Analysis of Leisure Expenditures
in the United States

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The objective of this research was to investigate the impact of household socio-economic characteristics on three categories of leisure expenditures. Tobit analysis was applied to data from the U.S. 1988-89 Consumer Expenditure Surveys. The dependent variables were household expenditures on active leisure, passive leisure and social entertainment. The results indicated that salary of household head and non-salary income were the two major income variables while the number of adults and age, race and education of the household head were the major demographic variables.

Introduction

In the past few decades the United States has undergone significant social and economic changes. These include increased participation by married women in the labor force, greater interest in physical fitness and changes in the composition of the population. These economic and social changes have affected leisure and non-leisure aspects of life. Time use studies indicate that from 1960s to 1980s there has been an increase in time spent on leisure activities, particularly by younger people (Robinson, 1985; Hill, 1985; Juster, 1985a; Juster, 1985b; Stafford and Duncan, 1985). However, information on expenditures on leisure activities is limited.

This research was undertaken to investigate the determinants of leisure expenditures by households in the United States. Three leisure categories were investigated. They were active leisure, passive leisure and social entertainment. These three categories were chosen based on previous time use studies. Quarterly data from the 1988-89 Bureau of Labor Statistics' Consumer Expenditure Study were used and resulted in a sample size of 2,088 households. The sample was confined to households for which information was available for four consecutive quarters.

The research differs from previous leisure expenditures in several ways. First, three categories of leisure activities are examined. Second, consideration is given to the source of in-come in examining the impact of income on the demand for leisure. Finally, tobit analysis is used since some households have zero expenditures in a particular category. The results of this research should be of use to consumer economists and to leisure activities industries by providing information on the impact of economic and demographic conditions on the demand for three types of leisure activities.

Leisure Activity Studies

There have been only a few studies on the demand for leisure activities.

White (1975) used multiple regression analysis to analyze participation in outdoor recreation activities by 2,969 households. The dependent variable was the number of times an individual reported participating in an activity. The independent variables were occupation, income, family size, age and city size. Occupation turned out to be a weak predictor of participation in outdoor recreation activities. The main predictors were income and education.

Thompson and Tinsley (1978) used time series data from 1955 to 1975. The dependent variable was per capita recreation expenditures and included expenditures on vacations, club dues, sporting equipment and tickets to sporting events and movies. The independent variable was per capita take home pay. There were five income classes and each income group was analyzed separately using OLS analysis. Expenditures on recreation were significantly and positively related to income in all instances and income elasticities were greater than one in most instances.

Dardis, Derrick, Lehfeld and Wolfe (1981) analyzed data from the 1972-73 BLS Consumer Expenditure Surveys to determine factors influencing recreation expenditures in the United States. Separate analyses were performed for 1972 and 1973 using OLS analysis. The dependent variable was expenditures on total recreation and included expenditures on vacation homes, boats, wheel goods, lodging and transportation, television and other recreational items. The independent

variables were household income; age, marital status, race, occupation and education of household head; presence of children under six, location, and employment status of wife. Similar results were obtained for both years. Recreation expenditures were influenced positively by income and education and negatively influenced by age of household head.

Procedure

The first section gives the demand model while the second and third sections provide information on the dependent and independent variables. Tobit analysis and data sources are discussed in the last two sections.

Model

A single equation model is used to estimate the relationship between leisure expenditures, household income and other household characteristics.

$$E_i = \alpha + \sum_k \beta_k Y_{ik} + \sum_j \gamma_j X_{ij} + U_i \qquad (1)$$

where

E_i = expenditures on a particular type of leisure by household i

Y_{ik} = income of household i from source k, k=1,...,4

X_{ij} = other demographic characteristics of household i, and

u_i = the disturbance term

The value of the dependent variable was zero in some instances necessitating the use of tobit analysis.

Selection of Dependent Variables

The dependent variables were expenditures on active leisure, passive leisure and social entertainment. The categories were identified as major categories of leisure time use by Hill (1985), Stafford and Duncan (1985) and Juster (1985b). Each category is discussed below.

Active leisure. This includes a wide range of activities needing some physical effort. Activities range from jogging and cycling, which are primarily physical, to other activities such as fishing, and photography.

Passive leisure. This category involves recreational activities which do not demand active participation on the part of the individual. Television watching is a dominant form of passive leisure. Other forms include the use of radios, VCRs, and other sound equipment.

Social entertainment. This category includes attendance at spectator activities such as sports events as well as going to theaters and museums. It differs from active leisure in that the individual is a spectator rather than a participant.

Selection of Independent Variables

The independent variables were income, family life cycle variables, education and race of household head and household location. The family life cycle variables were age and marital status of household head, the number of adults and the number of children. Each of the variables is discussed below.

Income. There were four income variables based on income. They were income of the head of the household, income of the spouse, income of other household members, and non-salary income. It was hypothesized that income would have a positive impact on all the three types of leisure expenditures based on previous studies by Thompson and Tinsley (1978) and Dardis et al. (1981).

Age of household head. Six age categories were used. They were below 25, 25-34, 35-44, 45-54, 55-64 and above 64. Dummy variables were used for the age variable and the 35-44 age group was the omitted category. It was hypothesized that age would have a positive impact on expenditures involving passive leisure activities but a negative impact on expenditures involving active leisure and social entertainment activities. Rapoport and Rapoport (1975) cite family life cycle as a major determinant of leisure spending behavior.

Marital status of household head. There were two categories, married and not married. The later category included widowed, divorced, separated or never married individuals.

Number of children. All individuals below sixteen years of age were classified as children. It was hypothesized that the number of children would have a negative impact on leisure expenditures.

Number of adults. This variable was hypothesized to have a positive impact on all three types of leisure expenditures since it was expected to increase the demand for leisure activities.

Education of household head. Three categories were used for education. They were not a high school graduate, high school graduate, and beyond high school. The high school graduate category was the omitted category. It was hypothesized that education would have a positive impact on all the three categories of leisure expenditures based on studies by Dardis et al. (1981) and Juster (1985a).

Race and sex of household head. Three race categories were included in this study to account for possible differences in expenditures due to racial differences. The categories were white,

black and others (Asian, Pacific Islander, Aleut, and Eskimos). The white category was the omitted category. It was hypothesized that white households would spend more on leisure activities than the other two groups of households. It was also hypothesized that male headed households would spend more on all the three types of leisure activities than female headed households due to the different time constraints faced by the two household heads (Becker 1981).

Location. Five regions were included in the analysis; one was rural and four were urban. Four dummy variables were used and the urban midwest was the omitted category. It was hypothesized that rural households would spend less than urban households based on the study by Dardis et al. (1981).

Data Source

Consumer Expenditure Survey (CES) data for 1988-89 were used in this study. These data were obtained from the Bureau of Labor Statistics (BLS), U. S. Department of Labor. Consumer units are interviewed once each quarter for five consecutive quarters. Expenditure information is collected in the second through fifth interviews. Every quarter one fifth of the sample is dropped and replaced by a new group in order to improve efficiency. In this study, only those households for which information was available for four consecutive quarters were selected for analysis in order to allow for purchases of durable goods such as TV sets and sports equipment.

Tobit Analysis

The proportion of households with no leisure expenditures ranged from 30 percent for active leisure to 53 percent for passive leisure. Thus, a censored sample was involved (we had complete information on the independent variables but zero observations on the dependent variables in some instances). Tobit analysis is appropriate if there are no systematic differences between participants and non-participants (Kinsey 1984). This possibility was investigated using two stage probit analysis and the results indicated that there was no selection bias, i.e. no difference between the two groups (Heckman 1976).

The general Tobit model is defined as

$$Y_i = Y_i^*, \quad \text{if } Y_i^* > 0$$
$$Y_i = 0 \quad \text{otherwise} \tag{2}$$

The resulting sample $Y_1, Y_2, \ldots, Y_N$ is called a censored sample. For the observations $Y_i = 0$, all we know is that $Y_i^* \leq 0$; so the probability that $Y_i = 0$ is the probability that $Y_i^* \leq 0$. Iterative methods, using the Lindep softwear package, were used to obtain the maximum likelihood estimates of β and σ^2.

The significance of the model was tested using the following statistical test. Chi-square= -2 [log likelihood$_R$ - log likelihood$_U$] where the restricted model(R) only included the constant and the unrestricted model (U) included all variables. This statistic has a chi-square distribution with k degrees of freedom where k is equal to the number of independent variable minus the constant. The likelihood ratio statistic was computed from the log likelihood values obtained from the tobit analysis. Asymptotic t-test were used to test the significance of individual variables (Maddala 1987).

Results

Sample characteristics are described first followed by the results of the tobit analysis for the three leisure expenditure categories.

Sample Characteristics

There were a total of 2,088 households in the sample, of which 1,466 participated in active leisure activities, 982 in passive leisure activities and 1,106 in social entertainment activities. Table 1 presents the distribution of households by income source for the three leisure categories.

Table 2 presents the mean values and distributions of independent variables describing households with three types of leisure expenditures. While non-salary income is similar for the three groups there are differences with respect to the other income sources.

The distribution of the three groups of households is similar in terms of age, marital status, number of adults, number of children and sex. However, there are differences in terms of education, race and location.

Tobit Analysis

The results of the analysis for the three leisure expenditure categories are given in Table 3. The model was significant in all instances as indicated by the likelihood ratio statistics. The effects of the independent variables were similar in many instances and are discussed below.

Income. Income had a significant and positive impact in seven out of twelve instances. These results are in agreement with previous leisure demand studies by White (1975), Thompson and Tinsley (1978), and Dardis et al. (1981), and with time use studies by Stafford and Duncan (1985) and Juster (1985a). The salary of household head was significant for passive leisure and social entertainment while it was not significant for active leisure. However, it was significant in the probit analysis. In contrast, the salary of spouse and salary of other members in the household were only significant for active leisure. This implies that

Table 1. Percentage of Households Receiving Income from Different Sources[a]

Income Source	Leisure Category		
	Active Leisure (n=1,466)	Passive Leisure (n=982)	Social Entertainment (n=1,106)
Salary of Household Head	65%	66%	69%
Salary of Spouse	39%	40%	41%
Salary of Others	19%	19%	20%
Non-Salary Income	90%	88%	93%

[a]Percentages add to more than 100 due to multiple income sources.

Table 2. Mean Values and Distribution of Independent Variables Describing Households with Three Types of Leisure Expenditures.

Variable	Active (1,466)	Passive (982)	Social Entertainment (1,106)
Income			
Salary of head	$17,574.40	$18,435.29	$10,983.70
Salary of spouse	$6,745.66	$6,555.48	$4,328.41
Salary of others	$2,076.79	$2,045.00	$1,515.72
Non-salary income	$7,906.65	$7,963.57	$7,284.38
Family Life Cycle			
Age			
0-24	3.75%	3.76%	3.79%
25-34	24.48%	24.94%	24.91%
35-44	28.03%	27.69%	28.10%
45-54	17.94%	17.51%	17.75%
55-64	13.36%	14.05%	13.70%
above 64	12.41%	12.01%	11.72%
Married	66.91%	68.12%	67.84%
Not married	33.09%	31.88%	32.16%
Number of adults	2.15	2.16	2.00
Number of children	0.72	0.68	0.59
Education			
Not a high school graduate	14.18%	13.44%	33.09%
High school graduate	33.22%	34.11%	30.56%
Beyond high school	52.50%	52.44%	36.34%
Race			
White	89.90%	90.90%	84.72%
Black	6.90%	5.90%	12.65%
Others	3.00%	3.15%	2.62%
Sex			
Male	71.69%	74.23	73.44%
Female	28.31%	25.77%	26.56%
Location			
Rural	10.02%	9.98%	12.74%
Urban Northwest	20.53%	20.87%	21.51%
Urban Midwest	26.46%	27.18%	22.87%
Urban South	23.67%	23.42%	24.05%
Urban West	19.30%	18.53%	18.80%

Table 3. Results of Tobit Analysis

Variable (Reference Group in Parenthesis)	Coefficients		
	Active	Passive	Social Entertainment
Constant	19.558	-262.650**	-200.130**
Income			
Salary of head	0.185E-02	0.295E-02**	0.421E-02**
Salary of spouse	0.442E-02**	-0.105E-02	0.113E-02
Salary of others	0.760E-02**	0.368E-02	0.224E-02
Non-salary income	0.644E-02**	0.388E-02**	0.752E-02**
Family Life Cycle			
Age (35-44)			
0-24	136.760	177.070	44.613
25-34	56.152	65.217	-2.101
45-54	-116.420	-77.151	-36.694
55-64	-313.450**	-117.220	-96.349**
Above 64	-485.200**	-330.490**	-198.240**
Married (not married)	-43.221	79.630	-19.430
Number of adults	66.209**	58.171*	37.042**
Number of children	-24.877	-47.681*	-14.554
Education			
(High school graduate)			
Not a high school graduate	-296.100**	-332.050**	-178.170**
Beyond high school	121.610**	41.527	76.808**
Race (white)			
Black	-223.660**	-297.090**	-145.460**
Others	-86.296	20.880	-14.250
Sex (female)			
Male	125.940**	80.505	90.360**
Location (urban midwest)			
Rural	99.260	-166.570**	-62.121
Urban northeast	-39.990	-104.880	-35.712
Urban south	-10.814	-66.256	-48.362
Urban west	-57.517	-196.180**	-52.455
Likelihood ratio	252.74**	180.74**	344.44**

*Significant at 0.10 level.
**Significant at 0.05 level.

Table 4. Income Elasticities for Three Types of Leisure Expenditures

Income Source	Active Leisure (1466)	Passive Leisure (982)	Social Entertainment (1106)
Salary of household head	n.s.	1.11	1.71
Salary of spouse	0.26	n.s.	n.s.
Salary of others	0.14	n.s.	n.s.
Non-salary income	0.40	0.59	0.72

n.s.: Variable not significant.

income of spouse and other household members play a role in determining expenditures on active leisure activities. Non-salary income had a significant and positive impact on all three types of leisure expenditures. This result is in agreement with the household production model (Becker 1965).

Age of household head. In general, older households spent less than younger households. This is in agreement with studies by Dardis et al. (1981) and Hill (1985). The study by Hill reported that the time spent on active leisure and social entertainment declined after the age of 44. There are several reasons for this result. First, older households are less likely to participate in active or social entertainment activities than other households. Second, older households are more likely to have inventories of durable goods such as sports equipment and TV sets which are included in active and passive leisure expenditures. Thus, they are less likely to purchase such items. Finally, older households may pay lower prices due to discounts for senior citizens.

Family size. The number of adults in the household had a significant and positive impact in all three instances. This reflects the fact that we are analyzing household expenditures rather than per capita expenditures. Thus, the number of adults should increase the demand for household leisure activities and hence expenditures. In contrast, the number of children was only significant for passive leisure where its impact was negative. A similar result was obtained by Juster (1985a) for children under five.

Education of household head. This variable had a significant and positive impact in all instances and is in agreement with previous research by White (1975), Dardis et al. (1981), and Juster (1985a). On explanation for the positive effect of education is that the knowledge and skills acquired in the process of education are likely to increase the range of potential leisure activities in all areas. Justin (1985a) also argued that leisure activities might be considered as a type of investment. More educated individuals tend to have a longer time horizon and be more aware of future needs. Investments in active leisure are linked to improvements in the state of one's physical health while investments in passive leisure are linked to the acquisition of knowledge and the development of skills that will yield future benefits.

Race and sex of household head. Households with a black head spent less than other households in all instances. This result is also in agreement with that of Dardis et al. (1981) and may reflect cultural differences and/or racial barriers. Households with a male head spent more on active leisure and social entertainment than households with a female head. In addition, households with a male head were more likely to participate in all three types of leisure activities (probit analysis). This may be due to several factors including the different time constraints faced by the two households. A female head is likely to have both work and household responsibilities and hence less time for leisure activities (Becker 1981).

Location. Location was significant in only two instances where rural and western households spent less than other households for passive leisure. Similar results were obtained by Dardis et al. (1981).

Income Elasticities

Income elasticities were calculated for all sources of income whose coefficients were significant. The results are presented in Table 4. The elasticities range from 0.14 to 1.71. The highest elasticity values were obtained for salary of household head. They were 1.11 and 1.71 for passive leisure and social entertainment respectively.

In contrast, the elasticities with respect to salary of spouse and salary of others were either low (0.26 and 0.14) or insignificant. Thus, expenditures on the three leisure categories are not very responsive to changes in these income sources. The elasticities with respect to non-salary income ranged from 0.40 to 0.72.

Summary

Tobit analysis was used to examine the impact of income and household characteristics on expenditures on three leisure categories - active leisure, passive leisure and social entertainment. There were some differences in the impact of the independent variables on the three leisure categories suggesting that it was appropriate to examine each category separately. In particular, the effects of three income sources (salary of household head, salary of spouse and salary of others) varied according to leisure expenditure category. In general, the results for the four income variables indicated that leisure expenditures are sensitive to economic conditions. The salary of household head and non-salary income were the two major income variables based on the proportion of households with income from this source and average income by source. These two income variables also had the greatest impact on expenditures as measured by the income elasticities.

Age was another major variable and older households spent less on leisure activities than younger households, particularly for active leisure and social entertainment. Female headed households also spent less than male headed households. Thus, an increase in the proportion of older households or in the proportion of female headed households will reduce the demand for leisure activities. These two negative effects might be offset by rising levels of education since education had a positive impact in all instances.

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The results of this study should be of interest to organizers of various sports activities, owners of movie theaters and other leisure facilities and manufacturers of recreation equipment and home entertainment equipment. Further research in this area might examine the demand for more specific leisure categories and/or demand by different population groups. The percentage of older people in the U.S. population is increasing and this is likely to have long term consequences on the demand for leisure. Therefore, it might be interesting to examine the demand for different leisure activities by older households.

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