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THE UNIVERSITY OF ALBERTA

NEIGHBORHOOD TYPES AND LEISURE BEHAVIOR IN EDMONTON

by

© William V. Roth

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

IN

RECREATION

Physical Education

EDMONTON, ALBERTA

SPRING 1982

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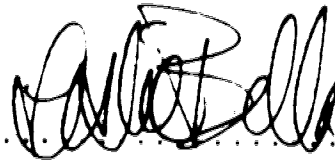written permission.

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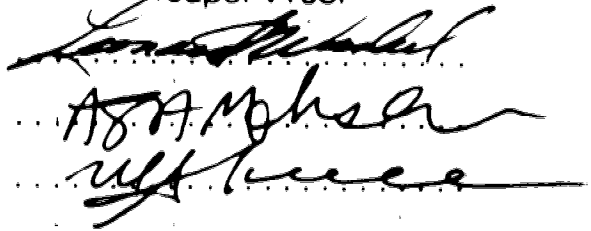
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## ABSTRACT

The City of Edmonton's Parks and Recreation Department proposed, in its 1979-83 Master Plan, that leisure behavior could be determined by the type of area or neighborhood of residence. Existing neighborhoods had been clustered into six groups based on various socio-demographic variables.

The purpose of this study was to test the hypothesis that leisure behavior would vary by neighborhood type. Measures of leisure behavior in each of three leisure categories, Outdoor Recreation, Sports/Athletics and Arts and Cultural, were compared among the six neighborhood types.

The data for the analysis were obtained from the 1980 Leisure Study that had been conducted by the Parks and Recreation Department in November of 1980. This survey contacted over 2,000 households and produced 2254 useable, returned questionnaires. The purpose of the survey had been to collect data on a wide range of leisure topics.

Multiple paired comparison techniques were used to test the differences among the neighborhood types for each of the measures of leisure behavior. An analysis of the results of these tests revealed that for the most part no significant differences existed among the neighborhood types, at least in terms of leisure behavior. Only two consistencies could be found. First, there were differences between neighborhood type 2, an older, residential area, and neighborhood type 5, a middle-aged, professional area. Second, similar

differences existed between type 2 and neighborhood type 6. The latter were classified as new areas, and consisted of all neighborhoods for which no data had been available during the original clustering. In both cases the neighborhood types were different on six of the possible eighteen different measures of leisure behavior. Overall only 29 of the total 270 possible between neighborhood type leisure behavior comparisons were significant.

It was concluded that the neighborhood typology developed by the City of Edmonton's Parks and Recreation Department would be of little value in predicting leisure behavior.

Although the use of the neighborhood typology, as it now stands, is not recommended, the total rejection of this approach to the problem of predicting leisure behavior was not. It was instead recommended that the analysis that produced the neighborhood types be repeated using more recent data in the hope that this would enhance its usefulness.

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# I. THE PROBLEM AND ITS SETTING

## A. INTRODUCTION

Canada, like most of the western world, is moving into what is called the post-industrial era (Mankin, 1978). This era is, and will be to an even greater extent in the future, de-emphasizing the work ethic of the industrial revolution, and replacing it with the leisure ethic. People will no longer be identified primarily by their work, but instead will seek to fulfill themselves through non-work activities. While much of this increased demand for leisure opportunities will be met through the efforts of the individual, greater demands will also be placed on the services and programs of the leisure or recreation agency. The recreation professional therefore must be able to predict the direction and content of this demand for increased services. This will require an understanding of the nature of leisure and recreation and of the factors affecting participation in leisure activities.

While theories of leisure and recreation will be briefly touched upon, the main emphasis of this thesis will be on the factors affecting participation in leisure activities. Socio-demographic variables have long been the object of study by researchers seeking to understand the determinants of leisure behavior. There are, however, limitations to the effectiveness of this type of study (Burch, 1969; Field and O'Leary, 1973).

One of these limitations is the fact that socio-demographic variables create aggregate groupings, ie. people are grouped because of a shared characteristic like age, when in reality they may have no relationship to each other. Another limitation is that socio-demographic variables often account for only a limited amount of the variance in leisure/recreation behavior. This study will examine one attempt to go beyond the basic socio-demographic variables. This new variable is a composite one, combining the standard socio-demographic variables with a spatial component. This new variable has been called a neighborhood type and will be tested to determine whether or not it can predict leisure behavior. Prior to a review of the literature on the correlates of leisure/ recreation behavior, definitions of these terms, leisure and recreation will be established.

B. LEISURE AND RECREATION: DEFINITIONS

Several definitions of leisure are discussed in the literature. The ancient Greek culture was one of the first to identify leisure as a separate kind of life (Murphy, 1975). They conceived of leisure as a way of life in which the individual attempted to elevate the spiritual self through intellectual and artistic pursuits (McIntosh, 1966; Kraus, 1978). Work and physical activities did not fit into this life of leisure, thereby limiting it to a wealthy few. This "classical" theory of leisure, because of the limits it

imposes, has fallen into disfavor among present day recreation professionals (Kraus, 1978). The idea that leisure and self actualization, personal well-being and pleasure are interrelated has been, however, an important contribution by the Greeks to modern concepts of leisure.

Leisure has also been defined in terms of time. With the rise of machine power, man was supplied with an abundance of goods that required less work time to produce. Leisure became recognized as a block of time free from the obligations of work, or free from the necessities of life, such as working, sleeping and eating (Jensen, 1977). In addition it has been argued that leisure was the use of this free time in some constructive manner including, personal improvement, social services and joyfull activity (De Grazia, 1962; Kelly, 1972; Murphy, 1975; Kraus, 1978). The argument that leisure was free time that was used led to the term recreation.

Individual writers defining recreation usually agree that it is something that occurs during leisure. Recreation can either be viewed as a "process of involvement", or as a "result or outcome" (Jensen, 1977). The latter view holds that recreation is an experience or emotional state.

"Recreation is an emotional condition within an individual human being that flows from a feeling of well-being and satisfaction. It is characterized by feelings of mastery, achievement, exhilaration, success, personal worth, and pleasure. It reinforces a positive self-image. Recreation is a response to aesthetic experience, achievement of personal goals, or positive feedback from others. It is independent of activity, leisure or social acceptance." (Gray,

1972: 19)

The "process of involvement" definition of recreation generally describes recreation as activities or experiences that occur in leisure time. These activities also require voluntary involvement and provide some personal satisfaction to the participant (Jensen, 1977; Kraus, 1978).

Jensen (1977), has argued that either of these definitions can be logically viewed as correct. The measures of leisure behavior that are to be used here are based on activities, and it is therefore proposed that the process or activity definition will be used in this study. These activities, because they occur during leisure, might be called leisure activities. It is further proposed that a distinction between leisure and recreation is, therefore, not required when referring to these activities. Burton (1972), in preparation for his studies on recreation in Britain, argued that for the average person the differences between the terms leisure and recreation were minimal. He proposed that they could be used interchangeably, although he would use a single term, recreation. Throughout the rest of this study the term leisure will be used, and it will be used to describe those activities or experiences that are freely entered into, provide personal satisfaction, occur in free non-obligated time, and the outcomes, if any, of such activities are "...couched within a framework of constructive and socially accepted moral values..." (Kraus and Curtis, 1972).

Given this definition of leisure as a certain kind of
activity, the professional must consider the factors that
influence people when they make decisions as to their
leisure behavior, ie. will they participate, in what will
they participate, and how often will they participate?

## C. THE CORRELATES OF LEISURE INVOLVEMENT

The leisure agency is generally concerned with only a
portion of the leisure activities participated in by its
clientele, ie. formal organized leisure programs. The need
for an agency to have an understanding and awareness of the
leisure preferences of its clientele has been identified as
one of the keys to effective leisure services by Lowery and
Curtis(1973). They have suggested several methods for
determining these preferences, including analysis of
participation records, questioning of local organizations,
direct observations, and general surveys. All of these
methods, except surveys, tend to give more weight to the
opinion of the active participant of the moment, ignoring
the opinions of the non-participant. The survey, if properly
conducted, can also sample the non-participants to discover
their preferences.

In fact for many years, surveys have been the primary
instrument used to gather information about the leisure
activites engaged in by different population groups. Many of
the earlier studies were concerned primarily with listing
the leisure activities participated in, due perhaps to

limited data processing capabilities. [r] These inventories of the numbers participating in various leisure activities generally can only tell us what happened in the past to one population group.

. A procedure of greater use to the professional is one that gathers information about leisure behavior correlates which in turn can be used to make comparisons between population groups. From these comparisons, predictions can be attempted regarding future leisure behavior. A researcher who can establish a strong correlation between leisure participation and education for example, may then attempt to predict the leisure participation habits of a group of people if their level of education is known.

### Socio-Demographic Variables

One of the first studies to attempt a comparison of leisure activity among diverse population groups was conducted by Lundberg, Komorovsky and McInerney, in 1934. The authors divided their sample into seven occupational groups, laborer, white collar, professional/executive, housewife, unemployed, highschool student, and college student. They found that each occupational group spent a similar percentage of its available leisure time in each of the broad leisure categories created for the study. There were significant differences, however, in the actual leisure

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[r]For example, see Ruth Toogood, "A Survey of Recreational Interests and Pursuits of College Women," *Research Quarterly*, Vol. 10, 1939.

time available to each group so that the actual time spent on leisure varied. For example, in the category "motoring" a white collar male spent twenty minutes per day or 5% of his leisure time, whereas, a female laborer spent thirteen minutes per day and it claimed 4% of her leisure time. In one type of activity, sports, there were considerable differences among the occupation groups in both the absolute and per cent of time spent in participating. The differences ranged from 95 minutes (23%) for college males to 16 minutes (3%) for housewives. The researchers also noted a considerable qualitative difference in the activities engaged in by the different occupational groups.[2] They concluded that further studies should be conducted using variables such as income, education, age, occupation, cultural status and sex to further analyze leisure behavior.

In another study, Edgren (1937) analyzed the leisure behavior of highschool students. He found that males participated in a wider range of activities than females. His respondents were chosen from four different highschools that were thought to represent different socio-economic status groups, and would, therefore, provide a cross-section of highschool students. He discovered that there were differences in interests among the students from the different schools. He also found that the students in the

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[2] For instance, "going to the theatre" could have meant attending a New York play or a Wild West movie. It was implied by the authors that attending a New York play was a higher quality leisure experience than was attending the movie.

lower status schools participated less than those from the higher status schools in the activities they had found to be of interest. Although this study found differences in leisure behavior between different socio-economic status groups, one must be careful in generalizing from these results. They were based on only one school from each status group. From these early studies it became obvious that people with or from different backgrounds had different leisure behavior patterns.

White (1958), also examined the differences in leisure participation between social classes. He established four social classes based on the occupation of the family head, sources of family income and the kind of residential neighborhood lived in. He used paired groups for his analysis and found differences in the amount and use of leisure time among the four social classes. He found these differences to become more pronounced as the person aged (his sample included individuals ranging from six to over eighteen years of age).

Clark (1958), studied leisure behavior using a more specific variable, occupational prestige, and asked questions about specific, leisure activities. For example, he differentiated between attending football games and attending baseball games. He found that participation in specific activities was related to occupational prestige level and for most activities this relationship was linear. Also of interest in this study was the fact that there were

twelve specific activities linked to the highest level of occupational prestige, ten linked to the lowest level, but only five linked to the three remaining levels. More recently Burdge (1969), conducted a similar study using the same occupational prestige scale. While he found differences in the type of activities engaged in by the different occupational classes, he did not find that activities were loaded at either end of the occupational scale. Burdge used a far more diverse list of activities to measure leisure participation and this may have accounted for the differences between his results and those of Clark. He also found that persons in the highest occupational levels participated at a greater rate in all leisure activites.

These studies seemed to indicate that occupation was an important correlate of leisure involvement. A more recent study, however, discovered that occupation was not an independent determinant of leisure behavior (White, 1975). White found that the effects of occupation disappeared if education and income were held constant. Similiarly, Kenyon (1966), and Cheek and Burch (1976) did not find occupation to be a significant determinant of leisure if other variables were held constant. Apparantly occupation was highly related to other variables, ie. education and income.

Education has proven to be a consistent determinant of leisure behavior, whether this behavior consisted of sport (Curtis and Milton, 1976; Hobart, 1974; Kenyon, 1966), physical activity (Curtis and Milton, 1976; Kenyon, 1966),

outdoor recreation (White, 1975) or a combination of leisure activities (Cheek and Burch, 1976). These studies have all found that the higher the level of education the greater the extent of leisure participation, whether it be measured in terms of rate, diversity or intensity.

Curtis and Milton analyzed data from a nation-wide leisure survey conducted in Canada in 1972. Respondents were measured on their rate of participation, frequency of participation and their variety of participation. Measures were obtained for both sport activities and physical exercise activities. [3] They found that education was positively related to all three measures used, ie. the higher the education, the greater the rate of participation, the greater the percentage of high frequency participators, and the greater the variety of activities participated in. Education was found to be a consistent correlate even when the effects of other variables, such as age and income, were accounted for. Other demographic variables have also proven to be fairly consistent in their relationship to leisure behavior, although not to the same extent as education.

Income has been found to be positively related to the rate of participation in various types of leisure activities (Kenyon, 1966; White, 1975). Kenyon found that the higher the income the greater the frequency of both watching sports, and participating in sports and physical activities.

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[3] Sport consisted of activities like hockey, tennis and golf, whereas, physical exercise consisted of activities like jogging, calisthenics and yoga.

White's findings indicated that both the frequency of and the variety of activities increased as income increased. When Cheek and Burch (1976) examined this variable, they found that while income had a positive relationship to overall leisure participation, for specific activities the highest income groups were not necessarily the most frequent participators. They concluded that income was more an enabler variable than a determinant and that after a certain level of income was reached other factors, such as education, became more important in determining both the level of participation and the nature of participation.

The third variable found to have a consistent relationship to leisure behavior was age. It was found to have a negative relationship to participation in active types of leisure (Kenyon, 1966; White 1975; Curtis and Milton, 1976; Hobart, 1974). Kenyon found, however, that age was not significantly related to sports spectatorship. It seems logical to conclude that with advancing years the individual will turn from activities that make demands on the physical self and engage in more sedentary activities. A recent study by Rogers (1977), casts some doubt on this logic. He did a cross-national study in four European countries on sports participation. He found that the majority of the aged that did not participate were what he termed "sport illiterate". They had never participated in sport even as a child. He also found that those who had participated in childhood were highly likely to continue

participating well past middle-age. The same might be true
for other types, of leisure activities as several studies
have found that participation in childhood was likely to
lead to participation as an adult (Hall, 1976; Yoesting and
Christensen, 1978; Snyder and Spreitzer, 1979). Age is
perhaps not so much a determinant of leisure activity as it
is an indication of personal skills learned in different
times. Interest and participation in leisure activities,
particularily sports and exercise, has increased
significantly over the past decade. As younger generations
grow older they will have learned leisure participation
habits far different from those of their parents. It is
likely that age will, therefore, not continue to be such a
negative factor in overall leisure participation. It will
, probably be a factor, however, in determining the nature of
that participation due to the physical limitations imposed
by increasing age?

Several other demographic variables have been examined
in relationship to leisure behavior but with considerably
less consistency in the results. In sport type activities,
researchers have consistently found that males participated
more, with more intensity and in a greater variety than did
females, (Lundberg et al 1934; Kenyon, 1966; Robinson, 1967;
Hobart, 1974; Curtis and Milton, 1976). Kenyon also found
that men were more likely than women to be sport spectators.
Sex was not a factor, however, in determining participation
in physical activities or exercise (Kenyon, 1966; Curtis and

Milton, 1976). Other studies have found differences in the nature of leisure participation between the sexes but have not found consistent differences in the intensity of participation (Lundberg et al, 1934; Edgren, 1936; White, 1958).

Marital status has also been analyzed for its relationship to leisure behavior. White (1975) found it to have no significance in determining participation in outdoor recreation activities. Hall (1976), however, found marriage to have a negative effect on female participation in sport. Evidence from other studies (Sillitoe, 1966; Curtis and Milton, 1976) has indicated a similar effect for males. This decrease in participation due to marriage was, however, only temporary. Curtis and Milton found that for those over thirty-five marriage was not a deterrent to participation in sports, whereas, for those between twenty and thirty-five it was. Hall believed that the child bearing responsibilities that followed marriage were the main reason for non-participation among women, and Curtis and Milton pointed to career aspirations along with family responsibilities as the reasons for non-participation among males. Marriage, it seems, was not a direct determinant of participation. Marriage was a reflection of changes in other factors, lifestyle, time available, and so on, which would affect leisure behavior. White (1975) also looked at family size and city size but found they were of little use in predicting leisure participation.

In summary, it has been found by many researchers that there is some correlation between leisure behavior and certain socio-demographic variables. A positive relationship with leisure paricipation exists for income, occupation and education, with the latter being the most consistent of the three. Age has been found to have a negative reationship to leisure participation. There is some evidence that being of a particular age only indicates that one has learned certain leisure behavior habits, and not that age itself is the deterrent. Further, changing responsibilities through career and family may have more, important effects on participation than age itself. The results for other variables have proven to be unstable across studies. Sex differentiates levels of participation in sports, but males and females have been found to participate equally in physical exercise activities. In other forms of leisure activity, the type of activity engaged in varies between the sexes, but the intensity of participation has not been found to vary with the same consistency. Studies using marital status as a predicter variable also have mixed results, with marriage being a deterrent for certain age groups but not for others. For recreation planners this type of information can at least provide some indication of the leisure interests and needs of their clientele (at least if they are aware of the clientele's demographic profile).

There have been, however, some who have argued that the standard social variables fail to predict leisure behavior

and are only useful for describing past behavior (Burch, 1969). Others have pointed to the small amounts of the variance in leisure behavior accounted for by these same variables as a drawback to their use, thus limiting their usefulness in predicitng leisure behavior and for planning recreation programs (Field and O'Leary, 1973; White, 1975; Kelly, 1980).

In their study of water based activities, Field and O'Leary used nine demographic variables and found that only for the activity of fishing was as much as twenty-six per cent of the variance accounted for by these nine variables. For the three other activities analyzed, less than five per cent of the variance was accounted for by the demographic variables

Kelly reviewed the literature and found that demographic variables, while sometimes accounting for only 10% of the variance, often reached the 30% level. White, studied five variables (income, occupation, education, family size and city size) and was able to predict as much as 21% of the variance in his leisure participation measures. Attempts have been made to increase the predictive power of the socio-demographic variable by using them in conjunction with other variables, or by grouping them to create new composite variables.

## Composite Variables

Cheek and Burch (1976) observed that leisure
participation was not an individualistic pursuit as implied
by demographic survey analysis. They felt that most leisure
was primarily a social activity and occurred in the context
of differing social groups. They used variables that
measured who one participated with (family, friends, family
and friends) and found that there were significant
differences between these groups in the type of water-based
leisure activities engaged in. Field and O'Leary (1973) used
similar variables in combination with demographic ones and
found similar results. They also found that the amount of
variance accounted for by these combinations increased
dramatically. For example, nine demographic variables
combined could only explain 3.4 percent of the variance in
swimming but when the factor, friendship group, was added to
these variables twenty-three percent of the variance was
accounted for. Although these social groups have reasonable
explanatory power, they do have a major drawback for the
recreationist trying to determine the leisure behavior of
his clientele. They will tell him the likely relationships
between participants but will not necessarily tell him which
of his clientele, and how many, will be participating.

The creation of a combination variable like family life
cycle was an attempt to overcome this problem. Marital
status, age and number of children and age of the parents
have been the variables that were usually grouped together

to produce stages of the family life cycle (Kelly, 1978; DeWitt and Goodale, 1980). Stages of the family life cycle proved to have some success in predicting both the nature and the amount of leisure involvement. Kelly found that marriage and parenthood decreases the amount of leisure participation. He also found that these factors affect who one participates with. After marriage the family became the focus of leisure participation.

Despite the apparent success of these combination variables the fact remains that a considerable proportion of the variance in leisure behavior cannot be accounted for by the standard socio-demographic variables that have been discussed so far. In an attempt to solve this problem researchers have examined variables other than social measures.

## Other Correlates of Leisure Involvement

Knopp (1972), was interested in the effects of both the home and work environments on leisure behavior. He analyzed variables such as, population density, size of property and number of people in the-work relationship, and concluded that these factors affected the individual's choice of leisure environment. He also found differences in the effect of these variables depending on whether the individual lived in a rural-farm, rural-non-farm or urban setting. Based on this study Knopp concluded that environmental determinants might prove useful in predicting leisure behavior

differences even among differing urban groups. While the rural-urban differences in leisure participation have been examined (Hauser, 1962; Hendee, 1969), relatively little research has been devoted to within urban differences.

Hendricks (1971), was one of the few researchers to examine intra-urban differences in leisure behavior. He focussed on the type of residence lived in, feeling that it reflected the person's lifestyle, and hence would affect the person's choice of leisure. His study involved the analysis of similar (in terms of demography) urban populations whose difference lay in whether they lived in an apartment or a single family detached house. He found that apartment dwellers were twice as active as home dwellers in "urban leisure activities", ie. activities such as museum visiting and dancing. He further found that apartment dwellers were involved less than home dwellers in outdoor leisure (fishing, hiking, etc.), at least at a high level of participation. He observed that apartment dwelling was no longer a temporary condition that people were forced into until they could move into a house. It was instead a conscious lifestyle choice, and this was reflected in their leisure behavior.

In a Canadian study conducted in Toronto, Michelson (1973), analyzed the relationship between residence selection and participation in certain leisure activities. Data were gathered for this study by way of both personal interviews and time budget diaries. The sample was selected

from middle class, married couples in their child-bearing years, who had recently decided to move to a different residence. Residences were classified as downtown apartments, downtown houses, suburb houses, and suburb apartments. Michelson found that there was a relationship between housing type selected and the individuals discretionary activities. People moving to apartments, particularily highrises, expected to spend more time on activities such as sport and less on house maintenance and gardening. Those moving to apartments also expected to be able to go "out" more often whereas, those moving to houses expected to entertain "in" more often.

## Social Area Analysis

There appears to be a relationship, not only between leisure behavior and housing type, but also between leisure behavior and where the housing type is located within the urban area. Studies not directly concerned with leisure behavior have attempted to develop a typology of urban sub-areas (Shevsky and Williams, 1948; Greer, 1956; Kaufman and Greer, 1960). These studies used census tract data to rank enumeration districts on three variables, social rank, segregation, and urbanization.[4] This technique was known as

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[4]Social rank was based on occupation and education; segregation measured the ratio of whites to nonwhites and foreign born; urbanization was a composite measure based upon fertility ratios, proportion of single family dwelling units and proportion of women in the labour force (Kaufman and Greer (1960).

social area analysis. Certain social behaviors, for example, voting behavior, within enumeration areas could then be analyzed for relationships to the three variables or combinations thereof. Social area analysis, however, did not create sub-areas that were necessarily linked to a spatial area within the city. The area types created were artificially related only by virtue of similar rankings on the three variables.

Bell and Force (1956), took a slightly different approach in their study of San Francisco neighborhoods. They used existing spatial areas and then ranked each on the three variables, social rank, segregation, and urbanization. The segregation variable was held constant, and four neighbourhoods were chosen to represent the extremes on each of the other two variables. These researchers were interested in "formal association" (eg. fraternities, unions, service clubs) participation among the male residents of these neighborhoods. They found evidence to support their hypothesis that this behavior would vary depending on the neighborhood type in which the respondent resided. The "high family" (their term for the urbanization measure), "high status" neighborhood was almost twice as active in multiple association memberships as was the "low family", "high status" neighborhood. Both of these neighborhoods were significantly different from the other two. There was no significant difference between the two "low status". neighborhoods. Men from the "high status",

"high family" area also held office in formal associations significantly more often then did men from the other areas. They also tended to go to meetings more often. The authors concluded that the status ranking was more important than the family ranking in differentiating formal associaton behavior.

The application of social area analysis to geographic neighborhoods is of interest to those searching for something other than the standard socio-demographic variables with which to predict leisure behavior. It is no longer necessary to analyze individual data and create artificial aggregate groups. The area or neighborhood of residence could instead be classified (on whatever scale) and the behavior predicted based on that evidence. This classification could be achieved using readily available census data, thereby simplifying considerably the task of the researcher.

In a somewhat different study, Ginsberg (1975), analyzed the leisure behavior of men in each of two neighborhoods in Tel Aviv. These neighborhoods, although close to each other geographically, differed in most other respects, for example, age of neighborhood, ethnic origin and occupation. The residents in each of these neighborhoods had different joint leisure patterns (leisure with their spouses) in terms of going to movies and cafes. There were different social structures in each of the two neighborhoods. The older, more established neighborhood

resembled a 'village', and maintained the tradition and custom which separated men and women. In this neighborhood going to movies and cafes was done with one's peers and not one's spouse. The other neighborhood was a more modern and newer urban residential area. Male residents of this neighborhood did not adhere to traditional customs and spent much of their leisure in the company of their wives. Ginsberg concluded that the differences in leisure behavior between the residents of the two neighborhoods was due to the differences in the nature or character of the neighborhoods.

It remained then for social area analysis to be applied to the study of leisure behavior.

## Neighborhood Types in The City of Edmonton

The City of Edmonton's Parks and Recreation Department was interested in finding a more accurate and reliable way to plan for the leisure needs of its clientele. It was decided to try a social area analysis procedure somewhat similar to that carried out in San Francisco by Bell and Force (1956). Census tract data for each of the existing neighborhoods in Edmonton was analyzed in the hope of finding similarities among them. The analysts went beyond the three dimensions (urbanism, social status, and ethnicity) used in the earlier Bell and Force(1956) study. They included measures of housing type and housing age in their analysis, as well as age, sex, marital status and

education.

Unfortunately, the exact details of the analysis were not available. Due to staff turnover, and the fact that most of the statistical analysis was carried out by outside consultants, the documents containing these details were misplaced. The information that was available indicated that the analysis contained the following processes. A multiple regression technique was used to reduce the original number of measures by eliminating highly correlated items. Factor analysis was performed on the remaining variables resulting in four factors. A cluster analysis, using the factor scores, produced five groupings of neighborhoods. A sixth grouping contained all the new neighborhoods for which no census data were available. Information obtained from the *1979-83 Master Plan* produced by the Parks and Recreation Department indicates that the neighborhood types were established mainly on the basis of age of neighborhood, type of dwelling, and age of the residents.

A basic assumption underlying the Department's neighborhood type approach was that residents within each neighborhood type would be more similar in their leisure needs and interests, than individuls living in different neighborhood types. These differences in leisure needs and interests would require unique programming and planning for each neighborhood type. To date, there has not been a detailed analysis of leisure behavior that would support these assumptions. Frequency tables were produced for

specific activities by neighborhood type (see Figure 1) but no statistical analysis was performed. It is the intention of this study to carry out an analysis that will test the assumption that leisure behavior varies by neighborhood type.

## D. STATEMENT OF THE PROBLEM

### Problem

Social area analysis has been used to study vario kinds of social behavior. The behaviors examined have included such things as voting behavior (Kaufman and Greer, 1960), formal association membership (Bell and Force, 1956), and urbanization (Greer, 1956). The City of Edmonton used social area analysis to produce six neighborhood types and proposed that they could be used to predict leisure behavior. The problem dealt with in this study was to determine the usefulness of this particular social area analysis in predicting leisure behavior. More specifically, how did leisure behavior vary between the neighborhood types.

### Hypothesis

Due to the lack of information pertaining to the relation of different neighborhood types to specific leisure behavior, no directional hypotheses were stated. Rather, it was decided to simply test the null hypothesis of no difference in leisure behavior between neighborhood types.

# PARTICIPATION IN SELECTED RECREATION ACTIVITIES AMONG SIX NEIGHBOURHOOD TYPES

| ACTIVITY | Neighbourhood Types 1 | 2 | 3 | 4 | 5 | 6 | City |
|---|---|---|---|---|---|---|---|
| Badminton | 10.8 *. | 9.6 *. | 9.4 *. | 9.1 *. | 17.6 *. | 6.5 *. | 10.4 *. |
| Baseball | 8.9 | 13.6 | 9.5 | 19.0 | 17.6 | 5.0 | 13.1 |
| Canoeing | 3.8 | 15.1 | 7.6 | 7.5 | 18.8 | 6.3 | 9.9 |
| Cross Country Skiing | 10.1 | 5.3 | 17.0 | 7.5 | 27.1 | 4.8 | 12.1 |
| Downhill Skiing | 16.3 | 14.5 | 22.6 | 12.3 | 36.5 | 9.5 | 18.7 |
| Gardening Landscaping | 15.2 | 15.0 | 13.3 | 10.5 | 15.3 | 25.4 | 15.1 |
| Historic Site Touring | 12.7 | 17.0 | 18.9 | 11.6 | 25.9 | 23.0 | 17.6 |
| Horse-back Riding | 6.3 | 10.5 | 3.9 | 10.7 | 3.5 | 3.2 | 6.6 |
| Jogging | 11.3 | 12.5 | 16.0 | 13.0 | 34.1 | 9.7 | 16.2 |
| Lawn Darts | 7.6 | 12.1 | 5.7 | 14.9 | 1.2 | 6.3 | 4.9 |
| Nature Viewing | 11.3 | 5.4 | 10.4 | 5.8 | 14.1 | 14.8 | 8.3 |
| Physical Fitness | 13.8 | 17.2 | 15.1 | 15.6 | 35.3 | 12.7 | 18.2 |
| Playground Activities | 5.1 | 7.4 | 7.5 | 10.7 | 5.9 | 15.9 | 8.6 |
| Quilting | 0.0 | 5.4 | 4.7 | .8 | 1.2 | 0.0 | 2.2 |
| Resin Craft | 0.0 | 4.3 | .9 | .8 | 0.0 | 3.2 | 1.5 |
| Sewing | 11.3 | 16.3 | 12.3 | 16.4 | 27.4 | 15.9 | 16.5 |
| Skateboarding | 1.3 | 7.5 | 9.5 | 9.6 | 9.4 | 0.0 | 6.9 |
| Soccer | 3.8 | 14.0 | 10.4 | 15.0 | 14.3 | 4.8 | 11.0 |
| Swimming | 32.5 | 41.5 | 39.6 | 35.5 | 54.1 | 27.0 | 38.8 |
| Tennis | 22.5 | 12.8 | 21.7 | 10.7 | 27.1 | 3.2 | 16.6 |
| Tobogganing | 6.3 | 18.3 | 17.0 | 20.5 | 21.2 | 7.9 | 16.1 |
| Trail Walking | 16.5 | 20.4 | 16.2 | 11.6 | 25.9 | 11.3 | 16.9 |
| Volleyball | 15.2 | 18.1 | 10.4 | 13.0 | 21.2 | 9.5 | 14.6 |
| Walking for Pleasure | 45.0 | 40.9 | 34.9 | 28.7 | 52.9 | 36.5 | 39.0 |
| Weaving | 1.3 | 2.2 | 1.9 | 1.7 | 8.2 | 1.6 | 2.7 |
| Whist/Bridge | 12.5 | 18.3 | 8.6 | 11.6 | 28.2 | 11.3 | 14.8 |

SOURCE EDMONTON PARKS AND RECREATION SURVEY 1977

Figure 1 ACTIVITIES BY NEIGHBORHOOD TYPE:1977

## Definition of Terms

*Leisure Behavior* consists of engagements or activities
that are freely entered into, occur during non-work time,
are mainly self-rewarding and have constructive or socially
accepted outcomes. For the purposes of this study leisure
engagements will include those listed on the survey
instrument used by the City to gather data for the 1980
Leisure Survey. Further, they will include only those listed
under the following headings: Outdoor Recreation, Active
Sports/Athletics, and Arts and Cultural. Because this study
is intended to focus on those leisure activities for which
leisure agencies currently have some responsibility, those
activities listed under Passive Leisure Activities will be
excluded.

A *Neighborhood* is a defined spatial area within the
City of Edmonton with a population ranging from three to
seven thousand residents.

A *Neighborhood Type* consists of a grouping of
neighborhoods all of which received similar rankings on
variables such as age of neighborhood, age of residents,
type of dwelling, and education level.[5]

## Delimitations

This study did not set out to examine the validity of
social area analysis as a technique, nor did it set out to

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[5] It was assumed that at least these variables were used in
the grouping of neighborhood, because they were the ones
mentioned in the Master Plan

analyze the processes carried out by the City of Edmonton to produce the neighborhood types.

Measures of leisure behavior were limited to those that could be obtained from the *1980 Leisure Study*.

## Assumptions

It is assumed that the factor analysis conducted by the City of Edmonton to produce its six neighborhood types was done accurately and correctly. It is also assumed that the neighborhood characteristics discovered at the time of the factor analysis still exist and, therefore, still differentiate the six types of neighborhoods

## Justification of The Study

The City of Edmonton used the neighborhood types as a major part of its *1979-83 Master Plan*, indicating that planning and programming were to be based on the neighborhood types. This document has been made public and has presumably, been used as a working document. It was felt to be important, therefore, to see if leisure behavior does vary by neighborhood type. To this date there have been no other attempts to do this.

## II. METHODOLOGY

An analysis of secondary data was carried out to determine leisure behavior within each of the six neighborhood types. A comparison of this behavior between neighborhood types was then performed to determine if, and where, there were differences.

### A. DATA

#### Source

The data to be used for this study were collected as part of a city-wide leisure survey of Edmonton. The purpose of this survey was to gather data describing the leisure behavior patterns of the citizens of Edmonton.

A two-stage systematic sample was drawn of all households in Edmonton. Addresses were initially grouped into the five administrative districts set up by the Parks and Recreation Department. Within each district addresses were further organized into one of the six neighborhood types. Addresses were then chosen in a systematic fashion until the required sample size for each neighborhood type within a city district was reached.

The sample frame used was the City of Edmonton's 1980 Census Tape in which addresses were listed by census tract and enumeration district. These census tracts and enumeration districts were manually matched to the neighboourhood type boundaries prior to the drawing of the

sample. The size of the sample was determined by using a 95% ±10 confidence limit for each neighborhood type within a Recreation and Parks district. Computer assistance was required to group the addresses by neighborhood type and city districts, and was also used to make the final selection of the sample addresses. The total sample size was 2,081.

The survey was conducted in November 1980, using a detailed 10 page questionnaire (see Appendix A). This was a self-completed instrument that was both dropped off to and picked up from the respondents by professional survey staff. Each person over the age of 14 in each of the sample households was requested to complete the questionnaire. A free pass entitling the bearer to one free admission to either a city-owned pool or arena was offered as an incentive to the respondents. Information from the returned questionnaires was transferred to computer storage, and subsequent analysis was performed using the Statistical Package for the Social Sciences (SPSS).

## Response Rate

The overall response to the survey was 55:5%. In other words, of the 2,081 households selected, 1,151 returned one or more questionnaires. The useable number of questionnaires obtained from this survey totaled 2,254, an average of slightly less than 2 per responding household. The breakdown of returned questionnaires by neighborhood type has been

summarized in Table 1.

Table 1

Ratio: Respondents to Sample Size

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| Neighbourhood Type | Households Selected | Respondents | Ratio:3/2* |
| One | 298 | 207 | .695 |
| Two | 496 | 466 | .94 |
| Three | 397 | 466 | 1.17 |
| Four | 96 | 358 | 1.2 |
| Five | 97 | 270 | 1.37 |
| Six | 397 | 487 | 1.23 |

* Information as to the numbers of households responding per neighborhood type was unavailable. The ratio used gave a measure of the strength of the response in each neighborhood type. It was selected as an alternate means of comparing response to the survey among the six different neighborhood types.

## Representativeness

The City of Edmonton examined the representativeness of the survey population (Research and Planning,1981). The survey's population characteristics were compared to those of the population of Edmonton as a whole (see Appendix B). The survey population (within the 10% error limit) was quite similar to that of Edmonton. Certain population segments, senior citizens, widowers and retired persons, were under-represented. These characteristics seem to describe the same segment, and were probably under-represented because institutions were not sampled. Unemployed persons were also under-represented in the survey population, but no explanations were offered in the City's report.

## B. DEPENDENT VARIABLES

The review of previous literature revealed that leisure behavior has been measured in many different ways. The most common being participation, (Lundberg et al; Clark,1958; White,1958; Field and O'Leary,1973; Burch,1969), frequency of participation (White,1975; Hendriks,1971; Curtis and Milton,1976 ), and number of activities participated in (Curtis and Milton,1976; Burton,1972; White,1975). These three variables were used in this study in the following manner. Three categories of leisure behavior (outdoor recreation, active sport/athletics, and arts and cultural) were analyzed separately to produce measures of each of the three variables. The general forms of the questions used to

produce the dependent variables were as follows: (see Appendix A for more detail).

a) Have you participated in any 'Outdoor Recreation, Sports/Athletics, Arts and Cultural' activities WITHIN THE LAST 12 MONTHS?

[ ]YES          [ ]NO

b) Please indicate whether or not you have participated in any of the following 'Outdoor Recreation, Sports/Athletics, Arts and Cultural' activities in the Last 12 Months.

Check "Yes" or "No" for each activity. For those activities marked "Yes" answer questions 'c' and 'd'.

'Activity name'          [ ] No [ ]Yes

c) How many times in the Last 12 Months did you engage in each activity marked "Yes" in Question 'b'?

Times in Last Year

'Activity name'          [ ]1-10 [ ]11-20 [ ]21-30 [ ]over 30

## Participation Rate

In each leisure category respondents were requested to
indicate whether or not they had engaged in that type of
activity within the previous 12 months. If they had, they
were then requested to answer questions about specific
activities. It was originally intended to use the response
to the category questions as the measure of participation.
An examination of some preliminary frequency tables
indicated, however, that several respondents who had failed
to answer the category question had responded positively to
questions on the individual activities. The final measure
for the participation rate in a leisure category was
achieved by measuring the percentage of respondents, within
a neighborhood type, who had responded 'Yes' to the category
question, or had not answered the category question but had
responded positively to one or more specific activities.

## Number of Different Activities Engaged In

The total number of different activities engaged in by
each respondent was calculated. This was achieved by
counting the number of positive responses to specific
activity questions for each respondent. A mean within each
leisure category was calculated for each neighborhood type.

## Frequency of Participation

For each specific activity they had engaged in
respondents were asked to indicate their frequency of

participation by checking one of four frequency intervals (1-10; 11-20; 21-30; over 30) that measured the number of times per year he or she had engaged in a particular activity. The open endedness of the final interval precluded an overall frequency rate for each respondent. The measure chosen consisted of the number of activities checked for each frequency interval by the respondent. The mean number for each frequency interval was then calculated for each neighborhood type.

## C. INDEPENDENT VARIABLES

The neighborhood types used in this study were the six neighborhood types developed by the city of Edmonton in its *1979-83 Recreation Master Plan*. These types were created by clustering individual neighborhoods based on certain socio-demographic characteristics. These included age, marital status, age of dwelling, education, and type of dwelling. For purposes of this study the different types have been given titles other than numbers. These titles indicate the main characteristic(s) describing the types: Type 1: Older, highrise; Type 2: Older, residential; Type 3: Middle-aged; Type 4: Younger; Type 5: Professional; Type 6: New.

A more detailed description of each type can be found

in Figures 2 through 6. [6]

## D. ANALYSIS

The Statistical Package for the Social Sciences (SPSS) was used to analyze the data and produce the required statistics. The procedures used were identical for all three leisure categories. Descriptions of these procedures will, therefore, be of a general nature and will be applicable to each of the leisure categories.

### Participation Rate

The measure used for participation rate was based on nominal data and, therefore, produced tables indicating proportions of various responses. Chi-square was chosen as the appropriate statistical test to determine whether participation rates differed among the six neighborhood types. The SPSS program 'Crosstabs' was used to perform the appropriate calculations, and the chi-square test was used to determine statistical significance. The decision point for significance was set at .05.

A significant chi-square could be produced when only one of the possible fifteen comparisons among six

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[6]No census data were available for the new areas of the city and they were grouped together as Neighborhood Type 6. They were given the following general descripion: a *newly developing* neighborhood with a high proportion of young couples with very young children. The housing is mainly single-family, with some single attached and multiple-family dwellings. Because these are new neighborhoods, detailed demographic data were not available for them. (1979-83 Master Plan)

NEIGHBOURHOOD TYPE 1 - an older neighbourhood with a high proportion of people between the ages of 15 and 24 and over 55. This neighbourhood has many high density multiple dwelling units occupied by young singles, young couples with either no children or very young children, and older persons.

## NEIGHBOURHOOD TYPE 1



Figure 2 NEIGHBORHOOD TYPE ONE

NEIGHBOURHOOD TYPE 2 - an older residential neighbourhood with a high proportion of middle-aged and elderly couples with older children or children who have left home. This neighbourhood has a high proportion of both single family dwellings and high density multiple dwellings.

NEIGHBOURHOOD TYPE 2
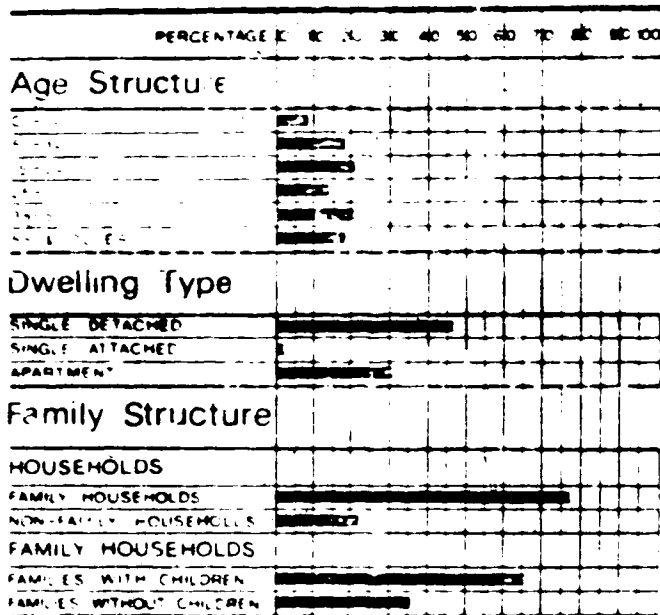


Figure 3 NEIGHBORHOOD TYPE TWO

NEIGHBOURHOOD TYPE 3 - a middle-aged neighbourhood with a high proportion of couples between the ages of 35 and 54 and children between the ages of 5 and 14. This neighbourhood has a high proportion of single-family dwellings.

NEIGHBOURHOOD TYPE 3



Figure 4 NEIGHBORHOOD TYPE THREE

NEIGHBOURHOOD TYPE 4 - a younger to middle-aged neighbourhood
with a high proportion of married couples ranging from
25 to 34 years of age. There is a high proportion of
children under the age of 14 and a high proportion of
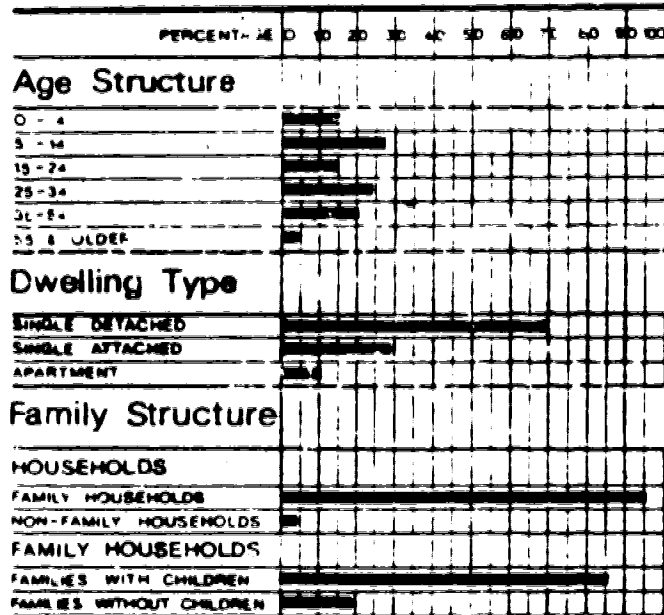single family dwellings.

## NEIGHBOURHOOD TYPE 4



Figure 5 NEIGHBORHOOD TYPE FOUR

NEIGHBOURHOOD TYPE 5 - a *middle-aged* neighbourhood with a high proportion of middle-aged couples with children between the ages of 5 and 14. This neighbourhood is similar to Neighbourhood Type 3 except that Neighbourhood Type 5 has a higher proportion of its population in professional occupations.

NEIGHBOUi HOOD TYPE 5

PERCE  T.G ' 0  10  20  30  40  50  60  70  80  90  100

Age Structure

0 -
5 - 14
15 - 24
25 - 34
38 - 64
55 & OLDER

Dwelling Type

SINGLE DETACHED
SINGLE ATTACHED
APARTMENT

Family Structure

HOUSEHOLDS
FAMILY HOUSEHOLDS
NON-FAMILY HOUSEHOLDS
FAMILY HOUSEHOLDS
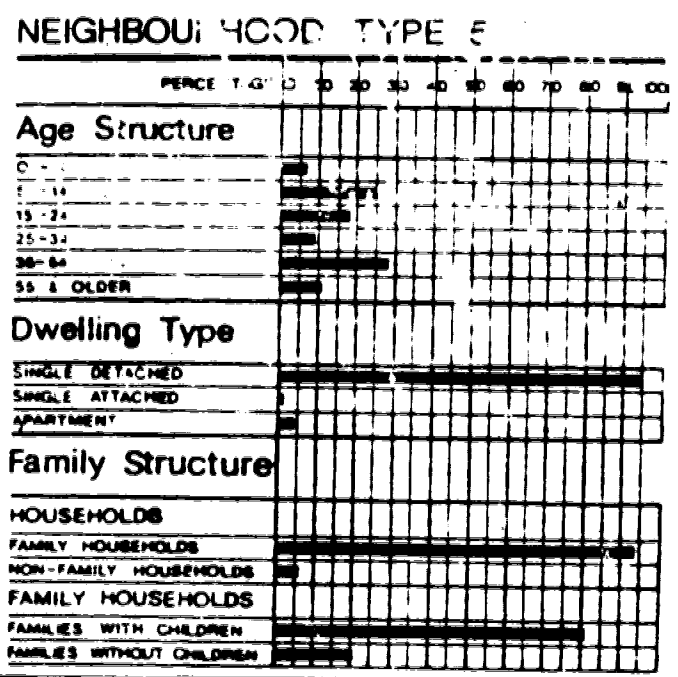FAMILIES WITH CHILDREN
FAMILIES WITHOUT CHILDREN

Figure 6 NEIGHBORHOOD TYPE FIVE

neighborhood types produced a significant difference. In order to determine which of the neighborhood types were in fact different from one another a *post hoc* multiple comparison procedure was used.

This procedure, taken from Marascuilo and McSweeney(1977), makes paired comparisons among the neighborhood types, and approximates methods that can be used for analysis of variance tests. The procedure maintains the probabililty of a type one error at the level set for the original chi-square test (in this case .05).

This procedure involves the construction of confidence intervals around estimates of the possible pair contrasts. The confidence interval is then tested for significance. If the confidence interval for a contrast does not embrace zero it is considered significant and the two neighborhood types thus compared are said to have different participation rates. For further detail see Appendix C.

## Number of Different Activities Engaged In

The data for this measure was the mean number of activities participated in by respondents in each neighborhood type, providing a ratio level of measurement. Oneway analysis of variance could therefore be performed with neighborhood type as the independent variable. The SPSS program 'Oneway' was used to calculate the $F$ probability statistic that there were differences among the neighborhood types. The decision level of significance was set once again

at .05.

A significant overall $F$ provided a similar problem to that described in the previous section dealing with a significant $X^2$, which particular comparison was causing the significant overall difference? Scheffe's test was used to make comparisons between pairs of neighborhood 'types.

This procedure is very similar to the *post hoc* procedure used for the variable Participation Rate; ie. it requires the construction of confidence intervals around estimates of the contrasts.

This process was performed using the SPSS program 'Oneway' with the 'Ranges' test set to 'Scheffe (.05)'.

There were two reasons that Scheffe's test was the one, chosen to make the pairwise comparisons of means for the variable 'Number of Activities'. Scheffe's test was the most stringent of the *a posteriori* tests that can be used to investigate ANOVA tables. Although Kirk recommended Tukey's HSD test for pairwise comparisons instead of Scheffe's, Tukey's HSD was only approximate when cell sizes were unequal. Scheffe's test, however was exact even when cell sizes were not equal. The cell sizes in this study ranged from 207 to 487.

## Frequency of Participation

The data available for this measure were a breakdown of that used for the variable Number of Activites. The mean number of activities engaged in by respondents was

sub-divided into the four frequency intervals; 1-10 times per year, 11-20 times per year, 21-30 times per year, and over 30 times per year. This produced a mean for each category, and 'Oneway' and 'Scheffe (.05.)' were run on each category. The decision level for significance was also set to .05.

## Summary

The null hypothesis was tested using three measures of leisure behavior in each of three leisure categories. These measures were "participation rate", "number of activities engaged in", and "frequency of participation" (in four frequency intervals). Scores for these measures were obtained for the six neighborhood types from data collected for a city-wide survey. Initial comparisons were made using chi-square (for "participation rate"), and one way analysis of variance (for the other measures). Post hoc analysis was undertaken to determine which neighborhood types differed from each other.

# III. RESULTS

The results of this study will be presented in two parts.
The first will describe the leisure behavior within each
neighborhood type. The second part will deal with the
results of the analysis carried out to test the study's
hypothesis. This latter section will be divided into three
sub-sections one for each of the leisure categories, outdoor
recreation, sports/athletics, and arts and cultural.


## A. LEISURE BEHAVIOR IN NEIGHBOURHOOD TYPES

### Neighbourhood Type One: Older Highrise

These were older neighborhoods with a high proportion
of apartments and young, single persons. This neighborhood
had the smallest response rate ratio (see Table 1: Chapter
II) among the six types. It also produced the fewest number
of respondents, 207.

The type 1 neighborhood had the smallest number (4.25)
of different activities engaged in for the Outdoor
Recreation leisure category. In general this neighborhood
type was near the low end of most of the measures of leisure
behavior. The exception was in the Arts and Cultural
category where this neighborhood had the second highest
number (1.59) of different activities engaged in. The
details of the leisure behavior for this type have been
placed in Table 2.

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Table 2 Neighborhood Type 1: Older Highrise

Participation Rate

| Leisure Category | Per Cent Participating |
|---|---|
| Outdoor Recreation | 90.6% |
| Sports/Athletics | 73.2% |
| Arts and Cultural | 57.4% |

Number of Activities

| Leisure Category | Average # of Activities |
|---|---|
| Outdoor Recreation | 4.25 |
| Sports/Athletics | 3.65 |
| Arts and Cultural | 1.59 |

Frequency of Participation

| Leisure Category | Average # of Activities In Each Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| Outdoor Recreation | 2.55 | .76 | .22 | .48 |
| Sports/Athletics | 1.86 | .66 | .32 | .70 |
| Arts and Cultural | .60 | .29 | .18 | .43 |

## Neighbourhood Type Two: Older Residential

These neighborhoods were also located in older areas of Edmonton, but in comparison to the type one neighborhoods contained significantly more single family dwellings, families with children, and older people (over 55). The type 2 neighborhoods, despite the fact they returned the second largest number of useable questionnaires (466), had the second smallest response rate ratio (.94, see Table 1). The type 2 neighborhood was the only one common to all the Parks and Recreation districts, and for this reason had the greatest number of households selected for the sample.

Type 2 reported the lowest rates of participation in all three leisure categories; 87.0% in Outdoor Recreation; 68.1% in Sports/Athletics; and 52.3% in Arts and Cultural. These respondents also reported the lowest number of different activites engaged in for the Sports/Athletics and Arts and Cultural categories, 3.36 and 1.35 respectively. The average number of different activities reported for Outdoor Recreation was 4.26 which placed type 2 .01 activities above the type 1 neighborhoods which reported the lowest average for this category. Table 3 summarizes the findings for this neighborhood type.

## Neighbourhood Type Three: Middle-aged

Type 3 consisted of middle-aged neighborhoods with a high proportion of single family dwellings and middle-aged families (aged 35-55). These neighborhoods returned the same

Table 3 Neighborhood Type 2: Older Residential

### Participation Rate

| Leisure Category | Per Cent Participating |
|---|---|
| Outdoor Recreation | 87.0% |
| Sports/Athletics | 68.1% |
| Arts and Cultural | 52.3% |

### Number of Activities

| Leisure Category | Average #of Activities In Each Category |
|---|---|
| Outdoor Recreation | 4.26 |
| Sports/Athletics | 3.36 |
| Arts and Cultural | 1.35 |

### Frequency of Participation

| Leisure Category | Average #of Activities In Each Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| Outdoor Recreation | 2.73 | .71 | .30 | .39 |
| Sports/Athletics | 1.80 | .58 | .31 | .55 |
| Arts and Cultural | .53 | .26 | .15 | .36 |

number of useable questionnaires (466) as the type 2
neighborhoods, but from almost one hundred fewer sample
households (397 vs. 496). This produced a response rate
ratio of 1.17 (see Table 1).

The measures of leisure behavior for this neighborhood
type were generally in the middle of the group. Table 4
contains the details of these measures.

## Neighborhood Type Four: Younger

These were younger to middle-aged neighborhoods with a
high proportion of young families (aged 25-34) and some
multiple family housing. The response rate ratio for this
neighborhood type was 1.21 (Table 1), and this produced 358
respondents. Neighbourhood type 4 produced the second
smallest number of sample households (296).

The measures of leisure behavior for this neighborhood
type were also in the middle of the group. In general they
were slightly higher than the measures for the type 3
neighborhoods. The details of these measures have been
presented in Table 5.

## Neighborhood Type Five: Professional

These were middle-aged neighborhoods similar to type
3's but with a higher proportion of people engaged in
professional occupations. These neighborhoods returned the
highest number of useable questionnaires per household
contacted, 1.37 (Table 1). The type 5 neighborhood was

Table 4 Neighborhood Type 3: Middle-aged

Participation Rate

| Leisure Category | Per Cent Participating |
|---|---|
| Outdoor Recreation | 90.7% |
| Sports/Athletics | 73.1% |
| Arts and Cultural | 57.6% |

Number of Activties

| Leisure Category | Average # of Activities |
|---|---|
| Outdoor Recreation | 4.62 |
| Sports/Athletics | 3.81 |
| Arts and Cultural | 1.53 |

Frequency of Participation

| Leisure Category | Average # of Activities In Each Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| Outdoor Recreation | 2.85 | .76 | .30 | .46 |
| Sports/Athletics | 1.92 | .79 | .33 | .46 |
| Arts and Cultural | .51 | .36 | .21 | .39 |

Table 5 Neighborhood Type 4: Younger

## Participation Rate

| Leisure Category | Per Cent Participating |
|---|---|
| Outdoor Recreation | 91.5% |
| Sports/Athletics | 73.2% |
| Arts and Cultural | 57.2% |

## Number of Activities

| Leisure Category | Average # of Activities |
|---|---|
| Outdoor Recreation | 4.57 |
| Sports/Athletics | 4.32 |
| Arts and Cultural | 1.52 |

## Frequency of Participation

| Leisure Category | Average # of Activities In Each Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| Outdoor Recreation | 2.96 | .75 | .27 | .43 |
| Sports/Athletics | 2.27 | .75 | .39 | .64 |
| Arts and Cultural | .53 | .33 | .18 | .44 |

located in only two of the five Parks and Recreation
Districts, resulting in the smallest sub-sample size of 197
households.

Type 5 neighborhoods reported the highest participation
rates in all three leisure categories; 96.6% in Outdoor
Recreation, 85.5% in Sports/Athletics and 68.4% in Arts and
Cultural.

The respondents in these neighborhoods also engaged in
the highest average number of different activities for all
three categories. They were the only neighborhood type to
report an average of greater than five (5.2) different
activities engaged in for Outdoor Recreation.

The average number of Sports/Athletics engaged in by a
type 5 respondent was 4.69. Type 5 also reported the largest
average number (.83) of Sports/Athletics activities done
more than 30 times per year.

An average of 1.73 different Arts and Cultural
activities were engaged in annually, with 31.3% (.54) of
these being done more than 30 times per year. These figures
were also the highest actual and relative amounts in this
category among the six neighborhood types. The measures of
leisure behavior for this neighborhood type have been
summarized in Table 6.

## Neighborhood Type Six: New

Neighbourhoods in this type were not determined via the
analysis conducted by the City of Edmonton's Parks and

Table 6 Neighborhood Type 5: Professional

Participation Rate

| Leisure Category | Per Cent Participating |
|---|---|
| Outdoor Recreation | 96.6% |
| Sports/Athletics | 85.5% |
| Arts and Cultural | 68.4% |

Number of Activities

| Leisure Category | Average # of Activities |
|---|---|
| Outdoor Recreation | 5.19 |
| Sports/Athletics | 4.69 |
| Arts and Cultural | 1.73 |

Frequency of Participation

| Leisure Category | Average # of Activities In Each Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| Outdoor Recreation | 3.06 | 1.05 | .33 | .51 |
| Sport/Athletics | 2.17 | 1.03 | .44 | .83 |
| Arts and Cultural | .56 | .35 | .15 | .54 |

Recreation Department. They were placed in this group because they came into existence after the 1971 census was taken. These neighborhoods produced the largest group of respondents, 487. The response rate ratio for type 6 was 1.23 (Table 1), second only to the type 5 neighborhoods. Participation rates reported for this neighborhood type were also second only to those reported for type 5. Outdoor Recreation was participated in by 94.6% of the respondents, 82.3% engaged in Sports/Athletics, and 63.4% engaged in Arts and Cultural activities.

While the average number of different Outdoor Recreation activities (4.89) was the second largest, the average number of different Sports/Athletics activities engaged in was less than both type 4 and type 5 neighborhoods. The average number of Arts and Cultural activities participated in was 1.57, which was less than the average reported for type 5 and type 1. Further details on the measures of leisure behavior for neighborhood type 6 have been presented in Table 7.

## B. THE COMPARISONS AMONG NEIGHBOURHOOD TYPES

Tables 8,9,10, and 11 summarize the leisure behavior results discussed in the previous section. Table 8 contains 'participation rates', and 'number of activities' by neighborhood type, while tables 9,10 and 11 contain the 'frequency' measures by neighborhood type.

Table 7 Neighborhood Type 6: New

### Participation Rate

| Leisure Category | Per Cent Participating |
|---|---|
| Outdoor Recreation | 94.6% |
| Sports/Athletics | 82.3% |
| Arts and Cultural | 63.4 |

### Number of Activities

| Leisure Category | Average # of Activities |
|---|---|
| Outdoor Recreation | 4.89 |
| Sports/Athletics | 4.29 |
| Arts and Cultural | 1.57 |

### Frequency of Participation

| Leisure Category | Average # of Activities In Each Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| Outdoor Recreation | 3.26 | .79 | .29 | .41 |
| Sports/Athletics | 2.24 | .80 | .38 | .59 |
| Arts and Cultural | .53 | .37 | .19 | .40 |

## Table 8 Participation Rate and Number of Activities

| Neigh.<br>Type | | | Leisure Category | | | | |
|---|---|---|---|---|---|---|---|
| | Outdoor<br>Recreation | | Sports/<br>Athletics | | Arts and<br>Cultural | | |
| | Rate* | Activ.# | Rate* | Activ.# | Rate* | Activ.# | |
| One | 90.6% | 4.25 | 73.2% | 3.65 | 57.7% | 1.59 | |
| Two | 87.0% | 4.26 | 68.1% | 3.36 | 52.3% | 1.35 | |
| Three | 90.7% | 4.62 | 73.1% | 3.81 | 57.6% | 1.53 | |
| Four | 91.5% | 4.57 | 78.4% | 4.32 | 59.4% | 1.52 | |
| Five | 96.6% | 5.19 | 85.5% | 4.69 | 68.7% | 1.73 | |
| Six | 94.6% | 4.89 | 82.3% | 4.29 | 63.6% | 1.57 | |

* Participation Rates / Percentage of respondents
  engaging in that type of activity
# Number of different activities engaged in.

Table 9 Frequency: Outdoor Recreation

| Neigh. Type | Frequency Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| One | 2.59 | 0.76 | 0.22 | 0.48 |
| Two | 2.73 | 0.71 | 0.30 | 0.39 |
| Three | 2.85 | 0:76 | 0.30 | 0.46 |
| Four | 2.96 | 0.75 | 0.27 | 0.43 |
| Five | 3.06 | 1.05 | 0.33 | 0.51 |
| Six | 3.26 | 0.79 | 0.29 | 0.41 |

## Table 10 Frequency: Sports/Athletics

| Neigh. Type | Frequency Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| One | 1.86 | 0.66 | 0.32 | 0.70 |
| Two | 1.80 | 0.58 | 0.31 | 0.55 |
| Three | 1.92 | 0.79 | 0.33 | 0.52 |
| Four | 2.27 | 0.75 | 0.39 | 0.64 |
| Five | 2.17 | 1.03 | 0.44 | 0.83 |
| Six | 2.24 | 0.80 | 0.38 | 0.59 |

## Table 11 Frequency: Arts and Cultural

| Neigh. Type | Frequency Category | | | |
|---|---|---|---|---|
| | '1-10' | '11-20' | '21-30' | 'over 30' |
| One | 0.60 | 0.29 | 0.18 | 0.43 |
| Two | 0.53 | 0.26 | 0.15 | 0.36 |
| Three | 0.51 | 0.36 | 0.21 | 0.39 |
| Four | 0.53 | 0.33 | 0.18 | 0.44 |
| Five | 0.56 | 0.35 | 0.15 | 0.54 |
| Six | 0.53 | 0.37 | 0.19 | 0.40 |

## Outdoor Recreation

### Participation Rates

The comparison of participation rates among the neighborhood types involved the use of the chi-square statistic. The proportional data used to calculate chi-square has been summarized in Table 12. The calculated chi-square was significant at the .001 level of significance, hence the Outdoor Recreation participation rates of the neighborhood types were considered different.

Table 11

Outdoor Recreation: Participation Rates

| Neighbor- hood Type | No | Yes |
|---|---|---|
| One | 9.4% | 90.6% |
| Two | 13.0% | 87.0% |
| Three | 9.3% | 90.7% |
| Four | 8.5% | 91.5% |
| Five | 3.4% | 96.6% |
| Six | 5.4% | 94.6% |

Chi-square = 27.4; degrees of freedom = 5; probability <.0001

In order to determine wherein this difference lay, multiple paired comparisons were conducted . The significant chi-square arose because of differences between neighborhood type 2 and neighborhoods type 5 and 6. The details of this *post hoc* analysis have been

placed in Appendix C.

## Number of Activities

The mean number of activities by respondent was calculated for each neighborhood type (Table 13). One way analysis of variance was conducted with neighborhood type being the independent variable. The calculated $F$ had a probability of .0001 thus exceeding the decision level of significance which was set at .05. This indicated that the mean number of activities engaged in by respondents were different across neighborhood types.

Scheffe's test was used to conduct *post hoc* multiple paired comparisons. Differences were found for the following pairs; type 2 and type 5, type 2 and type 6, and type 1 and type 5. No other significant differences were found. The details of this analysis have been placed in Appendix C.

Table 13

Outdoor Recreation: Number of Activities

| Neighborhood Type | Average # of Activities |
|---|---|
| One | 4.25 |
| Two | 4.26 |
| Three | 4.62 |
| Four | 4.57 |
| Five | 5.19 |
| Six | 4.89 |

Degrees of freedom (5;2248); $F$ ratio = 5.088; $F$ probability <.0001.

Frequency of Participation

For each leisure category there were four measures of frequency, corresponding to the four "times per year"

categories used on the *1980 Leisure Survey* questionnaire. Each measure consisted of the average number of activities engaged in by respondents at each level of frequency. For each frequency category, therefore, a one way analysis of variance was conducted with neighborhood type as the independent variable.

For Outdoor Recreation, two of the four frequency categories were found to have significantly different means (Table 14). They were the '1 - 10', and the '11 - 20' categories. Scheffe's test on the '1 - 10' category means revealed that neighborhood type 6 had a significantly different mean from both type 1 and type 2, but that no other differences among the neighborhoods were significant at the .05 level. The same test on the '11 - 20' category indicated that the F was significant because differences existed between type 5 and types 2, 3 and 4. No other paired differences were significant at the .05 level. Details of this analysis have been placed in Appendix C.

Table 14

Outdoor Recreation: Frequency of Participation

| Neighborhood Type | Frequency | Category |
|---|---|---|
| | '1-10' | '11-20' |
| One | 2.59 | .76 |
| Two | 2.73 | .71 |
| Three | 2.85 | .76 |
| Four | 2.96 | .75 |
| Five | 3.06 | 1.05 |
| Six | 3.26 | .79 |
| F probability | .0022 | .0016 |

## Summary

In the Outdoor Recreation leisure category four of the six measures of leisure behavior resulted in a significant difference being indicated among the neighborhood types. Further investigation revealed that the differences could be traced to a relatively small number of paired neighborhood differences. There were 90 possible paired comparisons from the four measures. Only ten of these proved to have significant differences. Neighborhood type 6 and neighborhood type 5 were both significantly different from neighborhood type 2 on three of the four measures. For the measure, 'participation rate', differences arose only between neighborhood type 2 (older, residential) and types 5 (professional) and 6 (new). In both cases measures for type 2 were lower. For 'number of activities'; type 2 was again different (lower) from types 5 and 6, and type 1 (older highrise) also proved different (lower) than type 5. For the '1-10' frequency category both types 1 and 2 were significantly lower than type 6. Type 5 had a significantly higher measure than types 2,3 (middle-aged) and 4 (younger) in the '11-20' frequency category.

## Sports/Athletics

### Participation Rate

The participation rate measure for this leisure category was identical to that used for Outdoor Recreation, therefore, chi-square was used to test for equality of proportions. These proportions have been displayed in Table 15. The calculated value of $X^2$ for this comparison proved significant beyond the .001 level.

Table 15

Sports/Athletics: Rate of Participation

| Neighbor-<br>hood Type | No | Yes |
|---|---|---|
| One | 26.8% | 73.2% |
| Two | 31.9% | 68.1% |
| Three | 26.9% | 73.1% |
| Four | 21.6% | 78.4% |
| Five | 14.5% | 85.5% |
| Six | 17.7% | 82.3% |

Raw $X^2$ = 43.24; degrees of freedom = 5;

probability < .001

The ensuing *post hoc* multiple comparisons revealed a
number of paired differences that were significant at
the .05 level. Neighbourhood type 2 was different from
neighborhood types 4, 5 and 6. Neighbourhood type 3 was
also different from both neighborhood type 5 and type 6.

See Appendix C for the complete details of this
analysis.


## Number of Activities

The one-way analysis of variance performed on the
mean number of activities per respondent by neighborhood
type (see Table 16) produced an $F$ ratio with a
probability less than .001 that the difference was due
to chance. The level of signficance was set at .05.
Therefore, it was accepted that the means were in fact
different.

Table 16

Sports/Athletics: Number of Activities

| Neighborhood Type | Average # of Activities |
|---|---|
| One | 3.65 |
| Two | 3.36 |
| Three | 3.81 |
| Four | 4.32 |
| Five | 4.69 |
| Six | 4.29 |

Degrees of freedom = (5:2248); $F$ ratio = 5.978; $F$ probability < .001

The subsequent paired comparisons using Scheffe's test indicated that only three of the comparisons were significantly different. Type 2 proved to be different from three other neighborhood types, type 4, type 5 and type 6. Further details of this analysis can be examined

in Appendix C.

## Frequency of Participation

One-way analysis of variance was conducted on each of the four frequency categories. Two of the categories, '1-10', and '11-20', produced significant $F$ ratios indicating that the means of the six neighborhood types were different.

Table 17

Sports/Athletics: Frequency of Participation

| Neighborhood Type | Frequency | Category |
|---|---|---|
| | ' 1-10' | ' 11-20' |
| One | 1.86 | .66 |
| Two | 1.80 | .58 |
| Three | 1.92 | .79 |
| Four | 2.27 | .75 |
| Five | 2.17 | 1.03 |
| Six | 2.24 | .80 |
| F probability | .01 | .0001 |

The *post hoc* multiple comparisons for the '1-10' frequency category failed to produce any significant paired differences when Scheffe's test was used. For the '11-20' frequency category one paired comparison proved significantly different. There was a difference between

neighborhood type 2 and neighborhood type 5. The details of this analysis have been placed in Appendix C.

## Summary

Four of the six measures of leisure behavior for the Sports/Athletics category were significantly different among the neighborhood types. These measures, 'participation rate',' number of activities', '1-10' frequency, and '11-20' frequency, were the same ones that proved significant in the Outdoor Recreation. category. Once again these 'significant' differences could be attributed to differences between only a few of the neighborhood types.

For 'participation rate' five of the fifteen possible pairs were significantly different. Type 2 (older, residential) had a lower participation rate than types 4 (younger), 5 (professional) and 6 (new). Type 3 (middle-aged) also had a lower participation rate than type 5 and type 6. For the 'number of activities' measure, the paired comparison analysis indicated that differences existed between neighborhood type 2 and types 4, 5 and 6 only. These three neighborhood types all had higher measures than type 2. Although the ANOVA for the '1-10' frequency category indicated a significant difference, the *post hoc* analysis found none

of the paired comparisons to be significantly different.
The same analysis applied to the '11-20' category
discovered significant differences between neighborhoods
type 5 and 6. Type 5 neighborhoods had a higher measure
in this frequency category than did the type 6's.

In the Sports/Athletics category only 9 of the 90
possible comparisons were significantly different. The
differences between types 2 and types 4, 5 and 6 were
consistent for only two of the measures, 'participation
rate', and 'number of activities'. No other differences
between neighborhood types were consistent across
measures of leisure behavior in the Sports/Athletics
category.

## Arts and Cultural

### Participation Rate

The comparison of participation rates in Arts and
Cultural activities among the six neighborhood types
once again involved the chi-square statistic (see Table
18). The calculated $X^2$ was significant thus indicating
that participation rates were different.

Table 18


Arts and Cultural: Participation Rates

| Neigbour-hood Type | No | Yes |
|---|---|---|
| One | 42.3% | 57.7% |
| Two | 47.7% | 52.3% |
| Three | 42.4% | 57.6% |
| Four | 40.6% | 59.4% |
| Five | 31.3% | 68.7% |
| Six | 36.4% | 63.6% |

Raw $X^2=22.47$; degrees of freedom=5; probability < .001


The *post hoc* multiple comparisons performed for
this measure indicated that two of the comparisons had
significant differences. Neighborhood type 2 had a
significantly different rate of participation from both
neighborhood type 5 and type 6. The details of this
analysis have been placed in Appendix C.

Number of Activities

The one-way analysis of variance performed on the mean number of different Arts and Cultural activities engaged in by respondents in the different neighborhood types indicated that there were no significant differences among the means.

Table 19

Arts and Cultural: Number of Activities

| Neighborhood Type | Average # of Activities |
|---|---|
| One | 1.59 |
| Two | 1.35 |
| Three | 1.58 |
| Four | 1.52 |
| Five | 1.73 |
| Six | 1.57 |

Degrees of freedom=(5;2248);$F$ Ratio=1.469;$F$ Probability=.1969

The non-significant $F$ ratio precluded any further comparisons among the means. (see Appendix C for the detailed ANOVA table)

## Frequency of Participation

None of the four frequency categories proved to have signficant $F$ ratios (see Appendix C). The means of the six neighborhood types were not considered different in each frequency category, and as stated above further comparisons would have been meaningless.

## Summary

In this leisure category only one of the measures 'participation rate', indicated that significant differences existed among the neighborhood types. The paired comparison test used to analyze these differences revealed that this significance arose because neighborhood type 2 (older,residential) had lower participation rate than both types 5 (professional) and 6 (new).

## Summary of Results

In each leisure category at least one, and as many as
four, of the measures of leisure behavior seemed on the
surface to support the hypothesis (ie. leisure behavior
varies by neighborhood type). Both the Outdoor Recreation
and the Sports/Athletics leisure categories had four
measures indicating that differences existed among the
neighborhood types. In both cases these measures were
'participation rate', 'number of activities', the '1-10-
frequency category, and the '11-20' frequency category. For
the Arts and Cultural leisure category only one measure,
'participation rate', indicated that differences existed
among the neighborhood types.

*Post hoc* analyses of these differences consisted of
making paired comparisons among the neighborhood types.
These analyses revealed which neighborhood types differed
from each other. The only consistent differences that could
be found were between neighborhood type 2 and neighborhood
types 5, and between neighborhood type 2 and neighborhood
type 6. The following list contains all the significant
paired comparisons by leisure category and behavior measure.

1. Outdoor Recreation

   a. Participation rate

      1) type 2 and types 5 and 6

   b. Number of activities

      1) type 2 and types 5 and 6; type 1 and type 5

   c. Frequency: '1-10' times per year

        1)   types 1 and 2 and type 6

    d.   Frequency: '11-20' times per year

        1)   types 2,3 and 4 and type 5

2.   Sports/Athletics

    a.   Participation rate

        1)   type 2 and types 4,5 and 6; type 3 and types 5 and 6

    b.   Number of activities

        1)   type 2 and types 4,5 and 6

    c.   Frequency: '1-10' times per year

        1)   None

    d.   Frequency: '11-20' times per year

        1)   type 2 and type 5

3.   Arts and Cultural

    a.   Participation rate

        1)   type 2 and types 5 and 6

Each of the fifteen different comparisons of neighborhood types was made on eighteen measures in the study (6 measures X 3 leisure categories). For 11 of the 15 possible paired comparisons a significant difference arose one or fewer times out of 18 possible occurences. One paired comparison (2 and 5) was significantly different on 7 out of 18 possible occurences. One other pair (2 and 6) was different on 6 of the 18 measures, and two others (3 and 5; and 2 and 4) were significantly different on 2 out of 18 . A

total of 270 (15 pairs X 18 measures) paired comparisons were possible. Twenty-nine of these proved to measure significant differences, and thirteen of these involved only two of the pairs; type 2 and type 5, and type 2 and type 6.

It should be noted that there were some difficulties in interpreting the results from the frequency measures. The nature of the measure (average number of activities engaged in per frequency interval) meant that frequency was being measured four different times. The difficulty arose in interpreting the direction of the differences. For example, if a neighborhood type has a higher average number of activities engaged in '1-10' times per year, does this mean that its respondents participate less frequently, or more frequently than respondents from the other neighborhood types. All that really could be said was that the neighborhood types were different. Unfortunately, little could be said about the diretion of that difference.

The data analyzed in this study provides support for the hypothesis that leisure behavior does not vary significantly by neighborhood type. The hypothesis holds for all three of the leisure categories but was most strongly supported for the Arts and Cultural category. There were however, two consistencies revealed by the data. Neighborhood type 2 (older, residential) had a lower incidence of leisure behavior than both neighborhood type 5 (professional) and neighborhood type 6 (new). Respondents from the type 2's participated at a lower rate and engaged

in fewer different activities than the respondents from both the type 5 and type 6 neighborhoods.


## C. DISCUSSION

Neighborhood type 2 (older, residential) respondents consistently reported the lowest participation rates, and the fewest number of different activities engaged in, for all three leisure categories. These respondents also reported the lowest (except for Sports/Athletics where they were the second lowest) number of activities engaged in more than thirty times per year. [7]

On the other end of the scale, type 5 (professional) neighborhoods had the highest participation rates, the largest number of different activities, and the largest number of activities engaged in more than 30 times per year.

The age structure of the type 2 neighborhoods as presented in the *1979-83 Master Plan*, indicated that in comparison to the other neighborhood types, they had the largest proportion of residents in the '55 and older' category. Age, having a negative effect on participation, was probably one of the factors affecting the leisure behavior patterns of these neighborhoods. The percentage of the respondents to the survey from neighborhood type 2 who fell in this age category was also the largest among the six types. Age was apparently not an important factor in

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[7] This measure was chosen as representative of of a high frequency of participation in the absence of an overall frequency measure.

determining leisure behavior in the type 5 neighborhoods.
The age characteristics of type 5 respondents were simflar
to the average, and not on the young side as might have been
expected.

While education level was not specified in the *1979-83
Master Plan*, at least in terms of specific levels reached by
residents of the various neighborhood types, there was a
reference to 'professionals' as being the difference between
type 5 and type 3. The fact that one has a "professional
occupation' usually implies a high education level.
Education has been found to be positively related to both
participation rates and number of activities engaged in
(White, 1975; Curtis and Milton. 1976). The type 5 education
level was the highest of the 6 neighborhoods. 43.5% of these
respondents had attended at least some university. This was
in comparison to type 2 respondents of whom only 28.9% had
attained this level of education. The type 2 respondents did
not have the lowest education level even though this could
have been expected because of their low scores on the
measures of leisure behavior. The type 2 education level was
approximately at the average.

These two neighborhood types were on opposite ends of
the leisure behavior measures in almost every case (ignoring
the other three measures of frequency), and the differences
between them proved significant for six of the eighteen
possible measures. These measures were 'participation rate'
in all three leisure categories; 'number of activities

engaged in' and the '11-20' times per year frequency
interval in both the Outdoor Recreation and Sports/Athletics
categories. Although the actual scores on the various
measures can be explained in part by specific socio-demogra-
phic variables (age for type 2 and education for type 6),
the reasons for the differences between the two types were
not as evident. The type 2 residents were, on the average,
older than the type 5 respondents, however, type 5 was far
from the youngest of the neighborhood types. The same holds
true for education level. Type 5 respondents were the most
educated of the six types, but type 2 respondents were not
the least educated. Some other factor or combination of
factors were also influencing the leisure behavior of these
two types and produced the significant differences that were
found.

The type 6 neighborhoods were also significantly
different from the type 2's on five of the nine measures
discussed previously. The type 6 neighborhoods, although
treated as a separate cluster in this study, were not
produced by the analysis that came up with the other five.
Instead, this cluster consisted entirely of new
neighborhoods for which no census data were available. The
only evident characteristic of these neighborhoods was age
of the neighborhood. There was no certainty that they would
have rated different from the type 4's (they were rated as
the youngest of the neighborhoods) on this characteristic.
There was, therefore, but limited evidence that the type 6's

would have been characterized as a unique grouping of

neighborhoods had they been subjected to the proper

analysis. For this reason little can be said about the

differences that were found between this neighborhood type

and the others.

## IV. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### A. SUMMARY

This study has examined the usefulness of the neighborhood typology put forth by the City of Edmonton's Parks and Recreation Department, in predicting leisure behavior. Neighborhoods were clustered on the basis of various socio-demographic variables. The City then proposed that the residents within each cluster (called a neighborhood type) would exhibit different leisure behavior from the residents of the other neighborhood types. The City had hoped to be able to plan and implement recreation programs based on these differences.

There was only limited information available concerning the methods used by the City to arrive at their neighborhood types. Little or no documentation could be located, and information had to be obtained through an interview with a former employee who was several years removed from the project. For this reason no predictions could be made as to how each neighborhood type might vary from the others. Instead, the null hypothesis was tested, ie. there would be no differences in leisure behavior among the neighborhood types. For the same reasons, the validity of the process that produced the neighborhood types was not examined, and it had to be assumed that the groupings of neighborhoods was the result of their having some similar characteristics.
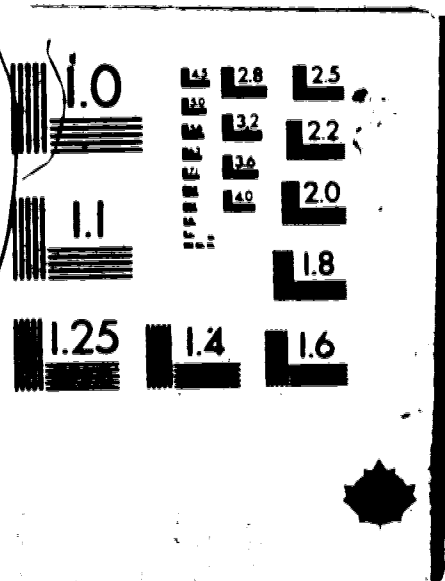
The data used to test the hypothesis was from a city-wide survey on leisure conducted by the Parks and Recreation Department in Edmonton, in November of 1980. (The 1980 Leisure Survey) This survey gathered information on many different aspects of leisure, varying from activity participated in, to why one did not participate in certain types of leisure behavior.

The measures of leisure behavior used in this study were rate of participation, number of different activities engaged in, and frequency of participation.[8] Leisure behavior itself was divided into three categories: Outdoor Recreation, Sports/Athletics, and Arts and Cultural.

The hypothesis of no difference between neighborhood types was initially tested via tests for homogeneity of proportions (in the case of 'participation rates'), and tests of homogeneity of means (for the other measures). These tests were conducted separately for each of the three leisure categories. In the Outdoor Recreation and Sports/Athletics categories four of the six measures indicated significant differences existed among the neighborhood types. Only one measure gave a similar indication in the Arts and Cultural category. Because of the generality of these measures,[9] further analysis was required

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[8] Due to the nature of the question on the survey instrument, this last measure was in fact four separate measures of frequency of participation.

[9] A significant difference can be indicated when only two of the neighborhood types have different proportions or means. With six neighborhood types there were a total of fifteen possible comparisons of two types.

to identify which specific neighborhood types were different
in their leisure behavior.

The *post hoc* analysis involved paired comparisons among
the neighborhood types. These tests revealed that the
significant differences found by the initial tests for
homogeneity were usually due to differences between two or
three types. The only consistent differences found were
between type 2 (older, residential) and type 5
(professional), and between type 2 and type 6 (new).

## B. CONCLUSIONS

It was proposed that leisure behavior would vary by
neighborhood type. The data analyzed provided very little
support for this postulate. The evidence supporting a
difference in leisure behavior between neighborhood types
involved three of the types.

The neighborhood typology was successful in
differentiating leisure behavior between type 2 and type 5,
and if we accept type 6 as a separate cluster the typology
was also successful in differentiating type 2 and type 6.
This gives some hope that the social area analysis carried
out by the City of Edmonton might yet be developed into a
useful tool for predicting leisure behavior. At present,
however this composite model with a spatial component added
to socio-demographic variables does not appear much
effective than the primary sociological variables (age,
education, etc.) themselves.

A number of factors made it difficult to interpret the generally negative results. One interpretation was that the neighborhood types were obsolete in 1980. Redevelopment in the older residential areas since the 1971 census has increased the population density of these neighborhoods. Many areas that were once primarily single family housing areas have become well-populated with walk-ups and highrise apartment buildings. One of the characteristics that was used to distinguish one neighborhood type from another was type of dwelling. A change in the mix of dwelling types might well lead to a different clustering of the neighborhoods into types if the procedure were repeated. Similar changes over the ten year period may also have affected the other characteristics that describe a neighborhood type. Nevertheless, for the neighborhood type idea to be useful in predicting leisure behavior, a degree of permanence in neighborhood type and leisure behavior must be assumed.

Another explanation for the results might be that the quality of the data did not allow an adequate test. Response to the survey was slightly better than 55%. While this is fairly high for the type of survey that was conducted,[10] 45% of the sample did not answer the questionnaire. Response ratios also varied by neighborhood type, and while the representativeness of the survey sample as a whole was

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[10] An acceptable response rate is 50% while a good response rate is 60%(Babbie, 1973)

established, it was not established within each neighborhood
type. The non-respondents to the 1980 Leisure Survey might
well have been a major contributing factor to the results
produced in this study. Leisure behavior may have been
similar across neighborhood types because only a certain
type of person was encouraged to respond to the survey. The
55% response rate and the evidence of representativeness
were, however, considered to be sufficient for the analysis
that was undertaken.

Finally, this study gives no consideration to supply
factors and how they affect participation behavior. There is
some evidence that supply, or opportunities available, have
a positive affect on the frequency of participation (Smith,
1980), and also influences the rate of non-participation
(ie. no opportunity, no participation) (Romsa and Hoffman,
1980). Holding the supply factor constant during the
analysis might have given more significance to the
differences in leisure behavior among the neighborhood
types. The supply factor is a variable that perhaps should
have been included in the analysis that produced the
neighborhood types. There is no evidence to suggest that
supply was considered as a variable when the analysis was
performed.

## C. RECOMMENDATIONS

It is recommended that the analysis that derived the neighborhood types be repeated (and this time fully documented) using both the 1971 federal census data and the most recent update (1981 if possible) of that data. The former is to ensure that the procedures used are correct, and that the same groupings of neighborhoods can be produced. The latter is suggested so as to update the groupings and to include those areas (type 6) that could not be analyzed in the original study. Not only may the groupings of neighborhoods be different, but the variables may also load differently on the factors, thus producing different characteristics to describe the clusters.

Until this kind of replication occurs or some substantiating documentation of the first analysis can be found, there is little use in utilizing the neighborhood typology in further studies. If the typology can be confirmed, however, there are several further studies that could be undertaken. A replication of this study is recommended only if the clustering of neighborhoods is altered in some manner. Instead, it is suggested that a more detailed interview survey be carried out. These surveys generally can achieve response rates in the ninety percent range and thus can provide a sample that has a greater likelihood of representing the population. This type of survey, therefore, would reduce the chances that the non-respondents were adversely affecting the results.

A study using participation in specif         es as a measure of leisure behavior is also recomme-           e of the characteristics the neighborhood type model  ses is type of dwelling. There is some evidence that the type of dwelling lived in influences the specific type of leisure activities participated in (Hendricks, 197?). Information as to the specific activities participated in by respondents, is available from the 1980 Leisure Survey so that this kind of study could be easily done. Success with this type of study could also give strong support for the need to redo the neighborhood type analysis, although it is strongly suggested that the latter should be carried out before any further work is done.

This study has provided little support for the hypothesis that leisure behavior varies by the neighborhood types defined by the City of Edmonton. Until the analysis that produced the neighborhood types has been verified and updated, it is suggested that it not be used in planning and programming for recreation by the Parks and Recreation Department in Edmonton. The use of this model by other cities is also not recommended until these same tests have been undertaken.

Most of the empirical evidence in this study points to a rejection of the neighborhood types as a valid predictor of leisure behavior. However, there still remains a great deal of merit in this approach to the continuing problem that faces most city recreation departments. How do we know

what the people want, or rather how do we predict what they want with at least a resonable degree of success? The traditional standards approach is perhaps even less useful for planning leisure opportunities, and the City of Edmonton took an innovative step with the use of neighborhood types.

As with any bureaucracy dealing with human behavior, a recreation department must attempt to get some insight into that behavior. There are many factors involved in determining an individual's or a collection of individuals' behavior patterns. The science of the study of human interaction is as yet hardly developed enough to be more than occasionally predictive. Although the neighborhood types failure to predict leisure behavior completely should not be surprising, there is something appealing about this attempt to relate leisure behavior to where we live. Who we are (demographically speaking) and where we live should have considerable affect on what we do with our leisure time. The neighborhood typology should be viewed as a tentative step towards understanding the factors influencing leisure behavior in an urban setting.

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APPENDICES

1. A: 1980 Leisure Survey Questionnaire

2. B: Tables Establishing Representativeness of Survey

3. C: Data Analysis

APPENDIX A: 1980 LEISURE SURVEY QUESTIONNAIRE

# 1980 Leisure Survey
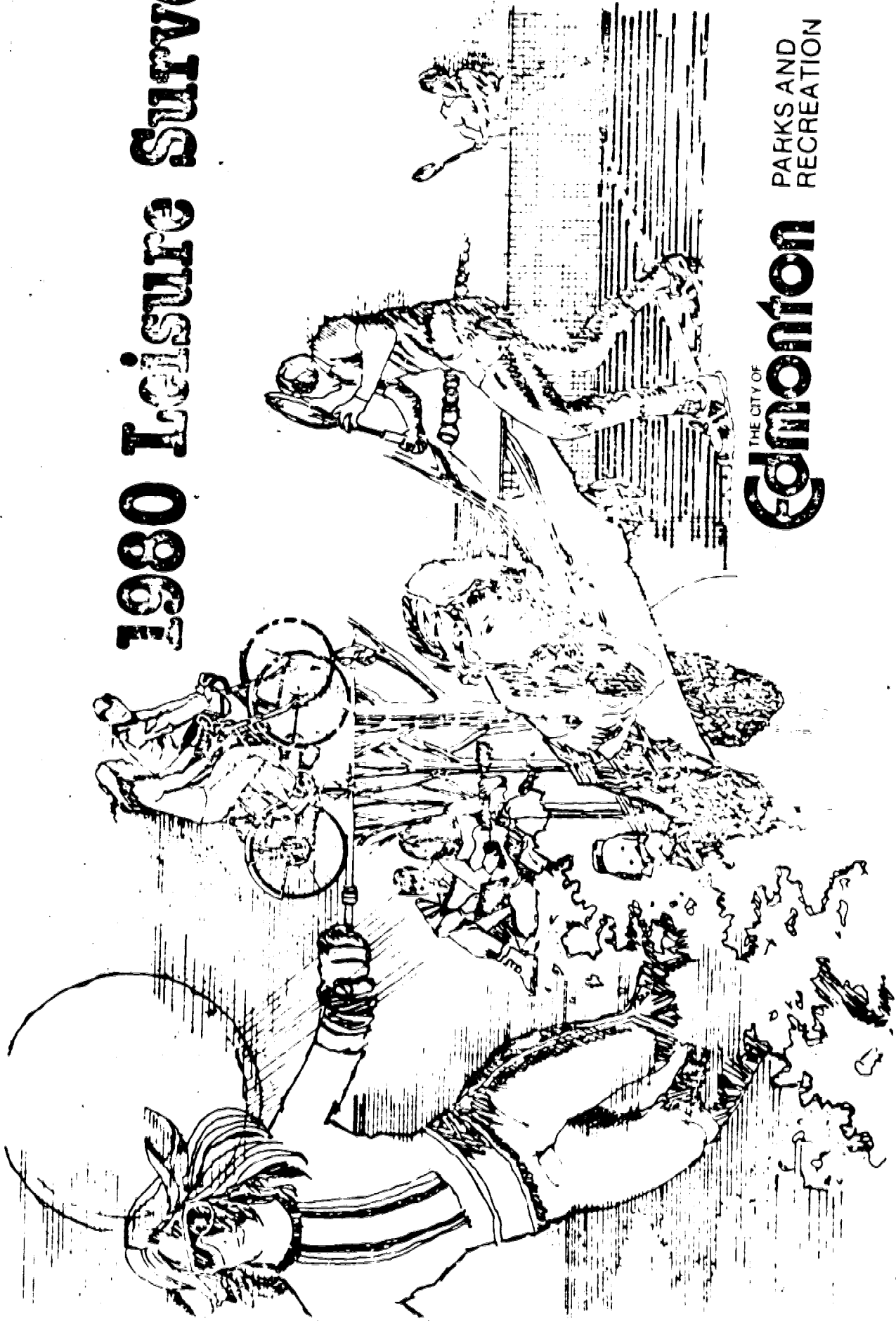
## THE CITY OF Edmonton PARKS AND RECREATION

# SECTION I   Passive Leisure Activities

Please answer the following questions about your participation in less active and spectator type leisure activities.

**1.**
Please indicate whether or not you have participated in any of the following leisure activities in The Last Month.

Check "Yes" or "No" for each activity. For those activities marked "Yes" answer Question 2

**2.**
How many hours in a Typical week during the last month did you spend doing each activity marked "Yes" in Question 1

Number of hours spent in a typical week

| | NO | YES | Less than 2 | 2 | 3 | 4 | 5 | 10 or more |
|---|---|---|---|---|---|---|---|---|
| Watching T.V. | | | | | | | | |
| Listening to the radio | | | | | | | | |
| Listening to records, tapes or cassettes | | | | | | | | |
| Reading books for leisure | | | | | | | | |
| Reading newspapers, magazines for leisure | | | | | | | | |
| Socializing or visiting with friends or relatives | | | | | | | | |
| Landscaping/gardening/home repairs | | | | | | | | |
| Playing bingo, cards, chess or other games | | | | | | | | |
| Dancing (social) | | | | | | | | |
| Going to pubs, lounges, taverns, etc. with friends | | | | | | | | |

**3.**
Please indicate whether or not you have participated in any of the following leisure activities Within The Last 12 Months.

Check "Yes" or "No" for each activity. For those activities marked "Yes" answer Question 4

**4.**
How many times Within The Last 12 Months did you attend each activity marked "Yes" in Question 3?

Times in last year

| | NO | YES | Less than 5 | 6-10 | 11-20 | Over 20 |
|---|---|---|---|---|---|---|
| A movie or other film | | | | | | |
| Popular music performance | | | | | | |
| Classical music performance or opera | | | | | | |
| A sporting event as a spectator | | | | | | |
| A cultural centre, museum, art gallery etc. | | | | | | |
| A live theatre production, a ballet or other dance | | | | | | |
| A zoo, exhibition or circus | | | | | | |
| A cultural festival or arts and crafts fair | | | | | | |

# SECTION II  Outdoor Recreation

Please answer the following questions about your participation in recreation activities. These activities that take place out of doors. If you participate in any Outdoor Recreation activity not listed in Question 6, please include it in the Other (specify) category

**5.** Have you participated in any Outdoor Recreation activities WITHIN THE LAST 12 MONTHS? ☐ Yes ☐ No ▶ Go To Question 16

**6.**

Please indicate whether or not you have participated in any of the following Outdoor Recreation activities in The Last 12 Months.

Check "Yes" or "No" for each activity. For those activities marked "Yes" answer Questions 7 and 8.

**7.**

How many times In The Last 12 Months did you engage in each activity marked "Yes" in Question 6

Times in Last Year

**8.**

Please indicate the type of area you use MOST OFTEN for each activity marked "Yes" in Question 6.

Check one only for each activity

| Activity | NO | YES | 1-10 | 11-20 | 21-30 | over 30 | Your Own Yard | Municipal or Neighbourhood Park or Campground | Provincial Park or Campground | National Park or Campground | Public Land or Area | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boating | | | | | | | | | | | | |
| Picnicking | | | | | | | | | | | | |
| Downhill Skiing | | | | | | | | | | | | |
| Camping | | | | | | | | | | | | |
| Tobogganing | | | | | | | | | | | | |
| Canoeing/Kayaking | | | | | | | | | | | | |
| Trail Walking/Hiking | | | | | | | | | | | | |
| Walking for Pleasure | | | | | | | | | | | | |
| Snowboarding | | | | | | | | | | | | |
| Bicycling | | | | | | | | | | | | |
| Cross Country Skiing | | | | | | | | | | | | |
| Nature Study | | | | | | | | | | | | |
| Fishing | | | | | | | | | | | | |
| Other (specify) | | | | | | | | | | | | |

NOTE: If you engaged in an Outdoor Recreation activity not listed above please include it in the Other (specify) space. If you participated in more than one activity not listed above please list the one you did most often.

# Outdoor Recreation (Cont'd)

**9.** There are many reasons why people engage in Outdoor Recreation activities. How important are each of the following reasons to you?

(Circle one number for each reason)

| | Of no importance | | Of some importance | | Of great importance |
|---|---|---|---|---|---|
| A chance to be with friends | 1 | 2 | 3 | 4 | 5 |
| For the release of tension (pain, unload, etc.) | 1 | 2 | 3 | 4 | 5 |
| As a challenge to my abilities | 1 | 2 | 3 | 4 | 5 |
| For pleasure and/or excitement | 1 | 2 | 3 | 4 | 5 |
| It gives me a feeling of accomplishment | 1 | 2 | 3 | 4 | 5 |
| To compete with others | 1 | 2 | 3 | 4 | 5 |
| For personal health and fitness | 1 | 2 | 3 | 4 | 5 |
| A chance to spend time with my family | 1 | 2 | 3 | 4 | 5 |
| A chance to learn a new skill | 1 | 2 | 3 | 4 | 5 |

**10.** Are there any Outdoor Recreation activities in which You Don't Participate but would like to start?

☐ Yes ↓  ☐ No → Go To Question 12.

Please specify the 3 activities you would like to start most, in order of preference

_____
(print name of 1st activity)

_____
(print name of 2nd activity)

_____
(print name of 3rd activity)

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☐☐
☐☐
☐☐

**11.** Of the activities listed in Question 10, which are you most likely to start doing in the next 6 months?

(Check one or more of the following)

☐ 1st
☐ 2nd
☐ 3rd
☐ None

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☐☐
☐☐
☐☐

**12.** According to your own experience, how important are each of the following factors in reducing your participation in Outdoor Recreation activities?

(Circle one number for each factor)

| | Of no importance | | Of some importance | | Of great importance |
|---|---|---|---|---|---|
| I don't have enough information about where/when I could participate | 1 | 2 | 3 | 4 | 5 |
| I'm not at ease in social situations | 1 | 2 | 3 | 4 | 5 |
| I don't have enough free time due to work, school etc | 1 | 2 | 3 | 4 | 5 |
| It is difficult to keep commitments | 1 | 2 | 3 | 4 | 5 |
| It costs too much to participate | 1 | 2 | 3 | 4 | 5 |
| I don't know how to do it well enough | 1 | 2 | 3 | 4 | 5 |
| It difficult to find others to do things with | 1 | 2 | 3 | 4 | 5 |
| Too many family obligations | 1 | 2 | 3 | 4 | 5 |
| Programs/courses/facilities are not available | 1 | 2 | 3 | 4 | 5 |
| It is difficult to get to where the facility/program is located | 1 | 2 | 3 | 4 | 5 |

# SECTION III    Active Sports/Athletics

Please answer the following questions about your participation in active sport, athletic and exercise activities. *If there is an Active Sport/Athletics activity in which you participated that is not listed below, please include it in the Other (specify) category of Question 14.*

**13.** Have you participated in any Active Sport/Athletics activities WITHIN THE LAST 12 MONTHS?  ☐ Yes  ☐ No → Go To Question 18

**14.**

Please indicate whether or not you have participated in any of the following Active Sport/Athletics activities in The Last 12 Months

Check "Yes" or "No" for each activity. For those activities marked "Yes" answer Questions 15 and 16.

**15.**

How many times in The Last 12 Months did you engage in each activity marked "Yes" in Question 14

**16.**

Please indicate the type of area you used MOST OFTEN for each activity marked "Yes" in Question 14

Check one only for each activity

Squash/Racquetball/Handball
Badminton
Soccer
Tennis
Jogging/Running
Ice Skating
Volleyball
Golf
Ice Hockey
Calisthenics/Exercises
Football
Alley Bowling
Weightlifting/Weight Training
Yoga
Softball/Baseball
Basketball
Curling
Rugby
Swimming
Other (specify)

NOTE: If you engaged in any Active Sport/Athletics activities not listed above, please list in the Other (specify) category. If you participated in more than one activity not listed above, please list the one you did most often.

# Active Sports/Athletics (Cont'd)

**17.** People participate in Active Sports/Athletics activities for many reasons. How important are each of the following to you?

(Circle one number for each reason)

|  | Of no importance | Of some importance | Of great importance |
|---|---|---|---|
| A chance to be with friends | 1 | 2 | 3 | 4 | 5 |
| For the release of tension (relax, unwind, etc) | 1 | 2 | 3 | 4 | 5 |
| As a challenge to my abilities | 1 | 2 | 3 | 4 | 5 |
| For pleasure and/or excitement | 1 | 2 | 3 | 4 | 5 |
| It gives me a feeling of accomplishment | 1 | 2 | 3 | 4 | 5 |
| To compete with others | 1 | 2 | 3 | 4 | 5 |
| For personal health and fitness | 1 | 2 | 3 | 4 | 5 |
| A chance to spend time with my family | 1 | 2 | 3 | 4 | 5 |
| A chance to learn a new skill | 1 | 2 | 3 | 4 | 5 |

**18.** Are there any Active Sports/Athletics activities in which You Don't Participate but would like to start?

☐ Yes ☐ No → Go to Question 20.

Please specify the 3 activities you would like to start most, in order of preference

_____
(print name of 1st activity)

_____
(print name of 2nd activity)

_____
(print name of 3rd activity)

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☐☐  ☐☐  ☐☐

**19.** Of the activities listed in Question 18, which are you most likely to start doing in the next 6 months?

(Check one or more of the following)

☐ 1st
☐ 2nd
☐ 3rd
☐ None

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☐  ☐·☐  ☐

**20.** According to your own experience, how important are each of the following factors in reducing your participation in Active Sport/Athletics activities? (Circle one number for each factor)

|  | Of no importance | Of some importance | Of great importance |
|---|---|---|---|
| I don't have any/enough information about when/where I could participate | 1 | 2 | 3 | 4 | 5 |
| I'm not at ease in social situations | 1 | 2 | 3 | 4 | 5 |
| Feel too much daily stress to participate | 1 | 2 | 3 | 4 | 5 |
| Don't have enough free time due to work, school, etc | 1 | 2 | 3 | 4 | 5 |
| It is difficult to keep commitments | 1 | 2 | 3 | 4 | 5 |
| It costs too much to participate | 1 | 2 | 3 | 4 | 5 |
| I don't know how to just well enough | 1 | 2 | 3 | 4 | 5 |
| It is difficult to find others to do things with | 1 | 2 | 3 | 4 | 5 |
| Too many family obligations | 1 | 2 | 3 | 4 | 5 |
| Programs/courses/facilities are not available | 1 | 2 | 3 | 4 | 5 |
| It is difficult to get to where the facility/program is located | 1 | 2 | 3 | 4 | 5 |

# SECTION IV  Arts and Cultural

Please answer the following questions about your participation in arts, crafts, hobbies and cultural activities. If you participated in any Arts and Cultural activity which is not listed in *Question 22 please include it in the Other (specify) category.*

**21.** Have you participated in any Arts and Cultural activities WITHIN THE LAST 12 MONTHS?

☐ Yes↓  ☐ No → Go To Question 26

**22.**
Please indicate whether or not you have participated in any of the following Arts and Cultural activities in The Last 12 Months.

Check "Yes" or "No" for each activity. For those activities marked "Yes" answer Questions 23 and 24.

**23.**
How many times In The Last 12 Months did you engage in each activity marked "Yes" in Question 22

**24.**
Please indicate the type of facility used MOST OFTEN for each activity marked "Yes" in Question 22

Check one only for each activity

|  | NO | YES | Times in Last 12 months | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Music (play or sing) | ☐ | ☐ | | | | | | | | | | | | | | | |
| Needlecrafts (sewing, knitting) | ☐ | ☐ | | | | | | | | | | | | | | | |
| Painting/Sculpture (any media) | ☐ | ☐ | | | | | | | | | | | | | | | |
| Graphic Arts | ☐ | ☐ | | | | | | | | | | | | | | | |
| Woodworking/Carving | ☐ | ☐ | | | | | | | | | | | | | | | |
| Photography | ☐ | ☐ | | | | | | | | | | | | | | | |
| Drawing/Sketching | ☐ | ☐ | | | | | | | | | | | | | | | |
| Creative Writing | ☐ | ☐ | | | | | | | | | | | | | | | |
| Dance (jazz, ballet, etc.) | ☐ | ☐ | | | | | | | | | | | | | | | |
| Drama | ☐ | ☐ | | | | | | | | | | | | | | | |
| Weaving/Spinning | ☐ | ☐ | | | | | | | | | | | | | | | |
| Batik/Textile dyeing or printing | ☐ | ☐ | | | | | | | | | | | | | | | |
| Ceramics/Pottery | ☐ | ☐ | | | | | | | | | | | | | | | |
| Other (specify) _____ | ☐ | ☐ | | | | | | | | | | | | | | | |

NOTE: If you engaged in any Arts and Cultural activity not listed above, please include it in the Other (specify) category. If you participated in more than one activity not listed above please list the one you did most often

| FOR OFFICE USE ONLY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

# Arts and Cultural (Cont'd)

**25.** People participate in Arts and Cultural activities for many reasons. How important are each of the following to you? (Circle one number for each reason)

|  | Of no importance | | Of some importance | | Of great importance |
|---|---|---|---|---|---|
| A chance to be with friends | 1 | 2 | 3 | 4 | 5 |
| For the release of tension (relax, unwind, etc.) | 1 | 2 | 3 | 4 | 5 |
| As a challenge to my abilities | 1 | 2 | 3 | 4 | 5 |
| For pleasure and/or excitement | 1 | 2 | 3 | 4 | 5 |
| It gives me a feeling of accomplishment | 1 | 2 | 3 | 4 | 5 |
| A chance to spend time with my family | 1 | 2 | 3 | 4 | 5 |
| A chance to learn a new skill | 1 | 2 | 3 | 4 | 5 |

**26.** Are there any Arts and Cultural activities in which You Don't Participate but would like to start?

□ Yes   □ No → Go to Question 28

Please specify the 3 activities you would like to start most, in order of preference.

_____
(print name of 1st activity)

_____
(print name of 2nd activity)

_____
(print name of 3rd activity)

OFFICE USE ONLY

**27.** Of the activities listed in Question 26, which are you most likely to start doing in the next 6 months?

(Check one or more of the following)

□ 1st
□ 2nd
□ 3rd
□ None

OFFICE USE ONLY

**28.** According to your experience, how important are each of the following factors in reducing your participation in Arts and Cultural activities? (Circle one number for each factor)

|  | Of no importance | | Of some importance | | Of great importance |
|---|---|---|---|---|---|
| I don't have enough information about where/when I could participate | 1 | 2 | 3 | 4 | 5 |
| I'm not at ease in social situations | 1 | 2 | 3 | 4 | 5 |
| Feel too much daily stress to participate | 1 | 2 | 3 | 4 | 5 |
| Don't have enough free time due to work, school, etc. | 1 | 2 | 3 | 4 | 5 |
| It is difficult to keep commitments | 1 | 2 | 3 | 4 | 5 |
| It costs too much to participate | 1 | 2 | 3 | 4 | 5 |
| I don't know how to do it well enough | 1 | 2 | 3 | 4 | 5 |
| It is difficult to find others to do things with | 1 | 2 | 3 | 4 | 5 |
| Too many family obligations | 1 | 2 | 3 | 4 | 5 |
| Programs/courses/facilities are not available | 1 | 2 | 3 | 4 | 5 |
| It is difficult to get to where the facility/program is located | 1 | 2 | 3 | 4 | 5 |

# SECTION V    Edmonton Facilities

Please answer the following questions about your use of specific Edmonton facilities

**29.**
Did you use or attend any of the following Edmonton facilities WITHIN THE LAST 12 MONTHS?

Check "Yes" or "No" for each facility. For those facilities marked "Yes" answer Question 30.

**30.**
For each facility marked "Yes" in Question 29, how often did you use it In The Last 12 Months.

|  | NO | YES | Times in Last Year | | | |
|---|---|---|---|---|---|---|
|  |  |  | Less than 5 | 6-10 | 11-20 | Over 20 |
| The Coliseum |  |  |  |  |  |  |
| Valley Zoo |  |  |  |  |  |  |
| Fort Edmonton |  |  |  |  |  |  |
| Commonwealth Stadium |  |  |  |  |  |  |
| Kinsmen Centre |  |  |  |  |  |  |
| John Walter Museum |  |  |  |  |  |  |
| Planetarium |  |  |  |  |  |  |
| John Janzen Nature Centre |  |  |  |  |  |  |
| Jubilee Auditorium |  |  |  |  |  |  |
| Renfrew Park |  |  |  |  |  |  |
| Muttart Conservatory |  |  |  |  |  |  |
| Edmonton Arts Gallery |  |  |  |  |  |  |
| Citadel Theatre |  |  |  |  |  |  |
| Theatre 3 |  |  |  |  |  |  |
| Provincial Museum and Archives |  |  |  |  |  |  |
| Capital City Recreation Park |  |  |  |  |  |  |

# Section VI    Your Opinion of Recreation Services

Please answer the following questions which ask for your opinion about the way that recreation services are made available in Edmonton.    (Please circle the one number that best describes your opinion of each of the following statements.)

*Note: Where a question mentions Parks and Recreation, it refers to the City of Edmonton Parks and Recreation Department.

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|---|---|---|---|---|
| 31. I prefer to visit city parks such as Hawrelak Park and Kinsmen Park more than local neighbourhood parks. | 1 | 2 | 3 | 4 | 5 |
| 32. Community leagues and organizations should become more involved in providing their own recreation opportunities. | 1 | 2 | 3 | 4 | 5 |
| 33. The main role of Parks and Recreation should be that of helping other groups and agencies to provide recreation opportunities. | 1 | 2 | 3 | 4 | 5 |
| 34. The development of local neighbourhood parks should receive a greater emphasis than the building of city level facilities. | 1 | 2 | 3 | 4 | 5 |
| 35. One of the major problems with recreation today is that there is too much emphasis placed on courses, programs and instruction, and too little on just being involved. | 1 | 2 | 3 | 4 | 5 |
| 36. The amount of the fee charged by Parks and Recreation has stopped me from participating in some recreation activities. | 1 | 2 | 3 | 4 | 5 |
| 37. Parks and Recreation should concentrate mainly on providing recreation programs, courses and opportunities for the citizens of Edmonton. | 1 | 2 | 3 | 4 | 5 |
| 38. Tax dollars should be used to support recreation programs and to lower the fees charged to users. | 1 | 2 | 3 | 4 | 5 |
| 39. Parks and Recreation should continue its policy of having the public participate in the planning of programs, facilities, and open spaces. | 1 | 2 | 3 | 4 | 5 |
| 40. The services provided by Parks and Recreation should encourage family members to participate together as a unit. | 1 | 2 | 3 | 4 | 5 |

# Section VII    About You Personally

The following questions will be useful in groups; your replies with those of the other respondents in the survey. This information will greatly assist Parks and Recreation in meeting your recreation needs. All answers will be treated as confidential.

41. How old are you? ☐☐

42. Are you ☐ male; ☐ female.

43. What is your marital status?
☐ single; ☐ married; ☐ divorced or separated; ☐ widowed; ☐ other.

44. How long have you lived at your present address?
☐ less than one year; ☐ 1-3 years; ☐ 4-5 years; ☐ more than 5 years.

45. How long have you lived in Kelowna?
☐ less than one year; ☐ 1-3 years; ☐ 4-5 years; ☐ more than 5 years.

46. Please indicate which of the following BEST describes your employment status over THE PAST 12 MONTHS.
(Check the one best answer)
☐ student;
☐ homemaker;
☐ employee part-time;
☐ retired;
☐ employee full-time;
☐ unemployed;
☐ other.

47. Please indicate your present level of Education.
(Check one answer)
☐ 0-6 years;
☐ 7-9 years;
☐ some high school;
☐ high school graduation;
☑ post-secondary certificate or diploma;
☐ some university;
☐ university degree.

APPENDIX B: REPRESENTATIVENESS OF THE SURVEY

Table 1.0 Comparison of Sex Distributions

| | Distributions - Percent of Respective Populations | |
| --- | --- | --- |
| | 1980 Survey | 1979 Census |
| MALE | 47.1 | 50.4 |
| FEMALE | 51.0 | 49.6 |

Table 1.1 Comparison of Age Distribution

| | Distributions - Percent of Respective Populations | |
| --- | --- | --- |
| | 1980 Survey | 1979 Census |
| 14 - 19 | 14.6 | 11.4 |
| 20 - 29 | 32.7 | 33.2 |
| 30 - 39 | 18.6 | 18.1 |
| 40 - 49 | 13.8 | 12.9 |
| 50 - 59 | 11.1 | 11.3 |
| 60 - 64 | 3.8 | 4.0 |
| 65+ | 5.2 | 9.2* |

NOTE: The asterisk (*) denotes that these population segments are not representative based on the 95.0% confidence level and 10.0% error bound used in the sample selection.

Table 1.2 Comparison of Marital Status Distributions

| | Distributions - Percent of Respective Populations | |
| --- | --- | --- |
| | 1980 Survey | 1979 Census |
| Single | 33.3 | 35.9 |
| Married | 52.2 | 53.8 |
| Divorced/Separated | 7.7 | 5.0 |
| Widowed | 3.1 | 4.7* |
| Other | 2.2 | 0.5 |

NOTE: The asterisk (*) denotes that these population segments are not representative based on the 95.0% confidence level and 10.0% error bound used in the sample selection.

Table 1.3 Comparison of Occupation Distributions

| | Distributions - Percent of Respective Populations | |
| --- | --- | --- |
| | 1980 Survey | 1979 Census |
| Student | 16.6 | 13.6 |
| Homemaker | 13.3 | 14.6 |
| Employed Part-time | 8.7 | 5.4 |
| Retired | 5.6 | 7.5* |
| Employed Full-time | 51.1 | 55.5 |
| Unemployed | 0.8 | 2.6* |
| Other | 1.8 | 0.8 |

NOTE: The asterisk (*) denotes that these population segments are not representative based on the 95.0% confidence level and 10.0% error bound used in the sample selection.

Leaf 117 omitted in page numbering

**APPENDIX C: DATA ANALYSIS**

## POST HOC ANALYSIS: PROPORTIONAL TABLES

General Process: Calculate confidence intervals around the estimate of the compared proportions.

$$\hat{\psi}_k \pm \sqrt{\chi^2_{k-1:1-\alpha}}\left(\sqrt{\frac{p_k q_k}{N_k} + \frac{p_{k'} q_{k'}}{N_{k'}}}\right)$$

$\chi^2$ is taken from the S.P.S.S. caculations (see tables immediately preceeding each set of paired comparison data).

$$\hat{\psi} = p_k - p_{k'}$$

Decision-Point: If the confidence interval does not embrace zero, the proportions are said to be different.

Source: Marascuilo, L.A. and M. McSweeney, Nonparametric and Distribution Free Methods for The Social Sciences, Monteray, Cal.: Brooks/Cole Publishing, 1977.

# OUTDOOR RECREATION

```
N-WAYS OF PARTICIPATION VARIABLES PLUS CROSSTABS                              06/02/81        PAGE   3
FILE    GNU1      (CREATION DATE = 06/21/81)
* * * * * * * * * * * * * * * * * * *   C R O S S T A B U L A T I O N   O F   * * * * * * * * * * * * * * * * *
     WEIGHTYP                                                BY  ORECPAR
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                      ORECPAR
           COUNT   I
           ROW PCT INO        YES        ROW
           COL PCT I                     TOTAL
           TOT PCT I      1  I      2  I
WEIGHTYP   --------I---------I---------I
                1  I     19  I    183  I    202
                   I    9.4  I   90.6  I    9.1
                   I   10.2  I    9.0  I
                   I    0.9  I    8.2  I
                  -I---------I---------I
                2  I     60  I    402  I    462
                   I   13.0  I   87.0  I   20.8
                   I   32.1  I   19.7  I
                   I    2.7  I   18.1  I
                  -I---------I---------I
                3  I     43  I    418  I    461
                   I    9.3  I   90.7  I   20.7
                   I   23.0  I   20.5  I
                   I    1.9  I   18.8  I
                  -I---------I---------I
                4  I     30  I    325  I    355
                   I    8.5  I   91.5  I   15.9
                   I   16.0  I   15.9  I
                   I    1.3  I   14.6  I
                  -I---------I---------I
                5  I      9  I    256  I    265
                   I    3.4  I   96.6  I   11.9
                   I    4.8  I   12.6  I
                   I    0.4  I   11.5  I
                  -I---------I---------I
                6  I     26  I    455  I    481
                   I    5.4  I   94.6  I   21.6
                   I   13.9  I   22.3  I
                   I    1.2  I   20.4  I
                  -I---------I---------I
            COLUMN      187       2039      2226
             TOTAL      8.4       91.6     100.0

RAW CHI SQUARE =    27.84278 WITH     5 DEGREES OF FREEDOM   SIGNIFICANCE =  0.0000
LAMBDA (ASYMMETRIC) =  0.01948 WITH WEIGHTYP DEPENDENT           =  0.0     WITH ORECPAR  DEPENDENT
LAMBDA (SYMMETRIC) =  0.01700
UNCERTAINTY COEFFICIENT (ASYMMETRIC) =  0.00373 WITH WEIGHTYP DEPENDENT          =  0.02260 WITH ORECPAR  DEPENDENT
UNCERTAINTY COEFFICIENT (SYMMETRIC) =  0.00660
ETA =  0.08311 WITH WEIGHTYP DEPENDENT          =  0.11184 WITH ORECPAR  DEPENDENT
```

## POST HOC ANALYSIS: PROPORTIONAL TABLES
### Outdoor Recreation

| contrast | estimate $\psi$ | $SE^2 = \left(\dfrac{p_k q_k}{N_k} + \dfrac{p_{k'} q_{k'}}{N_{k'}}\right)$ | $\sqrt{SE^2} \times \sqrt{\chi^2}$ | upper limit | lower limit |
|---|---|---|---|---|---|
| $p_1 - p_2$ | .036 | .0258147 | .08596 | .1219 | -.0499 |
| $p_1 - p_3$ | -.001 | .0245886 | .08188 | .08088 | -.08288 |
| $p_1 - p_4$ | -.009 | .0253121 | .084289 | .07529 | -.09329 |
| $p_1 - p_5$ | -.06 | .0233559 | .077775 | .01775 | -.13775 |
| $p_1 - p_6$ | -.04 | .022973 | .076503 | .0365 | -.1165 |
| $p_2 - p_3$ | -.037 | .020583 | .068875 | .0319 | -.1059 |
| $p_2 - p_4$ | -.045 | .0215821 | .071692 | .0267 | -.1167 |
| $p_2 - p_5$ | -.096 | .0192016 | .062941 | -.032: | -.1599* |
| $p_2 - p_6$ | -.076 | .018735 | .062388 | -.0136 | -.1384* |
| $p_3 - p_4$ | -.008 | .0200524 | .066775 | .0588 | -.0748 |
| $p_3 - p_5$ | -.059 | .017586 | .053336 | .0007 | -.1173 |
| $p_3 - p_6$ | -.039 | .0170059 | .056629 | .0176 | -.0956 |
| $p_4 - p_5$ | -.051 | .0183246 | .061021 | .01 | -.112 |
| $p_4 - p_6$ | -.031 | .018036 | .06006 | .029 | -.091 |
| $p_5 - p_6$ | .02 | .015165 | .050513 | .0705 | -.0305 |

| Neighborhood Type | ONE | TWO | THREE | FOUR | FIVE | SIX |
|---|---|---|---|---|---|---|
| Total Respondants (N) | 202 | 462 | 461 | 355 | 265 | 481 |
| % Participating (p) | .906 | .870 | .907 | .915 | .966 | .946 |
| % Not Participating (q) | .094 | .130 | .093 | .085 | .034 | .054 |
| $\dfrac{pq}{N}$ | .0004216 | .0002448 | .000183 | .0002191 | .0001239 | .0001062 |

* Indicates a significant difference in proportions

SPORTS/ATHLETICS

# SPORTS/ATHLETICS

FILE    NONI    (CREATION DATE = 05/21/81)

· · · · · · · · · · · · · · · · · · · C R O S S T A B U L A T I O N   O F · · · · · · · · · · · · · · · · · · ·
       WEIGHTYP                                    BY SPORTPAR
· · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · PAGE  1 OF

|  | | SPORTPAR | | |
|---|---|---|---|---|
| COUNT<br>ROW PCT<br>COL PCT<br>TOT PCT | | NO<br>1 | YES<br>2 | ROW<br>TOTAL |
| WEIGHTYP | | | | |
| 1 | | 83<br>26.8<br>16.2<br>2.6 | 185<br>73.2<br>8.8<br>8.8 | 795<br>7.0 |
| 2 | | 145<br>31.9<br>27.9<br>8.8 | 309<br>68.1<br>18.4<br>18.1 | 464<br>20.7 |
| 3 | | 192<br>26.8<br>22.8<br>6.6 | 321<br>73.1<br>18.7<br>18.1 | 463<br>20.6 |
| 4 | | 77<br>21.9<br>14.5<br>3.6 | 270<br>78.0<br>10.8<br>12.7 | 504<br>16.2 |
| 5 | | 36<br>14.8<br>-7.8<br>1.7 | 226<br>85.5<br>13.3<br>10.2 | 262<br>11.8 |
| 6 | | 84<br>17.7<br>16.2<br>3.6 | 290<br>82.3<br>23.2<br>17.3 | 474<br>21.6 |
| COLUMN<br>TOTAL | | 610<br>23.6 | 1070<br>76.4 | 2107<br>100.0 |

RAW CHI SQUARE =   43.26101 WITH   5 DEGREES OF FREEDOM   SIGNIFICANCE =   0.0000
LAMBDA (ASYMMETRIC) =   0.02040 WITH WEIGHTYP DEPENDENT            = 0.0   WITH SPORTPAR DEPENDENT
LAMBDA (SYMMETRIC) =   0.0272
UNCERTAINTY COEFFICIENT (ASYMMETRIC) =   0.00073 WITH WEIGHTYP DEPENDENT            = 0.01030 WITH SPORTPAR DEPENDENT
UNCERTAINTY COEFFICIENT (SYMMETRIC) =   0.0072
ETA =   0.12301 WITH WEIGHTYP DEPENDENT            = 0.14021 WITH SPORTPAR DEPENDENT

## POST HOC ANALYSIS: PROPORTIONAL TABLES
### Sports/Athletics

| contrast $p_k - p_{k'}$ | estimate $\psi$ | $SE^2 = \frac{p_k q_k}{N_k} + \frac{p_k q_{k'}}{N_{k'}}$ | $\sqrt{SE^2} \times \sqrt{\alpha^2}$ | upper limit | lower limit |
|---|---|---|---|---|---|
| $p_1 - p_2$ | .051 | .0383314 | .1276 | .1786 | -.0766 |
| $p_1 - p_2$ | .001 | .030293 | .1009 | .1019 | -..0991 |
| $p_1 - p_4$ | -.052 | .038290 | .1275 | .0755 | -.1795 |
| $p_1 - p_5$ | -.123 | .038262 | .1274 | .0044 | -.2504 |
| $p_1 - p_6$ | -.091 | .036029 | .1199 | .0289 | -.2109 |
| $p_2 - p_3$ | -.05 | .030209 | .1006 | .0506 | -.1506 |
| $p_2 - p_4$ | -.103 | .030890 | .1029 | -.0001 | -.2059* |
| $p_2 - p_5$ | -.174 | .030849 | .1027 | -.0713 | -.2767* |
| $p_2 - p_6$ | -.142 | .028032 | .0933 | -.0487 | -.2353* |
| $p_3 - p_4$ | -.053 | .030160 | .1004 | .0474 | -.1534 |
| $p_3 - p_5$ | -.124 | .027982 | .0931 | -.0309 | -.2171* |
| $p_3 - p_6$ | -.092 | .027229 | .0907 | -.0013 | -.1527* |
| $p_4 - p_5$ | -.071 | .027937 | .0930 | .0220 | -.1640 |
| $p_4 - p_6$ | -.039 | .027980 | .0918 | .0528 | -.1308 |
| $p_5 - p_6$ | .032 | .027940 | .0930 | .1250 | -.0610 |

* Indicates a significant difference in proportions

| Neighborhood Type | ONE | TWO | THREE | FOUR | FIVE | SIX |
|---|---|---|---|---|---|---|
| Total Respondents (N) | 198 | 454 | 453 | 356 | 262 | 474 |
| % Participating (p) | .732 | .681 | .731 | .784 | .855 | .823 |
| % Not Participating (q) | .268 | .319 | .269 | .216 | .145 | .177 |
| $\frac{pq}{N}$ | .0009908 | .0004785 | .0004341 | .0004757 | .0004732 | .0003073 |

125

ARTS AND CULTURAL

# ARTS AND CULTURAL

FILE    RUN    (CREATION DATE = 06/31/81)

- - - - - - - - - - - - - - - C R O S S T A B U L A T I O N   O F - - - - - - - - - - - - - - - -
    WEIGHTYP                                    BY  AREOPAR
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - PAGE  1 OF  1

| COUNT ROW PCT COL PCT TOT PCT | AREOPAR NO | YES 2 | ROW TOTAL |
|---|---|---|---|
| WEIGHTYP 1 | 85 42.3 9.7 3.9 | 116 57.7 9.0 5.4 | 201 9.3 |
| 2 | 214 47.7 24.6 9.9 | 236 52.3 18.3 10.9 | 450 20.9 |
| 3 | 193 42.9 22.0 6.9 | 257 57.1 20.1 12.1 | 450 21.1 |
| 4 | 140 40.5 16.0 6.5 | 205 59.5 16.0 9.5 | 345 16.0 |
| 5 | 79 31.3 9.0 3.7 | 173 68.7 13.6 8.0 | 252 11.7 |
| 6 | 187 36.4 19.0 7.7 | 282 63.6 22.3 13.6 | 469 21.2 |
| COLUMN TOTAL | 878 40.6 | 1283 59.4 | 2161 100.0 |

RAW CHI SQUARE =    27.60458 WITH    5 DEGREES OF FREEDOM    SIGNIFICANCE =    0.0000
LAMBDA (ASYMMETRIC) =    0.02701 WITH WEIGHTYP DEPENDENT                    = 0.0    WITH AREOPAR DEPENDENT
LAMBDA (SYMMETRIC) =    0.01522
UNCERTAINTY COEFFICIENT (ASYMMETRIC) =    0.00300 WITH WEIGHTYP DEPENDENT            =    0.00770 WITH AREOPAR DEPENDENT
UNCERTAINTY COEFFICIENT (SYMMETRIC) =    0.00433
ETA =    0.08218 WITH WEIGHTYP DEPENDENT            =    0.10198 WITH AREOPAR DEPENDENT

## POST HOC ANALYSIS: PROPORTIONAL TABLES
### Arts and Cultural

| contrast $p_k - p_{k'}$ | estimate $\psi$ | $SE^2 = \dfrac{p_k q_k}{N_k} + \dfrac{p_{k'} q_{k'}}{N_{k'}}$ | $\sqrt{SE^2} \times \sqrt{x^2}$ | upper limit | lower limit |
|---|---|---|---|---|---|
| $p_1 - p_2$ | .054 | .04207 | .1401 | .1941 | -.0861 |
| $p_1 - p_2$ | .001 | .04185 | .1393 | .1403 | -.1383 |
| $p_1 - p_4$ | -.017 | .04370 | .1457 | .1287 | -.1627 |
| $p_1 - p_5$ | -.110 | .04547 | .1514 | .0414 | -.2614 |
| $p_1 - p_6$ | -.059 | .04145 | .1381 | .0791 | -.1971 |
| $p_2 - p_3$ | -.053 | .03306 | .1101 | .0571 | -.1631 |
| $p_2 - p_4$ | -.071 | .03540 | .1179 | .0469 | -.1889 |
| $p_2 - p_5$ | -.164 | .03754 | .1250 | -.0390 | -.2890* |
| $p_2 - p_6$ | -.113 | .03250 | .1084 | -.0046 | -.2214* |
| $p_3 - p_4$ | .018 | .03515 | .1171 | .0991 | -.1351 |
| $p_3 - p_5$ | .111 | .03728 | .1241 | .0131 | -.2351 |
| $p_3 - p_6$ | -.060 | .03226 | .1075 | .0475 | -.1675 |
| $p_4 - p_5$ | -.093 | .03939 | .1312 | .0382 | -.2242 |
| $p_4 - p_6$ | -.042 | .03469 | .1155 | .0735 | -.1575 |
| $p_5 - p_6$ | .051 | .03685 | .1227 | .1737 | -.0717 |

* Indicates a significant difference in proportions

| Neighborhood Type | ONE | TWO | THREE | FOUR | FIVE | SIX |
|---|---|---|---|---|---|---|
| Total Respondents (N) | 201 | 449 | 455 | 345 | 252 | 459 |
| % Participating (p) | .577 | .523 | .576 | .594 | .687 | .636 |
| % Not Participating (q) | .423 | .477 | .424 | .406 | .313 | .364 |
| $\dfrac{pq}{N}$ | .0012143 | .000556 | .005368 | .000699 | .0008533 | .0005044 |

ANALYSIS OF VARIANCE

AND SCHEFFE'S TEST

Leaf 129 omitted in page numbering

# NUMBER OF ACTIVITIES ENGAGED IN

## OUTDOOR RECREATION

SURVEY FOR ACTIVITIES VARIABLES

SUBFILE   TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

- - - - - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - -

VARIABLE   ORACT
BY VARIABLE   SUBFILE

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 213.3740 | 42.6740 | 5.065 | 0.0001 |
| WITHIN GROUPS | 2248 | 18855.0017 | 8.3876 | | |
| TOTAL | 2253 | 19068.3633 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 307 | 4.2513 | 3.0137 | 0.7025 | 0.0 | 14.0000 | 3.8513 TO 4.9505 |
| TYPE2 | 436 | 4.2675 | 3.1300 | 0.1300 | 0.0 | 10.0000 | 3.8820 TO 4.5324 |
| TYPE3 | 406 | 4.5202 | 2.8751 | 0.1322 | 0.0 | 10.0000 | 3.9535 TO 4.5010 |
| TYPE4 | 395 | 4.5070 | 2.5623 | 0.1523 | 0.0 | 10.0000 | 4.2075 TO 4.5055 |
| TYPE5 | 270 | 5.1600 | 2.7620 | 0.1600 | 0.0 | 13.0000 | 4.8564 TO 5.5273 |
| TYPE6 | 487 | 4.0013 | 2.8502 | 0.1290 | 0.0 | 14.0000 | 4.5754 TO 5.1457 |
| TOTAL | 2254 | 4.5295 | 2.9093 | 0.0613 | 0.0 | 14.0000 | 4.5004 TO 5.7457 |
| FIXED-EFFECTS MODEL | | | 2.8962 | 0.0610 | | | 4.5005 TO 5.7462 |
| RANDOM EFFECTS MODEL | | | | 0.1630 | | | 4.2521 TO 4.5070 |

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE          0.0024

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.1820  P = 0.515 (APPROX)
BARTLETT-BOX F =                                     0.500  P = 0.735
MAXIMUM VARIANCE / MINIMUM VARIANCE =                1.176

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SURVEY FOR ACTIVITIES VARIABLES

SUBFILE   TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

- - - - - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - -

VARIABLE   ORACT
BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
2.0470 * RANGE * SQRT(1/N(I) + 1/N(J))

(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

```
              T  T  T  T  T
              Y  Y  Y  Y  Y
              P  P  P  P  P
              E  E  E  E  E
              1  3  4  2  6
```

| MEAN | GROUP |
|---|---|
| 4.2513 | TYPE1 |
| 4.2675 | TYPE2 |
| 4.5070 | TYPE4 |
| 4.5202 | TYPE3 |
| 4.0013 | TYPE6 |
| 5.1600 | TYPE5 |

SPORTS/ATHLETICS

ONEWAY FOR ACTIVITIES VARIABLES                                    06/25/81        PAGE

FILE   RUN1   (CREATION DATE = 06/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3      TYPE4       TYPE5       TYPE6

- - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - -

          VARIABLE   SPACT
     BY VARIABLE   SUBFILE

                              ANALYSIS OF VARIANCE

          SOURCE              D F        SUM OF SQUARES      MEAN SQUARES      F RATIO      F PROB

     BETWEEN GROUPS             5           434.7681          86.9536         6.873       0.0000

     WITHIN GROUPS           2248         33097.5852          14.7282

     TOTAL                   2253         33132.3518

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 3.8822 | 3.8021 | 0.2504 | 0.0 | 20.0000 | 3.1688 TO 4.1684 |
| TYPE2 | 465 | 3.3866 | 3.7866 | 0.1740 | 0.0 | 18.0000 | 3.0270 TO 3.7687 |
| TYPE3 | 465 | 3.8000 | 3.8853 | 0.1800 | 0.0 | 18.0000 | 3.4553 TO 4.1877 |
| TYPE4 | 356 | 4.3156 | 3.9712 | 0.2087 | 0.0 | 18.0000 | 3.808 TO 4.5122 |
| TYPE5 | 270 | 4.8925 | 3.8312 | 0.2333 | 0.0 | 18.0000 | 4.227 TO 5.135 |
| TYPE6 | 487 | 4.2854 | 3.7478 | 0.1698 | 0.0 | 18.0000 | 3.851 TO 4.619 |
| TOTAL | 2254 | 3.9820 | 3.8348 | 0.0808 | 0.0 | 20.0000 | 3.8338 TO 4.1094 |
| FIXED EFFECTS MODEL | | | 3.8138 | 0.0803 | | | 3.8345 TO 4.1093 |
| RANDOM EFFECTS MODEL | | | | 0.7041 | | | 3.8868 TO 4.5173 |

RANDOM EFFECTS MODEL   ESTIMATE OF BETWEEN COMPONENT VARIANCE        0.1989

TESTS FOR HOMOGENEITY OF VARIANCES

     COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.1777, P = 0.052 (APPROX.)
     BARTLETT BOX F =                             0.810, P = 0.888
     MAXIMUM VARIANCE / MINIMUM VARIANCE =        1.191


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ONEWAY FOR ACTIVITIES VARIABLES                                    06/25/81        PAGE

FILE   RUN1   (CREATION DATE = 06/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3      TYPE4       TYPE5       TYPE6

- - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - -

          VARIABLE   SPACT
     BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

          4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
     2.6956 * RANGE * SQRT(1/N(I) + 1/N(J))

(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

                              T T T T T T
                              Y Y Y Y Y Y
                              P P P P P P
                              E E E E E E
                              2 1 3 6 4 5

| MEAN | GROUP | | |
|---|---|---|---|
| 3.3866 | TYPE2 | | |
| 3.8822 | TYPE1 | | |
| 3.8000 | TYPE3 | | |
| 4.2854 | TYPE6 | * | |
| 4.3156 | TYPE4 | * | |
| 4.8925 | TYPE5 | * | |

ARTS AND CULTURAL

FILE   RUN1    (CREATION DATE = 08/25/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - - - - -

VARIABLE   ARACT
BY VARIABLE   SUBFILE

### ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 26.3180 | 5.2636 | 1.480 | 0.1880 |
| WITHIN GROUPS | 2248 | 8065.8967 | 3.5840 | | |
| TOTAL | 2253 | 8093.2148 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 5942 | 2.0023 | 0.1392 | 0.0 | 10.0000 | 3108 TO 8888 |
| TYPE2 | 488 | 3561 | 1.7968 | 0.0833 | 0.0 | 10.0000 | 1903 TO 6170 |
| TYPE3 | 488 | 5232 | 1.2309 | 0.0600 | 0.0 | 12.0000 | 3800 TO 7088 |
| TYPE4 | 394 | 5223 | 2405 | 0.0073 | 0.0 | 8.0000 | 3316 TO 7138 |
| TYPE5 | 270 | 5200 | 2.8006 | 0.1211 | 0.0 | 13.0000 | 4578 TO 8864 |
| TYPE6 | 487 | 5867 | 1.8711 | 0.0845 | 0.0 | 10.0000 | 4861 TO 7333 |
| TOTAL | 2254 | 5303 | 8841 | 0.0388 | 0.0 | 13.0000 | 4819 TO 5884 |
| FIXED EFFECTS MODEL | | 1.8832 | 0.0388 | | | | 4820 TO 8884 |
| RANDOM EFFECTS MODEL | | | 0.0451 | | | | 5000 TO 5882 |

RANDOM EFFECTS MODEL   ESTIMATE OF BETWEEN COMPONENT VARIANCE       0.0048

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.1830   P = 0.411 (APPROX.)
BARTLETT-BOX F = 1.388, P = 0.275
MAXIMUM VARIANCE / MINIMUM VARIANCE = 1.239

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FILE   RUN1    (CREATION DATE = 08/25/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - - - - -

VARIABLE   ARACT
BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

TUKEY-HSD PROCEDURE
RANGES FOR THE 0.050 LEVEL

4.04    4.04    4.04    4.04    4.04

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
1.3367 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

SIGNIFICANT FREQUENCY MEASURES

OUTDOOR RECREATION: "1-10" TIMES PER YEAR

. . . . . . O N E W A Y . . . . . . . . . . . . . . . . . .

VARIABLE  BELOW
BY VARIABLE  SUBFILE

ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 103.9865 | 20.7973 | 3.786 | 0.0022 |
| WITHIN GROUPS | 2248 | 12348.7 | 5.5264 | | |
| TOTAL | 2253 | 12848.76 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 2.9842 | 2.2381 | 0.1355 | 0.0 | 9.0000 | 2.2875 TO 3.0000 |
| TYPE2 | 444 | 3.7316 | 3.3600 | 0.4667 | 0.0 | 10.0000 | 2.9100 TO 2.9073 |
| TYPE3 | 496 | 2.8499 | 2.2735 | 0.1061 | 0.0 | 10.0000 | 2.8424 TO 7.9567 |
| TYPE4 | 350 | 3.9553 | 2.5134 | 0.1324 | 0.0 | 10.0000 | 2.8941 TO 3.2155 |
| TYPE5 | 270 | 3.0553 | 2.2275 | 0.1351 | 0.0 | 10.0000 | 2.7973 TO 3.3282 |
| TYPE6 | 487 | 3.2041 | 2.4057 | 0.1090 | 0.0 | 12.0000 | 2.9807 TO 3.4791 |
| TOTAL | 2254 | 2.9336 | 2.3601 | 0.0497 | 0.0 | 12.0000 | 2.8380 TO 3.1304 |
| FIXED EFFECTS MODEL | | | 2.3530 | 0.0498 | | | 2.8383 TO 3.0305 |
| RANDOM EFFECTS MODEL | | | | 0.0905 | | | 2.8777 TO 3.1812 |

RANDOM EFFECTS MODEL.   ESTIMATE OF BETWEEN COMPONENT VARIANCE       0.0413

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C   MAX   VARIANCE/SUM(VARIANCES) =  0.1823  P = 0.076 (APPROX )
BARTLETT BOX F                              4.76  P = 0.196
MAXIMUM VARIANCE / MINIMUM VARIANCE          2.73

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. . . . . . O N E W A Y . . . . . . . . . . . . . . . . . .

VARIABLE  BELOW
BY VARIABLE  SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL.

4.61    4.61    4.61    4.61    4.61

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
5038 * RANGE * SQRT(1/N(I) + 1/N(J))

(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL.

```
                    T T T T T T
                    Y Y Y Y Y Y
                    P P P P P P
                    E E E E E E
                    1 2 3 4 5 6
```

| MEAN | GROUP |
|---|---|
| 2.9842 | TYPE1 |
| 3.7316 | TYPE2 |
| 2.8499 | TYPE3 |
| 3.9553 | TYPE4 |
| 3.0553 | TYPE5 |
| 3.2041 | TYPE6 |

OUTDOOR RECREATION: "11-20" TIMES PER YEAR

ONEWAY FOR ACTIVITY ES VARIABLES                    05/03/81    PAGE

FILE  RUN    (CREATION DATE = 05/21/81)
SUBFILE  TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

- - - - - - - - - O N E W A Y - - - - - - - - -

VARIABLE  ORMED
BY VARIABLE  SUBFILE

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 22.0434 | 4.5087 | 3.493 | 0.0015 |
| WITHIN GROUPS | 2048 | 2545.6890 | 1.1328 | | |
| TOTAL | 2253 | 2567.9314 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | | |
|---|---|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 0.7623 | 0.9925 | 0.0454 | 0.0 | 5.0000 | 0.8205 | TO | 0.9061 |
| TYPE2 | 466 | 0.7146 | 1.0255 | 0.0475 | 0.0 | 5.0000 | 0.6212 | TO | 0.8079 |
| TYPE3 | 466 | 0.7554 | 1.0517 | 0.0485 | 0.0 | 5.0000 | 0.6542 | TO | 0.8525 |
| TYPE4 | 358 | 0.7455 | 0.9205 | 0.0579 | 0.0 | 5.0000 | 0.6307 | TO | 0.8513 |
| TYPE5 | 270 | 0.9451 | 1.1850 | 0.0722 | 0.0 | 5.0000 | 0.8020 | TO | 1.0882 |
| TYPE6 | 487 | 0.7485 | 1.0841 | 0.0491 | 0.0 | 5.0000 | | | |
| TOTAL | 2254 | 0.7804 | 1.0675 | 0.0225 | 0.0 | 5.0000 | 0.7363 | TO | 0.8325 |
| FIXED EFFECTS MODEL | | | 1.0642 | 0.0224 | | | 0.7464 | TO | 0.8323 |
| RANDOM EFFECTS MODEL | | | 0.0456 | | | | 0.6705 | TO | 0.9013 |

RANDOM EFFECTS MODEL   ESTIMATE OF BETWEEN COMPONENT VARIANCE    0.0089

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) =   0.2055   P = 0.002 (APPROX.)
BARTLETT-BOX F =                             2.240    P = 0.048
MAXIMUM VARIANCE / MINIMUM VARIANCE          1.4

ONEWAY FOR ACTIVITIES VARIABLES                    05/03/81    PAGE

FILE  RUN    (CREATION DATE = 05/21/81)
SUBFILE  TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

- - - - - - - - - O N E W A Y - - - - - - - - -

VARIABLE  ORMED
BY VARIABLE  SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

4.71  4.71  4.71  4.71  4.71

THE RANGES ABOVE ARE TABLE RANGES.  THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
0.7526 * RANGE * SQRT(1/N(I) + 1/N(J)).

(*) DENOTES PAIRS OF GROUP SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

```
        T T T T T T
        Y Y Y Y Y Y
        P P P P P P
        E E E E E E
        2 4 3 1 6 5
```

| MEAN | GROUP |
|---|---|
| 7146 | TYPE2 |
| 7455 | TYPE4 |
| 7554 | TYPE3 |
| 7623 | TYPE1 |
| 7685 | TYPE6 |
| 9451 | TYPE5 |

SPORTS/ATHLETICS: "1-10" TIMES PER YEAR

141

ONEWAY FOR ACTIVITIES VARIABLES                                          06/03/81        PAGE

FILE   RUN1    (CREATION DATE = 06/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - -

     VARIABLE   SPLOW
  BY VARIABLE   SUBFILE

                              ANALYSIS OF VARIANCE

               SOURCE          D F     SUM OF SQUARES    MEAN SQUARES    F RATIO    F PROB

        BETWEEN GROUPS           5         82.7634          16.5457       3.933      0.0121

        WITHIN GROUPS         2246      12562.0303           5.6419

        TOTAL                2251      12765.1050

|  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | |
| TYPE1 | 797 | 1.8847 | 2.3857 | 0.1543 | 0.0 | 12.0000 | 1.9519 TO | 2.1779 |
| TYPE2 | 486 | 1.7963 | 2.3032 | 0.1095 | 0.0 | 15.0000 | 1.5832 TO | 2.0134 |
| TYPE3 | 486 | 1.9163 | 2.3062 | 0.1106 | 0.0 | 16.0000 | 1.6991 TO | 2.1335 |
| TYPE4 | 356 | 2.3604 | 2.4744 | 0.1305 | 0.0 | 13.0000 | 2.0062 TO | 2.5326 |
| TYPE5 | 270 | 2.1567 | 2.3706 | 0.1443 | 0.0 | 12.0000 | 1.8826 TO | 2.4507 |
| TYPE6 | 457 | 2.2262 | 2.3416 | 0.1051 | 0.0 | 16.0000 | 2.0310 TO | 2.4407 |
| TOTAL | 2254 | 2.0026 | 2.3804 | 0.0501 | 0.0 | 16.0000 | 1.9442 TO | 2.1600 |
| FIXED EFFECTS MODEL |  | 2.3752 | 0.0500 |  |  |  | 1.8445 TO | 2.1407 |
| RANDOM EFFECTS MODEL |  | 0.0554 |  |  |  |  | 1.8103 TO | 2.2099 |

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE        0.0206

TESTS FOR HOMOGENEITY OF VARIANCES

     COCHRANS C = MAX VARIANCE/SUM(VARIANCES) = 0.1819, P = 0.555 (APPROX.)
     BARTLETT-BOX F =                            0.613, P = 0.440
     MAXIMUM VARIANCE / MINIMUM VARIANCE =       1.177

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ONEWAY FOR ACTIVITIES VARIABLES                                          05/03/81        PAGE

FILE   RUN1    (CREATION DATE = 06/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - -

     VARIABLE   SPLOW
  BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

          4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
     1.6796 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

SPORTS/ATHLETICS: "11-20" TIMES PER YEAR

SUMMARY FOR ACTIVITIES VARIABLES                                    05/02/81    PAGE

FILE    RUN1    (CREATION DATE = 05/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - -

VARIABLE   SPEED
BY VARIABLE   SUBFILE

ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 38.1906 | 7.6381 | 5.041 | 0.0001 |
| WITHIN GROUPS | 2248 | 3405.3307 | 1.5549 | | |
| TOTAL | 2253 | 3534.5303 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 307 | 0.8815 | 1.0295 | 0.0716 | 0.0 | 5.0000 | 0.5204 TO 0.8020 |
| TYPE2 | 485 | 0.8781 | 1.1906 | 0.0610 | 0.0 | 5.0000 | 0.4731 TO 0.8771 |
| TYPE3 | 485 | 0.7676 | 1.3122 | 0.0606 | 0.0 | 7.0000 | 0.6860 TO 0.8071 |
| TYPE4 | 363 | 0.7942 | 1.1672 | 0.0617 | 0.0 | 5.0000 | 0.6230 TO 0.8766 |
| TYPE5 | 370 | 1.0233 | 1.5072 | 0.0654 | 0.0 | 14.0000 | 0.5402 TO 1.2211 |
| TYPE6 | 487 | 0.7066 | 1.2375 | 0.0561 | 0.0 | 5.0000 | 0.6655 TO 0.8065 |
| TOTAL | 2254 | 0.7567 | 1.2026 | 0.0254 | 0.0 | 14.0000 | 0.7060 TO 0.8100 |
| FIXED EFFECTS MODEL | | | 1.2460 | 0.0263 | | | 0.7071 TO 0.8102 |
| RANDOM EFFECTS MODEL | | | | 0.0613 | | | 0.6012 TO 0.9101 |

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE         0.0170

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) =   0.2015,  P =  0.000 (APPROX.)
BARTLETT-BOX F =                             12.364,  P =  0.000
MAXIMUM VARIANCE / MINIMUM VARIANCE =         2.317

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SUMMARY FOR ACTIVITIES VARIABLES                                    05/02/81    PAGE

FILE    RUN1    (CREATION DATE = 05/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - -

VARIABLE   SPEED
BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL

4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES.  THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
0.8817 * RANGE * SQRT(1/N(I) + 1/N(J))

(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

```
                    T T T T T T
                    Y Y Y Y Y Y
                    P P P P P P
                    E E E E E E
                    2 1 4 3 6 5
```

| MEAN | GROUP |
|---|---|
| 0.7066 | TYPE2 |
| 0.8815 | TYPE1 |
| 0.7942 | TYPE4 |
| 0.7676 | TYPE3 |
| 0.7066 | TYPE6 |
| 1.0233 | TYPE5 |

NON-SIGNIFICANT ANALYSIS OF VARIANCE TABLES

FILE   RUN    CREATION DATE   06/21/81
SUBFILE   TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

O N E W A Y

VARIABLE   ANACT
BY VARIABLE   SUBFILE

ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 26.3100 | 5.2620 | 1.480 | 0.1900 |
| WITHIN GROUPS | 2248 | 8056.8867 | 3.5840 | | |
| TOTAL | 2253 | 8082.2100 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | |
|---|---|---|---|---|---|---|---|---|
| TYPE1 | 307 | 5.042 | 2.0023 | 0.1392 | 0.0 | 10.0000 | 3.106 TO | 5.886 |
| TYPE2 | 455 | 3.541 | 1.7533 | 0.0632 | 0.0 | 10.0000 | 1.903 TO | 5.170 |
| TYPE3 | 455 | 5.322 | 1.0330 | 0.0609 | 0.0 | 12.0000 | 3.668 TO | 7.000 |
| TYPE4 | 354 | 5.223 | 0.6405 | 0.0073 | 0.0 | 8.0000 | 3.310 TO | 7.130 |
| TYPE5 | 276 | 7.355 | 2.8804 | 0.1212 | 0.0 | 13.0000 | 5.074 TO | 8.556 |
| TYPE6 | 457 | 5.557 | 2.5000 | 0.0444 | 0.0 | 10.0000 | 3.001 TO | 7.322 |
| TOTAL | 2254 | 5.302 | | 0.0389 | 0.0 | 13.0000 | 3.4815 TO | 5.0064 |
| FIXED EFFECTS MODEL | | | | 0.0399 | | | 3.4820 TO | 5.0064 |
| RANDOM EFFECTS MODEL | | | | 0.0491 | | | 3.4040 TO | 5.0043 |

RANDOM EFFECTS MODEL   ESTIMATE OF BETWEEN COMPONENT VARIANCE   0.0043

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C   MAX VARIANCE/SUM(VARIANCES) = 0.1934   P = 0.411   (APPROX )
BARTLETT-BOX F =   3.266   P = 0.276
MAXIMUM VARIANCE / MINIMUM VARIANCE   3.230

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MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
1.3367 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Outdoor Recreation: '21-30' Frequency Interval

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 1.6116 | 0.3223 | 0.934 | 0.5752 |
| WITHIN GROUPS | 2260 | 866.5002 | 0.3843 | | |
| TOTAL | 2265 | 870.1187 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | | |
|---|---|---|---|---|---|---|---|---|---|
| TYPE1 | 307 | 0.2222 | 0.5100 | 0.0255 | 0.0 | 2.0000 | 0.1677 | TO | 0.2922 |
| TYPE2 | 496 | 0.3004 | 0.5974 | 0.0277 | 0.0 | 3.0000 | 0.2461 | TO | 0.3548 |
| TYPE3 | 486 | 0.3006 | 0.5762 | 0.0314 | 0.0 | 3.0000 | 0.2367 | TO | 0.3632 |
| TYPE4 | 390 | 0.2964 | 0.5696 | 0.0296 | 0.0 | 3.0000 | 0.2072 | TO | 0.3236 |
| TYPE5 | 270 | 0.3259 | 0.6076 | 0.0370 | 0.0 | 3.0000 | 0.2531 | TO | 0.3987 |
| TYPE6 | 457 | 0.2875 | 0.6762 | 0.0307 | 0.0 | 6.0000 | 0.2271 | TO | 0.3479 |
| TOTAL | 2266 | 0.2879 | 0.6216 | 0.0131 | 0.0 | 6.0000 | 0.2623 | TO | 0.3136 |
| FIXED EFFECTS MODEL | | | 0.6216 | 0.0131 | | | 0.2623 | TO | 0.3136 |
| RANDOM EFFECTS MODEL | | | | 0.0131 | | | 0.2543 | TO | 0.3216 |

WARNING    BETWEEN COMPONENT VARIANCE IS NEGATIVE
           IT WAS REPLACED BY 0.0 IN COMPUTING ABOVE RANDOM EFFECTS MEASURES

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE        -0.0002

TESTS FOR HOMOGENEITY OF VARIANCES

     COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.2073, P = 0.002 (APPROX.)
     BARTLETT-BOX F =                             7.853, P = 0.000
     MAXIMUM VARIANCE / MINIMUM VARIANCE =        1.766

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Outdoor Recreation: '21-30' Frequency Interval

VARIABLE  ONMES2
BY VARIABLE  SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

     4.71  4.71  4.71  4.71  4.71

THE RANGES ABOVE ARE TABLE RANGES   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
     0.4305 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

SUMMARY FOR ACTIVITIES VARIABLES

FILE   RUN1   (CREATION DATE = 05/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - O N E W A Y - - - - - - -

VARIABLE   ORNISH
BY VARIABLE   SUBFILE

# Outdoor Recreation: 'over 30' Frequency Interval

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 3.8887 | 0.7393 | 0.926 | 0.4612 |
| WITHIN GROUPS | 2248 | 1791.5257 | 0.7968 | | |
| TOTAL | 2253 | 1795.2222 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | |
|---|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 0.4821 | 0.8824 | 0.0592 | 0.0 | 1.0000 | 0.3802 TO | 0.5895 |
| TYPE2 | 488 | 0.3563 | 0.8430 | 0.0351 | 0.0 | 1.0000 | 0.2916 TO | 0.4530 |
| TYPE3 | 488 | 0.4870 | 0.8498 | 0.0412 | 0.0 | 1.0000 | 0.3898 TO | 0.5488 |
| TYPE4 | 358 | 0.4330 | 0.8361 | 0.0442 | 0.0 | 1.0000 | 0.3203 TO | 0.5326 |
| TYPE5 | 270 | 0.5074 | 0.8762 | 0.0534 | 0.0 | 1.0000 | 0.4023 TO | 0.6125 |
| TYPE6 | 487 | 0.4127 | 0.8807 | 0.7399 | 0.0 | 1.0000 | 0.3301 TO | 0.4884 |
| TOTAL | 2264 | 0.4397 | 0.8926 | 0.0188 | 0.0 | 14.0000 | 0.4026 TO | 0.4765 |
| FIXED EFFECTS MODEL | | | 0.8837 | -0.0188 | | | 0.4008 TO | 0.4780 |
| RANDOM EFFECTS MODEL | | | | 0.0188 | | | 0.3813 TO | 0.4980 |

WARNING - BETWEEN COMPONENT VARIANCE IS NEGATIVE
          IT WAS REPLACED BY 0.0 IN COMPUTING ABOVE RANDOM EFFECTS MEASURES

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE          -0.0002

TESTS FOR HOMOGENEITY OF VARIANCES

    COCHRANS C = MAX   VARIANCE/SUM(VARIANCES) = 0.2105, P = 0.000 (APPROX )
    BARTLETT-BOX F =                             0.082, P = 0.001
    MAXIMUM VARIANCE / MINIMUM VARIANCE =        1.082

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SUMMARY FOR ACTIVITIES VARIABLES

FILE   RUN1   (CREATION DATE = 05/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - O N E W A Y - - - - - - -

VARIABLE   ORNISH
BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL

        6.71   6.71   6.71   6.71   6.71

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
    0.6313 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

FILE     RUN1     (CREATION DATE = 06/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - -

    VARIABLE  SPMED3
 BY VARIABLE  SUBFILE          Sports/Athletics: '21-30' Frequency Interval

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 4.1253 | 0.8249 | 1.428 | 0.2110 |
| WITHIN GROUPS | 2248 | 1300.2000 | 0.5784 | | |
| TOTAL | 2253 | 1304.3250 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | |
|---|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 0.3237 | 0.7616 | 0.0525 | 0.0 | 5.0000 | 0.2203 TO | 0.4271 |
| TYPE2 | 466 | 0.3966 | 0.7600 | 0.0357 | 0.0 | 5.0000 | 0.3267 TO | 0.3772 |
| TYPE3 | 466 | 0.3306 | 0.7266 | 0.0336 | 0.0 | 4.0000 | 0.2644 TO | 0.3966 |
| TYPE4 | 358 | 0.3243 | 0.7573 | 0.0401 | 0.0 | 5.0000 | 0.3066 TO | 0.4676 |
| TYPE5 | 270 | 0.4467 | 0.8153 | 0.0496 | 0.0 | 4.0000 | 0.3426 TO | 0.5346 |
| TYPE6 | 487 | 0.3799 | 0.7734 | 0.0350 | 0.0 | 5.0000 | 0.3110 TO | 0.4487 |
| TOTAL | 2254 | 0.3685 | 0.7609 | 0.0160 | 0.0 | 5.0000 | 0.3270 TO | 0.3866 |
| FIXED EFFECTS MODEL | | | 0.7605 | 0.0160 | | | 0.3271 TO | 0.3999 |
| RANDOM EFFECTS MODEL | | | | 0.0194 | | | 0.3066 TO | 0.4064 |

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE       0.0007

TESTS FOR HOMOGENEITY OF VARIANCES

    COCHRANS C = MAX  VARIANCE/SUM(VARIANCES) = 0.1916, P = 0.067 (APPROX.)
    BARTLETT-BOX F =                            1.113, P = 0.352
    MAXIMUM VARIANCE / MINIMUM VARIANCE =       1.273

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FILE     RUN1     (CREATION DATE = 06/21/81)
SUBFILE   TYPE1        TYPE2        TYPE3        TYPE4        TYPE5        TYPE6

- - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - -

    VARIABLE  SPMED3
 BY VARIABLE  SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

        4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES.  THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
        0.5378 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

FILE   RUN1   (CREATION DATE : 05/21/81)
SUBFILE   TYPE1       TYPE2       TYPE3       TYPE4       TYPE5       TYPE6

- - - - - - - O N E W A Y - - - - - - -

VARIABLE   SPHIGH
BY VARIABLE   SUBFILE

## Sports/Athletics: 'over 30' Frquency Interval

ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 15.3314 | 3.0663 | 2.346 | 0.0478 |
| WITHIN GROUPS | 2248 | 3070.8348 | 1.3660 | | |
| TOTAL | 2253 | 3086.1660 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 307 | 0.7009 | 1.3608 | 0.0931 | 0.0 | 10.0000 | 0.5100 TO 0.8850 |
| TYPE2 | 456 | 0.6515 | 1.0700 | 0.0435 | 0.0 | 7.0000 | 0.4540 TO 0.6490 |
| TYPE3 | 456 | 0.6100 | 1.1041 | 0.0541 | 0.0 | 9.0000 | 0.5102 TO 0.7234 |
| TYPE4 | 358 | 0.6660 | 1.0614 | 0.0572 | 0.0 | 9.0000 | 0.5524 TO 0.7772 |
| TYPE5 | 270 | 0.6295 | 1.2053 | 0.0734 | 0.0 | 7.0000 | 0.5215 TO 0.6702 |
| TYPE6 | 407 | 0.5970 | 1.2033 | 0.0545 | 0.0 | 10.0000 | 0.4662 TO 0.6685 |
| TOTAL | 2254 | 0.6304 | 1.1704 | 0.0247 | 0.0 | 10.0000 | 0.5801 TO 0.6884 |
| FIXED EFFECTS MODEL | | | 1.1688 | 0.0246 | | | 0.5601 TO 0.6887 |
| RANDOM EFFECTS MODEL | | | | 0.0279 | | | 0.6610 TO 0.7235 |

RANDOM EFFECTS MODEL   ESTIMATE OF BETWEEN COMPONENT VARIANCE   0.0045

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX  VARIANCE/SUM(VARIANCES) = 0.2150, P = 0.000 (APPROX.)
BARTLETT-BOX F =   6.272, P = 0.001
MAXIMUM VARIANCE / MINIMUM VARIANCE   1.667

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MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL

4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
0.8260 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

- - - - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - -

VARIABLE   ARLOW
BY VARIABLE  SUBFILE     Arts and Cultural: '1-10' Frequency Interval

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 1 3930 | 0 1788 | 0 276 | 0 9277 |
| WITHIN GROUPS | 2246 | 2267 3730 | 1 0175 | | |
| TOTAL | 2253 | 2268 7664 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN |
|---|---|---|---|---|---|---|---|
| TYPE1 | 307 | 0 5550 | 1 1515 | 0 0521 | 0 0 | 5 0000 | 0 4371 TO 0 7010 |
| TYPE2 | 466 | 0 5300 | 0 5500 | 0 0057 | 0 0 | 7 0000 | 0 4403 TO 0 6195 |
| TYPE3 | 466 | 0 5001 | 0 5777 | 0 0053 | 0 0 | 7 0000 | 0 4174 TO 0 5904 |
| TYPE4 | 358 | 0 5550 | 0 5730 | 0 0515 | 0 0 | 10 0000 | 0 5241 TO 0 5353 |
| TYPE5 | 270 | 0 5550 | 1 0450 | 0 0550 | 0 0 | 10 0000 | 0 5255 TO 0 5550 |
| TYPE6 | 457 | 0 5315 | 0 5515 | 0 0435 | 0 0 | 5 0000 | 0 4452 TO 0 5176 |
| TOTAL | 2264 | 0 5342 | 1 0070 | 0 0212 | 0 0 | 10 0000 | 0 4025 TO 0 5755 |
| FIXED EFFECTS MODEL | | | 1 0057 | 0 0212 | | | 0 4025 TO 0 5755 |
| RANDOM EFFECTS MODEL | | | | 0 0212 | | | 0 4755 TO 0 5555 |

WARNING -- BETWEEN COMPONENT VARIANCE IS NEGATIVE
           IT WAS REPLACED BY 0 0 IN COMPUTING ABOVE RANDOM EFFECTS MEASURES

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE      -0 0030

TESTS FOR HOMOGENEITY OF VARIANCES

    COCHRANS C = MAX  VARIANCE/SUM(VARIANCES) = 0 2102, P = 0 000 (APPROX )
    BARTLETT-BOX F =                            3 700, P = 0 002
    MAXIMUM VARIANCE / MINIMUM VARIANCE =       1 011

- - - - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - -

VARIABLE   ARLOW
BY VARIABLE  SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0 050 LEVEL -

    4.71  4 71  4 71  4 71  4 71

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
    0 7132 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0 050 LEVEL

ONEWAY FOR ACTIVITIES VARIABLES

FILE    RUN1    (CREATION DATE = 05/21/81)
SUBFILE    TYPE1    TYPE2    TYPE3    TYPE4    TYPE5    TYPE6

- - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - -

VARIABLE   ARMED
BY VARIABLE   SUBFILE

# Arts and Cultural: '11-20' Frequency Interval

## ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|--------|------|----------------|--------------|---------|--------|
| BETWEEN GROUPS | 6 | 4.0433 | 0.6667 | 1.571 | 0.1550 |
| WITHIN GROUPS | 2246 | 1157.2623 | 0.5143 | | |
| TOTAL | 2252 | 1161.2054 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | | |
|-------|-------|------|--------------------|----------------|---------|---------|--------------------------|---|---|
| TYPE1 | 397 | 0.7850 | 0.8863 | 0.0465 | 0.0 | 3.0000 | 0.1954 TO | | 0.2747 |
| TYPE2 | 465 | 0.3354 | 0.8577 | 0.0372 | 0.0 | 3.0000 | 0.2915 TO | | 0.3668 |
| TYPE3 | 465 | 0.3562 | 0.7547 | 0.0350 | 0.0 | 3.0000 | 0.2875 TO | | 0.4245 |
| TYPE4 | 366 | 0.2208 | 0.7043 | 0.0272 | 0.0 | 3.0000 | 0.3584 TO | | 0.4022 |
| TYPE5 | 270 | 0.3519 | 0.7047 | 0.0422 | 0.0 | 3.0000 | 0.3574 TO | | 0.4203 |
| TYPE6 | 447 | 0.3655 | 0.8277 | 0.0375 | 0.0 | 3.0000 | 0.2915 TO | | 0.4392 |
| TOTAL | 2254 | 0.3281 | 0.7178 | 0.0151 | 0.0 | 3.0000 | 0.2984 TO | | 0.3557 |
| FIXED EFFECTS MODEL | | | 0.7178 | 0.0151 | | | 0.2985 TO | | 0.3557 |
| RANDOM EFFECTS MODEL | | | | 0.0193 | | | 0.2765 TO | | 0.3766 |

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE    0.0002

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.2266  P = 0.000 (APPROX.)
BARTLETT-BOX F =    12.105  P = 0.000
MAXIMUM VARIANCE / MINIMUM VARIANCE =    1.803

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ONEWAY FOR ACTIVITIES VARIABLES

FILE    RUN1    (CREATION DATE = 05/21/84)
SUBFILE    TYPE1    TYPE2    TYPE3    TYPE4    TYPE5    TYPE6

- - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - -

VARIABLE   ARMED
BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES.   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
0.5073 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

FILE   SUB1   (CREATION DATE = 05/21/81)
SUBFILE   TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

- - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - -

VARIABLE   ARMED2
BY VARIABLE   SUBFILE

## Arts and Cultural: '21-30' Frequency Interval

ANALYSIS OF VARIANCE

| SOURCE | D F | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 5 | 1.0225 | 0.2005 | 0.445 | 0.5175 |
| WITHIN GROUPS | 2248 | 549.2575 | 0.2442 | | |
| TOTAL | 2253 | 550.2800 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | | |
|---|---|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 0.1930 | 0.4878 | 0.0339 | 0.0 | 3.0000 | 0.1197 TO | | 0.2604 |
| TYPE2 | 486 | 0.1602 | 0.4672 | 0.0210 | 0.0 | 4.0000 | 0.1077 TO | | 0.1927 |
| TYPE3 | 486 | 0.2062 | 0.5005 | 0.0254 | 0.0 | 4.0000 | 0.1562 TO | | 0.2900 |
| TYPE4 | 354 | 0.1706 | 0.4500 | 0.0235 | 0.0 | 3.0000 | 0.1256 TO | | 0.2156 |
| TYPE5 | 270 | 0.1513 | 0.4255 | 0.0259 | 0.0 | 3.0000 | 0.1002 TO | | 0.2020 |
| TYPE6 | 447 | 0.1900 | 0.4685 | 0.0222 | 0.0 | 4.0000 | 0.1463 TO | | 0.2335 |
| TOTAL | 2254 | 0.1787 | 0.4943 | 0.0104 | 0.0 | 6.0000 | 0.1579 TO | | 0.1955 |
| FIXED EFFECTS MODEL | | | 0.4943 | 0.0104 | | | 0.1579 TO | | 0.1988 |
| RANDOM EFFECTS MODEL | | | | 0.0104 | | | 0.1515 TO | | 0.2051 |

WARNING - BETWEEN COMPONENT VARIANCE IS NEGATIVE
          IT WAS REPLACED BY 0.0 IN COMPUTING ABOVE RANDOM EFFECTS MEASURES

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE        -0.0001

TESTS FOR HOMOGENEITY OF VARIANCES

    COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.2202, P = 0.000 (APPROX.)
    BARTLETT-BOX F =                            5.975, P = 0.000
    MAXIMUM VARIANCE / MINIMUM VARIANCE =       1.700

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FILE   SUB1   (CREATION DATE = 05/21/81)
SUBFILE   TYPE1      TYPE2      TYPE3      TYPE4      TYPE5      TYPE6

- - - - - - - - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - -

VARIABLE   ARMED2
BY VARIABLE   SUBFILE

MULTIPLE RANGE TEST

SCHEFFE PROCEDURE
RANGES FOR THE 0.050 LEVEL -

      4.71   4.71   4.71   4.71   4.71

THE RANGES ABOVE ARE TABLE RANGES   THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS
    0.3496 * RANGE * SQRT(1/N(I) + 1/N(J))

NO TWO GROUPS ARE SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

- - - - - - - - - - - - - O N E W A Y - - - - - - - - - - - - - - - - - - - -

VARIABLE  ARNISH
BY VARIABLE  SUBFILE

# Arts and Cultural: 'over 30' Frequency Interval

ANALYSIS OF VARIANCE

| SOURCE | D.F. | SUM OF SQUARES | MEAN SQUARES | F RATIO | F PROB |
|---|---|---|---|---|---|
| BETWEEN GROUPS | 8 | 8.7907 | 1.3580 | 1.888 | 0.0888 |
| WITHIN GROUPS | 2244 | 1513.1000 | 0.6731 | | |
| TOTAL | 2253 | 1513.4000 | | | |

| GROUP | COUNT | MEAN | STANDARD DEVIATION | STANDARD ERROR | MINIMUM | MAXIMUM | 95 PCT CONF INT FOR MEAN | | |
|---|---|---|---|---|---|---|---|---|---|
| TYPE1 | 207 | 0.4351 | 0.8550 | 0.0594 | 0.0 | 4.0000 | 0.3000 TO | | 0.5533 |
| TYPE2 | 456 | 0.3564 | 0.7560 | 0.0354 | 0.0 | 4.0000 | 0.2861 TO | | 0.4200 |
| TYPE3 | 456 | 0.3527 | 0.7564 | 0.0354 | 0.0 | 4.0000 | 0.3213 TO | | 0.4543 |
| TYPE4 | 354 | 0.4355 | 0.6123 | 0.0430 | 0.0 | 4.0000 | 0.3400 TO | | 0.5231 |
| TYPE5 | 270 | 0.5407 | 0.9563 | 0.0583 | 0.0 | 5.0000 | 0.4200 TO | | 0.6550 |
| TYPE6 | 457 | 0.4025 | 0.7645 | 0.0352 | 0.0 | 4.0000 | 0.3530 TO | | 0.4725 |
| TOTAL | 2254 | 0.4167 | 0.8212 | 0.0173 | 0.0 | 5.0000 | 0.3816 TO | | 0.4493 |
| FIXED EFFECTS MODEL | | 0.8204 | 0.0173 | | | | 0.3816 TO | | 0.4493 |
| RANDOM EFFECTS MODEL | | 0.0942 | | | | | 0.3530 TO | | 0.4770 |

RANDOM EFFECTS MODEL - ESTIMATE OF BETWEEN COMPONENT VARIANCE    0.0015

TESTS FOR HOMOGENEITY OF VARIANCES

COCHRANS C = MAX. VARIANCE/SUM(VARIANCES) = 0.2200, P = 0.000 (APPROX.)
BARTLETT-BOX F = 3.040, P = 0.001
MAXIMUM VARIANCE / MINIMUM VARIANCE = 1.482