serve spatial
planners as economic indicators serve financiers.

The Appalachian Region of North Carolina lags behind
the rest of the State in nearly every statistical category
tabulated. This is sufficient reason for the formulation
and application of just such a system of spatial social
indicators as this by the State for the purpose of directing
aid into the region in the form in which it is needed, to
the location in which it is needed. Additionally, the index
possesses the ability to delineate areas of favorable con-
ditions and therefore is appropriate for use by those making
decisions of location, such as an industry or an instution,
in their selection process.

Guidelines for Future Research

Future efforts at assessing the quality of life in
the mountain counties of North Carolina should be integrated
with a questionnaire designed to incorporate the responses
of the inhabitants of the area into the selection of var-
iables instead of relying on what has been done elsewhere
for guidance. This method would add much creditability to
the final index as it would truly reflect the components of
a quality life as perceived by those it involves.

Sources of data other than the United States Census
are advisable due to the datedness of the information.
Much change has been recorded in the mountain counties with
the advent of increased tourism and industrialization and
more recent sources of information would offer data better
capable of illustrating the evolving conditions.

Much difficulty was encountered with the weighting process as the most efficient computer program for factor analysis was not among the packages of this University. Two substitutes were tried, but in neither instance could "factor scores" (an estimation comparable to the factor loadings which were ultimately used instead in this report) be obtained although they were clearly specified as part of the program by the instruction manual. This would call for the use of another computer capable of compiling factor scores, acquisition of the necessary canned program, or some additional, valid means of weighting the variables.

FOOTNOTES

[1]"Full Opportunity and Social Accounting Act," American Psychologist 22 (November, 1967): 974.

[2]Senator Walter F. Mondale, "New Tools for Social Progress," The Progressive 31 (September, 1967): 28.

[3]P. L. Knox, "Level of Living: A Conceptual Framework for Monitoring Regional Variation in Well-Being," Regional Studies 8 (March, 1974): 18.

[4]Peter Haggett, Geography: A Modern Synthesis, (New York: Harper and Row, Publishers, 1972): 393.

[5]David M. Smith, The Geography of Social Well-Being in the United States: An Introduction to Territorial Social Indicators, (New York: McGraw-Hill Book Co., 1973): 4.

APPENDIX

VARIABLES AND VARIABLE CODES

Variable	Variable Code
Perinatal Mortality	INMOR
Medical Personnel per 1,000 Population	DOCTS
Median Dollar Value of Owner Occupied Housing Units	VALHZ
Median Dollar Value of Contract Rent of Renter Occupied Housing Units	MERNT
Percentage of Homes with all Plumbing Facilities	NOPLM
Percentage of Housing Units with less than One Person per Room	RMDEN
Instructional Personnel per 100 Students	TEACH
Median School Years Completed by Males 25 Years Old and Over	YRSED
Second Homes per 1,000 Population	2HOME
Percentage of Outdoor Recreation Acreage	ACRES
Percentage of Workers with Employment Insurance	SECUR
Percentage of Families with a Female as Head of Household	%FEHD
Percentage of Population Over 65 or Under 18 Years of Age	OV&UN
Median Income	MEDIN

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