

# The Importance of Urban Milieu in Predicting Recreation Participation: The Case of Day Hiking

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*Abstract* Numerous outdoor recreation forecasting studies have included household characteristics as well as aspects of the recreation facilities and accessibility. Only a few studies, however, have included in the prediction equation any measure of the effects of urban milieu on behavior. Four commonly cited surrogates of urban milieu are used to cluster the cities of Illinois into three relatively homogeneous groups of environments. Regression analyses are then undertaken using individual household data, aspects of the recreation facilities patronized by the households, participation, and distance and travel time estimates. Comparisons of the regression analyses indicate that, as a concept, milieu is an important predictor of both the volume of recreation participation and salient features of recreation facilities.

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Most macro-scale studies in outdoor recreation forecasting have attempted to identify the relationships that exist between participation in an outdoor activity and such demographic characteristics of the household as average age, number of children, available leisure time, and family income; at the same time various measures of availability of recreation facilities, and people's willingness to travel, have been utilized to supplement this socioeconomic information (Cicchetti 1973). Beyond these variables, there has been a broad recognition that the social and economic, as well as physical, environment may condition the choice and frequency of participation in outdoor recreation activities (ORRRC 1962). The population of the community has been the most commonly used surrogate for "residential character," the milieu in which one resides. An urban-rural dichotomy was considered in the Outdoor Recreation Resource Review Commission study (ORRRC) in 1962:

Some city and country people differ so obviously in the extent to which the outdoors is a part of their day-to-day environment, that one might expect them to differ in the extent to which their recreation patterns involve outdoor activity (ORRRC, 1962: 11).

Contrary to the Commission's expectations the study found few differences in terms of predictors of participation among urban and rural residents. They did find, however, that in terms of representation in the national population, the differences in participation of outdoor activities are great.

Various theories have been proposed to explain these differences in outdoor recreation participation. Nielson (1969) reviewed many of the major theoretical works relating to the importance of rural-urban differences in recreation behavior, and Hendee (1969) has best characterized this literature with regard to two approaches to explanation: the first can be described as "opportunity theory," and the second is based upon cultural differences. According to opportunity theory, the spatial pattern of outdoor recreation activities, and thus participation, varies for urban and rural residents. City residents have less opportunity to participate in activities when most of those activities take place in facilities outside the

city; therefore, their level of participation will be less than for rural residents. Similarly, common activities such as walking for pleasure are overrepresented by urban residents because there are many more opportunities in the city. Hauser (1962: 48) tested this theory and found evidence to support it.

Theories based on rural-urban cultural differences stem from research that suggests that the urban environment directly affects one's perspective toward outdoor recreation. Research results in psychology and sociology suggest that the urban environment in which one resides is extremely important in determining one's behavior (Simmel 1950; Wirth 1960; Taylor and Jones 1964; Stokols 1978; and Schnore 1966). Milgram suggests that various aspects of the urban environment directly or indirectly affect human behavior patterns through the concept of overload, which refers to the mind's inability to cope with all of the inputs from a complex environment. Through various illustrations Milgram has argued that people create buffers that allow them to disengage from society (Milgram 1974; Milgram and Hollander 1964). He wrote:

When overload is present, adaptations occur. A may be processed first while B is kept in abeyance, or one input may be sacrificed altogether. City life, as we experience it, constitutes a continuous set of encounters with overload, and resultant adaptations. Overload characteristically deforms daily life on several levels, impinging on role performance, the evaluations of social norms, cognitive functions, and the use of facilities (Milgram 1974: 220).

Milgram concluded that individuals experiencing overload in their environment may construct adaptive mechanisms that create distinctive behavior, and recent work by Cohen (1978) and Baron and Rodin (1978) supports this view. Besides research dealing with effects of urban environments upon people, Hendee (1969) believed that variables describing the attitudes of the resident toward "family, church, school and fellow man in general" have not been adequately investigated. Hendee (1969) further criticized the research designs of many studies because socioeconomic variables such as age, occupation, and education had not been controlled for, and because samples of recreationists, rather than samples of the population, had been used to describe the population.

With these problems in mind the purpose of this paper is to make a more detailed search for possible effects of residential milieu upon outdoor recreation participation. Following the research of Milgram,

Schnore, and Wirth, groups of similar residential communities will be identified, and only then will behavioral differences be examined. Therefore, the principal tasks of this paper are:

- (1) to classify residential communities into discrete groups that typify the social and economic milieus of the study area, and
- (2) to calibrate the structural relationships within each milieu between outdoor recreation participation and features of households, recreation facilities, and accessibility.

### **Definition of Residential Milieu**

Attempts to define residential environments usually focus on the complex interaction of the physical, social, and economic characteristics of urban areas and their population. The nature of urbanism, and the degree to which it exists in various places, and the study of human ecology have been major areas for philosophical and empirical study (for an extensive review see Boots 1979). Although much of the literature has been contradictory, most scholars classify cities or residential communities with respect to what may be called an urban to rural continuum (Schnore 1966). Even though scholars may disagree as to the exact importance of various characteristics in defining such a continuum, the literature commonly cites four covariates: (1) population size, (2) population density, (3) the potential social interaction of residential communities with metropolitan centers or other communities, and (4) the occupational character of the community. Such characteristics may vary substantially, however, within a city or town reflecting variation in immediate residential conditions, with people experiencing the pace of activity characteristic not only of the entire city but also of their immediate surroundings (Feldman 1968; Fisher 1978; Milgram 1974). The combination of both, then, is reflected in patterns of human behavior. Although we do not presume to measure directly the affective component of individual experiences in residential milieus, these four variables are believed to be relevant surrogates of the effects. However, in this study they are computed for entire communities, since the characteristics of an individual's immediate surroundings are unobtainable.

In defining the milieu of a place, few researchers would argue with the use of population density or population size. Wirth (1960) and Milgram

(1974) have gone so far as to suggest that these variables are the two most important aspects of any community's environment that can be experienced by individuals and, consequently, are the two that are most likely to affect individual attitudes and behavior. Similarly, Taylor and Jones (1964) argue that these two aspects of a community significantly define the nature of a milieu. Recent reviews on the crowding construct by Stokols (1978) and Baron and Rodin (1978) support this view. Lastly, population size and density (people per square mile) are criteria of the U.S. Bureau of the Census in defining urban and nonurban areas (U.S. Bureau of the Census 1972).

The third major variable believed to underlie the characterization of residential communities is that of potential interaction, i.e., the social influence of one set of individuals upon another living in nearby communities. The extent of this influence is primarily a function of accessibility or travel time (Goheen 1971). Simmel (1950: 418) argued that "it is not only the immediate size of the area and the number of persons which makes the metropolis . . . it is rather in transcending this expanse that the city becomes the seat of cosmopolitanism." Sociologists and geographers have attempted to operationalize the concept of social interaction; Olsson's (1965) review is still one of the most succinct. Potential interaction, therefore, will be used to describe the influence that smaller communities and larger industrialized metropolitan areas exert upon each other (Ray 1965). In this study it is defined as the inverse of the distance (measured in miles) to the nearest of the nine Illinois SMSAs (Standard Metropolitan Statistical Areas), using the Manhattan or city block metric. In those instances where this distance could have been zero, an arbitrary value of 1 was taken.

Concentration of nonagricultural workers, the final criterion for identifying urban character, has been used by both Schnore and the U.S. Bureau of the Census to identify activity patterns and the orientation of the community. Schnore (1966) argued that the occupational character of a community is a fundamental distinguishing factor that identifies the function of a city within a region. That is, rural communities are most commonly agriculturally oriented, whereas urban communities are usually manufacturing and trade centers. This distinction is important as it identifies differences in attitudes toward the physical environment among communities (Taylor and Jones 1964).

These four attributes of the city, then, will be used to identify the

character of places in terms of an urban-rural continuum that ranges in character from industrial service centers to agricultural communities. Communities will be classified according to these four variables, and for each group of communities an analysis will be made using household data to calibrate the structural relationships between participation in outdoor recreation activities and the factors believed to underlie participation. From these structural relationships one can assess the relative sensitivity of households within each milieu to those variables that underlie participation. By comparing these structural relationships across milieus (groups of households) one can compare the best predictors of recreation behavior. From the results of these analyses one may then assess the relative merits of disaggregation by urban milieu.

### **The Case Study: Day Hiking in Illinois**

The study area for the present paper included the state of Illinois and its 358 cities of 2500 or more population (U.S. Bureau of the Census 1972); these are the cities in which all the needed census information was available. Clearly, another category of milieu exists, that of dispersed rural residential households. However, operationalizing the four surrogates of milieu mentioned earlier is a difficult, if not impossible, task for dispersed rural residential households. Although these communities comprise 70 percent of the total incorporated places in Illinois, they include only 10 percent of the total state population. As a result, only towns and cities with 2500 or more people were used to characterize residential milieus.

During the winter of 1977 a telephone-based recreation participation survey of 9328 households was conducted for the Illinois Department of Conservation (Lieber 1979). Random digit dialing techniques were used to ensure that the sample was representative of the general Illinois population of households. Twenty-three outdoor recreation activities formed the basis of the survey; for each activity in which the household participated the names of the facilities visited and the length of stay were obtained for up to five of the most frequented recreation sites for each activity during the past year. In addition, detailed demographic and socioeconomic data, including a complete household enumeration, were obtained.

During the survey it became apparent that day hiking was the most

popular outdoor recreation activity within the state.\* It requires relatively little experience and is easily undertaken; such an activity, then, allows the decision maker a wide variety of potential locations from which to choose. In essence, day hiking presents the least number of barriers (social, economic, or physical) to participation and for that reason was chosen for further investigation.

Originally over 3000 households of the 9328 interviewed indicated that they had participated in day hiking. However, only 994 interviews were complete with regard to social, economic, and supply information and were located in cities and towns with populations of more than 2500 persons. Slightly more than 350 additional interviews had complete household information, but were rural residential households.

### **Multivariate Analyses**

If, as the literature suggests, cities and towns can be divided into a number of relatively homogeneous groups (milieus), this should be reflected in the patterning of the four variables (population size, population density, potential interaction, and occupational character). There should, for example, be groups of cities and towns where the population density values are typical of predominantly large urban areas, of small community areas, and of transition areas. Each group, or type of milieu, should resemble a "fuzzy set," in the sense that individual cities or towns will be similar to a norm for the group to a greater or lesser degree. Thus, the first stage of analysis was concerned with identifying the number of groups of places present in the study area, and characterizing them through the four variables.

### **Cluster Analysis**

In order to define the milieus needed to calibrate the structural relationships between day hiking participation and features of households, recreation facilities, and accessibility, a clustering algorithm (Ander-

\*As defined by the Illinois Department of Conservation, day hiking refers to any walking activity that takes place at a publicly or privately owned facility managed for public use. Casual walking on urban streets is excluded, because it does not take place at a designated public or privately owned facility. Day hiking may involve any length of time or portion of a day, but cannot be less than one hour nor extend into the next calendar day.

berg 1973) was used to identify a fixed number of groups, each characterized by a set of values for each of the four study variables. The criterion to be satisfied in selecting the group is that when each town or city is allocated to the group it most resembles, the groupings so formed are as homogeneous as possible. Resemblance is defined as the generalized distance used in many forms of cluster analysis:

$$D_{ij}^2 = \sum_k (z_{ik} - u_{jk})^2$$

where  $i$  denotes a town or city,  $j$  denotes a group, and  $k$  represents the four criterion variables. Therefore,  $z_{ik}$  is the standardized score of unit  $i$  on variable  $k$ , and  $u_{jk}$  is the average value of variable  $k$  for all cities and towns in group  $j$ .

The algorithm used here identifies average values for group membership and allocates cities and towns to the groups in a direct adaptation of the alternating heuristic proposed by Cooper (1964) for location-allocation problems. This approach to cluster analysis requires the researcher to specify the number of groups in advance. Five different solutions (from two to six groups of towns or cities) were obtained and compared in terms of total within group dissimilarity (pooled within group sum of squares, PWGSS) as shown in Figure 1. The relatively

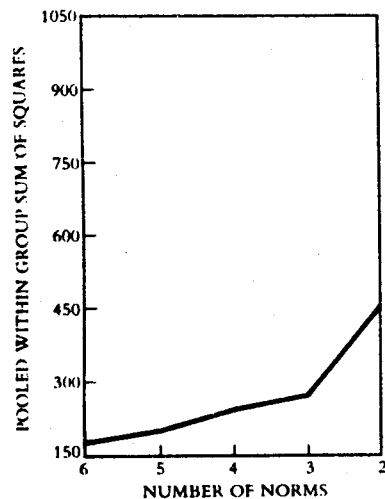


FIGURE 1. Pooled Within Group Sum of Squares for Given Number of Norms.



small increases from six to three groups, and the sharp jump between three and two, are strong support for the proposition that three groups exist in the data, that the cities of Illinois can be divided into three types of urban milieus.

Table 1 shows the values of each of the four variables for the three milieus. The first milieu shows values that may be considered typical of the large urbanized cities within Illinois; the third milieu, on the other hand, exhibits values expected of rural communities; while the second group of cities or milieu is intermediate on all variables, and as such will be referred to as suburban.

This statistical distinction between groups appears intuitively consistent, as the composition of each group was fairly homogeneous in character; the first group included only the nine standard metropolitan statistical areas (SMSAs) in Illinois (Bloomington, Chicago, Champaign-Urbana, Decatur, Normal, Peoria, the Quad Cities, Rockford, and Springfield). The second set of towns consisted of 63 suburban communities typified by places such as Harvey, Park Forest, and Blue Island, which are moderate in size and density and are near to the leisure-time amenities of major metropolitan areas. The third type of milieu was typified by smaller, more rural-oriented communities such as Plainfield, Chester, and Jacksonville; this group is identified by low population sizes and densities, and relatively low interaction with metropolitan areas.

### Regression Analyses

The variables used in this analysis include measures of the socioeconomic status of the household characteristics of each recreation

**Table 1**  
The Milieus Profile

| <i>Variable</i>         | <i>I</i><br><i>Urban*</i> | <i>II</i><br><i>Suburban</i> | <i>III</i><br><i>Rural</i> |
|-------------------------|---------------------------|------------------------------|----------------------------|
| Population size         | 535,336                   | 14,499                       | 4,741                      |
| Population density      | 5,426                     | 3,636                        | 2,390                      |
| Interaction             | .998                      | .045                         | .033                       |
| Percent Nonfarm Workers | 99.99                     | 99.99                        | 99.97                      |

\*Nine places were classified as urban, sixty-three were classified as suburban, and two hundred eighty-six were classified as rural from the analysis of milieus.

area visited by a member of the respective household, and a measure of the nearness of the household to that particular facility. The first variable, DAYS, is the measure of the household's day hiking activity and will be the dependent variable in the analysis. The complete list is as follows:

|                            |  |
|----------------------------|--|
| DAYS                       | = the number of days in which any member of the household had gone day hiking              |
| YEARS AT PRESENT RESIDENCE | = the number of years living at the present address  |
| NO. OF CHILDREN 0-2        | = the number of children in the household between 0 and 2 years of age                     |
| NO. OF CHILDREN 3-5        | = the number of children in the household between 3 and 5 years of age                     |
| NO. OF CHILDREN 6-12       | = the number of children in the household between 6 and 12 years of age                    |
| NO. OF CHILDREN 13-17      | = the number of children in the household between 13 and 17 years of age                   |
| PAID DAYS OFF              | = the number of vacation days the household head receives in a year                        |
| YEARS OF EDUCATION         | = the number of years of education the household head has obtained                         |
| MARITAL STATUS             | = marital status of the household head (0 = married, 1 = unmarried)                        |
| RACE                       | = the race of the household (0 = white, 1 = nonwhite)                                      |
| LOW INCOME                 | = whether the household's income is less than \$5000 per year (0 = yes, 1 = no)            |
| MIDDLE INCOME              | = whether the household's income is between \$5000 and \$15,000 per year (0 = yes, 1 = no) |
| NUMBER OF FOOT TRAILS      | = the number of foot trails within the facility  |
| MILES OF FOOT TRAILS       | = the miles of foot trails within the facility   |
| FACILITY ACREAGE           | = the total acreage of the facility  |
| NO. OF PICNIC TABLES       | = the number of picnic tables within the facility  |
| NO. OF PICNIC SHELTERS     | = the number of picnic shelters within the facility  |
| LINEAR FEET OF BEACH       | = the length of beach within the facility (in feet)  |
| TRAVEL TIME                | = the time needed to travel from home to the facility (in minutes)                         |

These variables were selected to represent aspects of socioeconomic characteristics and recreation areas commonly used in other studies to model recreation participation.

As suggested earlier, analyses have tended to show that raw participation rates do not differ significantly among milieus. As a preliminary step, this conclusion was tested using an analysis of variance and was performed for the dependent variable using the urban milieu to establish three samples. It was found that the difference in participation (the number of days on which any member of the household took part in day hiking) among milieus was not significant ( $\alpha = .520$ ), indicating that the average amount of day hiking does not significantly vary among the three milieus of Illinois. Analysis of variance, however, fails to account for possible interactions between milieu and other explanatory variables, or to control for significant differences in rates of activity caused by those other variables. The results of the following regression analyses, then, may provide the necessary basis for a more definite interpretation.

### **Regression Analysis—Comparison of Regression Coefficients**

The results of the analysis of variance suggest that there are insignificant differences in the amount of activity among residents of various urban milieus. However, this may be affected by correlations between milieus and the explanatory variables. The y-intercept of a multiple regression analysis describes the propensity to participate holding predictive variables constant. Comparison of this coefficient across urban milieus, then, may indicate whether there are any basic differences in participation in day hiking.

The y-intercept, however, is only one of many coefficients that may indicate variation in behavior. The regression coefficients, which describe the relative sensitivity of participation to change in characteristics of the household and the facility, may also be different. A multiple regression analysis was performed for each group of communities (urban, suburban, and rural). Simultaneous entry of all predictor variables was made to ensure direct comparability of both y-intercept and regression coefficients across urban milieus.

The results are shown in Table 2. Whereas the propensity to participate is 13.26 days for urban residents, the rural and suburban propensities are 16.98 and 22.85 days, respectively, suggesting that the effect

**Table 2**  
Regression Coefficients for Each Urban Milieu

| Variables                  | Urban Milieu |                  |                |
|----------------------------|--------------|------------------|----------------|
|                            | I<br>(Urban) | II<br>(Suburban) | III<br>(Rural) |
| YEARS AT PRESENT RESIDENCE | .141         | -.086            | .103           |
| NO. OF CHILDREN 0-2        | 1.407        | 3.847            | -.588          |
| NO. OF CHILDREN 3-5        | -1.808       | 3.860            | -.518          |
| NO. OF CHILDREN 6-12       | -.984        | -1.946           | -.724          |
| NO. OF CHILDREN 13-17      | -2.989       | 2.529            | .865           |
| PAID DAYS OFF              | .051         | .266             | -.023          |
| YEARS OF EDUCATION         | .283         | .957             | -.487          |
| MARITAL STATUS             | -10.560      | -4.660           | -.280          |
| RACE                       | -1.657       | -3.577           | 3.348          |
| LOW INCOME                 | -9.217       | -25.110          | -4.020         |
| MIDDLE INCOME              | -6.149       | -20.730          | -1.925         |
| NUMBER OF FOOT TRAILS      | .0078        | -.022            | -.004          |
| MILES OF FOOT TRAILS       | .012         | -.013            | -.009          |
| FACILITY ACREAGE           | -.0004       | -.0002           | .0000          |
| NO. OF PICNIC TABLES       | -.0055       | .0075            | -.0014         |
| NO. OF PICNIC SHELTERS     | .827         | -.428            | .949           |
| LINEAR FEET OF BEACH       | -.0036       | .0001            | .475           |
| TRAVEL TIME                | -.049        | .001             | -.032          |
| y-intercept                | 13.26        | 22.849           | 16.98          |

of the suburban milieu is to increase participation substantially. The regression coefficients for the 18 predictor variables also show substantial differences, and it is apparent that the sensitivity to these criteria varies in sign and magnitude.

The question of statistical significance presents problems. The standard test for the difference between two regression coefficients (Taylor 1977) requires a number of assumptions that are not fulfilled by these data, e.g., perfect independence of predictors, and it is difficult to determine the reliability of the results. However, routine application of the test, ignoring these difficulties, shows that despite the magnitude of the differences significant variations in coefficients occur for only three variables. It is possible, of course, that a larger sample or a general improvement in the level of prediction of the dependent variable would yield more significant results. The reliability of interpreting regression coefficients does depend upon the independence of the variables used in the analysis. The stability of the regression coefficients was judged not to be of great concern in this study, because the largest squared correlation ( $r^2$ ) did not exceed 27 percent (by inspecting the original intercor-

relation matrix of the variables used in the analysis), and only three pairs of squared correlations exceeded 20 percent.

An alternative to the conventional parametric test with its assumptions is to compare the order of coefficients. Under the null hypothesis, the differences in coefficients for the same predictor variable across samples occur randomly; there is no reason to expect any form of systematic ordering of estimated coefficients. On the other hand, if significant differences in the effects of milieus occur, one would expect this to be reflected in a systematic behavior of the coefficients. For 19 cases, the 18 predictor variables plus the y-intercept, a count was made of the number of times the corresponding coefficient was either the highest or the lowest of the three. The suburban coefficients were extreme in 16 out of 19 cases. Since under the null hypothesis the chance of any predictor being extreme is  $2/3$ , a test can be made using the binomial distribution, and gives the probability of obtaining as many as 16 extreme coefficients as less than .05. One may conclude that a significant pattern exists among the coefficients, or that milieu affects the volume of outdoor recreation participation in significant ways.

### **Regression Analysis—Comparison of Predictors**

Although there has been much debate concerning the problems of choosing the "best" predictors in a multiple regression equation, it has generally been recognized that the order of stepwise entry is a simple and efficient method of identifying such predictors (Crandell 1976; Christensen and Yosting 1976; McCuen 1974), and Table 3 shows the best five predictors for each milieu. As one might expect, given the previous results, there are predictors that are common to at least two of the groups; however, there are also substantial differences. In two of the regressions (Groups I and III) travel time is the single best predictor and, as expected, has a negative correlation with participation. The number of miles of foot trails within a recreation facility is found in all three equations but exhibits differing signs; in the urban milieu it appears that the length of trail attracts participation, whereas in the other two milieus abundance of trails acts to reduce participation.

The relative importance of these predictors and their respective relationships can be seen by the size and significance of the correlation coefficients. As indicated, there is a substantial increase in the correla-

Table 3

Correlation and Beta Coefficients for the Five Most Important Predictors of Day Hiking

| I                                |                 |       | II                            |                 |        |
|----------------------------------|-----------------|-------|-------------------------------|-----------------|--------|
| Variable                         | Cumulative<br>r | beta  | Variable                      | Cumulative<br>r | beta   |
| TRAVEL TIME                      | .154            | -.173 | NO. OF CHILDREN<br>13-17      | .338            | .115   |
| MARITAL STATUS                   | .219            | -.166 | LOW INCOME                    | .339            | -1.028 |
| MILES OF FOOT<br>TRAILS          | .243            | .113  | MIDDLE INCOME                 | .608            | -1.022 |
| NO. OF CHILDREN<br>13-17         | .261            | -.101 | NO. OF PICNIC<br>SHELTERS     | .654            | -.339  |
| YEARS AT PRES-<br>ENT ADDRESS    | .273            | .085  | MILES OF FOOT<br>TRAILS       | .686            | -.220  |
| Significance = .196              |                 |       | Significance = .014           |                 |        |
| III                              |                 |       | State prediction              |                 |        |
| Variable                         | Cumulative<br>r | beta  | Variable                      | Cumulative<br>r | beta   |
| TRAVEL TIME                      | .145            | -.112 | YEARS AT PRES-<br>ENT ADDRESS | .089            | .077   |
| YEARS AT PRES-<br>SENT RESIDENCE | .189            | .116  | TRAVEL TIME                   | .118            | -.124  |
| MILES OF FOOT<br>TRAILS          | .225            | -.127 | MILES OF FOOT<br>TRAILS       | .130            | -.057  |
| YEARS OF EDUCA-<br>TION          | .237            | -.074 | NO. OF CHILDREN<br>3-5        | .140            | -.045  |
| LOW INCOME                       | .244            | -.059 | NO. OF CHILDREN<br>6-12       | .145            | -.038  |
| Significance = .092              |                 |       | Significance = .284           |                 |        |

tion coefficients when the state population is disaggregated by urban milieu. Whereas the correlation coefficient of the state is .145 ( $\alpha = .284$ ), the coefficients for the urban milieus are .274 ( $\alpha = .196$ ), .686 ( $\alpha = .014$ ), and .244 ( $\alpha = .092$ ) for the urban, suburban, and rural communities, respectively. It is reasonable to suggest, then, that disaggregating by urban milieu provides more accurate estimates of recreation participation than would statewide analysis.

## Conclusions

The central hypothesis of this study was predicted upon the existence of an urban-rural continuum in Illinois. Specifically, day hiking participation was hypothesized to be influenced by one's milieu; the implications in accepting such a hypothesis are that by stratifying day hiking data by residential milieu, more accurate and sensitive predictions of outdoor

recreation participation might be possible. As shown by the results of the cluster analysis, the towns and cities of Illinois can be broken into three distinctly different groups of residential environments. The variables distinguishing these groups allow us to describe precisely metropolitan, suburban, and rural areas. In a sense, the analysis presented here has verified the utility of many intuitive urban classifications where states have a broad range of cities and towns. Although these results seem obvious, objective classification procedures may provide significantly different results in states such as South Dakota, Wyoming, and Idaho, or in other nations where urban places are not easily differentiated in terms of size, spacing, and interaction. The metropolitan type includes cities such as East St. Louis and Chicago; suburban cities such as Harvey, Park Forest, and Blue Island characterized the second group, and the third urban type was primarily identified by smaller rural communities such as Chester. The variables used to characterize this continuum were (1) population size, (2) population density, (3) potential interaction, and (4) occupational character. Although these four variables are the surrogates most often used to characterize residential milieu, the reader must be cautioned that the results of this study are to some extent dependent upon this choice of variables.

Segmentation of the population according to milieu has shown that the behavioral variations among the milieus are substantial, both in terms of participation rates and correlates. Urban residents, for example, participate in day hiking only 58 percent as often as suburban residents and less than four fifths as much as rural community residents. The results of the regression analyses have shown that both the power and order of the predictors vary with milieu. For suburban areas the cumulative correlation coefficient between the volume of participation and the best predictors of that volume was 0.686, about two-and-a-half times as great as for either central city or rural residents. Furthermore, the significance of the cumulative correlation coefficient for each milieu was substantially greater than for the state as a whole. The presence of middle class incomes was a significant predictor of suburban participation, in contrast to metropolitan and rural communities. Additionally, one might be surprised to note that travel time was not a significant predictor of participation in suburban communities, whereas it was important in both urban and rural areas. These findings are explainable when one reviews the relationship between income and leisure time

underlying most econometric forecasting models of outdoor recreation. One might suggest that the social and economic milieus that exist in suburban environments create the atmosphere for substantially increased participation in outdoor recreation and other leisure-time pursuits such as attendance at theaters. Central cities, in comparison, have become so congested that accessibility to other parts of the city and features external to the city have probably decreased. Decline in the relative accessibility of CBDs (Central Business Districts) and the growth of suburban shopping centers is one item of evidence often used to illustrate these changes (Cicchetti 1973). Rural residents, on the other hand, have not experienced dramatic increases in personal income and leisure time relative to urban and suburban residents. As a result, participation in outdoor recreation by rural households may not have increased substantially as a function of accessibility. In essence, one suspects that suburban area residents have the best combination of access to urban leisure activities and outdoor recreation environments. In addition, suburban incomes and mobility least constrain leisure-time options.

This paper has shown that behavioral variation in outdoor recreation is expressed in terms of participation rates as well as correlates; that, in fact, segmentation of the population by urban milieu may provide substantially improved estimates of recreation behavior. Although disaggregation may seem inevitably to improve predictability, Openshaw and Taylor (1979) have shown that the accuracy of model predictions is not related systematically to the level of aggregation. It is clear from the list of correlates that the availability of day hiking facilities is an important aspect affecting participation, and that various aspects of the household are similarly important in determining the degree of participation. The improvement in the overall predictability of the regression equation suggests that milieu affects the predictors as well as participation rates. A final note of caution, however, is in order. The regression analyses have demonstrated that there are factors, other than the variables used, that differ in the effects they have on recreational behavior in three classes of communities. These factors, if and when measured directly, may or may not be manifested in individual attitudes and cognition and may or may not be integral parts of what a psychologist would accept as "milieu." It would be interesting, then, to examine urban, suburban, and rural residential attitudes on McKechnie's (1974) Environmental Response Inventory (ERI) dimensions to see if cognition



or attitude toward environment or environmental types are significantly better predictors of behavior than the surrogates of milieu identified here.

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