SOCIO - ECONOMIC AND BEHAVIORAL CHARACTERISTIC DIFFERENCES BETWEEN CAMPERS AND DAY - USERS IN SOUTHERN MICHIGAN STATE PARKS

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DAVID ANTHONY LA POINTE

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ABSTRACT

SOCIO-ECONOMIC AND BEHAVIORAL CHARACTERISTIC DIFFERENCES BETWEEN CAMPERS AND DAY-USERS IN SOUTHERN MICHIGAN STATE PARKS

By

David Anthony La Pointe

Most of the data pertaining to state park users have been collected from campers. This would be a satisfactory method of data collection if state park campers were similar to state park day-users in both socio-economic and behavioral characteristics. If this is not the case, park planning and administration is being formulated on the basis of the needs and use patterns of a small segment of the park-using public--the campers.

To test whether or not campers and day-users exhibit similar use patterns, the hypothesis was formulated that there is a different in socio-economic and behavioral characteristics between these two sub-groups of park-users.

The data tested was collected at Holland State Park and Waterloo State Recreation Area during the summer of 1968 by a research team of the Research and Planning Unit of Michigan State University's Department of Parks and Recreation Resources, under a contract with the Recreation

Resource Planning Division of the Michigan Department of Natural Resources.

The data was computerized and subjected to statistical tests for significance at the .05 level, or a 95 per cent confidence limit. The chi square test was used for all characteristics except group mean size. For this characteristic, the test was for similarity of means.

The hypothesis was to be accepted if at least half of the socio-economic characteristics and behavioral characteristics were found to have a statistically significant difference between day-users and campers at each park sampled.

Significant differences were found between campers and day-users concerning age distribution patterns, age of the head of the family, occupational patterns of the head of the family, and income of the families. Among behavioral characteristics, differences were found in travel time, travel distance, group descriptions, group mean size, time of arrival, hours spent in the park, and in group activity participation patterns between campers and day-users.

It was also found that all state park user-groups differed from the general population in the socio-economic characteristic patterns. The southern Michigan state park-user is largely from the middle-class segments of the population. The camper exhibits middle-class characteristics even more strongly than does the day-user. State parks appear to be the outdoor recreational outlet for the

middle-class, with a marked absence of the socially-disadvantaged, and the very rich.

Implications that might be drawn from the findings are discussed with some possible explanations for the differences encountered.

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A THESIS

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This thesis is dedicated to my wife, Dianne. Without her patience and understanding, during a very disruptive period in our lives, thesis completion would have been extremely unlikely.

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CHAPTER I

THE PROBLEM AND DEVELOPMENT OF THE HYPOTHESIS

Introduction

In the past decade, Michigan state parks have experienced pressure from the nation-wide "recreation boom," a phenominal upsurge in park use by the public. An illustration of this was the 13.8 per cent increase in Michigan state park attendance experienced over just a one year span, from 1967 to 1968.[1] This one year example typifies a trend that shows no sign of abating.[2] The steady increase in park users has created many inadequacies of space and facilities in present parks. In 1966 alone, more than 55,000 camping groups were turned away from Michigan state parks campgrounds because they were full.[3] Many

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[1]Michigan Department of Natural Resources, Parks Division, State Park Attendance--1968 (Lansing, Michigan: Michigan Department of Natural Resources, n.d.), p. 1.

[2]Statistics for 1969 show an increase of over 14 per cent greater attendance than 1968 in Michigan state parks.

[3]Michigan Department of Natural Resources, Parks Division, Twenty-fourth Biennial Report, 1967-68 (Lansing, Michigan: Michigan Department of Natural Resources, n.d.), p. 3.

parks, designed for sparse crowds and extensive use have become the scene of unruly behavior and serious site deterioration.

It is obvious that Michigan, like most other states, must undergo a massive land acquisition and park development program if it is to meet this public demand. In the case of Michigan, a recently-approved $100,000,000 bond program was launched in recognition of these needs.[1]

A major consideration, however, is that before any massive program of land acquisition, development and construction is carried out, there should be considerable research on the people who use these parks. A greater expectancy of success in meeting the public demands and needs can be achieved if the characteristics and recreational habits of the park-using public are accurately identified and described. Park construction on the basis of demands by vocal, influential, or special interest groups may result in parks that do not meet the needs of the vast majority of the park-using public.

The Problem

A serious problem facing park planners is that there is a scarcity of information about state park users. There

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[1]This bond was approved by voters in the November, 1968 general election. The funds are to be divided between municipal recreation areas, state parks and state game areas. As of this writing, only a small portion of the bonds have been sold.

have been periodic surveys in Michigan state parks concerning place of residence, the percentage of out-of-state visitors, and even visitor preferences regarding the banning of dogs from state parks.[1] However, the bulk of information has been acquired from camping permit forms, and therefore, only concerns campers. Even this provides little information beyond such basic data as group size, county or state of origin, length of stay, and type of camping equipment.[2]

This information would have been helpful in detecting trends in travel patterns, lengths of say, and preferences in camping shelters and group sizes. However, this information concerns only about 10 per cent of Michigan state park users.[3] A major question for those involved in park planning is, how closely can information pertaining to campers apply to park users in general?

In essence, the problem can be stated thus: are campers and day-users identical (or very similar) in socio-economic backgrounds, and in behavioral trends regarding state park use?

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[1]The author personally took park in these surveys at state park entrance booths between 1962 and 1965.

[2]While this data used to be compiled by the Michigan Department of Natural Resources, it has not been gathered from camping permit forms since 1967.

[3]Michigan Department of Natural Resources, Biennial Report, p. 8.

Significance of Problem

The significance of the problem is obvious. If, in taking surveys to probe user preferences, a preponderance of campers are contacted, there is a distinct possibility that park planning may be geared to a minority demand.

Besides behavior characteristics, such as length of stay, time of arrival, etc., the socio-economic characteristics of the park user many be even more revealing to the park planner. Since personal background is vitally important towards developing an "outlook" or "mental set" in using a park, as in other aspects of life, research in this area can provide the "who" and the "why" to the park planner in understanding park user behavior.[1] An analogy to the wildlife manager can be used to illustrate this point. A wildlife manager could not possibly develop an effective habitat management plan for a game species without prior knowledge of that species' natural history. Since a park is a "habitat," in a sense, it is mandatory for an effective park planner that he also know his "species"--in this case, the park-using human, many seeking change or relief from the stresses of urban life--in order to plan for their needs and wants.

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[1]Karl Menninger takes important notice of the fact that a person's background shapes his outlooks and expectations in The Vital Balance (New York: Viking Press, 1963), repeatedly throughout the volume.

There are many aspects and questions regarding this problem. A few of them are:

1. Are park users a true random sampling of the Michigan population?
2. Could campers and day-users differ significantly in some parks, and not differ in other parks?
3. If campers and day-users do differ, is the difference more or less uniform throughout the state?
4. What regional differences are there? Could we expect to find the same day-user or camper characteristics in the upper peninsula, for example, as we find in the Detroit metropolitan area?
5. Would differences noted in 1968 be in evidence in 1970?

Answers to the above questions would involve exhaustive research over a prolonged period of time. For the purposes of this study, it is necessary to be somewhat more limited in scope.

Scope of Study

This study was limited to the southern one-third of Michigan at two of the most heavily-used state parks: Holland State Park and Waterloo State Recreation Area.

Combined attendance at these two parks exceeded two million people during the study year, 1968.[1]

It was felt that these two parks were ideal examples of the first two classes in a stratification scheme by Clawson.[2] Holland State Park represents Class #1, a user-oriented area close to an urban center. Waterloo State Recreation Area represents Class #2, an intermediate area within two hours driving time from urban centers, and more diversified in the activities offered. For the sake of brevity, these parks will henceforth be referred to in this thesis as simply "Holland" and "Waterloo."

The gathering of data was carried out from July 1 through September 5, 1968. This time span is the period of heaviest use in state parks throughout Michigan. The study was designed to measure certain socio-economic and behavioral characteristics of park users. The randomly-sampled park users were also divided into two groups of campers and day-users at both parks.

The results and conclusions are not intended to be rigidly applied throughout Michigan, or outside of the State, without supporting research. However, based on the

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[1]Michigan Department of Natural Resources, Attendance--1968.

[2]Marion Clawson and Jack L. Knetsch, "Recreation Research: Some Basic Analytical Concepts and Suggested Framework for Research Problems," Proceedings of the National Conference on Outdoor Recreation Research, Ann Arbor, Michigan 1959, p. 13.

author's experience as a southern Michigan state park manager, there is good reason to believe that similar patterns of user characteristics would be found at other southern Michigan state parks.[1]

The purpose of this study was to determine whether or not there was a difference in either socio-economic or behavioral characteristics (or both) between day-users and campers in southern Michigan state parks. If this can be shown to be true in the case of the study parks, there is a basis for exploring user differences in parks in other parts of the State and Nation.

Hypothesis

The hypothesis can be stated as follows: "There is a significant difference between campers and day-users at southern Michigan state parks in both socio-economic and in behavioral characteristics."

This implies that a larger percentage of the southern Michigan state park-using public are exclusive in their use classifications. At a particular park, certain people use the park only for day-use outings. If these people do camp, they usually go elsewhere. The same applies

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[1]The author was a park manager at Holly State Recreation Area from 1964 to 1967. This area was a Class #2 stratum park in the southern part of Michigan, and was very similar in many respects to Waterloo, both in physical facilities and in use patterns. In this capacity, the author had ample opportunity to observe and meet the southern Michigan state park user.

to the people who use that park primarily for camping. If this were not the case, there is little reason to expect significant differences between the two classes of park users in the characteristics sampled.

The hypothesis, in turn, is subdivided into twelve sub-hypotheses. Each of these sub-hypotheses pertain to a characteristic that is being measured. The data regarding each characteristic is subjected to a statistical test to determine a similarity or difference between campers and day-users. By the criteria of "similar" or "different," each sub-hypothesis will be supported or disproved. The sub-hypotheses are grouped under one of two headings, those pertaining to socio-economic characteristics, and those pertaining to behavioral characteristics. They are as follows:

Sub-hypotheses Pertaining to Socio-economic Characteristics

Sub-hypothesis 1: There is a statistically significant difference in age distributions between campers and day-users.

Sub-hypothesis 2: There is a statistically significant difference in the sex of the head of the family between campers and day-users.

Sub-hypothesis 3: There is a statistically significant difference in the age of the head of the family between campers and day-users.

Sub-hypothesis 4: There is a statistically significant difference in the occupational patterns of the head of the family between campers and day-users.

Sub-hypothesis 5: There is a statistically significant difference in the educational levels of the head of the family between campers and day-users.

Sub-hypothesis 6: There is a statistically significant difference in the income of the head of the family between campers and day-users.

Sub-hypotheses Pertaining to Behavioral Characteristics

Sub-hypothesis 7: There is a statistically significant difference in the distances traveled to the park between campers and day-users.

Sub-hypothesis 8: There is a statistically significant difference in the time spent traveling to the park between campers and day-users.

Sub-hypothesis 9: There is a statistically significant difference in the description of the visiting group between campers and day-users.

Sub-hypothesis 10: There is a statistically significant difference in the size of the visiting group between campers and day-users.

Sub-hypothesis 11: There is a statistically significant difference in the arrival time of the group between campers and day-users.

Sub-hypothesis 12: There is a statistically significant difference in the group activity participation patterns between campers and day-users.

Clearly the hypothesis cannot be rejected even if one or several sub-hypotheses are disproven. For instance, there still is a difference in socio-economic characteristics between campers and day-users if all sub-hypotheses except one are supported by statistical tests on the data.

This will be discussed in detail in Chapter II under Criteria For Characteristic Difference.

Definitions

Throughout this thesis, terms and phrases are used that have a precise meaning within this study context. Since many of the terms are in common usage--with a variety of meanings--some confusion to the reader may result. The following is a list compiled by the author:

Day-user.--A person who uses a park for a day's outing, but does not camp in that park. Day-user hours in Michigan State Parks are from 8 A.M. to 10 P.M.

Camper.--A person who camps in a state park.

Group.--A group is confined to those who arrive at the park in one vehicle. Two families visiting a park together in two separate vehicles would be considered two groups.

Family.--A family is confined to parents, dependent children, and any relatives living together in one home. If a couple and their children are visting with either set of grandparents who live apart, they would be considered as two families.

Head of Family.--This usually means the primary wage earner within a conjugal family, as described above. However, in the instance of a wife earning more than her

husband, the man would be considered the head. The same would apply to a married college student with a working wife.

Income, Head of Family.--In a practical sense, this means the combined income of both husband and wife. It does not include the income of an older, working child, unless the child is the primary support of the household.

Group Activity Participation.--If any one person in a group participated in an activity in the park, the entire group is considered to have participated in that activity.

State Park--State Recreation Area.--While there are certain legal and administrative differences between a state park and a state recreation area in Michigan, for the purposes of this study, the two are to be considered the same.

Once the problem and hypothesis was identified, the next step was gathering and the analysis of the data. The sub-hypotheses were subjected to statistical tests for similarities or differences between campers and day-users. The next chapter will discuss the source of the data, and the analysis methods used. Following the description of the methods, a discussion of the criteria for "difference" or "similarity" of a user characteristic is included.

CHAPTER II

DATA SOURCE AND ANALYSIS METHODS

Data Source

The data for this study was collected during a research study by the Recreation, Research and Planning Unit of Michigan State University's Department of Parks and Recreation Resources under a contract with the Recreation Resource Planning Division of the Michigan Department of Natural Resources.[1] The primary purpose of that study was to devise a survey questionnaire that would sample park attendance and a number of visitor characteristics with a high degree of reliability. In addition, the questionnaire was designed to achieve a high level of response.[2]

Data were collected from July 1 through September 5, 1968, at Waterloo State Recreation Area, Holland State Park, and Tawas Point State Park. Questionnaires were handed out at manned entrance gates by park staff according to a

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[1]Douglas Melvin Crapo, "Recreation Area 'Day-use' Investigation Techniques: A Study of Survey Methodology Within Michigan State Parks" (unpublished Master's thesis, Michigan State University, 1969), p. 5.

[2]A high response is achieved when a high percentage of persons receiving a questionnaire return it completed.

pre-determined sequence of random sampling. The number of groups to be sampled was determined by the ratio of campers in past years at each park. It was statistically necessary to have at least 385 day-user groups complete the entire questionnaire at each park. To attain this number of completed questionnaires, the study team set a goal of 900 respondents at each park.[1] Sampling intervals were calculated from past attendance records in order to achieve this goal. Every nth axle which crossed a pneumatic counter at the entrance rang a bell. The next vehicle was stopped, and the driver was handed a questionnaire. However, it should be stressed that the vehicle was the sampling unit, irrespective of the number of occupants.

To establish a control group, members of the study team orally interviewed a sampling of park users to compare their responses with the self-administered questionnaire results. At the time, there was much concern regarding bias that might be introduced through non-response by certain kinds of park users. The rationale was that those motivated enough to return the questionnaire might differ--such as in education--markedly from those who were not

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[1]Douglas Crapo and Michael Chubb, Recreation Area Day-Use Investigation Techniques: Part 1 A Study of Survey Methodology (East Lansing, Michigan: Recreation Research and Planning Unit, Department of Park and Recreation Resources, College of Agriculture and Natural Resources, Michigan State University, Technical Report No. 6, 1969), p. 51.

motivated to return the questionnaire.[1] It was found, however, that except for the questions pertaining to travel distance to Waterloo, and travel time to Holland, the questionnaire data did not statistically differ from interview data.

Data from Tawas Point State Park was not used in this present study.[2] At Waterloo and Holland, 993 and 1,011 questionnaires were returned, respectively. Of these, all questions were answered on 816 and 888 questionnaires. Interview responses were added to the data at each park for the purposes of data analysis in this present study. Because of the differences in the number of respondents replying to a question, a number of variations in the total number of respondents appear in the subsequent tables from characteristic to characteristic.

Data from the questionnaires and interviews were transferred onto mark-sense answer sheets. Answers to questions 1-21 were scored on sheet one, and answers to questions 22-24 were scored on sheet two.[3]

From these answer sheets, the data were machine punched onto pairs of data processing cards: cards one

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[1] Ibid., p. 27.

[2] Data from Tawas Point State Park was not utilized for this study because location, use patterns and attendance for that park had little in common with the other two parks.

[3] A copy of the questionnaire is included in Appendix C, p. 135.

and two corresponding to sheets one and two, respectively. At this point, the card pairs from both parks were sorted into sub-groups of campers and day-users. A "yes" answer to either question one--Did you camp in this park last night?--or two--Are you going to camp in the park tonight?--defined the group as campers. All other groups, including those who left the answers to questions one and two blank, were considered as day-users. Thus, four groups were formed for purposes of data analysis: campers and day-users from both Holland and Waterloo.

Simple frequency counts of answers to each category within questions 3, 4, 8, 9, 10, 11, 12, 13, 19, 21, and 23 were custom programmed for the Michigan State University CDC 3600 computer, and basic tabulations were produced. The results of these tabulations are shown in table form in Appendices A-1 to A-14. For various reasons, the data from questions 5, 6, 7, 14, 15, 16, 17, 18, 20, and 24 was unsuitable for use in this study, and were not tabulated.

Because there was a varying number of respondents within each sub-group, and responses to different questions varied within these sub-groups, responses were transformed to a percentage basis for graphical illustration.

Data Analysis Methods

A double set of comparisons was a primary goal of this study. First, the responses of day-users are compared to the responses of campers within each park sampled. Of

secondary importance, but essential to the study, is the comparison of responses between day-users in each park, and between campers in each park. It would be most unusual if both day-users and campers in a park responded in exactly the same way to even one question. Differences of varying degrees are almost certain. The problem facing the researcher is the decision as to whether the differences are significant--i.e., signifying a statistical difference--or merely reflect normal variation found in all sampling of similar populations.

Thus, the data were subjected to statistical testing. With the exception of data pertaining to the number of people per vehicle, all sets of data were compared with χ^2 distribution values to test whether both sampling distributions are likely to be from the same population distribution. This test was run at the .05 level of significance with varying degrees of freedom. This was a test for statistical difference. There are various approaches and formulas for this test, depending on the structure of the problem. The approach used here was a simplified form used where there are two columns and r rows.[1]

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[1]Wilfrid J. Dixon and Frank J. Massey, Jr., Introduction to Statistical Analysis (New York: McGraw-Hill Book Company, Inc., 1951), pp. 189-90.

Each column represents a sub-group within a park, either day-users or campers. Each row represents the frequency of responses in each category of both sub-groups. The table is set up as follows:

	Campers	Day-users	Total	
	X_{11}	X_{12}	$X_{11} + X_{12}$	$X_{11}^2/(X_{11} + X_{12})$
	X_{21}	X_{22}	$X_{21} + X_{22}$	$X_{21}^2/(X_{21} + X_{22})$
	.	.	.	.
	.	.	.	.
	.	.	.	.
	X_{r1}	X_{r2}	$X_{r1} + X_{r2}$	$X_{r1}^2/(X_{r1} + X_{r2})$
Total	ΣX_{i1}	ΣX_{i2}	$\Sigma(X_{i1} + X_{i2})$	$\sum_{i=1}^{r} [X_{i1}^2/(X_{i1} + X_{i2})]$

Then, χ^2 is given by the following formula:

$$\chi^2 = \left[\sum_{i=1}^{r} \left[\frac{X_{i1}^2}{(X_{i1} + X_{i2})} \right] - p \sum_{i=1}^{r} X_{i1} \right] / P(1 - p)$$

Where:

$$p = \frac{\sum_{i=1}^{r} X_{i1}}{\sum_{i=1}^{r} (X_{i1} + X_{i2})}$$

The formula for determining the degrees of freedom is: $(r - 1)(C - 1)$, with r representing the number of rows, and C representing the number of columns. For

example, if there are 8 rows--or categories to the particular question--(8 - 1)(2 - 1) = 7 degrees of freedom.

For χ^2 with a 95 per cent confidence limit at 7 degrees of freedom--referred to hereafter as 7 degrees freedom $\chi^2_{.95}$--it can be said that there is a .95 chance that χ^2 will be less than 14.07. These values are taken from Table 6b in Dixon and Massey.[1] Thus for the purpose of this study it can be declared that a <u>difference</u> exists between campers and day-users, in a particular characteristic, when the χ^2 value falls above the 95 per cent confidence limit values at the specified degrees of freedom.

The analysis method for comparing the mean persons per vehicle between campers and day-users required a different statistical test.[2]

$$z = \frac{\bar{X}_1 = \bar{X}_2}{\sigma\sqrt{(1/N_1) + (1/N_2)}}$$

Where:

$\alpha = .05$

$\sigma^2 = 3$

$\bar{X}_1$ = larger arithmetic mean group size

$\bar{X}_2$ = smaller arithmetic mean group size

N_1 = larger arithmetic mean sample size

N_2 = smaller arithetic mean sample size

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[1] <u>Ibid</u>., p. 308.

[2] <u>Ibid</u>., pp. 101-04.

This statistic, the Comparison of the Means of Two Populations, is a good test when the populations, N_1 and N_2, are large and are drawn from a normal distribution.

The statistical difference or similarity between means was determined by the value of z. A similarity of means can be assumed at the .05 significance level, if the value of z falls between the values of $z_{1/2\alpha}$ and $z_{1-1/2\alpha}$. These values were obtained from Table 4 in Dixon and Massey.[1] At the .05 significance level, these values were -1.96 and +1.96, respectively. If the value for z falls outside of this range, we can assume a statistical difference between the means at the .05 significance level.

The same variance can be assumed for both parks. There was no reason to assume that the capacity of group vehicles varies from park to park. A range of nine was assigned, by assuming that the top capacity of an American station wagon as ten persons. This involved another assumption, that buses carrying a large number of persons were included in an infinitesimally small part of the sample. The range, being a biased estimate of the variance, was multiplied by the coefficient in the appropriate table in Dixon and Massey to get an unbiased estimate of the variance, or σ.[2]

This statistic could have been replaced by the χ^2 distribution test. However the data would have had to have

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[1] Ibid., p. 306.

[2] Ibid., p. 239.

been compiled differently by the computer. Mean figures were established by dividing the total number of persons sampled within a sub-group by the total number of groups--vehicles--in the sub-group.

Criteria For Characteristic Difference

When a statistical difference was noted between sub-groups in both parks, we can clearly state that the data does not dispute the sub-hypothesis regarding the characteristic in question. Conversely, when a similarity was noted between sub-groups in a particular characteristic at both parks, we can declare that the data rejects the sub-hypothesis in question.

A more difficult case would be where a sub-hypothesis was not disputed by the data for a characteristic in one park, but the same sub-hypothesis was rejected by the data in the other park. This might suggest that the same type of sub-group, campers or day-users, could differ from park to park. It would also suggest that more research is needed in more parks regarding these particular characteristics.

In order to determine whether the main hypothesis is not disputed, we must decide on how many sub-hypotheses may be rejected before the main hypothesis is rejected. We will state, rather arbitrarily, that when at least 50 per cent of the sub-hypotheses concerning socio-economic characteristics, and at least 50 per cent of the

sub-hypotheses concerning behavioral characteristics are supported by the data for a particular park, the main hypothesis is not rejected for that particular park. In order for the main hypothesis to be accepted for the purposes of this thesis, the main hypothesis must not be rejected for either park of this study. For the main hypothesis to be accepted regarding a particular park, three, or more, sub-hypotheses must be supported by the data for socio-economic characteristics, and at least three sub-hypotheses must be supported for behavioral characteristics. It is not necessary for the same sub-hypotheses to be supported in both parks. When the above conditions are met, there is considered to be socio-economic differences, and there would be behavioral differences between campers and day-users in both parks. This is, in essence, what is stated in the main hypothesis.

The next chapter will cover the application of the above analysis methods to the collected data from both parks pertaining to the socio-economic characteristics of campers and day-users.

CHAPTER III

SOCIO-ECONOMIC CHARACTERISTIC ANALYSIS

Age Distribution

Sub-hypothesis 1 is as follows: there is a statistically significant difference in age distributions between campers and day-users.

χ^2 distribution at the 95 per cent confidence limit, and nine degrees of freedom--$\chi^2.95$ @ 9 d.f.--tests were run between campers and day-users of each sex from both parks. Age data may be found in Appendices A-1 and A-2. The test problems are worked out in entirety in Appendices B-1, B-2, B-3 and B-4.

At $\chi^2.95$ @ 9 d.f., the critical range, as explained in Chapter II (page 17) is above 16.92. We will reject the sub-hypothesis if the calculated χ^2 value falls below this value.

The calculated χ^2 values for age distributions are as follows:

Between female campers and day-users--Holland	28.5
Between male campers and day-users--Holland	82.3
Between female campers and day-users--Waterloo	21.0
Between male campers and day-users--Waterloo	40.9

What is significant is that all values are above the critical value and that a difference in age distributions between campers and day-users in both parks can be declared.

Thus, sub-hypothesis 1 can not be rejected from the available evidence at either park.

Figures 1 and 2 show a graphical presentation of age distribution patterns between campers and day-users at Holland and Waterloo, respectively.

Sex--Head of Family

Sub-hypothesis 2 is as follows: there is a statistically significant difference in the sex of the head of the family between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with one degree of freedom, between campers and day-users at Holland and Waterloo. Sex of the head of the family data may be found in Appendix A-3. The test problems are worked out entirely in Appendices B-3 and B-4.

At $\chi^2.95$ @ 1 d.f., the critical value is above 3.84. We will reject sub-hypothesis 2 if the calculated χ^2 values fall below this value.

The calculated χ^2 values for the sex of the head of the family are as follows:

Between campers and day-users--Holland 1.45

Between campers and day-users--Waterloo .625

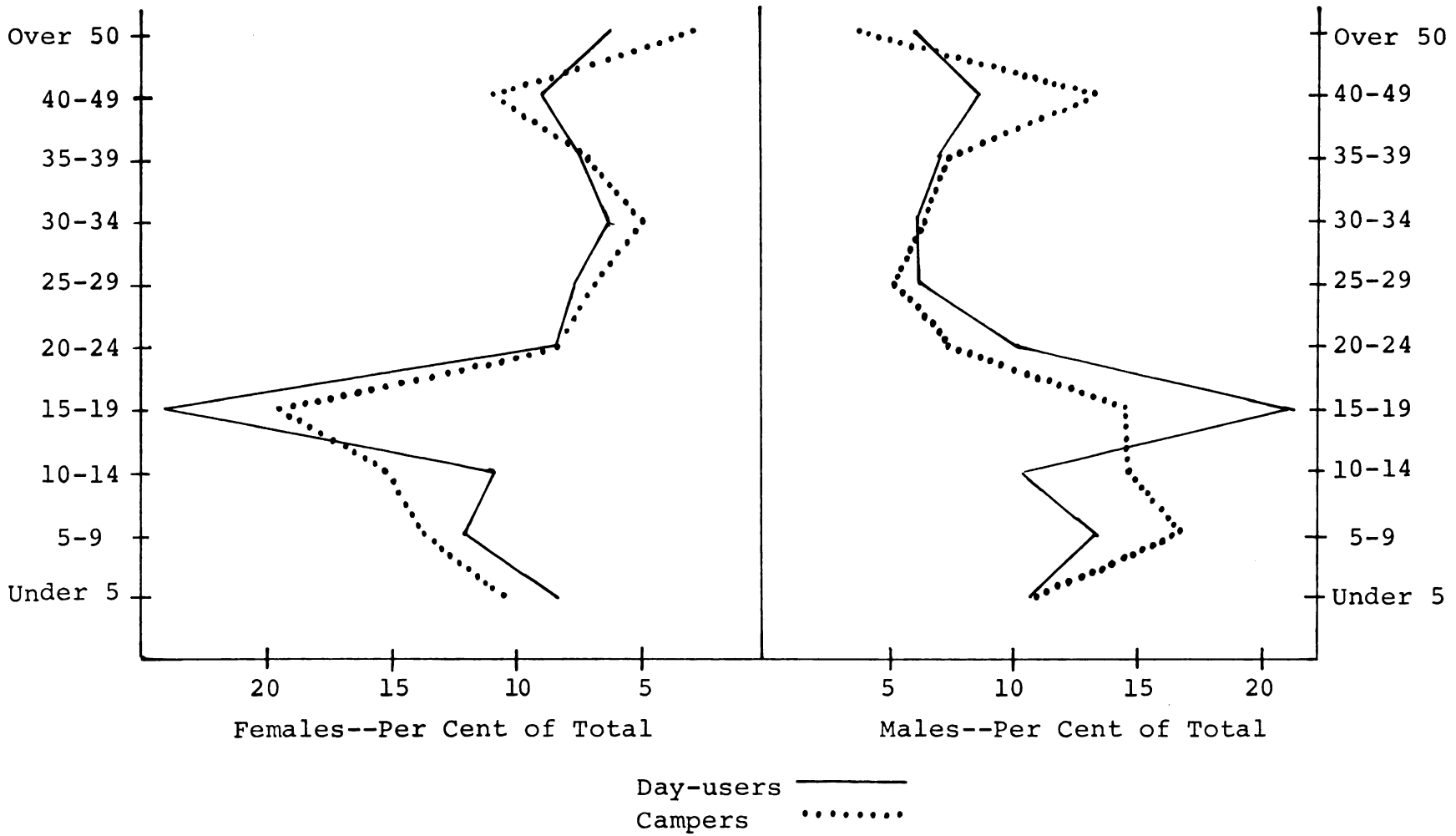

Figure 1.--Age distribution, by sex, of campers and day-users at Holland State Park for the data gathering period, 1968.

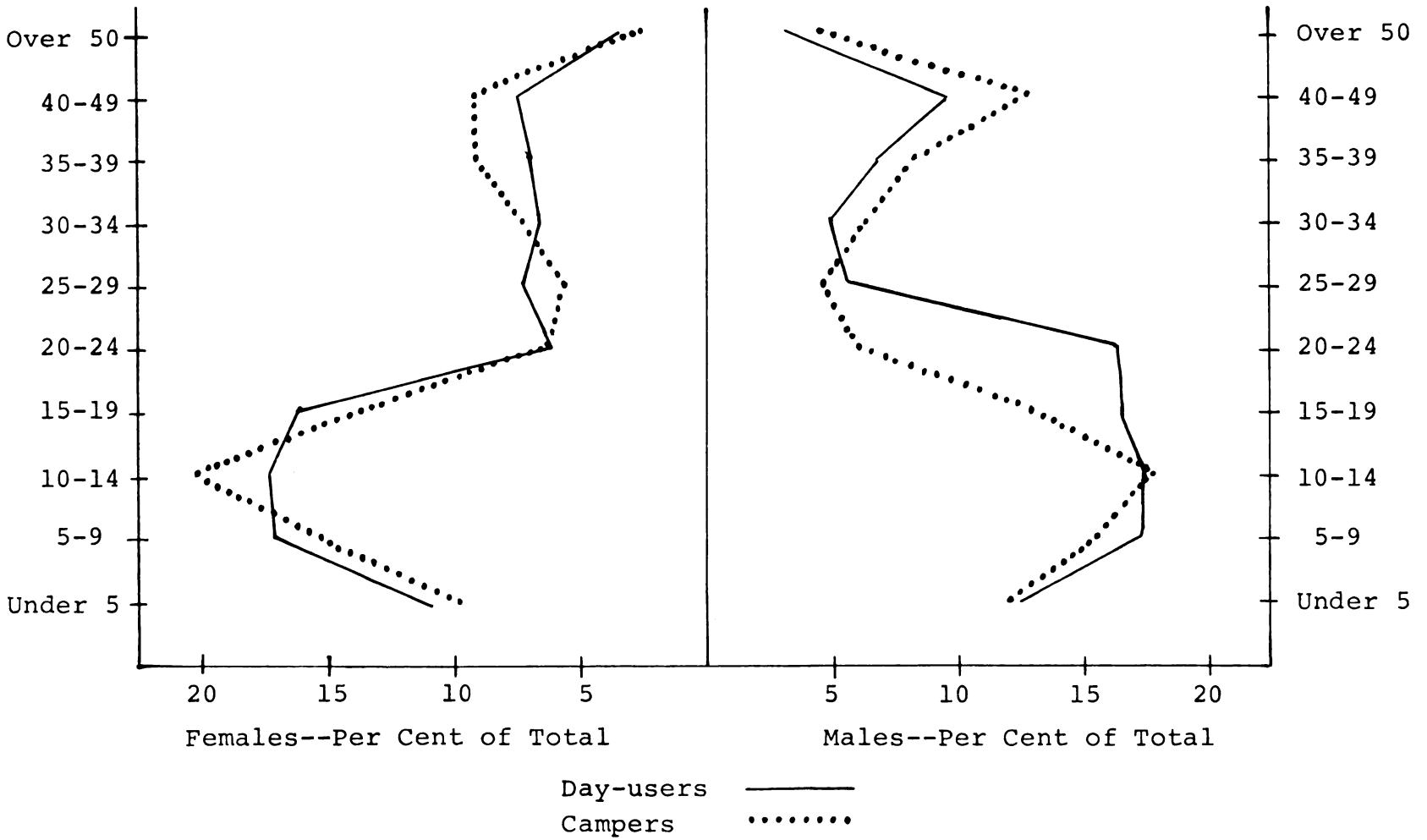

Figure 2.--Age distribution, by sex, of campers and day-users at Waterloo State Recreation Area for the data gathering period, 1968.

At both parks the calculated χ^2 values fall below the critical value. Thus, the sub-hypothesis is rejected by the data in both parks. We are forced to reject sub-hypothesis 2 at the .05 level of significance. From Figure 3, we can see a consistent and slightly greater representation of campers with a male head of the family at both parks. While not a significant variance for this study, it might suggest that more research is needed regarding this characteristic over a larger number of southern Michigan state parks.

Age Differences--Head of Family

Sub-hypothesis 3 is as follows: there is a statistically significant difference in the age of the head of the family between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with nine degrees of freedom, between campers and day-users at Holland and Waterloo. Age of the head of the family data may be found in Appendix A-4. The test problems are worked out entirely in Appendices B-5 and B-6.

At $\chi^2.95$ @ 9 d.f., the critical value is 16.92. We will reject sub-hypothesis 3 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the age of the head of the family are as follows:

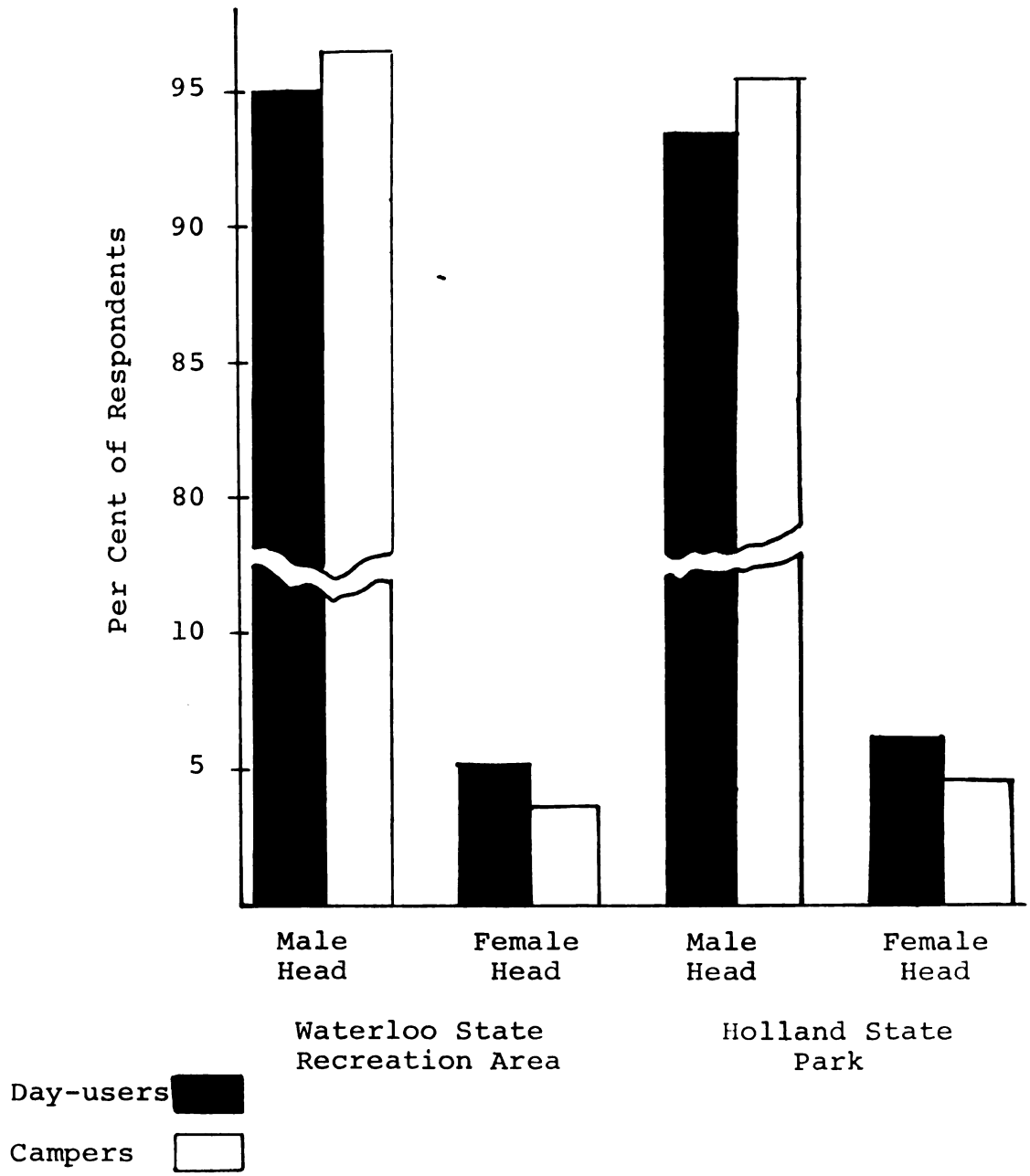

Figure 3.--Sex of the head of the family for campers and day-users at Holland State Park and Waterloo State Recreation Area during data gathering period, 1968.

Between campers and day-users--Holland 32.4

Between campers and day-users--Waterloo 8.879

At Waterloo, the calculated χ^2 value falls below the critical value. At Holland, the calculated χ^2 value falls well above the critical value. Thus, the data rejects sub-hypothesis 3 for Waterloo and we are forced to reject the sub-hypothesis for that park. The data at Holland does not reject sub-hypothesis 3. Thus, a significant difference in the ages of the head of the family between campers and day-users can be declared at Holland. This apparent contradiction between parks might suggest that different segments of the population in southern Michigan might use different parks. More research on this characteristic in more southern Michigan state parks must be accomplished before a clearer picture is obtained.

Figures 4 and 5 are graphical presentations of age patterns of the heads of families at Holland and Waterloo.

Occupation Differences--Heads of Families

Sub-hypothesis 4 is as follows: there is a statistically significant difference in the occupation patterns of the head of the family between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with sixteen degrees of freedom, between campers and day-users at Holland and Waterloo. Occupation of the head of the family data may be found in Appendix A-7.

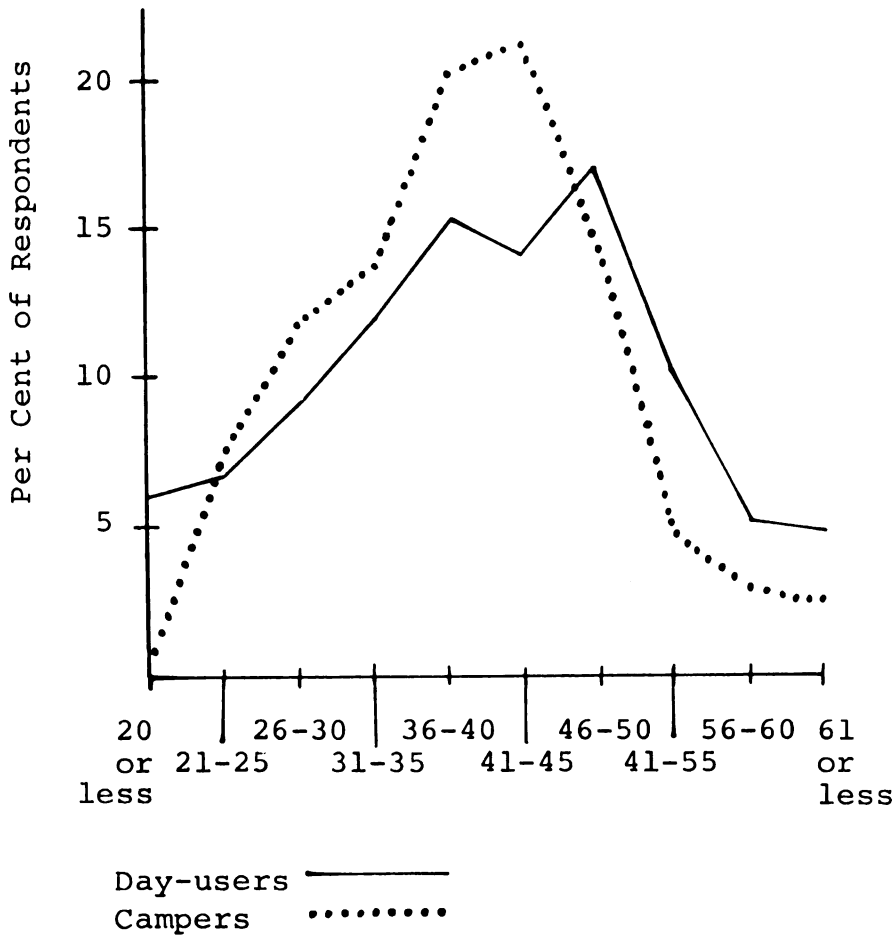

Figure 4.--Age patterns of the head of the family for campers and day-users at Holland State Park during data gathering period, 1968.

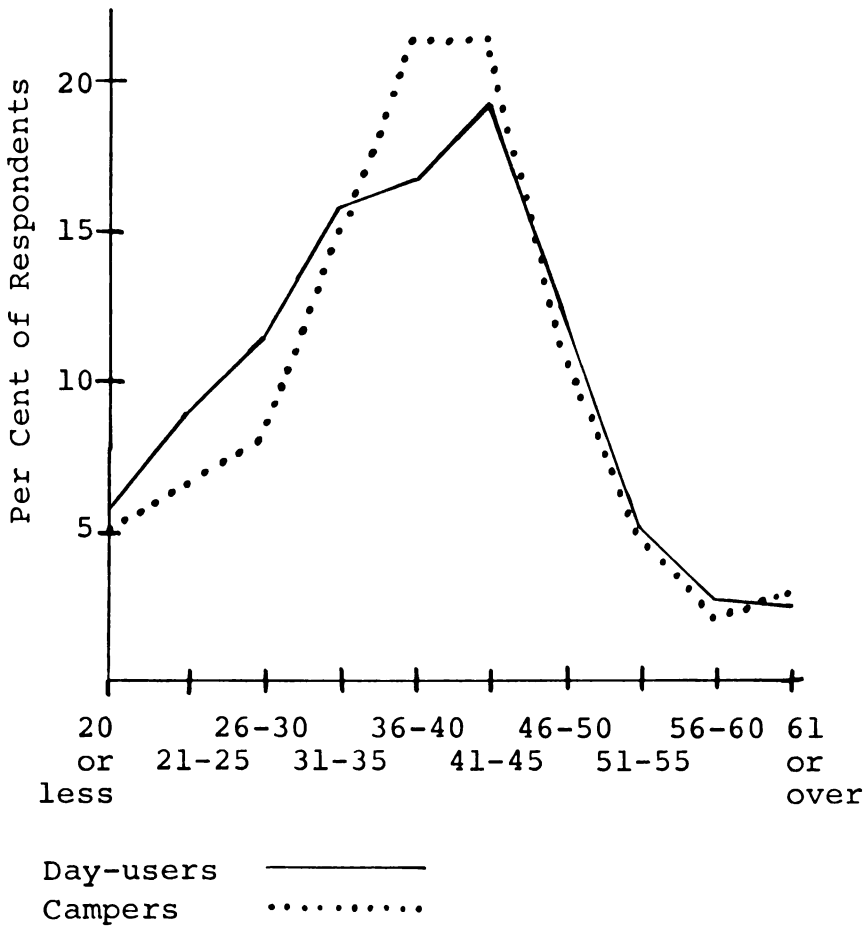

Figure 5.--Age patterns of the head of the family for campers and day-users at Waterloo State Recreation Area during data gathering period, 1968.

The test problems are worked out entirely in Appendices B-7 and B-8.

At $\chi^2.95$ @ 16 d.f., the critical value range is 26.30. We will reject sub-hypothesis 4 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the occupation of the heads of families are as follows:

Between campers and day-users--Holland	18.8
Between campers and day-users--Waterloo	26.6

At Holland, the calculated χ^2 value falls well below the critical value. At Waterloo, the calculated χ^2 value falls just above the critical value. Thus, at Holland, the data rejects sub-hypothesis 4. For Holland, we are forced to reject sub-hypothesis 4 at the .05 level of significance. At Waterloo, the data does not reject the sub-hypothesis that the occupations of the heads of families differ between campers and day-users.

Again, as with sub-hypothesis 3, we have an apparent contradiction in the data from the two parks. To resolve this contradiction, more research is needed. The sub-hypothesis should be tested at a number of other southern Michigan state parks before any conclusions can be drawn.

Figures 6 and 7 are graphical presentations of occupational patterns of the heads of families at Holland and Waterloo.

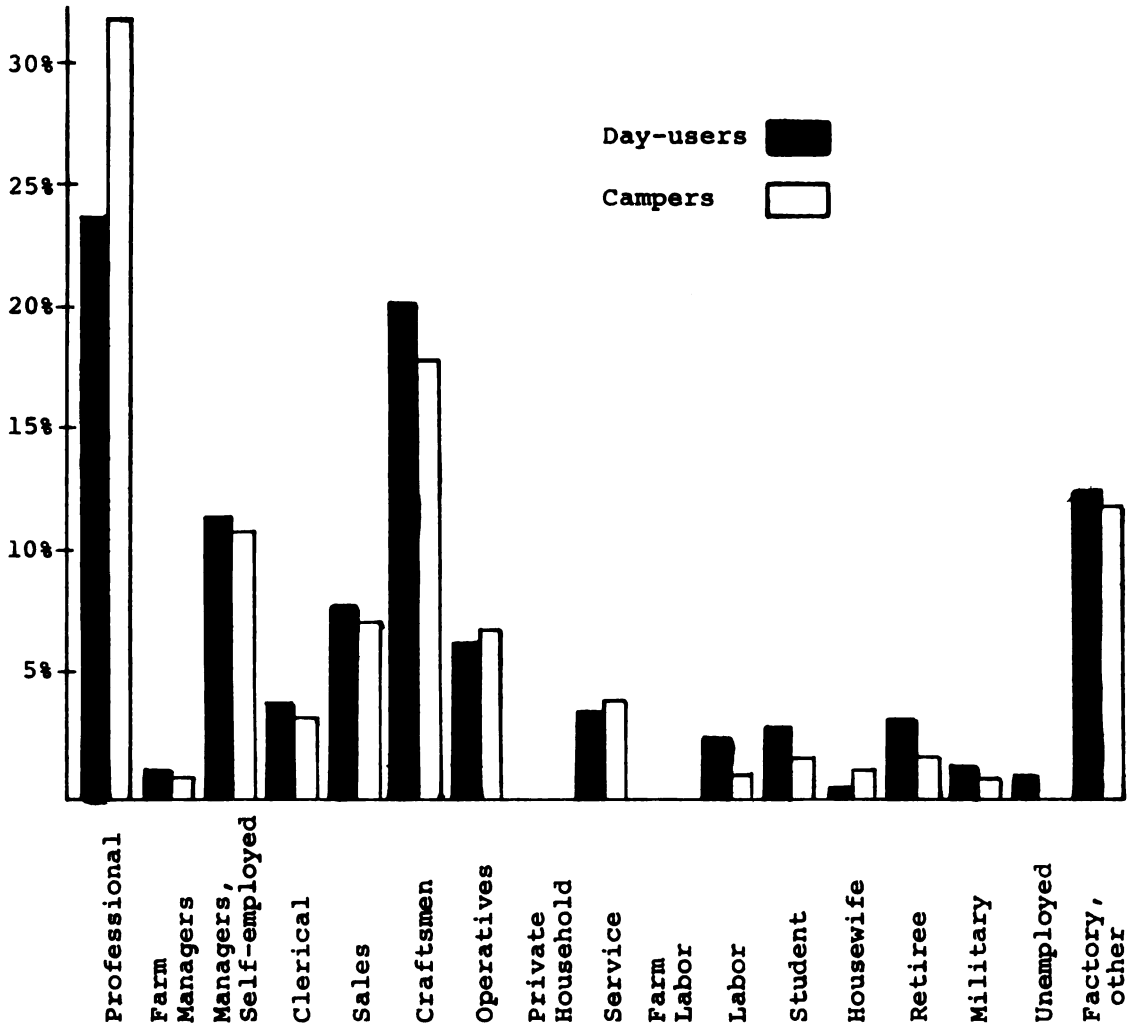

Figure 6.--Occupational patterns of the heads of families for campers and day-users at Holland State Park for data gathering period, 1968. Values are for percentage of respondents to questionnaires.

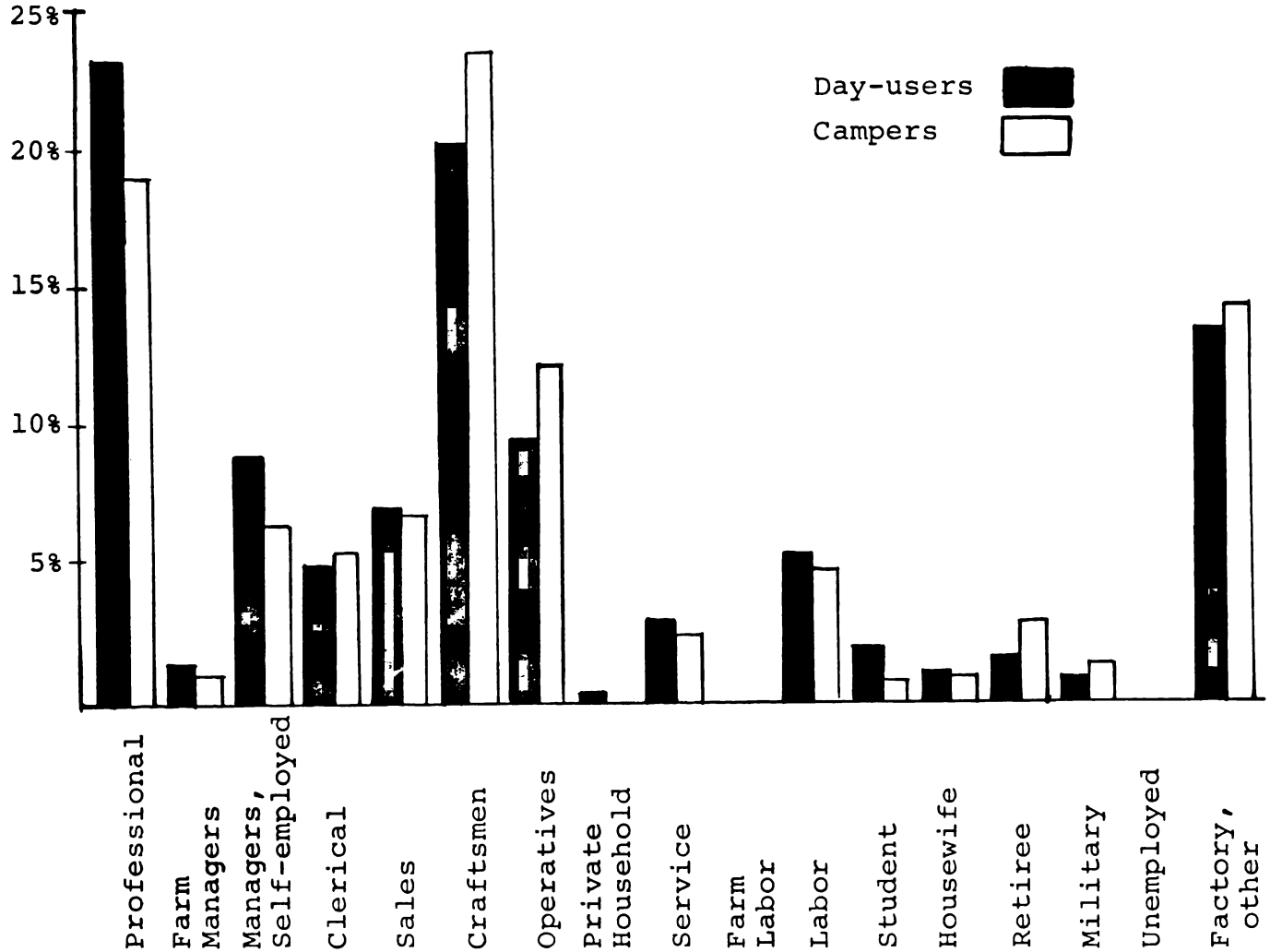

Figure 7.--Occupational patterns of the heads of families for campers and day-users at Waterloo State Recreation Area during data gathering period, 1968. Values are for percentage of respondents to questionnaires.

Educational Differences--Heads of Families

Sub-hypothesis 5 is as follows: there is a statistically significant difference in the educational levels of the head of the family between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with five degrees of freedom, between campers and day-users at Holland and Waterloo. Educational level of heads of families data may be found in Appendix A-6. The test problems are worked out entirely in Appendices B-9 and B-10.

At $\chi^2.95$ @ 5 d.f., the critical value range is 11.07. We will reject sub-hypothesis 5 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the educational levels of the heads of families are as follows:

Between campers and day-users--Holland	5.797
Between campers and day-users--Waterloo	5.70

At both Holland and Waterloo, the calculated χ^2 values fall below the critical value. Thus the data from both parks does not support sub-hypothesis 5, and it is rejected at the .05 level of significance. The graphical presentation of educational patterns of heads of families, as shown in Figures 8 and 9, does point out some pattern variances between campers and day-users. These

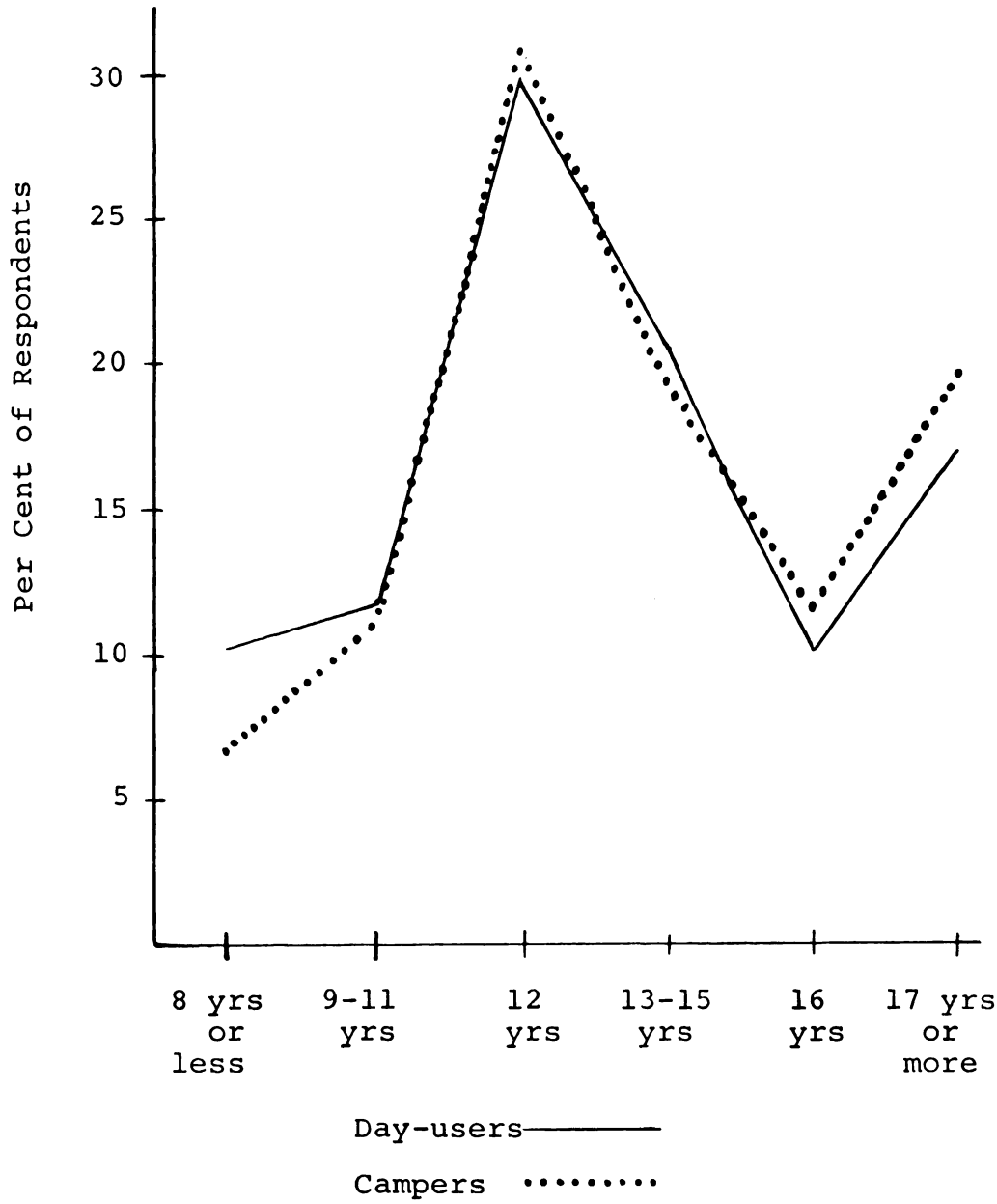

Figure 8.--Educational patterns of the heads of families for campers and day-users at Holland State Park during data gathering period, 1968.

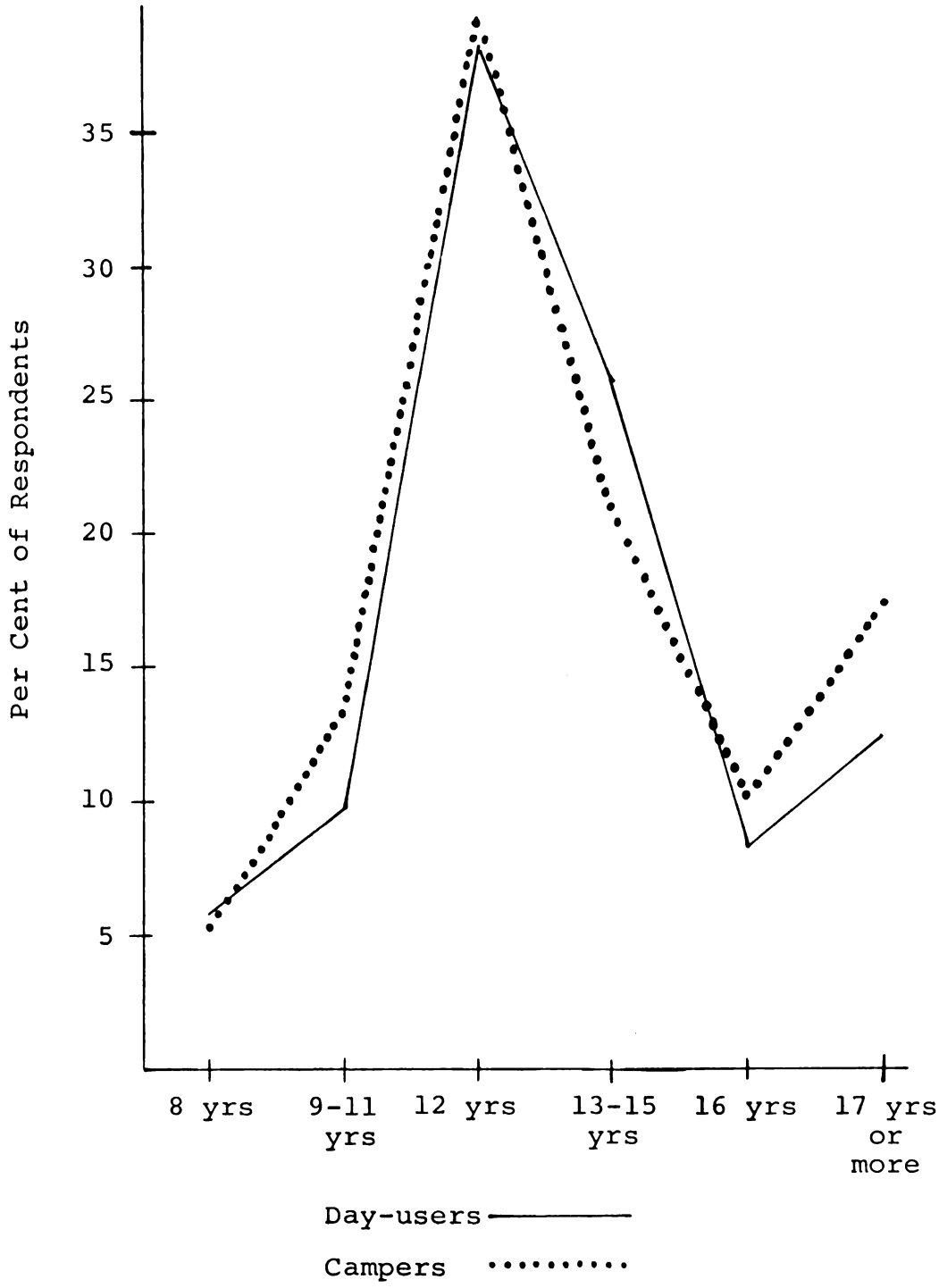

Figure 9.--Educational patterns of the heads of families for campers and day-users at Waterloo State Recreation Area during data gathering period, 1968.

differences are not significant at the 95 per cent confidence limit, however.

Income Differences--Families

Sub-hypothesis 6 is as follows: there is a statistically significant difference in the incomes of the heads of families between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with six degrees of freedom, between campers and day-users at Holland and Waterloo. Income levels of heads of families data may be found in Appendix A-7. The test problems are worked out entirely in Appendices B-11 and B-12.

At $\chi^2.95$ @ 6 d.f., the critical value is 12.59. We will reject sub-hypothesis 6 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the income levels of the heads of families are as follows:

Between campers and day-users--Holland	13.80
Between campers and day-users--Waterloo	16.70

At both Holland and Waterloo, the calculated χ^2 values fall above the critical value. Thus the data from both parks does not dispute sub-hypothesis 6, and it is accepted at the .05 level of significance. The graphical presentation of income patterns for heads of families for day-users and campers at Holland and Waterloo are shown in Figures 10 and 11, respectively.

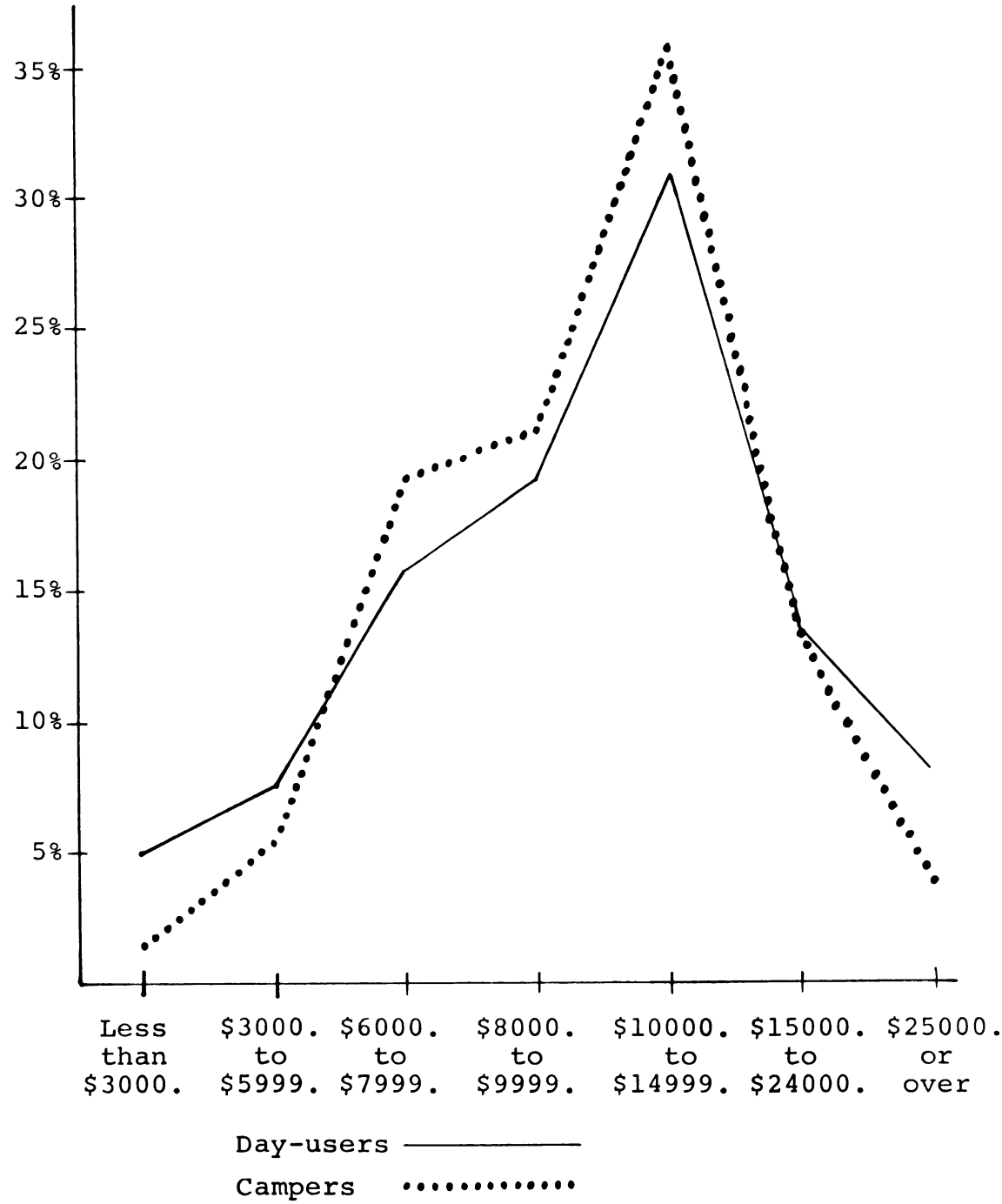

Figure 10.--Income patterns of the heads of families for campers and day-users at Holland State Park during data gathering period, 1968.

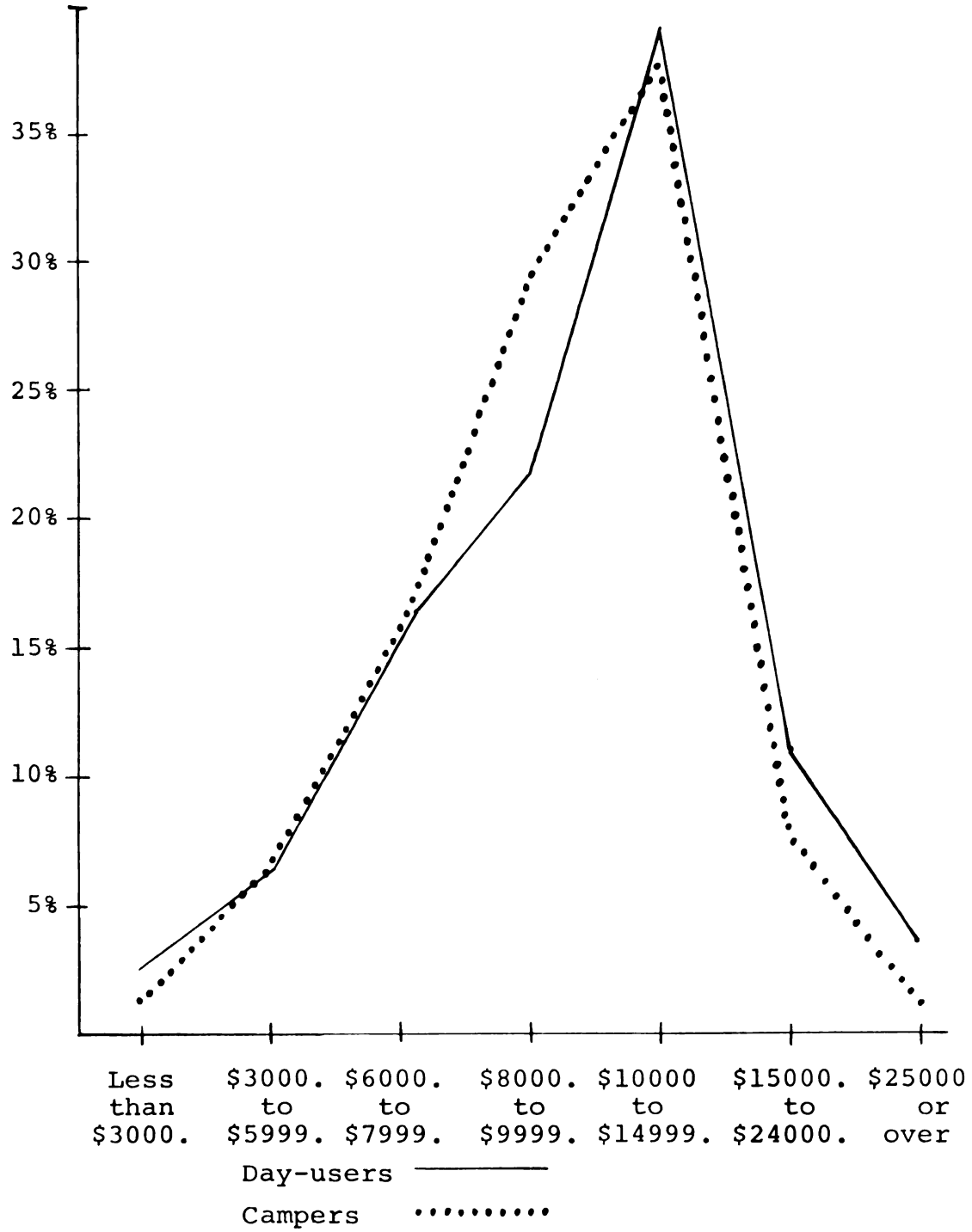

Figure 11.--Income patterns of the heads of families for campers and day-users at Waterloo State Recreation Area during data gathering period, 1968.

Summation of Socio-Economic Differences

A more lengthy discussion of the implications of the data analysis findings for socio-economic characteristics will be included in Chapter V. At this point, the data analysis findings covered in Chapter III are arranged in Table 1 for visual convenience.

In the next chapter, data analysis of behavioral characteristics will be covered between campers and day-users in both parks. This will consist of statistical tests of sub-hypotheses 7 through 12. The format will be similar to Chapter III.

TABLE 1.--A summation of analysis findings for sub-hypotheses pertaining to socio-economic characteristics.

Sub-hypothesis	Park	Park χ^2 Value	Critical χ^2 Value	Sit. Significance of Difference
1. Difference in Age Distribution	Waterloo Females	21.0	16.92	Significant
	Waterloo Males	40.9	16.92	Significant
	Holland Females	28.5	16.92	Significant
	Holland Males	82.3	16.92	Significant
2. Difference in Sex--Head of Family	Holland	1.45	3.84	Not Significant
	Waterloo	.625	3.84	Not Significant
3. Difference in Age--Head of Family	Holland	32.4	16.92	Significant
	Waterloo	8.879	16.92	Not Significant
4. Difference in Occupation--Head of Family	Holland	18.8	26.30	Not Significant
	Waterloo	26.60	26.30	Significant
5. Difference in Education --Head of Family	Holland	5.797	11.07	Not Significant
	Waterloo	5.70	11.07	Not Significant
6. Difference in Income of Family	Holland	13.80	12.59	Significant
	Waterloo	16.70	12.59	Significant

CHAPTER IV

BEHAVIORAL CHARACTERISTIC ANALYSIS

Travel Distances

Sub-hypothesis 7 is as follows: there is a statistically significant difference in distances traveled to the park between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with ten degrees of freedom, between campers and day-users at Holland and Waterloo. Travel distance data may be found in Appendix A-8. The test problems are worked out entirely in Appendices B-13 and B-14.

At $\chi^2.95$ @ 10 d.f., the critical value is 18.31 We will reject sub-hypothesis 7 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the group travel distances are as follows:

Between campers and day-users--Holland	85.6
Between campers and day-users--Waterloo	83.0

At both Holland and Waterloo, the calculated χ^2 values fall well above the critical value. Thus, the data

does not reject sub-hypothesis 7 at either park, at the .05 level of significance. The graphical presentation of group travel distance differences between campers and day-users are shown in Figures 12 and 13.

Travel Time

Sub-hypothesis 8 is as follows: there is a statistically significant difference in the time spent traveling to the park between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with nine degrees of freedom, between campers and day-users at Holland and Waterloo. Travel time data may be found in Appendix A-9. The test problems are worked out entirely in Appendices B-15 and B-16.

At $\chi^2.95$ @ 9 d.f., the critical value is 16.92 We will reject sub-hypothesis 8 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the group travel times are as follows:

Between campers and day-users--Holland	130.8
Between campers and day-users--Waterloo	64.1

At both Holland and Waterloo, the calculated χ^2 values fall well above the critical value. Thus, the data does not reject sub-hypothesis 8 at either park, at the .05 level of significance. The graphical presentations of group travel time differences between campers and day-users are shown in Figures 14 and 15.

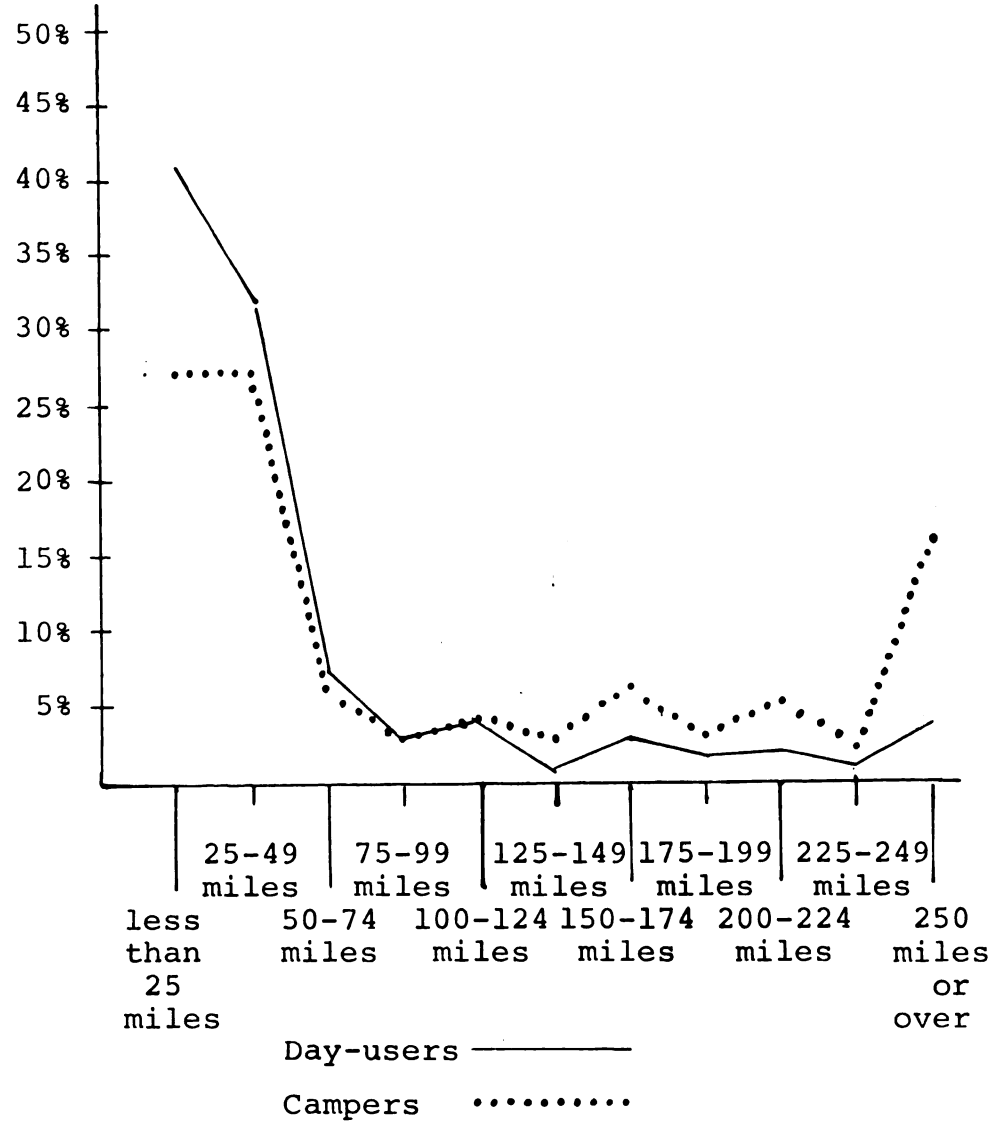

Figure 12.--Travel distance patterns of day-user and camper groups at Holland State Park during the data gathering period, 1968.

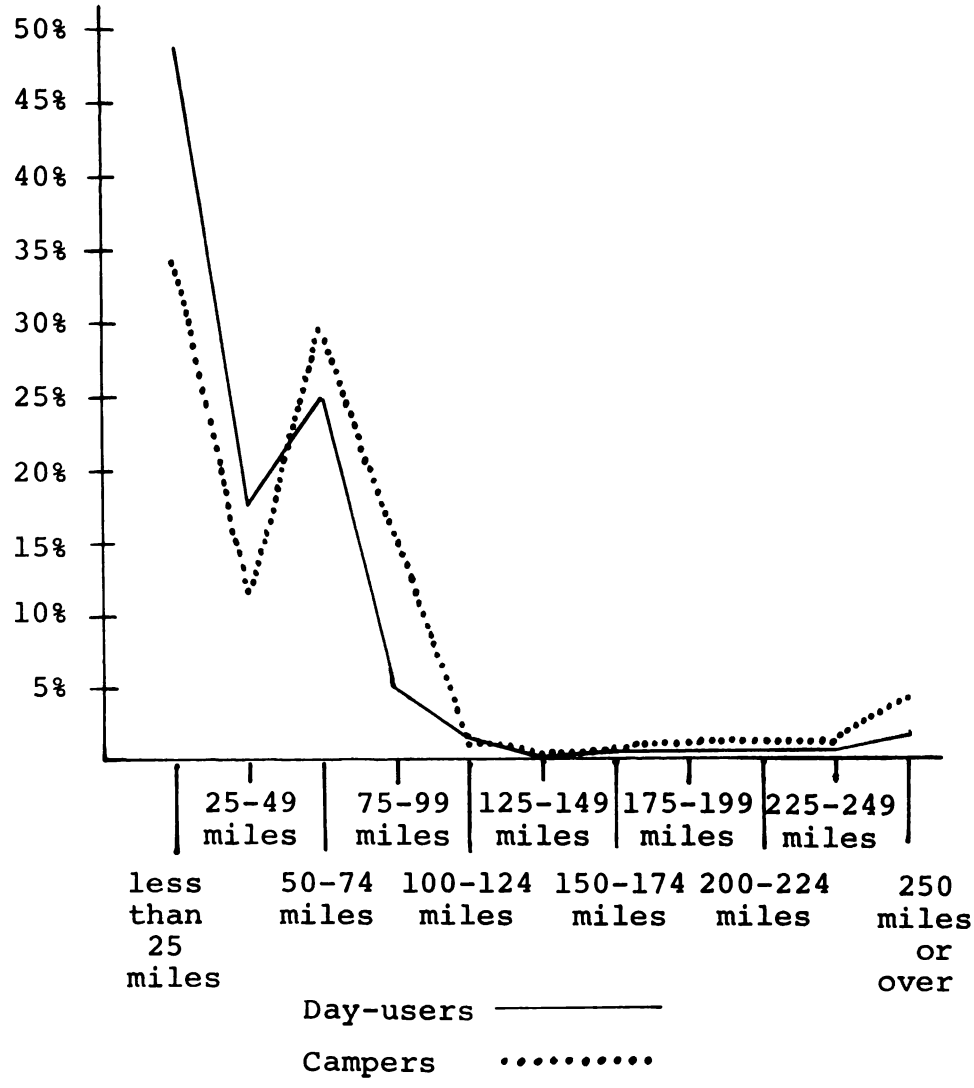

Figure 13.--Travel distance patterns of day-user and camper groups at Waterloo State Recreation Area during the data gathering period, 1968.

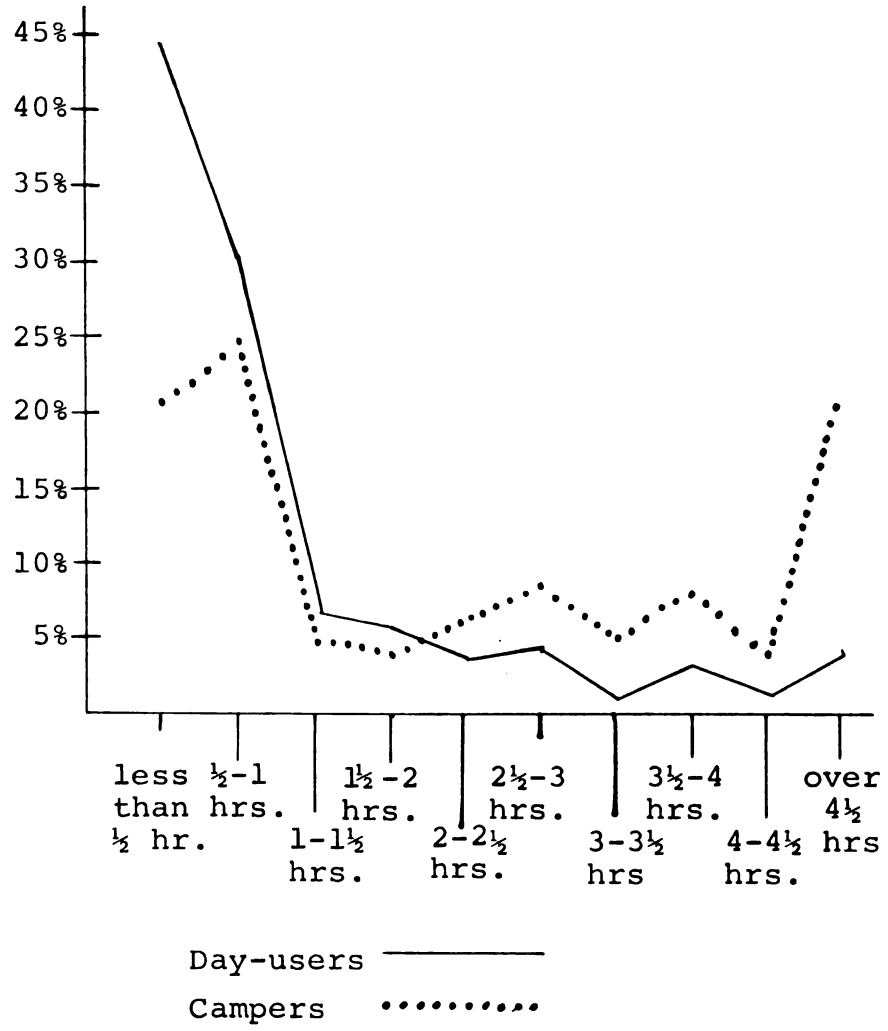

Figure 14.--Travel time patterns of day-user and camper groups at Holland State Park during data gathering period, 1968.

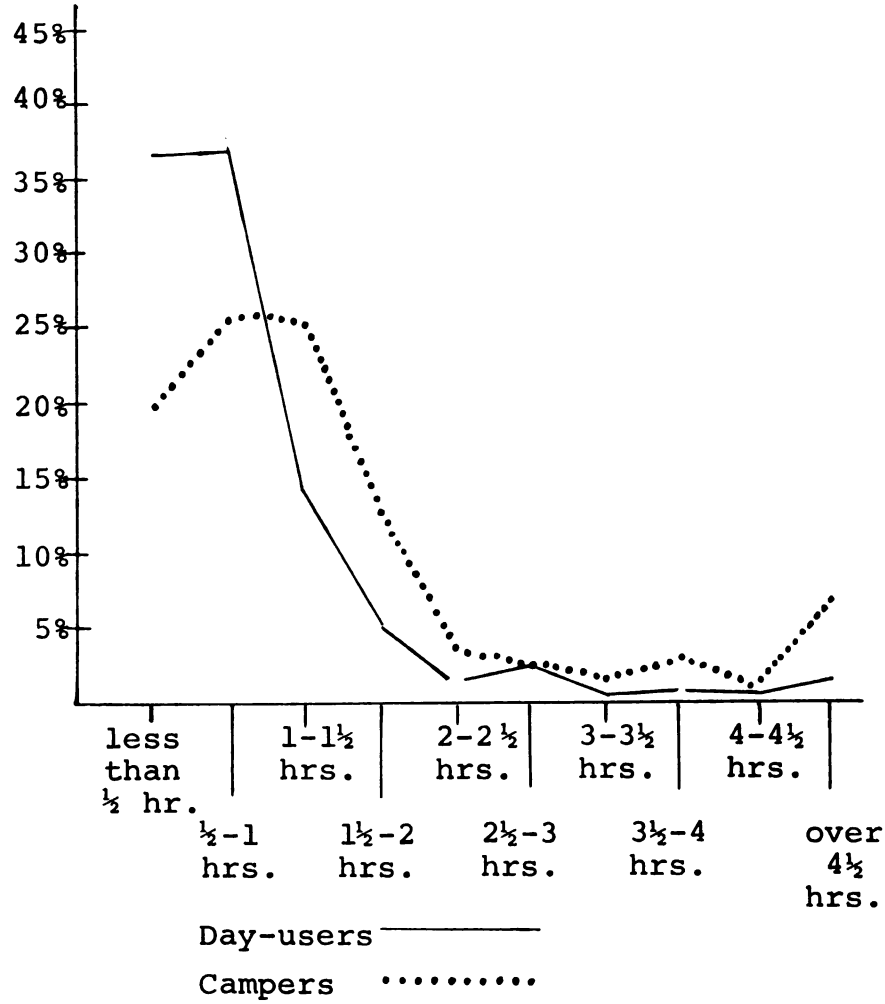

Figure 15.--Travel time patterns of day-user and camper groups at Waterloo State Recreation Area during data gathering period, 1968.

Group Descriptions

Sub-hypothesis 9 can be stated as follows: there is a statistically significant difference in the description of the visiting group between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with seven degrees of freedom, between campers and day-users at Holland and Waterloo. Group description data may be found in Appendix A-10. The test problems are worked out entirely in Appendices B-17 and B-18.

At $\chi^2.95$ @ 7 d.f., the critical value is 14.07. We will reject sub-hypothesis 9 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the group descriptions are as follows:

Between campers and day-users--Holland	66.9
Between campers and day-users--Waterloo	34.3

At both Holland and Waterloo, the calculated χ^2 values fall well above the critical value. Thus the data does not reject sub-hypothesis 9 at either park, at the .05 level of significance. The graphical presentations of group descriptions between campers and day-users for Holland and Waterloo are shown in Figures 16 and 17, respectively.

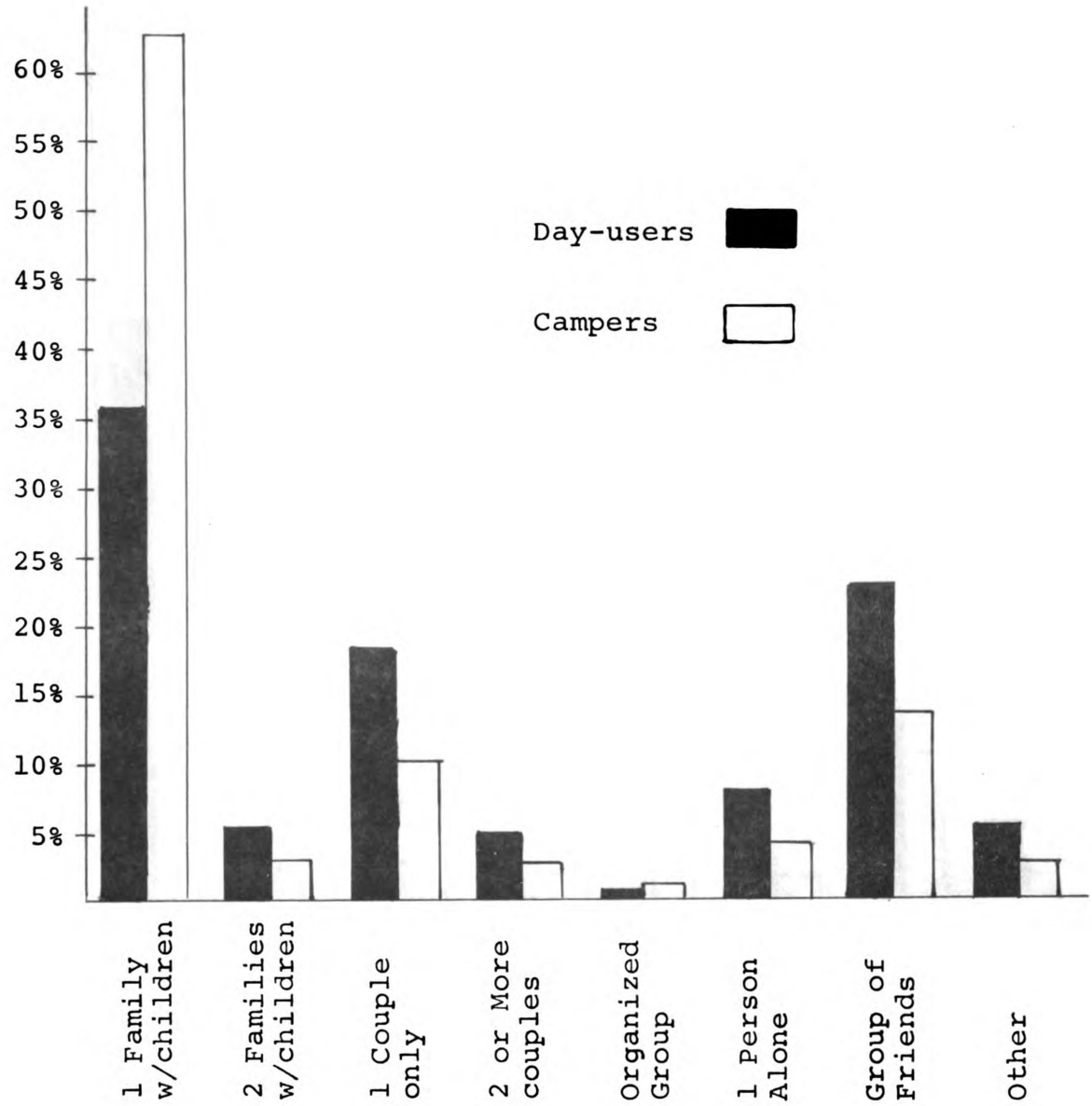

Figure 16.--Group description patterns of day-user and camper groups at Holland State Park during data gathering period, 1968.

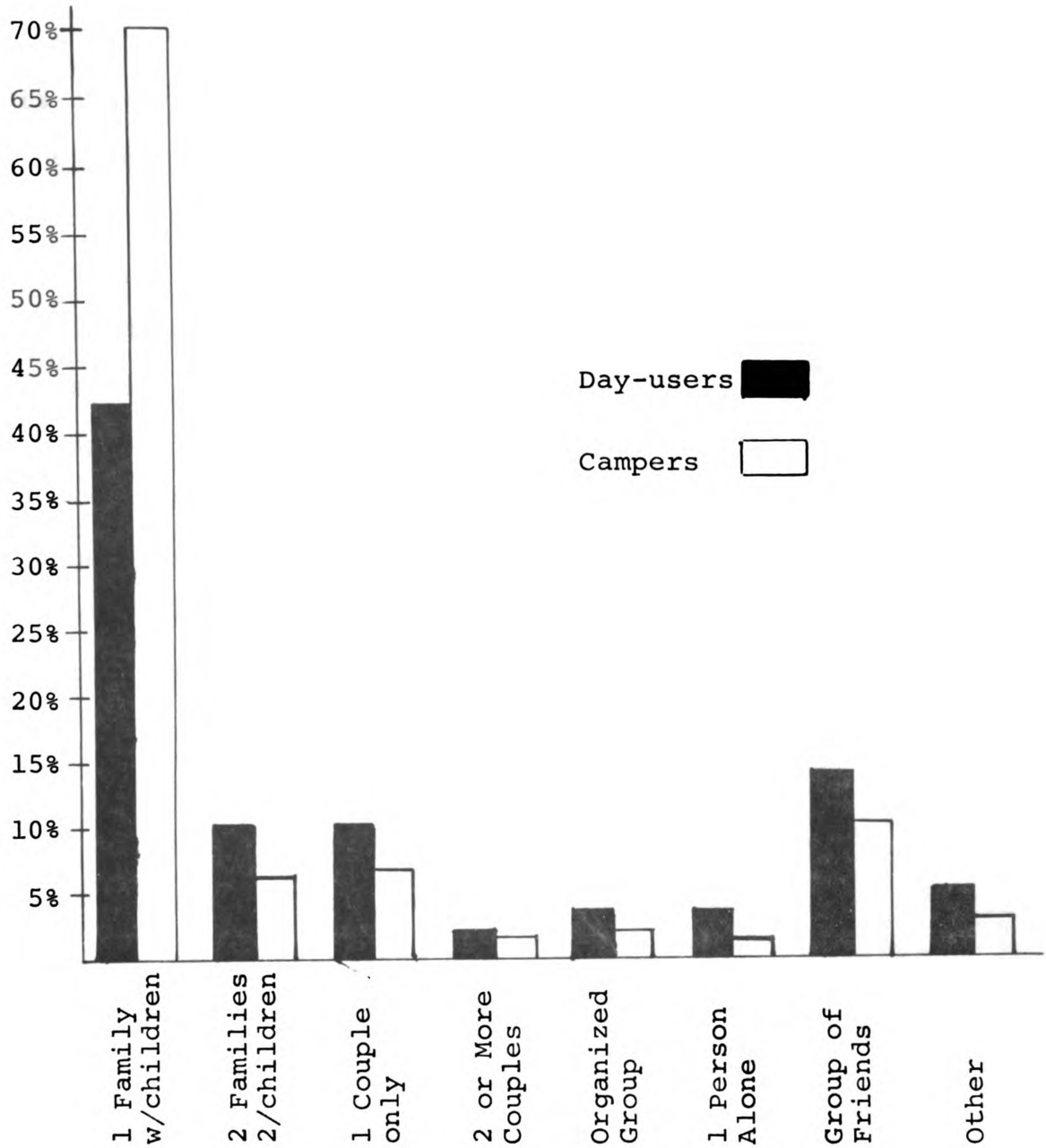

Figure 17.--Group description patterns of day-user and camper groups at Waterloo State Recreation Area during data gathering period, 1968.

Group Sizes

Sub-hypothesis 10 can be stated as follows: there is a statistically significant difference in the size of the visiting group between campers and day-users.

Tests for mean differences were run at the 95 per cent confidence limit between campers and day-users at Holland and Waterloo. Group mean size may be found in Appendix A-11. The test problems are worked out entirely in Appendices B-19 and B-20.

At the .05 level of significance, the critical range is between +1.960 and -1.960. We will reject sub-hypothesis 10 at either park if the calculated values for test of means fall within this range.

The calculated values for test of means are as follows:

Between campers and day-users--Holland	5.8
Between campers and day-users--Waterloo	2.3

At both Holland and Waterloo, the calculated values for test of means falls above the critical range. Thus the data does not reject sub-hypothesis 10 at either park at the .05 level of significance. The graphical presentation of group size patterns between campers and day-users for Holland and Waterloo are shown in Figure 18.

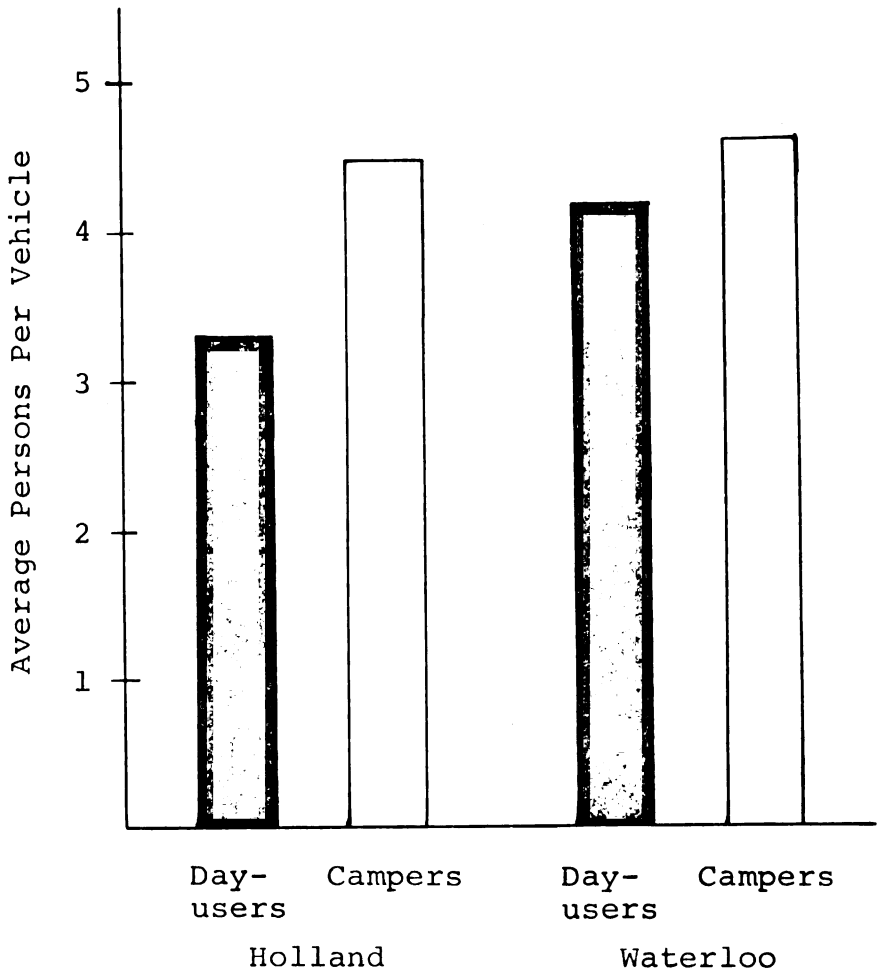

Figure 18.--Mean group size patterns of day-users and campers at Holland State Park and Waterloo State Recreation Area during data gathering period, 1968.

Arrival Times

Sub-hypothesis 11 can be stated as follows: there is a statistically significant difference in the arrival time of the group between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with six degrees of freedom, between campers and day-users at Holland and Waterloo. Group arrival time data may be found in Appendix A-12. The test problems were worked out entirely in Appendices B-21 and B-22.

At χ^2 .95 @ 6 d.f., the critical value is 12.59 We will reject sub-hypothesis 11 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for the group arrival times are as follows:

Between campers and day-users--Holland	44.3
Between campers and day-users--Waterloo	112.6

At both Holland and Waterloo, the calculated χ^2 values fall well above the critical value. Thus, the data does not reject sub-hypothesis 11 at either park at the .05 level of significance. The graphical presentations of group arrival time patterns between campers and day-users for Holland and Waterloo are shown in Figures 19 and 20, respectively.

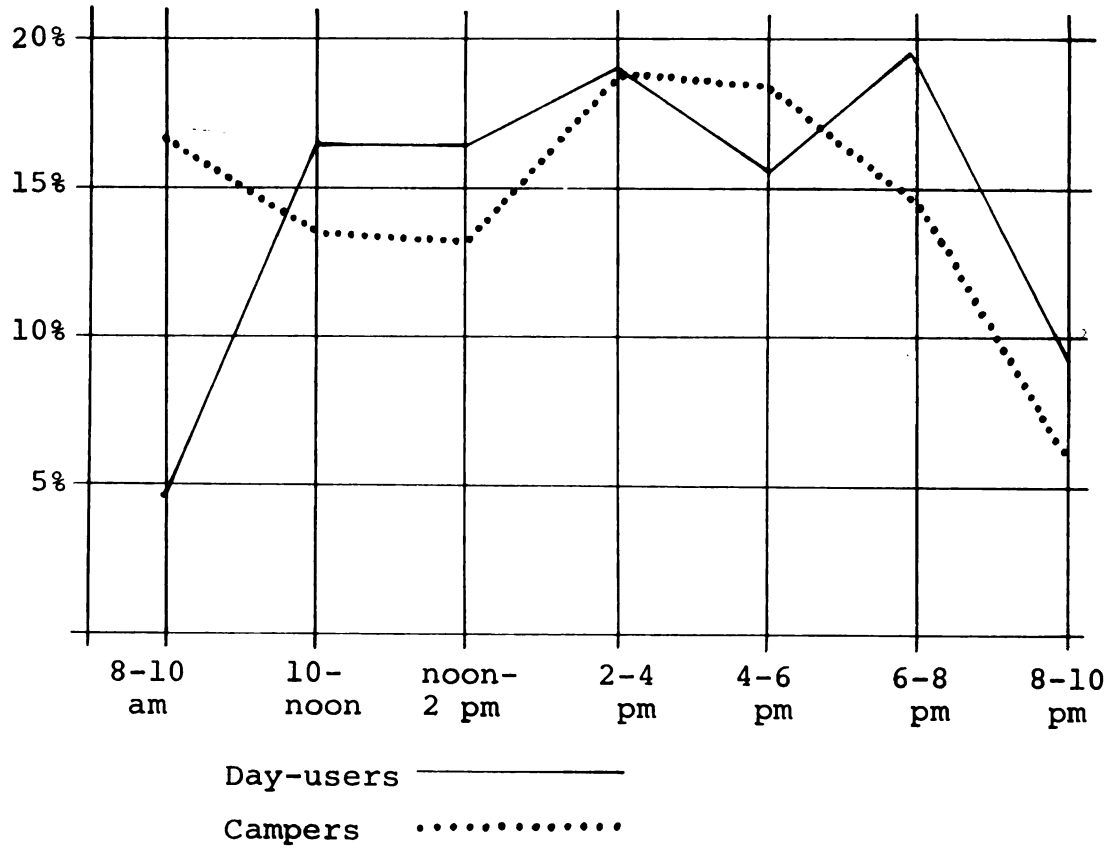

Figure 19.--Group arrival time patterns of day-users and campers at Holland State Park during data gathering period, 1968.

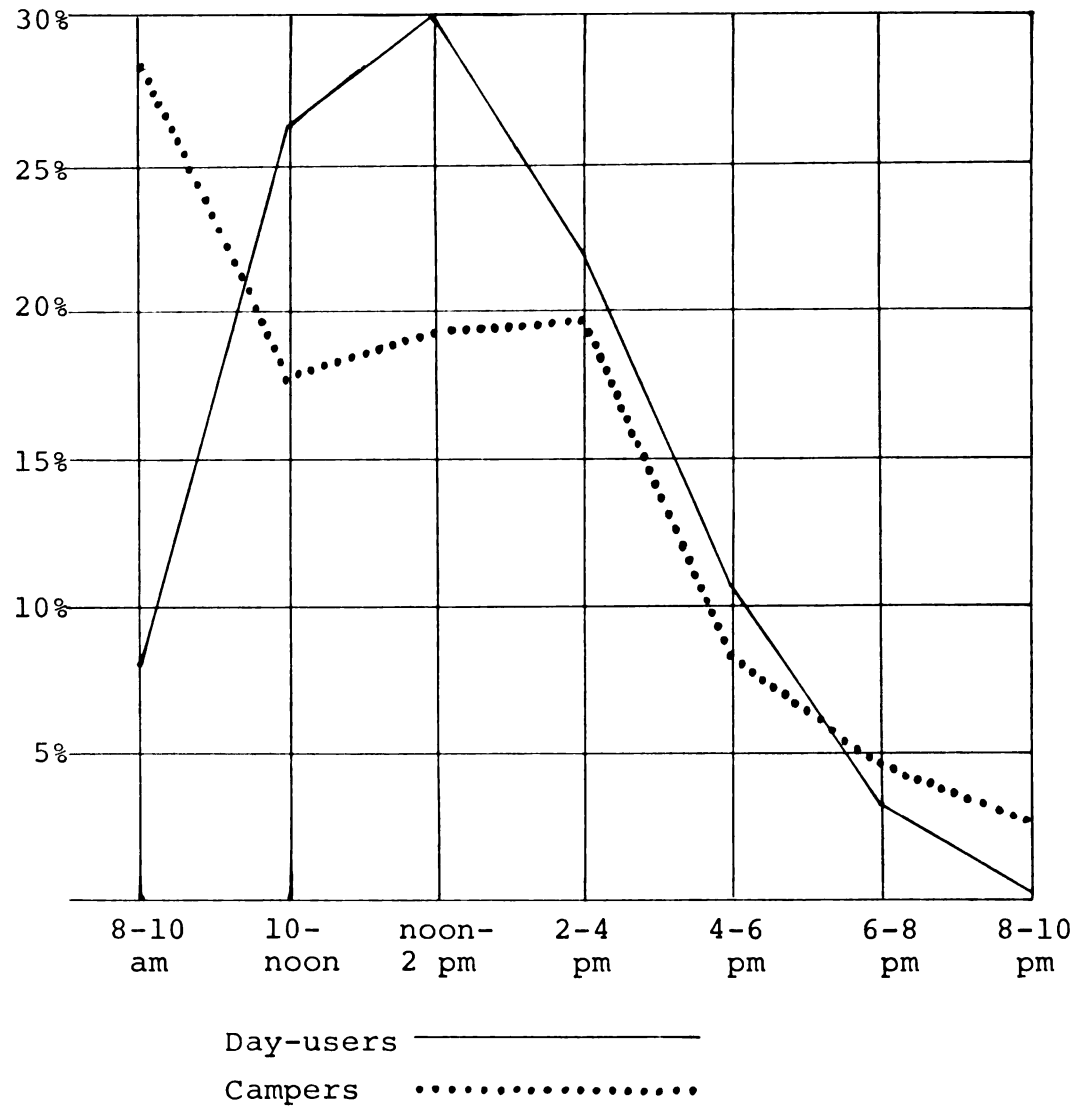

Figure 20.--Group arrival time patterns of day-users and campers at Waterloo State Recreation Area during data gathering period, 1968.

Group Activity Participation

Sub-hypothesis 12 can be stated as follows: there is a statistically significant difference in the group activity particpation patterns between campers and day-users.

χ^2 distribution tests were run at the 95 per cent confidence limit, with twenty-four degrees of freedom, between campers and day-users at Holland and Waterloo. Group activity participation data may be found in Appendix A-14. The test problems are worked out entirely in Appendices B-25 and B-26.

At $\chi^2.95$ @ 24 d.f., the critical value is 36.42. We will reject sub-hypothesis 13 for either park if the calculated χ^2 value falls below this value.

The calculated χ^2 values for group activity participation are as follows:

Between campers and day-users--Holland	100.4
Between campers and day-users--Waterloo	497.1

At both Holland and Waterloo, the calculated χ^2 values fall well outside of the critical range. Thus, the data does not reject sub-hypothesis 13 at either park at the .05 level of significance. The graphical presentations of group activity participation patterns between campers and day-users at Holland and Waterloo are shown in Figures 23 and 24, respectively.

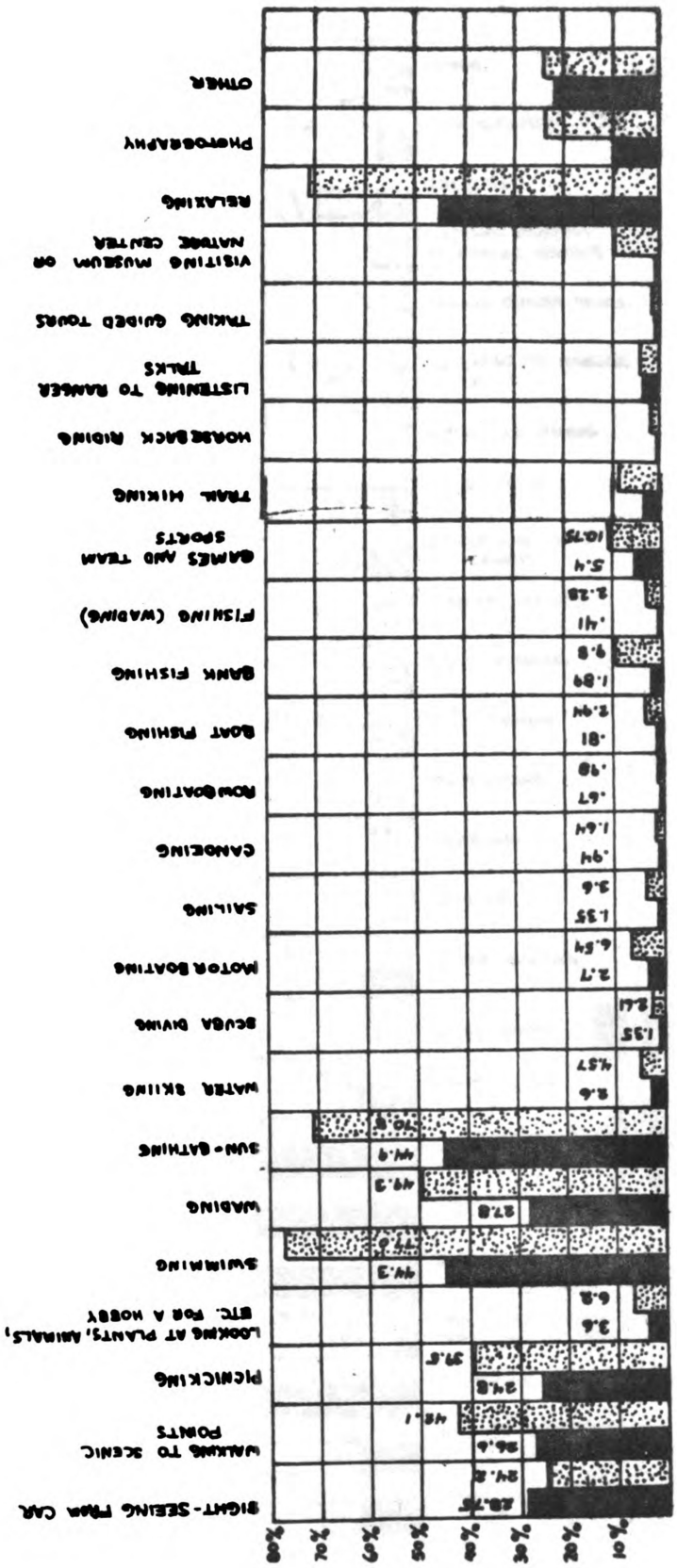

Figure 21.--Group activity participation patterns between campers and day-users at Holland State Park during data gathering period, 1968.

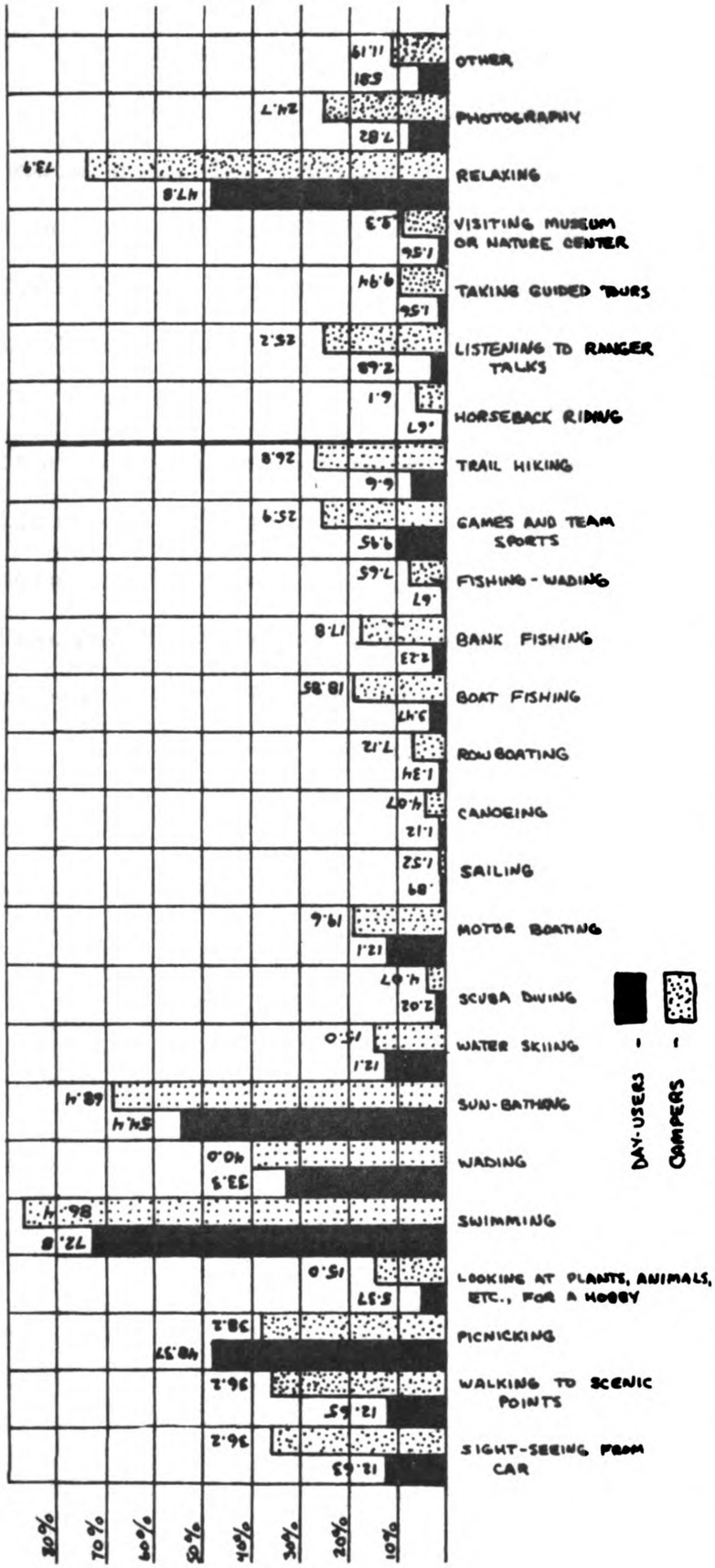

Figure 22.--Group activity participation patterns between campers and day-users at Waterloo State Recreation Area during data gathering period, 1968.

Summation of Behavioral Characteristics

A more lengthy discussion on the implications of the data analysis findings for behavioral characteristics will be included in Chapter V. At this point, the data analysis findings covered in Chapter IV are arranged in Table 2 for visual convenience.

With the data analysis complete, and the sub-hypotheses accepted or rejected, Chapter V will discuss the implications of the findings. The main differences between campers and day-users in southern Michigan state parks will be discussed, with possible explanations. Some obvious conclusions gained from the study will be stated.

TABLE 2.--A summation of analysis findings for sub-hypotheses pertaining to behavioral characteristics.

Sub-hypothesis	Park	Park χ^2 Value	Critical Value	Sit. Significance of Difference
7. Difference in Traveling Distances	Holland	85.6	18.31	Significant
	Waterloo	83.0	18.31	Significant
8. Difference in Traveling Time	Holland	130.8	16.92	Significant
	Waterloo	64.1	16.92	Significant
9. Group Description Differences	Holland	66.9	14.07	Significant
	Waterloo	34.3	14.07	Significant
10. Group Size Differences	Holland	5.8	-1.96 to +1.96	Significant
	Waterloo	2.3	-1.96 to +1.96	Significant
11. Arrival Time Differences	Holland	44.3	12.59	Significant
	Waterloo	112.6	12.59	Significant
12. Group Participation Differences	Holland	100.4	36.42	Significant
	Waterloo	497.1	36.42	Significant

CHAPTER V

DISCUSSION AND CONCLUSIONS

Discussion

There are a number of considerations that are important in evaluating the results of this investigation. These potential problems could, under certain circumstances, have an effect on the validity of the findings. The author has reason to believe that these problems do not significantly affect the results, as will be pointed out in the following discussion.

Size of Sample

The sample size was structured to include a minimum number of day-users that would return a complete questionnaire. This was necessary for Crapo's test for significance between survey questionnaires and oral interviews.[1] This was not necessarily the minimum sampling needed for a high degree of confidence in this present study. The sampling size was approximately .5 per cent of the total 1968 attendance for Waterloo, and approximately .3 per cent of

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[1]Crapo and Chubb, Day-use Investigation Techniques, p. 51.

the total 1968 attendance for Holland.[2] However, based on the total attendance during the sampling period--July 1 through September 5--approximately 1 per cent of Holland park users, and approximately 2 per cent of Waterloo park users were sampled.[2]

Such a small sample size would, of course, inflate the standard deviation; and the deviation would be extremely wide for high confidence levels. Ideally, a larger sampling, such as 5 per cent of attendance, would increase confidence levels. It would be interesting to re-run the tests for the rejected sub-hypotheses in Chapter III with data from a 5 per cent sampling.

Reliability

Nearly as important as validity is reliability. Given similar sampling sizes and statistical tests, would the same results be found in the above parks again? This would depend upon how "typical" a season 1968 was for the parks in question. If it was "abnormal"--in the sense that for some reason the parks attracted a higher, or lower percentage of certain types of park users than normal that year--the reliability of the data could be questioned.

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[1]Figures obtained by dividing total persons sampled in a park by total 1968 attendance figures.

[2]Figures obtained by dividing total persons sampled in a park by attendance during data gathering period, as determined from Park Manager's weekly report attendance figures from Holland and Waterloo.

For instance, 1967 was an abnormal year. For Holland, a heavy die-off of alewife (Alosa psuedoharengus) created extremely unhealthy and unpleasant conditions on the Lake Michigan beaches. Attendance was much reduced that year, as at many other Lake Michigan state parks.[1] During 1967, many people removed their families from the city in the summer due to riots and racial unrest. They camped at Waterloo and other state parks and recreation areas ringing the southeastern Michigan metropolitan area until the disturbances abated.[2]

No similar abnormalities occured in 1968. The summer was "normal," both sociologically and climatically. This is reflected in the 1968 attendance figures.[3] Thus, there is no reason to reject 1968 data as reflecting a summer of adnormal park usage.

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[1]Michigan Department Natural Resources, Biennial Report, p. 3.

[2]During the period of civil unrest during the summer of 1967, large numbers of people removed their families from Detroit, Pontiac, Jackson and other Michigan cities and camped in the state recreation areas of southern Michigan until the racial disturbances were over. The author personally spoke with many such families at Lakeport State Park, Holly State Recreation Area, and Proud Lake State Recreation Area. Waterloo rangers told the author that there were a number of such families at their campgrounds too.

[3]1968 attendance figures for both parks fit well into the gradual, upward curve formed by plotting 1965 through 1969 attendance figures.

Bias

Another possible source of error is bias. Of the groups handed a questionnaire, only a relatively small proportion returned them complete.[1] What bias was in effect in the return of the questionnaires? Were some types of park users--such as the higher-educated, the younger, the wealthier, etc.--more highly motivated to return the questionnaires than other types of park users? Were some questions in the questionnaire subject to bias by certain group segments? For instance, were respondents with higher educational levels more apt to answer the question on years of education than those with a lower level of education?

If there is bias towards individual questions, there should be a difference in the response rates to these questions between voluntary responses--questionnaires--and controlled responses--interviews. Crapo did not find this to be the case.[2] A high correlation was found between the data obtained by oral interviews and information from questionnaires voluntarily completed and returned. Only one question at each park showed a significant variance between voluntary and controlled response. At Waterloo, it was Question 9 regarding travel distance; and at Holland, it was Question 8 regarding travel time.

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[1]Crapo and Chubb, Day-use Investigation Techniques, p. 82.

[2]Ibid., p. 66.

If we assume that people responded truthfully, to the best of their knowledge, we must conclude that the above type of bias was not strongly in evidence.

There is also the possibility of bias towards campers in the sampling. Normally, campers represent approximately 3.3 per cent and 7.4 per cent of total yearly attendance at Holland and Waterloo, respectively.[1] In the study sample, campers represented 35.8 per cent and 32.5 per cent of the totals at Holland and Waterloo, respectively. This could mean that campers are more highly motivated towards returning the questionnaire, than are day-users. This probably is the case to a degree. Most park managers can attest to excellent cooperation by campers in past surveys. Another probable explanation is that campers will make many more trips through a park exit, on the average, than will day-users. Campers will thus increase their odds of receiving a questionnaire. Combine this with the high motivation for returning the questionnaire, and the large percentage of campers in the sampling is reasonable. Crapo and Chubb recognized this type of bias, and discussed it under the heading of "The Problem of Repetitive Entries."[2] As long as the camper response is kept segregated from

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[1]Michigan Department of Natural Resources, Biennial Report, pp. 5, 7-8.

[2]Crapo and Chubb, Day-use Investigation Techniques, p. 69.

day-user response, this type of data should not significantly affect the conclusions of this thesis.

Differences Between Campers and Day-users

Several sub-hypotheses pertaining to socio-economic characteristic differences were rejected at each park, and several were not rejected by the analysis of the data. No sub-hypotheses pertaining to behavioral characteristics were rejected by the data findings at either park.

At this point, we will discuss the implications of the sub-hypotheses that were not rejected by the analysis findings.

Socio-economic Differences

Age differences.--There was a distinct age distribution pattern difference between campers and day-users at both parks. As can be seen from Figures 1 and 2, a larger group percentage of late teens, young adults--25 to 35--and older persons over 50 were found among day-users at Holland. At Waterloo, larger group percentages of young children--under 10--late teens and young adults--20 to 30--were found among day-users. At Holland, campers had larger group percentages among younger children--under 10--early teens--under 15--and more middle-aged persons--35 to 50. At Waterloo, campers had larger group percentages in the early teens--under 15--and among the more middle-aged

adults--30 to 50. There were about equal group percentages among the older adults over 50 in both campers and day-users.

While there was some variation between parks, a basic pattern seemed to prevail. Campers seemed to be more at an age when most people are more established and have begun to increase their earning power and vacation time. The large percentages of children from late elementary grades through junior high school age seemed to bear out this image. The bulk of camping adults should have children in this age range.

Day-users appeared to be largely of four basic types. There were the young adults in their twenties and early thirties. These people are probably not so established in their jobs and in other social institutions. People of this age group would have children in the pre-school age and early elementary grades age, which are the next large group percentage of day-users. There were the older people, over 50. These people probably have grown children. The last class of day-users was the late teenage group. An American in his late teens is highly mobile today, and is usually strongly attracted to the beaches at state parks. These beaches serve as a social, as well as a recreational outlet for this age group. As Holland has a better swimming beach than Waterloo, it also had a higher group percentage of late teenage day-users.

Age differences of head of family.--A difference in age patterns of the head of the family was found at Holland. Day-users had higher group percentages of both younger and older heads of families. This pattern agreed with the differences in the age distribution patterns above. The young adults--probably young married couples--would have young heads of families. A person in his late teens will often have a parent approaching, or past, 45 years of age. Campers had much higher group percentages among 26 to 45 year old heads of families. The same pattern was duplicated at Waterloo. However, the differences were not extreme enough to register a statistically significant difference in the data analysis. The pattern of differences are presented in Figures 4 and 5.

Differences in occupation of head of family.--A difference in the occupational patterns of the heads of families was found at Waterloo. As can be seen from Figure 7, day-users had higher group percentages among craftsmen, operatives, factory workers and retirees. Campers had higher group percentages among professional people, managers and self-employed. Differences were very small between other occupations. The occupations of the day-users suggest, again, older and more skilled persons, as well as the young, as yet unskilled people. The occupations of the campers suggest middle-aged people--it requires a number of years of education and training to

rise to the professional or managerial level. As seen in Figure 6, the occupational patterns at Holland were very similar to that of Waterloo. However, the differences were not enough to show a statistically significant difference in the data analysis.

Interestingly enough, professional people among campers had the highest single group percentage. The proportion of day-user professional people, and day-user craftsmen were nearly identical in both parks. The camping percentages of the same occupations varied widely between the two parks. At the risk of stereotyping occupations, it may suggest that certain parks offer attractions that would appeal to a person who was also attracted to a particular kind of occupation. As will be seen in the discussion on travel distance, distance from home did not appear to be as important a factor in park selection among campers as with day-users.

Also significant was the percentage of representation of occupations in both sub-groups. It was far different from what might be expected on the basis of national occupation distribution.[1] For instance, while both parks are in rural locations, farm labor was conspicuously absent. This might suggest that certain occupational groups do not use state parks in the proportion that the occupations are present in the population.

[1]U.S. Department of Labor, Bureau of Labor Statistics, Monthly Labor Review (January, 1969).

Differences in family incomes.--A difference in income patterns between campers and day-users was found at both parks. Looking at Figures 10 and 11, we can see that campers tended to have greater group percentages in the middle income brackets--from $6,000 to $15,000 yearly income. Day-users had greater group percentages below $6,000, and above $15,000 yearly income. At both parks, $10,000 to $15,000 was the median yearly income for both sub-groups.

The day-user data on family income continues to suggest either young, unskilled and unestablished people or older, skilled persons who have reached their maximum earning power. Campers, on the other hand, seem to have a heavy representation of people who have increased their earning power, and have prospects of raising it still further before retirement.

As in the last characteristic discussed, a more significant fact, from a sociological aspect, is that state park users of both sub-groups seem to be well above the national and regional norms for family income.[1] This may suggest that both the rural and urban poor do not have the time, financial means, or the inclination for state park activities. There could be transportation problems for inner-city poor from Detroit, Jackson, Lansing and

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[1]U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-60, No. 59.

Grand Rapids. Another possibility is that activities such as camping are not attractive to low-income groups. There usually is a substantial investment in camping equipment involved, and this may be beyond their financial capabilities.

Whatever the reason, there is a strong "middle-class" aspect of state-park users in both sub-groups, campers having even more strongly middle-class characteristics than day-users. Douglas noted this trend and has cited statistics for Federal wilderness areas that also show incomes and educational levels that are above the national norm.[1]

Behavioral Differences

Statistically significant differences have been found in all behavioral characteristics between campers and day-users. These differences will now be discussed in detail.

Travel distance.--At both parks, campers tended to travel farther to the park. As can be seen from Figures 12 and 13, nearly 50 per cent of day-users in both parks traveled less than 25 miles. Approximately 50 per cent of campers in both parks traveled over 50 miles from home. It would seem that the day-users tended to visit the

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[1]William O. Douglas, A Wilderness Bill of Rights (Boston: Little, Brown and Company, 1965), p. 18.

closest park to home. Thus, Holland primarily drew day-users from Holland, Grand Rapids and the surrounding towns. Waterloo attracted day-users primarily from Lansing, Jackson, Ann Arbor and the smaller surrounding towns.

The indications are that campers were more selective in their choice of parks. They had more time to spend in the park, and they could travel farther. Campers were probably motivated by particular preferences for whatever attractions that a park can offer. Proximity to home was also a factor in park selection among campers. Many families remain in a southern Michigan state park campground for the maximum time allowed during the summer.[1] The wife and family vacations, while the husband commutes to and from the park to work. Closeness to home might also be a factor in selection of a park for a short, weekend camping trip. However, this is probably a less important factor with campers than with day-users.

Travel time.--The sampling of travel time may first appear redundant to travel distance to a park. However, people frequently decide on trips by the length of time that they can drive the distance. Frequently, it requires

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[1]Michigan State Parks Division camping policy states that a family may camp for a maximum of fifteen days in any state park between the dates of June 15 and Labor Day. Frequently, when a family exhausts their camping time in one park, they will move on to the next park for another fifteen days of camping.

less time to drive fifty miles on an expressway than it does to drive twenty miles through city traffic.

At Holland, 75 per cent of the day-users traveled less than one hour. The bulk of Holland campers traveled longer than two hours, as can be seen in Figure 14. This further supports the picture of day-users with more or less local origins, and campers who reside some distance from the park. At Waterloo, as shown in Figure 15, the difference was not quite so great. However, a similar pattern was exhibited. Nearly 75 per cent of the day-users lived within a one hour drive from the park. Almost 60 per cent of the campers traveled over two hours to reach the park.

Group descriptions.--The most interesting fact about campers, regarding group description, is that the overwhelming majority of them, at both parks, were single families with children. The only other camper group description with a group percentage of over 10 per cent was the "group of friends" category at Holland. Figures 16 and 17 reveal that day-users also had the largest group percentages in the "single family with children" category. However, day-users were much more heterogeneous as a group. Single couples and groups of friends were much more in evidence than among campers. This was particularly the case at Holland. An explanation may be that an overnight, or longer, trip is much more of a family affair than a several hours visit to a park.

Group mean size.--As can be seen from Figure 18, campers at both parks exhibited a significantly larger mean group size than did day-users. This tended to agree with group description data, where campers usually consisted of an entire family. With the larger percentages of single couples, single persons, and small groups of friends among day-users, the mean group size of day-users would be smaller.

Arrival time.--Day-users and campers exhibited significantly different arrival time patterns at both parks as shown in Figures 19 and 20. Campers, as a group, tended to arrive much earlier. At Waterloo, campers also tended to arrive earlier than most day-users. A perfect pattern was shown at Waterloo, with the most frequent arrival time for campers being 8 a.m., and the greatest arrival of day-users being between noon and 2 p.m. At Holland, the arrival time patterns for the two sub-groups were somewhat different. Greatest group percentage of day-user arrivals was between 6 and 8 p.m. Also different from Waterloo, the peak arrival time for campers was from 2 to 4 p.m.

This suggests that parks have different patterns of arrival times. The author, who has been employed at a number of Michigan state parks, has also noticed this difference between parks. A plausable explanation for the increase of day-user arrivals late in the day might have been the result of hot, tired people from the Holland area

who go to the beach after work for a picnic or a refreshing swim in Lake Michigan. The high percentage of campers entering Holland between 2 and 4 p.m. might have been due to people who had campsite assignments, and were able to occupy the site at 3 p.m.[1]

The high arrival number of campers at 8 a.m., and the high arrival number of day-users in early afternoon is perfectly logical. Competition for campsites at the crowded southern Michigan campgrounds demand an early arrival to assure a campsite lot. The favorite time for picnics and other outings would seem to be early afternoon.

Hours spent in park.--While not formulated into a sub-hypothesis, data was also tabulated for question 21, the number of hours spent in the park. For campers, this meant the number of hours they spent in the park on the day of departure.

As could be expected, campers spent many more hours in a state park than did day-users. However, rather than being a trite piece of data, Figures 23 and 24 reveal some interesting patterns of day-user park use. Nearly half of

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[1]Campground lot assignments are made according to expected vacancies that day. However, the previous night's occupant has until 3 p.m. to vacate the lot. The people who receive the lot assignment can not place their camping equipment on the lot until it is vacant. Subsequently, many campers, once they are assured of a lot via the assignment method, spend the day elsewhere until 3 p.m. when they return to occupy their campsite lot.

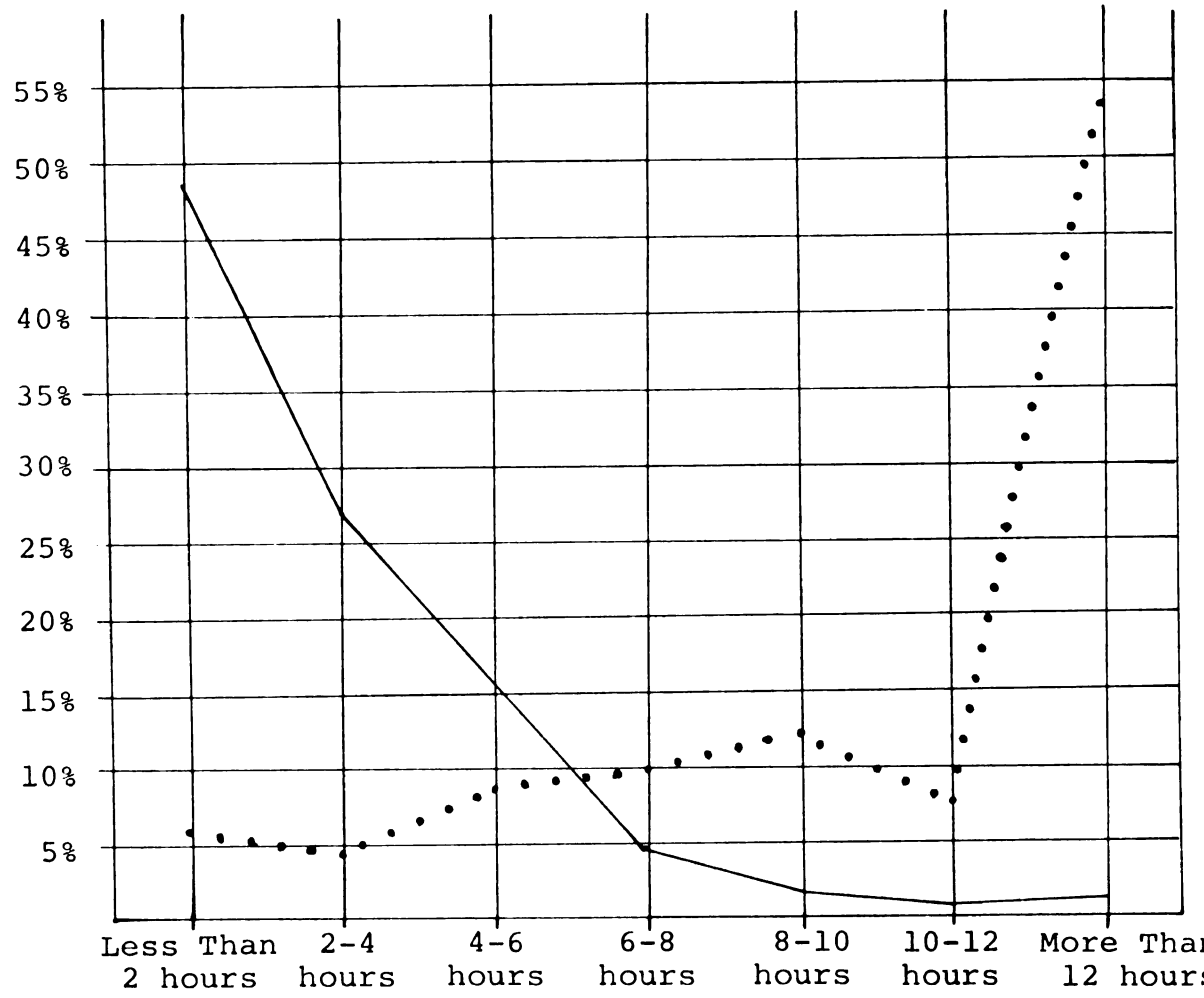

Figure 23.--Group time spent in the park patterns between day-users and campers at Holland State Park during data gathering period, 1968.

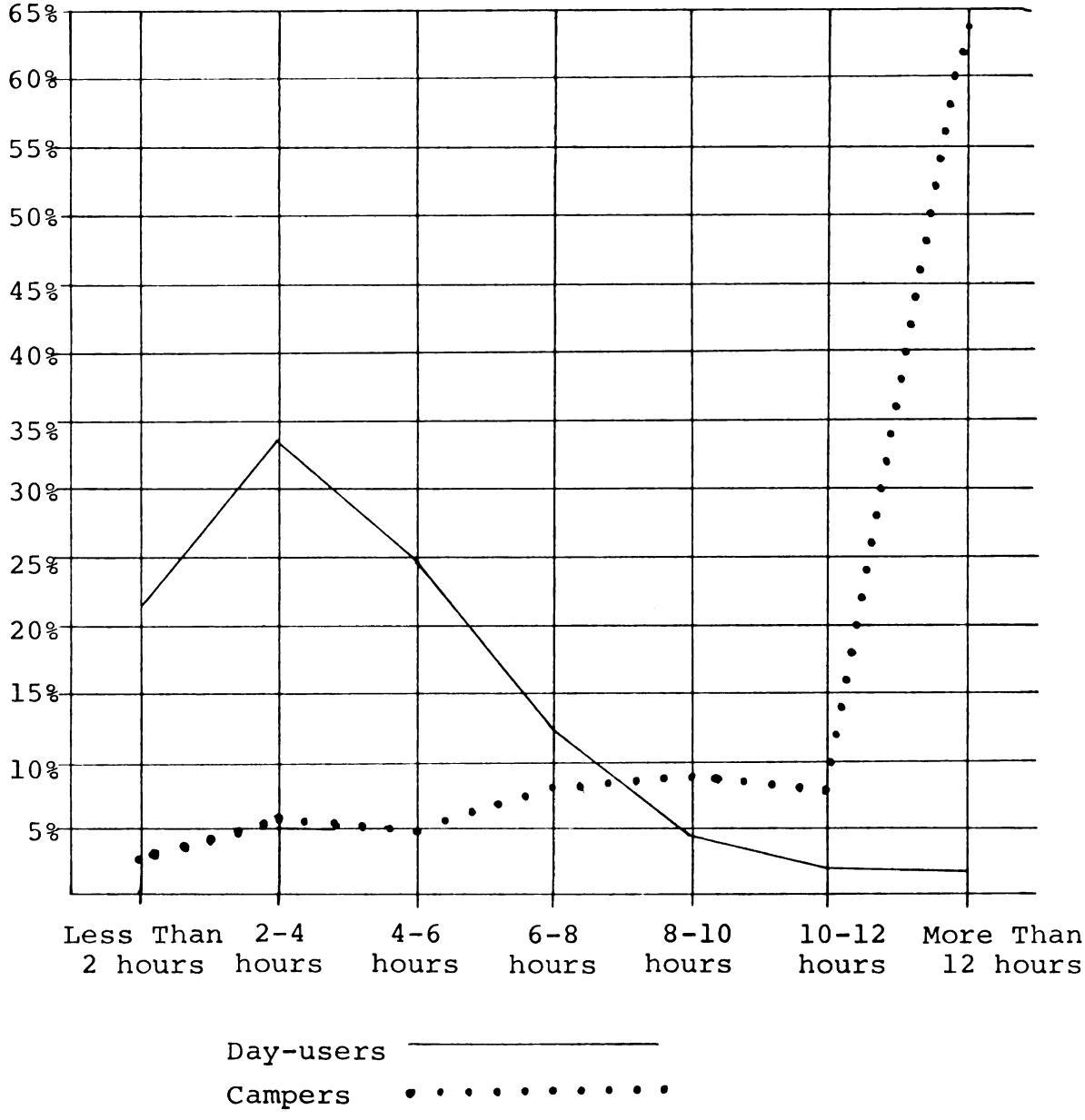

Figure 24.--Group time spent in the park patterns during day-users and campers at Waterloo State Recreation Area during data gathering period, 1968.

Holland day-users spent less than two hours in the park. Over ~~50 per cent~~ of Waterloo day-users spent less than four hours in the park.

Campers answered the question for the day they left the park. The large percentages of campers that spent over twelve hours in the park suggests that campers in southern Michigan state parks do spend most of the day of departure in the park. This also supports the conjecture that the large number of new camper arrivals between 2 and 4 p.m. was because the camp lots are occupied by the previous night's camper until 3 p.m. There was a chance that the question may have caused some confusion among campers. Some campers may have calculated the number of hours since 8 a.m.--the time of the park opening --and some campers may have calculated from midnight, the number of hours spent in the park that particular day. The reason for this conjecture is that if all campers calculated from 8 a.m., the majority of campers left the park after the park closing hour of 10 p.m. Also, if all campers calculated from midnight, some campers left the park at 1, 2 or 3 a.m., which is unlikely, in the number found in Appendix A-13.

The author feels that the question should have read: "How many hours, since 8 a.m., did you spend in the park today?" The question, as stated in the questionnaire, presents no such problems for day-users.

For the purposes of this study, we can assume that campers spent varying lengths of time in the park on the day of departure. However, the length of day-user visits data was more accurate and conclusive.

Group activity participation.--There was a significant difference at both parks in group activity participation patterns between day-users and campers. Figures 23 and 24 reveal that a greater percentage of campers participated in most activities than did day-users.

The three activities with the greatest group participation among campers at the two parks were also the three activities with the greatest group participation among day-users at both parks. These were swimming, sunbathing and relaxing. However, a much larger percentage of camper groups at both parks participated in these activities than did day-users. After the three most popular activities, there was some variation between parks. For the activity "sight-seeing by car," a greater percentage of day-users than campers at Holland indicated participation. Day-users at Waterloo had a greater percentage of picnickers than did campers.

Perhaps the most significant fact of these patterns was that the most popular activities for campers were also the most popular activities for day-users. However, there was usually a much smaller group percentage participation among day-users in each activity than among

campers. This is probably tied in with the fact that the majority of the day-users spent less than four hours in the parks. It suggests that day-users are more specific in their purpose for visiting a park. Apparently, campers had more time in the park and were able to be more exploratory in looking for things to do.

Non-significant Differences

While the differences between campers and day-users for the sex of the head of the family was not found to be statistically significant at either park, Figure 3 indicates a consistent trend toward more families with a female head among day-users. Perhaps a more interesting fact is that the national statistics for female heads of families is around 10 per cent and the park-user sampling for both sub-groups was considerably lower than that.[1] One reason may be that the "outdoor activity" aspect of state parks would attract families with male heads since the largest percentages of park-users in both sub-groups were entire conjugal families.

Educational differences were not found to be statistically significant. However, certain patterns for educational levels reached by the head of the families were fairly consistent between the two parks. Day-users

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[1]U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-20, No. 176.

had more families headed by a person with a grade school education, or less. Campers had a slightly greater percentage of heads of family with a high school education. Day-users had more heads of families with some years of college, while campers had a greater percentage of heads of families with college degrees or post-graduate work.

Educational levels from a random sampling of the national population would be expected to show much lower percentages of high school, college and post-graduate education for the heads of families.[1] The indications are that state park users are more highly-educated than the average national population. Douglas found the same to be true for users of Federal parks and wilderness areas.[2]

Conclusions

From the foregoing, it is apparent that a number of conclusions can be drawn from the study.

It is quite conclusive that the Michigan state park-using public is not a random sampling of the national or state population. As shown in the discussion, educational levels, occupational patterns, income levels, and the sex of the head of the family varied considerably from what a random sampling might be expected to show.

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[1]U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-25, No. 390.

[2]Douglas, Bill of Rights, p. 18.

Age distribution of park-users varied from the national or state population age structures.[1] There were more younger people, and far less representation among the middle age groups than would be expected in a broad sampling of the population.

All of the above indicates a strongly middle-class aspect of state park users. Conspicuous by their absence were the poor and the very rich. Obviously, the very rich can afford more exclusive private recreational facilities, while the poor may not be able to afford transportation or the equipment needed for a state park camping trip. Perhaps more importantly is the need for more research in sampling the attitudes of the poor--under $3,000 a year income--and the very rich--over $25,000 a year income--regarding state parks as a recreational outlet.

There were differences in the following socio-economic characteristics between campers and day-users at one, or both, parks. Age distributions, age of the head of the family, occupation of the head of the family, and income of families were all shown to differ significantly between campers and day-users at the 95 per cent confidence level.

All of the behavioral characteristics were shown to have statistically significant differences between campers and day-users at the 95 per cent level of confidence.

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[1] U.S. Department of Commerce, Bureau of the Census, Current Population Reports, Series P-25, No. 416.

Criteria for rejecting or accepting the main hypothesis, "There is a significant difference between campers and day-users in southern Michigan state parks in both socio-economic and behavioral characteristics," required that at least three socio-economic characteristics, and at least three behavioral characteristics be found to have a statistically significant difference at the 95 per cent level of confidence. The three sub-hypotheses--1, 3 and 6 for Holland State Park, and 1, 4, and 6 for Waterloo State Recreation Area--were not rejected at each park for socio-economic characteristics, and all six sub-hypotheses regarding behavioral characteristics were not rejected at both parks. Thus, there are no grounds for rejection of the main hypothesis.

The acceptance of the main hypothesis should be interpreted in the light of the following constraint: The hypothesis was not rejected for two parks in southern Michigan. It is likely that similar differences occur at other southern Michigan state parks of a comparable type and location. A broader application of the constraint would imply that it is assumed that conditions will remain more or less the same. The differences are present during the summer months of July and August, when the sample was taken. It must imply that there not be a sudden "revolution" in park use patterns, such as the camping "boom" of the late 1950s and 1960s. The constraint also implies that there be no drastic changes in policy by the Parks

Division of the Michigan Department of Natural Resources to disrupt present patterns. An example of this might be a program to encourage the socially-disadvantaged urban and rural groups to participate more in state park camping. And finally, it implies that there be no great sociological upheaval of catastrophic proportions, such as the Great Depression of the 1930s.

Concluding Remarks

In all park systems, and in every decision-making procedure from park planning to creating administrative policy, it is imperative to know as much as possible about the people who use that park system's facilities. This information is time-consuming and expensive to accumulate and analyze. In most park systems, the camper is more stationary and available, and is the most frequent subject of park surveys.

A question arises as to whether data gathered from the camping park-users are valid for application to day-users. If it is not valid, there is the prospect of applying standards based on the behavior and preferences of a small segment of the park-using public--campers--in formulating services and facilities for all state park users.

The author believes that the two user groups are significantly different in southern Michigan state parks,

and this belief has been substantiated by acceptance of the main hypothesis.

A two-park sample can not be considered to be completely conclusive regarding all the parks in the region. However, the sample represents what the author feels is a reasonably typical cross-section of southern Michigan state parks. There is good reason to assume that similar user patterns exist in other southern Michigan state parks, with perhaps minor differences due to local circumstances.

In the northern two-thirds of Michigan, where local population densities are sparse, use and user patterns could very well differ from the state parks in southern Michigan. For instance, the author would expect more similarity in socio-economic characteristics between campers and day-users in the northern Michigan state parks. Due to these regional differences, any conclusions about the above findings must be confined to state parks in the southern one-third of Michigan.

CHAPTER VI

RECOMMENDATIONS

The recommendations that follow apply to the Parks Division of the Michigan Department of Natural Resources only inasmuch as the data of this thesis concern southern Michigan state parks. The recommendations can also be applied by any similar agency concerned with defining the user and use patterns within their respective park systems.

1. Enough differences were found between day-users and campers in the two study parks to merit extending this kind of study to other parks. Much important information could be revealed to park planners and administrators by the extension of this study. It is possible that differences, not found to be statistically different at the study parks, would be found to be statistically different at other, similar parks. Several variations were found between the same kind of user groups at Holland and Waterloo. Extension of the study would reveal

which of the variations were the more general case throughout the region, or possibly, that all parks varied somewhat in these characteristics.

2. This kind of user research, to be meaningful, must be extended over a number of years. The same parks should be re-sampled at intervals of no more than every three years. A "trend" in user or use patterns can not be established in one season's sampling. Furthermore, the longer the time that has elapsed since data collection, the less relevant to current planning purposes that results become. For instance, the author suspects that 1958 data from the above study parks would vary considerably from the 1968 data discussed in this thesis. The 1968 data, already two years old, probably needs some 1970 season supplementary information to be considered current.

3. There is a need for constant effort to refine and simplify sampling and analysis methods. Since research is expensive and agency funds are seldom more than minimally adequate for operations, research is frequently the first activity to "suffer" in times of "budget-tightening."

4. If close use and user pattern similarities are found to exist between certain kinds of state parks--for instance, southwestern Michigan Lake Michigan parks--one representative park of the group could be selected as an index for continual sampling, thus saving on man-hours and computer time costs.
5. Within the context of good resource management, park master plans should be periodically reviewed in light of research findings.

SELECTED BIBLIOGRAPHY

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Books and Periodicals

Arkin, Herbert, and Colton, Raymond R. Tables for Statisticians. New York: Barnes and Noble, Inc., 1962.

Carlson, R. E.; Deppe, T. R.; and Maclean, J. R. Recreation In American Life. Belmont, Calif.: Wadsworth Publishing Company, 1963.

Clawson, Marion. "The Crisis In Outdoor Recreation." American Forests, Vol. 65, No. 3, 1959.

_____. "Economics and Environmental Impacts of Increasing Leasure Activities." In Future Environments of North America. Edited by F. F. Darling and J. P. Milton. New York: The Natural History Press, 1966.

_____. Land and Water for Recreation: Opportunities, Problems, and Policies. Chicago: Rand, McNally and Company, 1963.

_____, and Knetsch, Jack L. Economics of Outdoor Recreation. Baltimore: The John Hopkins Press, 1966.

_____, and Knetsch, Jack L. "Outdoor Recreation Research: Some Concepts and Suggested Areas of Study." Natural Resources, Vol. 3, 1963.

Douglas, Wm. O. A Wilderness Bill of Rights. Boston: Little, Brown & Company, 1965.

Dixon, Wilfrid J., and Massey, Frank J. Introduction to Statistical Analysis. New York: McGraw-Hill Book Company, Inc., 1951.

Menninger, Karl. The Vital Balance. New York: Viking Press, 1963.

Public Documents and Reports

Clawson, Marion, and Knetsch, Jack L. "Recreation Research: Some Basic Analytical Concepts and Suggested Framework for Research Problems." Proceeding of the National Conference on Outdoor Recreation Research. Ann Arbor, Mich., 1963, 9-42.

Crapo, Douglas, and Chubb, Michael. Recreation Area Day-use Investigation Techniques: Part I, A Study of Survey Methodology. East Lansing, Mich.: Recreation Research and Planning Unit, Department of Park and Recreation Resources, College of Agriculture and Natural Resources, Michigan State University, Technical Report No. 6, 1969.

King, David A. Characteristics of Family Campers Using the Huron-Manistee National Forests. St. Paul: U.S. Department of Agriculture, 1965.

Michigan Department of Conservation.[1] State Park Attendance--1965. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1966.

_____. State Park Attendance--1966. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1967.

_____. State Park Attendance--1967. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1968.

_____. State Park Camper Data for 1965. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1966.

_____. State Park Camper Data for 1966. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1967.

_____. State Park Camper Data for 1967. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1968.

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[1] In late 1968, the Michigan Department of Conservation was encorporated into the Michigan Department of Natural Resources. This included all of the former departmental agencies, as well as a number of previously unassociated organizations, in an effort to streamline Michigan government.

_____. Twenty-Fourth Bienniel Report for 1967-1968. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1968.

_____. Turn-away Data--Season 1965. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1966.

_____. Turn-away Data--Season 1966. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1967.

_____. Turn-away Data--Season 1967. Lansing, Mich.: Michigan Department of Conservation, Parks Division, 1968.

Michigan Department of Conservation, Recreation Resources Planning Division. Outdoor Recreation Planning In Michigan by a Systems Analysis Approach. Lansing, Mich.: Michigan Department of Conservation, Recreation Resource Planning Division, 1965.

_____. Michigan's Recreation Future. Lansing, Mich.: Michigan Department of Conservation, Recreation Resource Planning Division, 1968.

Michigan Department of Natural Resources, Parks Division. State Park Attendance--1968. Lansing, Mich.: Michigan Department of Natural Resources, Parks Division, 1969.

_____. State Park Camper Data for 1968. Lansing, Mich.: Michigan Department of Natural Resources, Parks Division, 1969.

_____. Turn-away Data--Season 1968. Lansing, Mich.: Michigan Department of Natural Resources, Parks Division, 1969.

Michigan State University, Department of Resource Development. Michigan Outdoor Recreation Demand Study. Lansing, Mich.: State Resource Planning Program, Michigan Department of Commerce, Technical Report No. 6, June, 1966.

Outdoor Recreation Resources Review Commission. Outdoor Recreation For America. Washington, D.C.: U.S. Government Printing Office, 1962.

_____. Study Report 22, Trends In American Living and Outdoor Recreation. Washington, D.C.: U.S. Government Printing Office, 1962.

Palmer, Walter L. An Analysis of the Public Use of Southern Michigan Game and Recreation Areas. Lansing, Mich.: Michigan Department of Conservation, Research and Development Division, 1967.

Twardzik, Louis F. The Future of State Parks as Suppliers of Recreation Opportunities. East Lansing, Mich.: Cooperative Extension Service, Michigan State University, PR 206, 1963.

_____. Expanding the User Approach to Recreation Area Planning. East Lansing, Mich.: Cooperative Extension Service, Michigan State University, PR 206, 1963.

U.S. Department of Agriculture. Resources and Recreation in the Northern Great Lakes Region. Washington, D.C.: U.S. Department of Agriculture Task Force Report, 1963.

U.S. Department of Commerce, Bureau of the Census. Current Population Reports. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census, Series P-25, No. 416.

_____. Current Population Reports. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census, Series P-60, No. 59.

_____. Current Population Reports. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census, Series P-20, No. 176.

_____. Current Population Reports. Washington, D.C.: U.S. Department of Commerce, Bureau of the Census, Series P-25, No. 390.

U.S. Department of the Interior, Bureau of Outdoor Recreation. Outdoor Recreation for America. Washington, D.C.: U.S. Government Printing Office, 1967.

_____. The 1965 Survey of Outdoor Recreation Activities. Washington, D.C.: U.S. Department of the Interior, Bureau Outdoor Recreation, 1967.

U.S. Department of Labor, Bureau of Labor Statistics. Monthly Labor Review. Washington, D.C.: U.S. Department of Labor, Bureau Labor Statistics, January, 1969.

Wisconsin Department of Natural Resources, Division of Conservation. Wisconsin's Outdoor Recreation Plan. Madison, Wis.: Wisconsin Department of Natural Resources, Division of Conservation, Publication 802, 1968.

Other Sources

Crapo, Douglas, Melvin. "Recreation Area Day-use Investigation Techniques: A Study of Survey Methodology Within Michigan State Parks." Unpublished M.S. Thesis, Michigan State University, 1969.

APPENDICES

APPENDIX A

PARK-USER CHARACTERISTIC DATA

TABLE A-1.--Frequency distribution of male park-users by park, age group, and user groups.

Age Group (Years)	Waterloo Campers		Waterloo Day-users		Holland Campers		Holland Day-users	
	No.	%	No.	%	No.	%	No.	%
Below 5	105	12.0	237	12.6	73	10.8	124	10.7
5-9	136	15.5	321	17.2	113	16.7	154	13.3
10-14	154	17.6	323	17.4	99	14.6	119	10.3
15-19	113	12.9	307	16.5	98	14.5	255	21.4
20-24	51	6.0	118	6.3	49	7.4	113	10.0
25-29	39	4.5	103	5.6	35	5.3	73	6.3
30-34	54	6.3	92	4.9	43	6.4	71	6.2
35-39	71	8.2	119	6.8	49	7.3	82	7.1
40-49	111	12.7	178	9.6	90	13.3	101	8.7
50 or Over	37	4.3	57	3.1	25	3.7	70	6.0
Totals	871	100.	1,855	100.	680	100.	1,162	100.
% User Group	48.4		49.8		49.96		47.2	

TABLE A-2.--Frequency distribution of female park-users by park, age group, and user groups.

Age Group (Years)	Waterloo Campers		Waterloo Day-users		Holland Campers		Holland Day-users	
	No.	%	No.	%	No.	%	No.	%
Below 5	90	9.9	213	11.1	72	10.5	106	8.4
5-9	141	15.4	325	17.2	95	13.8	152	12.0
10-14	195	20.3	330	17.4	105	15.3	138	10.9
15-19	127	13.8	310	16.4	135	19.6	319	24.3
20-24	57	6.2	119	6.1	57	8.3	105	8.3
25-29	52	5.7	140	7.2	47	6.8	97	7.6
30-34	67	7.4	128	6.6	34	4.9	79	6.2
35-39	85	9.2	134	7.0	53	7.2	91	7.3
40-49	86	9.3	146	7.5	75	10.9	112	8.9
50 or Over	24	2.8	73	3.5	20	2.7	78	6.1
Totals	929	100.	1,871	100.	688	100.	1,295	100.
% User Group	51.6		50.2		50.04		52.8	

TABLE A-3.--A distribution of park-user groups by the sex of the head of each family.

	Male Head of Family			Female Head of Family			No Response		
	No.	% Tot.*	% Resp.	No.	% Tot.	% Resp.	No.	% Tot.	
Waterloo Day-users	702	78.5	94.99	37	4.13	5.01	156	17.37	895
Waterloo Campers	316	80.08	96.34	12	3.06	3.66	65	16.86	393
Holland Day-users	637	85.8	93.40	45	6.1	6.60	60	8.1	742
Holland Campers	268	87.5	95.03	14	4.57	4.97	24	7.93	306

*"% Tot." reflects values obtained by including "No Response" answers.

TABLE A-4.--A distribution of the park-user groups by the age of the head of the family.

Age (Years)	Waterloo Day-users			Waterloo Campers			Holland Day-users			Holland Campers		
	Tot.	% Tot.*	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
Less Than 20	45	5.03	5.63	18	4.6	5.00	42	5.7	6.00	5	1.63	1.78
21-25	70	7.83	8.76	29	7.37	8.76	48	6.5	6.86	22	7.4	7.66
26-30	90	10.08	11.25	29	7.37	8.06	64	8.6	9.14	34	11.12	11.79
31-35	125	13.99	15.66	54	13.75	15.00	84	11.3	12.00	39	12.75	13.54
36-40	132	14.75	16.53	77	19.6	21.38	107	14.4	15.28	59	19.3	20.07
41-45	155	17.35	19.40	77	19.6	21.38	98	13.2	14.00	61	19.9	21.14
46-50	98	10.95	12.40	40	10.2	11.15	119	16.0	17.00	41	13.4	14.24
51-55	41	4.58	5.12	18	4.68	5.00	70	9.5	10.00	13	4.25	4.54
56-60	22	2.46	2.75	8	2.04	2.22	35	4.7	5.00	8	2.61	2.78
61 and Over	20	2.24	2.50	10	2.55	2.75	33	4.4	4.72	7	2.29	2.46
No. Resp.	97	10.74		33	8.24		42	5.7		17	5.35	
Total	895			393			742			306		

*"% Tot." reflects values obtained by including the "No Response" answers.

TABLE A-5.--Distribution of park-user groups by the occupation of the head of the family.

	Waterloo Day-users			Waterloo Campers			Holland Day-users			Holland Campers		
	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
Professional	170	19.00	23.03	64	16.20	18.93	152	20.60	23.52	80	26.20	31.75
Farm Managers	9	1.07	1.21	3	.80	.83	5	.75	.80	2	.65	.79
Managers, Self-employed	61	6.81	8.55	21	5.30	6.18	73	9.90	11.31	27	8.83	10.71
Clerical	36	4.03	4.88	18	4.60	5.29	17	2.40	3.84	8	2.60	3.17
Sales	51	5.70	6.92	23	5.80	6.77	49	6.70	7.61	18	5.85	7.12
Craftsmen	148	16.55	20.01	79	20.00	23.43	131	17.70	20.05	45	14.65	17.83
Operatives	69	7.71	9.36	41	10.40	12.12	40	5.50	6.21	17	5.50	6.75
Private Household	1	.11	.13	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
Service	20	2.23	2.71	8	2.00	2.32	22	3.10	3.43	10	3.26	3.97
Farm Labor	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
Labor	38	4.25	5.16	16	4.07	4.74	15	2.10	2.34	2	.65	.79
Student	14	1.63	1.90	2	.50	.54	18	2.60	2.81	4	1.32	1.58
Housewife	7	.78	.95	3	.70	.83	3	.40	.46	3	.98	1.19
Retiree	11	1.23	1.49	7	1.70	2.75	20	2.80	3.12	4	1.32	1.58
Military	4	.45	.54	4	1.00	1.13	8	1.10	1.24	2	.65	.79
Unemployed	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
Other, Factory	99	11.08	13.28	48	12.50	14.18	80	10.80	12.43	30	9.38	11.98
No Reply	157	17.85		56	13.70		94	12.75		54	17.74	
Totals	895			393			742			306		

TABLE A-6.--Distribution of park-user groups by education of the head of the family.

	Waterloo Day-users			Holland Day-users			Waterloo Campers			Holland Campers		
	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
8th Grade or Less	46	5.10	5.80	72	9.80	10.24	19	4.70	5.39	20	6.50	6.94
9th-11th Grade	77	8.60	9.70	84	11.30	11.86	47	11.70	13.32	32	10.50	11.09
Completed High School	303	33.80	38.21	210	28.20	29.98	138	34.40	39.10	89	29.00	30.98
1-3 Years College	203	22.80	25.59	145	19.50	20.71	90	24.60	25.51	56	18.30	19.45
Completed College	65	7.30	8.20	71	9.60	10.08	29	7.10	8.18	34	11.20	11.81
Post-Grad. Work	99	11.00	12.50	112	15.10	17.13	30	7.40	8.50	57	18.60	19.70
No Response	102	11.04		48	6.50		40	10.10		18	5.90	
Totals	895			742			393			306		

TABLE A-7.--Distribution of park-users by the income of families.

	Waterloo Day-users			Holland Day-users			Waterloo Campers			Waterloo Day-users		
	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
Less Than $3,000	20	2.20	2.56	32	4.40	5.00	5	1.28	1.37	4	1.30	1.45
$3,000 to $5,999	49	5.50	6.29	48	6.50	7.50	23	5.85	6.44	15	4.90	5.43
$6,000 to $7,999	121	13.40	15.62	101	13.90	15.62	56	14.25	15.75	53	17.30	19.21
$8,000 to $9,999	169	18.90	21.77	123	15.70	19.17	105	26.70	29.52	58	18.90	21.01
$10,000 to $14,999	304	33.80	39.17	198	26.90	30.87	135	34.40	37.97	98	32.00	35.58
$15,000 to $24,999	86	9.60	11.05	88	11.90	13.71	27	6.87	7.58	37	12.10	13.41
$25,000 or Over	28	3.40	3.58	52	7.20	8.13	5	1.28	1.37	11	3.60	3.91
No Response	118	13.20		100	13.50		38	9.37		30	9.90	
Totals	895			742			393			306		

TABLE A-8.--Distribution of park-user groups by travel distance (miles) to the park.

Distance (Miles)	Waterloo Day-users		Waterloo Campers		Holland Day-users		Holland Campers	
	Tot.	% Tot.	Tot.	% Tot.	Tot.	% Tot.	Tot.	% Tot.
Less than 25 miles	436	48.75	134	34.10	311	42.00	82	26.80
25 to 49	156	17.45	46	11.75	232	34.00	81	26.40
50 to 74	222	24.85	116	29.50	52	7.00	18	5.90
75 to 99	47	5.24	62	15.75	22	2.90	9	2.90
100 to 124	15	1.67	4	1.02	26	3.50	12	3.90
125 to 149	0	0.00	1	.26	5	.70	9	2.90
150 to 174	1	.11	2	.52	19	2.50	18	5.90
175 to 199	1	.11	4	1.02	10	1.30	9	2.90
200 to 224	2	.22	4	1.02	14	1.90	15	4.90
225 to 249	3	.33	4	1.02	5	.70	6	1.90
250 miles or over	12	1.27	16	4.04	26	3.50	47	15.60
Totals	895		393		722		306	

TABLE A-9.--Distribution of park-user groups by travel time (hours) to the park.

Travel Time	Waterloo Campers			Waterloo Day-users			Holland Campers			Holland Day-users		
	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
Less than 1/2 hour	65	16.50	19.62	283	31.65	36.46	55	18.00	20.90	312	43.00	44.40
1/2 to 1 hour	85	21.60	25.68	287	32.10	36.89	65	21.20	24.70	215	29.00	30.10
1 to 1 1/2 hours	83	21.10	25.05	114	12.75	14.59	12	3.90	4.55	46	6.30	6.58
1 1/2 to 2 hours	42	10.70	12.71	42	4.69	5.37	10	3.27	3.80	36	4.50	5.20
2 to 2 1/2 hours	11	2.80	3.32	8	.89	1.21	7	2.29	2.66	22	2.90	3.15
2 1/2 to 3 hours	8	2.04	2.42	21	2.34	2.42	21	6.85	7.98	26	3.50	3.70
3 to 3 1/2 hours	4	1.02	1.20	3	.33	.35	12	3.90	4.55	2	.25	.28
3 1/2 to 4 hours	9	2.28	2.72	6	.67	.74	19	6.20	7.23	20	2.50	2.86
4 to 4 1/2 hours	2	.51	.61	3	.33	.35	9	2.94	3.42	4	.50	.58
Over 4 1/2 hours	22	5.60	6.67	11	1.23	1.39	53	17.30	20.21	22	2.90	3.15
No Response	62	15.71		117	13.02		43	14.15		37	4.65	
Totals	393			895			306			742		

TABLE A-10.--Distribution of park-users by group descriptions.

Group Description	Waterloo Campers			Waterloo Day-users			Holland Campers			Holland Day-users		
	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
One Family With Children	256	65.00	70.08	413	46.20	52.17	190	62.50	62.93	262	35.40	35.60
Two Families With Children	22	5.30	6.09	80	9.00	10.06	9	2.90	2.99	38	5.10	5.14
One Couple Only	25	6.00	6.92	80	9.00	10.06	30	9.90	9.95	134	18.10	18.19
Two or More Couples	5	1.10	1.40	18	2.29	2.60	7	2.20	2.35	34	4.60	4.61
Organized Group	7	1.60	1.95	25	2.80	3.19	3	.90	.99	5	.70	.78
One Person Alone	4	1.00	1.12	26	2.90	3.31	12	3.90	3.97	58	7.80	7.86
Group of Friends	35	8.7	9.67	110	12.30	13.96	41	13.40	13.49	167	22.50	22.68
Other	10	2.54	2.77	39	4.40	4.96	10	3.30	3.32	38	5.00	5.14
No Response	29	7.30		104	11.60		4	1.10		6	.80	
Totals	393			895			306			742		

TABLE A-11.--Group mean size of the various park-user groups.

User Group	Number of Groups	Total People	Group Mean
Holland Day-users	742	2,457	3.31
Waterloo Day-users	895	3,726	4.16
Holland Campers	302	1,368	4.47
Waterloo Campers	393	1,800	4.58
Total	2,332	9,351	4.01

TABLE A-12.--Distribution of park-user groups by the time of arrival at the park.

Arrival Times	Waterloo Day-users			Waterloo Campers			Holland Day-users			Holland Campers		
	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.	Tot.	% Tot.	% Resp.
8-10 a.m.	59	6.60	7.59	99	25.10	28.16	32	4.40	4.63	49	16.00	16.51
10 a.m.-noon	205	22.80	26.29	62	15.60	17.60	114	15.40	16.49	40	13.00	13.47
noon-2 p.m.	237	26.50	30.07	68	17.20	19.31	113	15.10	16.37	39	12.70	13.12
2-4 p.m.	172	19.30	22.02	69	17.40	19.61	131	17.70	18.95	56	18.30	18.90
4-6 p.m.	84	9.40	10.76	29	7.20	8.23	107	14.40	15.48	54	17.70	18.20
6-8 p.m.	24	2.60	3.11	16	4.07	4.57	133	17.90	19.25	42	13.70	14.13
8-10 p.m.	1	.11	.16	9	2.29	2.56	61	8.20	8.83	17	5.50	5.67
No Response	113	12.60		41	10.10		51	6.90		9	2.29	
Totals	895			393			742			306		

TABLE A-13.--Distribution of user-groups by participation percentages in each park activity.

Activities	Waterloo Day-users		Holland Day-users		Waterloo Campers		Holland Campers	
	No. Groups Participating	% Group Participation	No. Groups Participating	% Group Participation	No. Groups Participating	% Group Participation	No. Groups Participating	% Group Participation
Sightseeing from car	113	12.65	213	28.75	142	36.20	74	24.20
Walking to scenic points	116	12.95	198	26.60	142	36.20	129	42.10
Picnicking	482	48.37	184	24.80	146	38.20	121	39.50
Looking at plants, animals or birds for hobby	48	5.37	25	3.60	59	15.00	19	6.20
Swimming	650	72.80	329	44.30	339	86.40	235	77.00
Wading	299	33.30	206	27.80	157	40.00	151	49.30
Sunbathing	486	54.40	332	44.90	269	68.40	217	70.80
Waterskiing	108	12.10	16	2.60	59	15.00	14	4.57
Skin or scuba diving	18	2.02	10	1.35	16	4.07	8	2.61
Motorboating	108	12.10	20	2.70	77	19.60	20	6.54
Sailing	8	.89	10	1.35	6	1.52	11	3.60
Canoeing	10	1.12	7	.94	16	4.07	5	1.64
Rowboating	12	1.34	5	.67	28	7.12	3	.98
Boat fishing	31	3.47	6	.81	74	18.85	9	2.94
Bank fishing	20	2.23	14	1.89	70	17.80	30	9.80
Fishing (wading)	6	.67	3	.41	30	7.65	7	2.28
Games and team sports	89	9.95	40	5.40	102	25.90	33	10.75
Trail hiking	59	6.60	11	1.48	105	26.80	24	7.85
Horseback riding	6	.67	1	.14	24	6.10	5	1.63
Listening to ranger talks	24	2.68	23	3.10	99	25.20	11	3.59
Taking guided tours	14	1.56	3	.41	39	9.94	5	1.64
Visiting museums or nature centers	14	1.56	8	1.08	36	9.30	28	9.16
Relaxing	428	47.80	326	44.00	290	73.90	215	70.04
Photography	70	7.82	64	8.65	97	24.70	73	23.80
Other	52	5.81	82	11.00	44	11.19	41	13.40

TABLE A-14.--Distribution of park-user groups by hours spent in the park.

Hours Spent in Park	Waterloo Campers			Waterloo Day-users			Holland Campers			Holland Day-users		
	No.	% Tot.	% Resp.	No.	% Tot.	% Resp.	No.	% Tot.	% Resp.	No.	% Tot.	% Resp.
Less than 2 hours	9	2.29	2.81	163	18.30	21.21	15	4.90	5.58	325	43.80	48.55
2 to 4 hours	17	4.34	5.31	255	28.50	33.11	11	3.60	4.10	181	24.40	27.01
4 to 6 hours	15	3.82	4.68	190	21.20	24.71	22	7.20	8.20	106	14.30	15.81
6 to 8 hours	25	6.28	7.81	95	10.60	12.37	26	8.50	9.69	33	4.40	4.93
8 to 10 hours	28	7.14	8.75	36	4.10	4.73	32	10.50	11.93	11	1.50	1.64
10 to 12 hours	24	6.12	7.50	15	1.80	2.00	20	6.50	7.46	6	.80	.89
More than 12 hours	202	51.40	63.14	14	1.70	1.87	142	46.50	53.04	8	1.10	1.17
No response	73	18.51		127	13.80		38	12.30		72	9.70	
Totals	393			895			306			742		

APPENDIX B

STATISTICAL ANALYSIS PROBLEMS OF DATA

TABLE B-1.--χ^2 distribution test for significance between male campers and day-users at Holland State Park at 95 per cent confidence level.

	X_{i1} Campers	X_{i2} Day-users	Total	$X_{i1}^2/X_{i1}+X_{i2}$
Under 5	73	124	197	27.1
5 - 9	113	154	267	47.8
10 - 14	99	119	218	44.9
15 - 19	98	255	353	27.2
20 - 24	49	113	162	14.8
25 - 29	35	73	108	11.3
30 - 34	43	71	114	16.2
35 - 39	49	82	131	18.3
40 - 49	90	101	191	42.3
50 or Over	25	70	95	6.6
Totals	674 ΣX_{i1}	1,162 ΣX_{i1}	1,836 $\Sigma (X_{i1}+X_{i2})$	256.5

$$\chi^2 = \left[\frac{256.5 - P\,(674)}{P\,(1-P)}\right] = \frac{256.5 - 237.4}{.232} = \frac{19.1}{.232}\Bigg] = 82.3$$

$$P = \frac{674}{1836} = .367$$

82.3 > 16.92 .˙. Difference is significant at .05 level.

TABLE B-2.--χ^2 distribution test for significance between female campers and day-users at Holland State Park at 95 per cent confidence level.

Age Group	X_{i1} Campers	X_{i2} Day-users	Total	$X_{i1}^2/X_{i1}+X_{i2}$
Under 5	72	106	178	29.1
5 - 9	95	152	247	36.5
10 - 14	105	138	243	45.4
15 - 19	135	319	454	40.1
20 - 24	57	105	162	20.1
25 - 29	47	97	144	15.3
30 - 34	34	79	113	10.2
35 - 39	53	91	144	19.5
40 - 49	75	112	187	30.1
50 or Over	20	78	98	4.1
Totals	693 ΣX_{i1}	1,277 ΣX_{i2}	1,970 $\Sigma(X_{i1}+X_{i2})$	250.4

$$\chi^2 = \left[\frac{250.4 - P\,(693)}{P\,(1-P)}\right] = \frac{6.5}{.288} = 28.5$$

$$P = \frac{693}{1970} = .352$$

28.5 > 16.92 .·. Difference is significant at .05 level

TABLE B-3.--χ^2 distribution test for significance between male campers and day-users at Waterloo State Recreation Area at 95 per cent confidence level.

Age Group	X_{i1} Campers	X_{i2} Day-users	Total	$X_{i1}^2/X_{i1}+X_{i2}$
Under 5	105	237	347	32.9
5 - 9	136	321	457	40.5
10 - 14	154	323	477	49.7
15 - 19	113	307	420	34.0
20 - 24	51	118	169	15.4
25 - 29	39	103	142	10.7
30 - 34	54	92	146	19.9
35 - 39	71	119	190	26.5
40 - 49	111	178	289	42.6
50 or Over	37	57	94	14.5
Totals	871 ΣX_{i1}	1,855 ΣX_{i2}	2,731 $\Sigma(X_{i1}+X_{i2})$	286.7

$$\chi^2 = \left[\left[286.7 \right] - P\,(871) \,/\, P\,(1-P) \right] = \frac{286.7 - 277.9}{.215}$$

$$P = \frac{871}{2731} = .319 \qquad \chi^2 = \frac{8.8}{.215} = 40.9$$

$40.9 > 16.92$ $\therefore$ Difference is significant at the .05 level.

TABLE B-4.--χ^2 distribution test for significance between female campers and day-users at Waterloo State Recreation Area at 95 per cent confidence level.

Age Group	X_{i1} Campers	X_{i2} Day-users	Total	$X_{i1}^2/X_{i1}+X_{i2}$
Under 5	90	213	303	26.7
5 - 9	141	325	466	42.5
10 - 14	195	330	525	72.4
15 - 19	127	310	437	36.9
20 - 24	57	119	176	18.5
25 - 29	52	140	192	14.1
30 - 34	67	128	195	23.0
35 - 39	85	134	219	33.0
40 - 49	86	146	232	31.9
50 or Over	24	73	97	5.9
Totals	924 ΣX_{i1}	1,918 ΣX_{i2}	2,842 $\Sigma (X_{i1}+X_{i2})$	304.9

$$\chi^2 = [304.9] - P\,(924) \,/\, P\,(1-P) =$$

$$\chi^2 = \frac{304.9 - 300.3}{.219} = \frac{4.6}{.219} = 21.0$$

$$P = \frac{924}{2842} = .325$$

$21.0 > 16.92$.˙. Difference is significant at the .05 level.

TABLE B-5.--χ^2 distribution test for significance between campers and day-users, sex-head of family, at Holland State Park at the 95 per cent confidence level.

Sex of Head of Family	Campers	Day-users	Totals
Male	268	637	905
Female	14	45	59
Totals	282	682	964

$$\chi^2 = \frac{(|268 \times 45 - 637 \times 12| - 1/2\ 964)^2\ 964}{(905)\ (282)\ (682)\ (59)}$$

$$\chi^2 = \frac{14,899,207,184}{10,269,139,980} = 1.451$$

$1.451 < 3.84$ $\therefore$ Difference is <u>not</u> significant at .05 level.

TABLE B-6.--χ^2 distribution test for significance between campers and day-users, sex-head of family, at Waterloo State Recreation Area at the 95 per cent confidence level.

Sex of Head of Family	Campers	Day-users	Total
Male	316	702	1,018
Female	12	37	49
Totals	328	739	1,067

$$\chi^2 = \frac{(|316 \times 37| - 702 \times 12| - 1/2\ 1067)^2\ 1067}{(1018)\ (328)\ (739)\ (49)}$$

$$\chi^2 = \frac{7,978,482,096.75}{12,815,217,744} = .625$$

$.625 < 3.84$ $\therefore$ Difference is <u>not</u> significant at the .05 level.

TABLE B-7.--χ^2 distribution test for significance between campers and day-users, age-head of family, at Holland State Park at the 95 per cent confidence level.

Age of Head of Family	X_{i1} Campers	X_{i2} Day-users	Total	$X_{i1}^2/X_{i1}+X_{i2}$
Below 20	5	42	47	.5
21 - 25	22	48	70	6.9
26 - 30	34	64	98	11.8
31 - 35	39	84	123	12.4
36 - 40	59	107	166	20.9
41 - 45	61	98	159	23.4
46 - 50	41	119	160	10.5
51 - 55	13	70	83	2.0
56 - 60	8	35	43	1.5
61 and Over	7	33	40	1.2
Totals	289 ΣX_{i1}	700 ΣX_{i2}	989 $\Sigma X_{i1}+X_{i2}$	91.1

$$\chi^2 = [91.1 - P\ (289)]\ /\ P\ (1 - P) = \frac{91.1 - 84.4}{.207} = 32.4$$

$$P = \frac{289}{989} = .292$$

At 9 d.f., 32.4 > 16.92 $\therefore$ Difference is significant at .05 level.

TABLE B-8.--χ^2 distribution test for significance between campers and day-users, age-head of family, at Waterloo State Recreation Area at the 95 per cent confidence level.

Age of Head of Family	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Below 20	18	45	63	5.1
21 - 25	29	70	99	8.5
26 - 30	29	90	119	7.1
31 - 35	54	125	179	16.3
36 - 40	77	132	209	28.4
41 - 45	77	155	232	25.6
46 - 50	40	98	138	11.6
51 - 55	18	41	59	5.5
56 - 60	8	22	30	2.1
60 or Over	10	20	30	3.3
Totals	360 ΣX_{i1}	798 ΣX_{i2}	1,158 $\Sigma X_{i1}+X_{i2}$	113.5

$$\chi^2 = [113.5 - P\ (360)]\ /\ P(1-P) = \frac{113.5 - 111.6}{.214} = 8.879$$

$$P = \frac{360}{1158} = .310$$

At 9 d.f., $8.879 < 16.92$ $\therefore$ Difference is <u>not</u> significant at .05 level.

TABLE B-9.--χ^2 distribution test for significance between campers and day-users, occupation-head of family, at Holland State Park at the 95 per cent confidence level.

Occupation	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Professional	80	152	232	27.6
Farm Managers	2	5	7	.6
Managers, self-employed	27	73	100	7.3
Clerical	8	17	25	2.6
Sales	18	49	67	4.9
Craftsmen	45	131	176	11.5
Operatives	17	40	57	5.1
Private Household	0	0	0	0.0
Service	10	22	32	3.1
Farm Labor	0	0	0	0.0
Labor	2	15	17	.2
Student	4	18	22	.7
Housewife	3	3	6	1.5
Retiree	4	20	24	.7
Military	2	8	10	.4
Unemployed	0	5	5	0.0
Other, factory	30	80	110	8.2
Totals	252 ΣX_{i1}	638 ΣX_{i2}	890 $\Sigma X_{i1}+X_{i2}$	74.4

$$\chi^2 = [74.4 - 252\ (P)]\ /\ P\ (1-P) = \frac{74.4 - 71.3}{.202} = 15.3$$

$$P = \frac{252}{890} = .283$$

At 16 d.f., 15.3 < 26.30 $\therefore$. Difference is <u>not</u> significant at the .05 level.

TABLE B-10.--χ^2 distribution test for significance between campers and day-users, occupation-head of family, at Waterloo State Recreation Area at the 95 per cent level of confidence.

Occupation	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Professional	64	170	234	13.2
Farm Managers	3	9	12	.8
Managers, self-employed	21	61	82	5.6
Clerical	18	36	54	6.0
Sales	23	51	74	7.1
Craftsmen	79	148	227	27.5
Operatives	41	69	110	15.3
Private Household	0	1	1	0.0
Service	8	20	28	2.3
Farm Labor	0	0	0	0.0
Labor	16	38	54	4.7
Student	2	14	16	.3
Housewife	3	7	10	.9
Retiree	7	11	18	2.7
Military	4	4	8	2.0
Unemployed	0	0	0	0.0
Other, factory	4	99	103	.2
Totals	293 ΣX_{i1}	738 ΣX_{i2}	1,031 $\Sigma X_{i1}+X_{i2}$	88.6

$$\chi^2 = [88.6 - 293\ (P)]\ /\ P\ (1-P) = \frac{88.6 - 83.2}{.203} = \frac{5.4}{.203} = 26.6$$

$$P = \frac{293}{1031} = .284$$

At 16 d.f., 26.6 > 26.30 $\therefore$ Difference is significant at the .05 level.

TABLE B-11.--χ^2 distribution test for significance between campers and day-users, education-head of family, at Holland State Park at the 95 per cent confidence level.

Education of Family Head	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
8 Years or Under	20	72	92	4.4
9 - 11 Years	32	84	116	8.8
12 Years	89	210	299	26.5
13 - 15 Years	56	145	201	15.6
16 Years	34	71	105	11.0
17 Years or More	57	112	169	19.2
Totals	288 ΣX_{i1}	694 ΣX_{i2}	982 $\Sigma X_{i1}+X_{i2}$	85.5

$$\chi^2 = [85.5 - 288\ (P)]\ /\ P\ (1-P) = \frac{85.5 - 84.3}{.207} = 5.797$$

$$P = \frac{288}{982} = .293$$

At 5 d.f., 5.797 < 11.07 $\therefore$ Difference is <u>not</u> significant at the .05 level.

TABLE B-12.--χ^2 distribution test for significance between campers and day-users, education-head of family, at Waterloo State Recreation Area at the 95 per cent level of confidence.

Education of Family Head	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
8 Years or Less	19	46	65	5.5
9 - 11 Years	47	77	124	17.8
12 Years	138	303	441	43.2
13 - 15 Years	90	203	293	27.6
16 Years	29	65	94	8.9
17 Years or More	30	99	129	6.9
Totals	353 ΣX_{i1}	793 ΣX_{i2}	1,146 $\Sigma X_{i1}+X_{i2}$	r 109.9 $\sum_{i=1}[X_{i1}^2/X_{i1}+X_{i2}]$

$$\chi^2 = [109.9 - 353\ (P)]\ /\ P\ (1-P) = \frac{109.9 - 108.7}{.212} = 5.7$$

$$P = \frac{353}{1146} = .308$$

At 5 d.f., 5.7 < 11.07 $\therefore$. Difference is <u>not</u> significant at the .05 level.

TABLE B-13.--χ^2 distribution test for significance between campers and day-users, income-family, at Holland State Park at the 95 per cent level of confidence.

Income of Family	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
$3,000 or Less	4	32	36	.4
$3,000 - $5,999	15	48	63	3.6
$6,000 - $7,999	53	101	154	18.2
$8,000 - $9,999	58	123	181	18.6
$10,000 - $14,999	98	198	296	32.4
$15,000 - $24,999	37	88	125	10.9
$25,000 or More	11	52	63	1.9
Totals	276 ΣX_{i1}	642 ΣX_{i2}	918 $\Sigma X_{i1}+X_{i2}$	r 86.0 $\sum_{i=1}[X_{i1}^2/X_{i1}+X_{i2}]$

$$\chi^2 = [86.0 - 276\ (P)] \ /\ P\ (1-P) = \frac{86.0 - 83.1}{.210} = 13.8$$

$$P = \frac{276}{918} = .301$$

At 6 d.f., 13.8 > 12.59 .˙. Difference is significant at .05 level.

TABLE B-14.--χ^2 distribution test for significance between campers and day-users, income-family, at Waterloo State Recreation Area at the 95 per cent level of confidence.

Income of Family	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
$3,000 or Less	5	20	25	1.0
$3,000 - $5,999	23	49	72	7.3
$6,000 - $7,999	56	121	177	17.7
$8,000 - $9,999	105	169	274	40.2
$10,000 - $14,999	135	304	439	41.5
$15,000 - $24,999	27	86	113	6.5
$25,000 and Over	5	28	33	.9
Totals	356 ΣX_{i1}	777 ΣX_{i2}	1,133 $\Sigma X_{i1}+X_{i2}$	115.1 $\sum_{i=1}^{r}[X_{i1}^2/X_{i1}+X_{i2}]$

$$\chi^2 = [115.1 - 356(P)] / P\,(1-P) = \frac{115.1 - 111.5}{.215} = 16.7$$

$$P = \frac{356}{1133} = .314$$

At 6 d.f., 16.7 > 12.59 $\therefore$ Difference is significant at .05 level.

TABLE B-15.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, travel distance (miles), at Holland State Park.

Travel Distance (Miles)	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Less than 25	82	311	393	17.1
25 - 49	81	232	313	20.9
50 - 74	18	52	70	4.6
75 - 99	9	22	31	2.6
100 - 124	12	26	38	3.8
125 - 149	9	5	14	5.6
150 - 174	18	19	37	8.8
175 - 199	9	10	19	4.3
200 - 224	15	14	29	7.8
225 - 249	6	5	11	3.3
250 or Over	47	26	73	30.3
Totals	306 ΣX_{i1}	722 ΣX_{i2}	1,028 $\Sigma X_{i1}+X_{i2}$	109.1 $\sum_{i=1}^{r}[X_{i1}^2/X_{i1}+X_{i2}]$

$$\chi^2 = [109.1 - 306\ (P)]\ /\ P\ (1-P) = \frac{109.1 - 91.2}{.209} = 85.6$$

$$P = \frac{306}{1028} = .298 \qquad \chi^2.95 \text{ @ } 10 \text{ degrees freedom} = 18.31$$

$85.6 > 18.31$ $\therefore$ Difference is significant at .05 level.

TABLE B-16.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, travel distance (miles), at Waterloo State Recreation area.

Travel Distance (Miles)	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Less than 25	134	436	570	31.5
25 - 49	46	156	202	10.5
50 - 74	116	222	338	39.8
75 - 99	62	47	109	35.3
100 - 124	4	15	19	.8
125 - 149	1	0	1	1.0
150 - 174	2	1	3	1.3
175 - 199	4	1	5	3.2
200 - 224	4	2	6	2.7
225 - 249	4	3	7	2.3
250 or Over	16	12	28	9.1
Totals	393 ΣX_{i1}	895 ΣX_{i2}	1,288 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r} \Sigma[X_{i1}^2/X_{i1}+X_{i2}]$ 137.5

$$\chi^2 = [137.5 - 393\ (P)]\ /\ P\ (1-P) = \frac{137.5 - 119.9}{.211} = 83.0$$

$$P = \frac{393}{1288} \qquad \chi^2 \text{ @ 10 degrees freedom} = 18.31$$

$83.0 > 18.31$.˙. Difference is significant at .05 level.

TABLE B-17.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, travel time (hours), at Holland State Park.

Travel Time (Hours)	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Less than 1/2	55	312	367	8.2
1/2 to 1	65	215	380	15.1
1 to 1 1/2	12	46	58	2.5
1 1/2 to 2	10	36	46	2.2
2 to 2 1/2	7	22	29	1.7
2 1/2 to 3	21	26	47	9.4
3 to 3 1/2	12	2	14	10.3
3 1/2 to 4	19	20	39	9.3
4 to 4 1/2	9	4	13	6.2
Over 4 1/2	53	22	75	37.5
Totals	263 ΣX_{i1}	705 ΣX_{i2}	968 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r}[X_{i1}^2/X_{i1}+X_{i2}]$ 102.4

$$\chi^2 = [102.4 - 263\ (P)]\ /\ P\ (1-P) = \frac{102.4 - 76.5}{.198} = 130.8$$

$$P = \frac{263}{968} = .272 \qquad \chi^2.95 \text{ @ } 9 \text{ degrees freedom} = 16.92$$

$130.8 > 16.92$ ∴ Difference is significant at .05 level.

TABLE B-18.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, travel time (hours) at Waterloo State Recreation Area.

Travel Time (Hours)	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Less than 1/2	65	283	348	12.1
1/2 to 1	85	287	372	19.4
1 to 1 1/2	83	114	197	35.0
1 1/2 to 2	42	42	84	21.0
2 to 2 1/2	11	8	19	6.4
2 1/2 to 3	8	21	29	2.2
3 to 3 1/2	4	3	7	2.3
3 1/2 to 4	9	6	15	5.4
4 to 4 1/2	2	3	5	.8
Over 4 1/2	22	11	33	7.4
Totals	331 ΣX_{i1}	778 ΣX_{i2}	1,109 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r} [X_{i1}^2/X_{i1}+X_{i2}]$ 112.0

$$\chi^2 = [112.0 - 331\ (P)]\ /\ P\ (1-P) = \frac{112.0 - 98.6}{.209} = 64.1$$

$$P = \frac{331}{1109} = .298 \qquad \chi^2.95 \text{ @ } 9 \text{ degrees freedom} = 16.92$$

$64.1 > 16.92$.·. Difference is significant at .05 level.

TABLE B-19.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, group descriptions, at Holland State Park.

Group Description	X_{i1} Campers	X_{i2} Day-users	Total	$X_{i1}^2/X_{i1}+X_{i2}$
One Family With Children	190	262	452	79.9
Two Families With Children	9	38	47	1.7
One Couple	30	134	164	5.5
Two or More Couples	7	34	41	1.2
Organized Group	3	5	8	1.1
One Person	12	58	70	2.1
Group of Friends	41	167	208	8.1
Other	10	38	48	2.1
Totals	302 ΣX_{i1}	736 ΣX_{i2}	1,038 $\Sigma X_{i1}+X_{i2}$	r 101.7 $\Sigma_{i=1}[X_{i1}^2/X_{i1}+X_{i2}]$

$$\chi^2 = [101.7 - 302\ (P)]\ /\ P\ (1-P) = \frac{101.7 - 87.9}{.206} = 66.9$$

$$P = \frac{302}{1038} = .291 \qquad \chi^2.95 \text{ @ 7 degrees of freedom} = 14.07$$

$66.9 > 14.07$.˙. Difference is significant at .05 level.

TABLE B-20.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, group descriptions, at Waterloo State Recreation Area.

Group Description	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
One Family With Children	256	413	669	98.0
Two Families With Children	22	80	102	4.7
One Couple	25	80	105	5.9
Two or More Couples	5	18	23	1.1
Organized Group	7	25	32	1.5
One Person	4	26	30	.5
Group of Friends	35	110	145	8.4
Other	10	39	49	2.0
Totals	364 ΣX_{i1}	791 ΣX_{i2}	1,155 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r} [X_{i1}^2/X_{i1}+X_{i2}]$ 122.1

$$\chi^2 = [122.1 - 364\ (P)]\ /\ P\ (1-P) = \frac{122.1 - 114.7}{.216} = 34.3$$

$$P = \frac{364}{1155} = .315 \qquad \chi^2.95 \text{ @ } 7 \text{ degrees freedom} = 14.07$$
$$.05 \text{ @ } 7 \text{ degrees freedom} = 2.17$$

$34.3 > 14.07$ ∴ Difference is significant at .05 level.

Test of Means at the .05 Level of Significance,
Group Mean Size Between Campers and Day-users
at Holland State Park

9 (Range x .337 (coefficient) = 3.0 (unbiased est. σ)

$$z = \frac{\bar{X}_1 - \bar{X}_2}{\sigma\sqrt{(1/N_1) + (1/N_2)}} = \frac{4.47 - 3.31}{3\sqrt{(1/306) + (1/742)}} =$$

$$\frac{1.16}{.2} = 5.8$$

Not significant if: $z > -1.960$, or $z < 1.960$ at .05 level of significance.

$5.8 > 1.960$

$\therefore$ Means are significantly different at .05 level.

Test of Means at the .05 Level of Significance, Group Mean Size, Between Campers and Day-users at Waterloo State Recreation Area

9 (Range) x .337 (coefficient) = 3.0 (unbiased est. σ)

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sigma\sqrt{(1/N_1) + (1/N_2)}} = \frac{4.58 - 4.16}{1.74\sqrt{(1/393) + (1/895)}} =$$

$$\frac{.42}{.103} = 4.2$$

Difference of means not significant if: $z > -1.960$, or $z < 1.960$, at .05 level of significance.

$2.30 > 1.960$

$\therefore$ Means are significantly different at .05 level.

TABLE B-21.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, arrival time, at Holland State Park.

Arrival Time	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
8 - 10 a.m.	49	32	81	29.6
10 - noon	40	114	154	10.4
noon - 2 p.m.	39	113	152	10.0
2 - 4 p.m.	56	131	187	16.8
4 - 6 p.m.	54	107	161	18.1
6 - 8 p.m.	42	133	175	10.1
8 -10 p.m.	17	61	78	3.7
Totals	297 ΣX_{i1}	691 ΣX_{i2}	988 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r} [X_{i1}^2/X_{i1}+X_{i2}]$ 98.7

$$\chi^2 = [98.7 - 297\ (P)]\ /\ P\ (1-P) = \frac{98.7 - 89.4}{.210} = 44.3$$

$$P = \frac{297}{988} = .301 \qquad \chi^2.95 \text{ @ 6 degrees freedom} = 12.59$$

$44.3 > 12.59$.˙. Difference is significant at .05 level.

TABLE B-22.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, arrival time, at Waterloo State Recreation Area.

Arrival Time	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
8 - 10 a.m.	99	59	158	62.0
10 - noon	62	205	267	14.4
noon - 2 p.m.	68	237	305	15.2
2 - 4 p.m.	69	172	241	19.7
4 - 6 p.m.	29	84	113	7.4
6 - 8 p.m.	16	24	40	6.4
8 - 10 p.m.	9	1	10	8.1
Totals	352 ΣX_{i1}	782 ΣX_{i2}	1,134 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r}[X_{i1}^2/X_{i1}+X_{i2}]$ 133.2

$$\chi^2 = [133.2 - 352\ (P)]\ /\ P\ (1-P) = \frac{133.2 - 109.1}{.214} = 112.6$$

$$P = \frac{353}{1134} = .310 \qquad \chi^2.95 \text{ @ } 6 \text{ degrees freedom} = 12.59$$

$112.6 > 12.59$.·. Difference is significant at .05 level.

TABLE B-23.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, time spent in the park, at Waterloo State Recreation Area.

Time in Park (Hours)	X_{i1} Campers	X_{i2} Day-users	Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Less than 2	9	163	172	.5
2 - 4	17	255	272	1.1
4 - 6	15	190	205	1.1
6 - 8	25	95	120	5.2
8 - 10	28	36	64	12.3
10 - 12	24	15	39	14.8
Over 12	202	14	216	188.9
Totals	320 ΣX_{i1}	768 ΣX_{i2}	1,088 $\Sigma X_{i1}+X_{i2}$	$\sum_{i=1}^{r} [X_{i1}^2/X_{i1}+X_{i2}]$ 223.9

$$\chi^2 = [223.9 - 320\ (P)]\ /\ P\ (1-P) = \frac{223.9 - 94.1}{.208} = 624.0$$

$$P = \frac{320}{1088} = .294 \qquad \chi^2.95 \text{ @ 6 degrees freedom} = 12.59$$

624.0 > 12.59 .˙. Difference is significant at .05 level.

TABLE B-24.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, group activity participation, at Holland State Park.

Activity	X_{i1} Campers	X_{i2} Day-users	$X_{i1}+X_{i2}$ Totals	$X_{i1}^2/X_{i1}+X_{i2}$
Sightseeing from car	74	213	287	19.1
Walking to scenic points	129	198	327	50.9
Picnicking	121	184	305	48.0
Looking at birds, etc.	19	25	44	8.2
Swimming	235	329	564	97.9
Wading	151	206	357	63.9
Sunbathing	217	332	549	85.8
Waterskiing	14	16	30	6.5
Skin or Scuba Diving	8	10	18	3.6
Motorboating	20	20	40	10.0
Sailing	11	10	21	5.9
Canoeing	5	7	12	2.1
Rowboating	3	5	8	1.1
Boat fishing	9	6	15	5.4
Bank fishing	30	14	44	20.5
Fishing (wading)	7	3	10	4.9
Games and team sports	33	40	73	14.9
Trail hiking	24	11	35	16.5
Horseback riding	5	1	6	4.2
Listening to ranger talks	11	23	34	3.6
Taking guided tours	5	3	8	3.1
Visiting museums or nature centers	28	8	36	21.8
Relaxing	215	326	541	85.4
Photography	73	64	137	38.9
Other	41	82	123	13.7
Totals	1,488 ΣX_{i1}	2,136 ΣX_{i2}	3,624 $\Sigma X_{i1}+X_{i2}$	r $\Sigma_{i=1}^{2}[X_{i1}^2/X_{i1}+X_{i2}]$ 635.9

$$\chi^2 = [635.9 - 1488\ (P)]\ /\ P\ (1-P) = \frac{635.9 - 611.6}{.242} = 100.4$$

$$P = \frac{1488}{3624} = .411 \qquad \chi^2 = .95 \text{ @ } 24 \text{ degrees freedom} = 36.42$$
$$\chi^2 = .05 \text{ @ } 24 \text{ degrees freedom} = 13.85$$

$100.4 > 36.42$ $\therefore$ Difference is significant at .05 level.

TABLE B-25.--χ^2 distribution test for significance at the 95 per cent level of confidence between campers and day-users, group activity participation, at Waterloo State Recreation Area.

Activity	X_{i1} Campers	X_{i2} Day-users	$X_{i1}+X_{i2}$ Totals	$X_{i1}^{w}/X_{i1}+X_{i2}$
Sightseeing from car	142	113	255	79.1
Walking to scenic points	142	116	258	78.2
Picnicking	146	482	628	33.9
Looking at birds, etc.	59	48	107	32.5
Swimming	339	650	989	116.1
Wading	157	299	456	54.1
Sunbathing	269	486	755	95.5
Waterskiing	59	108	167	20.8
Skin or Scuba Diving	16	18	34	7.5
Motorboating	77	108	185	32.0
Sailing	6	8	14	2.6
Canoeing	16	10	26	9.9
Rowboating	28	12	40	19.6
Boat fishing	74	31	105	52.5
Bank fishing	70	20	90	54.4
Fishing (wading)	30	6	36	25.0
Games and team sports	102	89	191	54.5
Trail hiking	105	59	164	67.2
Horseback riding	24	6	30	19.2
Listening to ranger talks	99	24	123	79.7
Taking guided tours	39	14	53	28.7
Visiting museums or nature centers	36	14	50	25.9
Relaxing	290	428	718	117.1
Photography	97	70	167	56.3
Other	44	52	96	20.2
Totals	2,466 ΣX_{i1}	3,271 ΣX_{i2}	5,737 $\Sigma X_{i1}+X_{i2}$	r 1,182.2 $\Sigma[X_{i1}^2/X_{i1}+X_{i2}]$ i=1

$$\chi^2 = [1182.2 - 2466\ (P)]\ /\ P\ (1-P) = \frac{1182.2 - 1060.4}{.245} = 497.1$$

$$P = \frac{2466}{5737} = .430 \qquad \chi^2.95 \text{ @ } 24 \text{ degrees freedom} = 36.42$$

497.1 > 36.42 .'. Difference is significant at .05 level.

APPENDIX C

SELF-ADMINISTERED QUESTIONNAIRE USED IN DATA COLLECTION

HANG THIS NEAR YOUR STEERING WHEEL AS A REMINDER.

PLEASE FILL OUT THIS PARK-USE CARD

* HELP PLAN YOUR PARKS

You are one of those selected to represent the people who use our State Parks. The information you give here will be used to help improve our park system and provide the activities you enjoy.

Please fill out all questions carefully.

IT WILL TAKE ONLY A COUPLE OF MINUTES

Your help will be greatly appreciated and, of course, all information that you supply will be treated confidentially.

This study is being conducted for the Department of Conservation and the Governor's Office of Planning Coordination by Michigan State University.

PLEASE FILL OUT EVERY QUESTION AND LEAVE THIS CARD IN THE BOX NEAR THE PARK EXIT.

1 DID YOU CAMP IN THIS PARK LAST NIGHT? ☐ yes ☐ no

2 ARE YOU GOING TO CAMP IN THIS PARK TONIGHT? ☐ yes ☐ no

3 WHICH OF THE FOLLOWING BEST DESCRIBES THE GROUP IN THIS VEHICLE? (Check one)

a. ☐ one family with children
b. ☐ two families with children
c. ☐ one couple only
d. ☐ two or more couples
e. ☐ organized group (troop, team, club, etc.)
f. ☐ one person alone
g. ☐ group of friends
h. ☐ other _____ (write in)

4 WHAT ARE THE AGES OF THE PEOPLE IN THIS VEHICLE?

MALE: ____, ____, ____, ____, ____, ____.

FEMALE: ____, ____, ____, ____, ____, ____.

Do not write below--Please turn page.

PARK CODE NUMBER:	DATE:	

5 WHAT KIND OF VISIT IS THIS FOR YOUR GROUP? (Check one)

a. ☐ one day outing or trip
b. ☐ part of a major annual vacation
c. ☐ part of two or more shorter vacations
d. ☐ part of an overnight trip
e. ☐ part of a combined business trip and vacation
f. ☐ other _____ (write in)

---

6 WHERE IS YOUR PRESENT HOME? (Exact street address not required)

_____ Town or City _____ County _____ State

---

7 WHAT IS YOUR ZIP CODE? _____

---

8 HOW MUCH TIME DID YOU SPEND TRAVELING TO THIS PARK TODAY? (NOT INCLUDING "STOPOVER" TIME ALONG THE WAY.)

_____ Hours _____ Minutes

---

9 HOW MANY MILES, BY THE MOST DIRECT ROUTE, IS THIS PARK FROM YOUR HOME?

_____ Miles

TO BE ANSWERED BY THE DRIVER OF THE VEHICLE

10 WHAT IS THE SEX AND APPROXIMATE AGE OF THE "HEAD OF YOUR FAMILY"?

AGE? _____ years SEX? ☐ male ☐ female

11 WHAT DOES THE "HEAD OF YOUR FAMILY" DO FOR A LIVING?

_____ Occupation (write in)

12 WHICH OF THE ANSWERS BELOW BEST INDICATES THE TOTAL NUMBER OF YEARS OF EDUCATION COMPLETED BY THE "HEAD OF YOUR FAMILY"? (Check one answer)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12

☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 or more

13 WHICH OF THE FOLLOWING BEST DESCRIBES THE TOTAL INCOME OF YOUR FAMILY LAST YEAR (Check one)

a. ☐ under $3,000
b. ☐ $3,000-$5,999
c. ☐ $6,000-$7,999
d. ☐ $8,000-$9,999
e. ☐ $10,000-$14,999
f. ☐ $15,000-$24,999
g. ☐ $25,000 and over

14 HOW MANY DAYS HAVE YOU USED THIS PARK IN 1968?

a. ☐ this is the first park visit
b. ☐ 1-4 days
c. ☐ 5-8 days
d. ☐ 9-12 days
e. ☐ 13-16 days
f. ☐ 17-20 days
g. ☐ 21-24 days
h. ☐ over 24 days

HOW MANY DAYS HAVE YOU USED THE VARIOUS PARK SYSTEMS BELOW IN 1968? CHECK ONE ANSWER FOR EACH PARK SYSTEM.

Park System	None	1-3 days	4-10 days	11-20 days	21-30 days	over 30 days
15 CITY	☐	☐	☐	☐	☐	☐
16 COUNTY and METROPOLITAN	☐	☐	☐	☐	☐	☐
17 STATE	☐	☐	☐	☐	☐	☐
18 NATIONAL	☐	☐	☐	☐	☐	☐

---

19 WHAT TIME DID YOU ENTER THIS PARK? (Check one)

a. ☐ 8:00-10:00 a.m.
b. ☐ 10:00-noon
c. ☐ noon-2:00 p.m.
d. ☐ 2:00-4:00 p.m.
e. ☐ 4:00-6:00 p.m.
f. ☐ 6:00-8:00 p.m.
g. ☐ 8:00-10:00 p.m.

---

20 WHY DID YOU CHOOSE THIS PARK RATHER THAN A DIFFERENT ONE?

DO NOT FILL OUT THE REMAINING QUESTIONS UNTIL JUST BEFORE YOU LEAVE THE PARK. ENJOY YOUR VISIT AND DON'T FORGET TO LEAVE THIS CARD IN THE BOX PROVIDED NEAR THE PARK EXIT.

---

21 HOW MANY HOURS DID YOU SPEND IN THIS PARK TODAY? (Check one)

a. ☐ 2 hours or less
b. ☐ 2-4 hours
c. ☐ 4-6 hours
d. ☐ 6-8 hours
e. ☐ 8-10 hours
f. ☐ 10-12 hours
g. ☐ 12 hours or more

22 WHAT KIND OF ADDITIONAL RECREATION OPPORTUNITY OR FACILITIES WOULD YOU LIKE TO SEE ADDED TO THIS PARK?

a. _____

b. _____

c. _____

---

23 WHICH OF THE ACTIVITIES LISTED BELOW DID YOUR GROUP DO WHILE HERE? (Check all the boxes that apply.)

a. ☐ sightseeing from car only
b. ☐ walking to scenic points
c. ☐ picnicking
d. ☐ looking at plants, animals or birds for a hobby
e. ☐ swimming
f. ☐ wading
g. ☐ sunbathing
h. ☐ water skiing
i. ☐ skin or scuba diving
j. ☐ motorboating
k. ☐ sailing
l. ☐ canoeing
m. ☐ rowboating
n. ☐ boat fishing
o. ☐ bank fishing
p. ☐ fishing (wading)
q. ☐ games and team sports
r. ☐ trail hiking
s. ☐ horseback riding
t. ☐ listening to ranger talks
u. ☐ taking guided tours
v. ☐ visiting museums or nature centers
w. ☐ relaxing
x. ☐ photography

other _____
(write in)

---

24 IN THE SPACES PROVIDED BELOW, WRITE IN THE FOUR ACTIVITIES YOUR GROUP SPENT THE MOST TIME DOING. ALSO WRITE IN THE NUMBER OF HOURS YOUR GROUP SPENT DOING EACH OF THE ACTIVITIES.

	Activities	Time Spent
a.	_____	_____ hours
b.	_____	_____ hours
c.	_____	_____ hours
d.	_____	_____ hours

THANKS FOR YOUR HELP! HAVE AN ENJOYABLE AND SAFE TRIP HOME

If you have accidently carried this card away from the park, please mail it to:

Recreation Research and Planning Unit
Room 302, Natural Resources Building
Michigan State University
East Lansing, Michigan 48823