How Much Is Leisure Worth?
Direct Measurement
With The Contingent Valuation Method

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Abstract: Previous measurement of leisure's value has multiplied leisure time estimates by a wage rate. That approach requires an appropriate wage rate and assumption of satisfaction maximization, while it ignores the contribution of other inputs such as capital. This study uses the open-ended contingent valuation method to directly measure individual's marginal and total leisure values of 16 leisure activities for 321 individuals sampled in the Missoula, Montana urban area. While estimates of leisure time were found to be similar to previous studies, the valuation of leisure was found to be lower. The estimated average daily value of leisure was $43.95, indicating the sizeable magnitude of leisure as an economic activity. Extrapolating to the United States as a whole we find leisure valued at slightly over $3 trillion dollars or approximately 42 percent of gross domestic product in 1996.

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I. Introduction

This paper demonstrates the empirical application of one method to measure the value of leisure. Leisure is clearly an important economic activity; it provides satisfaction and requires scarce resources in its production. As such there is reason to think of it as a component of national income and subject it to economic analysis, both of which require its valuation. Using a contingent valuation method, we estimate the equivalent national accounting value of leisure, excluding sleep and children, to be equal to 42% of Gross Domestic Product in 1996 and 56% when children are included.

Recently, there has been renewed interest in leisure behavior and a perception of a decline in leisure time. Schor (1991) argued that there was a considerable increase in the pace of life, with more time spent on market work and household production and less time spent in leisure and sleep. This sentiment has been echoed by less academic pieces such Graham and Crossen (1996) and Wasserman (1999). Robinson and Godbey (1997) argue that while the time shortage is a real perception, actual leisure time has not declined in the past twenty years. Rather the increased pace of the world has led to a perception that leisure is disappearing. In order to study these important issues, a clear accounting of leisure is needed.

William Nordhaus and James Tobin (1972) conducted one of the original works on this topic.[1] This work was a part of a study to measure a nation's economic welfare, of which they

[1] Beckerman (1978) subsequently used similar methodology.

deemed leisure to be a part. To value leisure, they multiplied an estimated average amount of leisure time by an estimated average wage rate of persons in several employment categories--- e.g. employed in manufacturing, females, under 20 years old --- and then aggregated according to the population in each category. A survey of people's average daily time use in 1954 provided the basis of their leisure time estimates. On this basis, they calculated leisure's value in the U.S. to be 101.9 percent of measured GNP in 1965.

This Nordhaus-Tobin study illustrates one method of valuing leisure. It may be termed the labor value approach and is conceptually identical to the labor value approach that has commonly been used to value household output.[2] If one assumes that a correct wage rate can be ascertained, then this approach can accurately value leisure if the time devoted to leisure is the end in itself for a person who behaves as a satisfaction maximizer. Doing nothing would be an example of such an activity. However, many leisure activities result from traditional production processes that combine human time with other productive inputs, particularly capital. Examples are watching television and engaging in sports.[3] Using the labor approach to value such leisure activities will ignore the contribution of capital.

The alternative is to value the leisure output directly, i.e. to find the quasi-market value of each leisure activity and multiply this value by the amount done. Heirich (1964, p. 387) argued that "To be conceptually useful, however, allocation of time (an input) must be linked to output from time use." If such an output value can be found, this approach avoids the problems of the labor value approach just as the direct output approach does for valuing household output. No longer is it

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[2]See Fitzgerald and Wicks (1990), pp. 130-132.

[3]Nordhaus and Tobin (1972), p.42; Becker (1965).

necessary to identify the appropriate wage rate to apply to leisure, for the output approach is not based on this wage rate. Identifying an appropriate wage rate can be problematic. Market wage rates are available only for the employed; imputing wages for those not employed is imprecise. The activity foregone to engage in leisure may be household production rather than market employment. Implicit wages earned from household production may differ from market work as well as among different types of household work. Reasons for these differences can include the inability to obtain the desired amount of market work and social norms influencing the division of duties between spouses. Positive or negative psychic income can influence a person's reservation wages for a given job or task. By its nature, an output value is the sum of the values added by each input, so no input such as capital is omitted.

This is the valuation technique used in national income accounting for market output. Computing output by this method may be contrasted with estimating the full willingness of consumers to pay for the item(s) in question. Finding the full willingness to pay involves estimating the amount each consumer would have been willing to pay for each unit she consumed and summing these amounts. Full willingness to pay includes consumer surplus; national income accounts do not.

The crux of the method is then to find this quasi-market value. As expounded by Becker (1965), the process by which a person consumes leisure is an intrapersonal market process where that person accounts for input prices (i.e. the opportunity cost of her time and the prices of relevant capital and intermediate inputs), the leisure good, and her preference function for the good. If she is to maximize her satisfaction, she must estimate marginal values of the good at various quantities within the quantity range relevant for her decision making. The marginal value to her at the quantity she chooses is thus a shadow price for that good within her intrapersonal market.

We empirically obtain this value by having her estimate the value. Specifically, we use the open-ended contingent value method to elicit this value. Asking about the most recent unit---i.e. marginal time unit such as an hour or event, depending on the activity--- focuses the respondent's attention on a specific experience she is most likely to recall. Her recollection may be imperfect, and her expectations may not have been realized, but there is no reason to anticipate bias in her response. The common criticism of strategic bias in contingent valuation and particularly open-ended numbers appears inapplicable here. With leisure, no public policy decisions are at stake, and strong emotions are unlikely. Accordingly, we felt we could apply the open-ended version of contingent valuation to take advantage of its ease in use.

II. Survey Results

Surveys administered by personal interview of 373 adults in the Missoula, Montana urban area chosen randomly according to a pre-set geographical pattern based on information from the 1990 Census of Population provided the data for the study. In a broad sense, leisure might be defined as all activities of a person except for work in the marketplace and the household. However, certain non-work functions are primarily intermediate inputs for work or other leisure activities and as such should not be valued separately. These activities include sleeping, eating, and grooming and were not included in the estimation. After eliminating persons whose reported value for an activity exceeded the mean by more than three standard deviations or who reported time spent in various ways that was in excess of twenty-four hours per day, there were 321 usable responses. The survey gathered standard socio-economic information concerning the respondent, including age, education, gender, number of children living at home and their ages, household gross income, employment status, and weekly hours worked at market work. Table 1 presents a demographic comparison of our sample to Missoula County and the United States.

Table 1
Descriptive Statistics for Respondents

	Current Sample 1996	Missoula City[a] 1990 Census Data	United States[a] 1990 Census Data
n or population	321	44,522	248,709,873
Percent male	51%	47%	48%
Percent High School Graduate (25 and over)	96.2%	87.2%	75.2%
Percent College Graduate (25 and over)	49.6%	33.4%	20.3%
Average Household Size	2.59	2.28	2.63
Household Income	$30,482	$21,033	$30,056

[a] Source: U.S. Bureau of the Census, County and City Data Book: 1994, Washington D.C.: U.S. Government Printing Office, 1994. Household incomes are 1989 figures.

The questionnaire asked each respondent the amount she would have been willing to pay for the last unit of leisure experienced within the last year for each of 16 leisure activities. One guideline in identifying a leisure activity was whether its primary function was leisure rather than market or household employment or necessary bodily maintenance. This criterion eliminated sleeping, although sleeping longer than biologically needed might be deemed leisure. Another definitional issue concerned the simultaneous conduct of two activities. Here, we considered the relevant activity the one likely to be the more important to the doer. Accordingly, we omitted radio listening but included TV and video watching.[4] Table 2 lists the activities. Depending on the activity, the last unit was pre-defined as a quarter hour, a half hour, an hour, or an event. Unless the activity was likely to take less than one hour per occurrence as in the case of relaxing or doing nothing, we chose one hour as the definition of one unit of activity.

The respondents also reported the cost of any intermediate goods purchased specifically for

[4]These appear to be the only leisure activities regularly done at the same time as another activity.

the marginal unit of the activity, e.g. the price of drinks at a bar, and the average amount of time per day, week, month, or year devoted to the activity. The proper treatment of the marginal cost of intermediate goods depends on the purpose of the leisure valuation process. If the purpose is to measure the value added by leisure to GDP – the primary focus of this paper – then the value of the intermediate goods must be subtracted to be consistent with national income accounting principles. Failure to make the subtraction would double count the value of the intermediate goods.

We then converted those marginal values that were reported for a time period of less than one hour or per event into a value per marginal hour devoted to the activity. This adjustment allowed comparison of marginal values. Table 2 provides a summary description of the value added for each of the 16 leisure activities for those respondents who engaged the activity. Column two lists the median values while column three shows the mean shadow prices. The fact that the means all exceed the medians shows that the distributions of the leisure values are skewed to the right. At first view, some of the mean values appear unusual. However, the low values of movie going and partying may reflect overly optimistic expectations, pressures to suit someone else sharing the activity, or unanticipated over-indulgence. For the entire sample, women had a higher mean marginal value ($7.48) than men ($5.30) and those with gross income above $28,000 had a higher mean marginal value ($7.19) than those with a lower gross income ($5.48).

Table 2

Net Marginal Values of Various Leisure Activities for Those Respondents Doing the Activity

Activity	Median Value per Marginal Hour	Mean Value per Marginal hour	Coefficient of Variation	Avg. Hours Per Day	Avg. Daily Value	n
Napping	$8.00	$13.65	1.27	0.22	$2.60	199
Movies, plays, concerts	0.00	0.89	3.47	.18	.15	289
Parties, bars	0.00	.35	11.19	.48	.19	240
Socializing, conversation	8.00	15.47	1.37	.79	14.18	318
Attending sporting events	1.43	1.67	2.12	.20	.40	232
Organized competitive sports	3.00	3.85	1.24	.32	1.01	81
Hunting, fishing	1.00	1.89	3.15.	.16	.53	141
Other outdoor activities	5.00	5.20	1.38	.37	2.26	284
Exercising, non-organized sports	4.00	4.83	1.29	.54	2.83	260
TV, video watching	1.00	2.03	1.73	1.63	3.92	315
Reading	2.00	5.35	2.09	.68	4.78	307
Relaxing, doing nothing	8.00	19.57	1.27	.36	5.12	263
Volunteering	5.00	6.00	1.94	.27	2.49	116
Pets	12.00	18.64	1.09	.42	9.37	151
Hobbies, crafts	3.00	3.94	1.66	.48	1.22	204
Religious, spiritual	5.00	7.36	1.17	.24	2.51	168

Column four shows the coefficients of variation, and column five shows the average daily time spent on each activity by those who participated in the activity. To obtain the average daily values in column six we computed the total value for each activity for each person by multiplying the hours she devoted to the activity multiplied by the net marginal value. We presented the means

of these total values for the sample for each activity.

Our sample reported slightly more leisure time than that reported by Robinson and Godbey (1997) but less than Nordhaus and Tobin (1972) who used older data. Table 3 reports a direct comparison of different leisure activities. The numbers appear consistent; while we found people reported spending an average of 6.3 hours per day of leisure, Robinson and Godbey (1997) report 5.1 hours and Nordhaus and Tobin (1972) reported men at 6.8 hours per day and women at 7.1 hours per day in the 1950s. Television watching may be lower in our sample than Robinson and Godbey's sample for three possible reasons: 1) the climate and easy access to wilderness leads to more time spent outdoors, or 2) people under report television watching when asked to recall how much they have done, or 3) some television watching is done simultaneously with other leisure activities and hence television watching is not considered the primary activity by us but may have been by Robinson and Godbey.

Table 3
Leisure Time Use
(Minutes per Day)

Activity	Current Sample	Robinson and Godbey (1997)[a]
Total Leisure Time	376 (6.3 hrs)	308 (5.1 hrs)[b]
Napping	8	16
Movies	10	4
Parties and Bars	22	12
Socializing	47	54
Attending Sports	9	3
Competitive Sports	5	10
Hunting and Fishing	4	
Outdoor Activity	20	9
Exercise	26	
Television	96	129
Reading	39	24
Relaxing	18	9
Volunteering	5	5[c]
Playing with Pets	12	

Hobbies and Crafts	47	24[d]
Religious Activity	8	9

[a] From Appendix A of John P. Robinson and Geoffrey Godbey, Time for Life: The Surprising Ways Americans Use Their Time, University Park, Pennsylvania: The Pennsylvania State University Press, 1997. We have excluded travel time. This reports 1985 data from a study by Robinson.

[b] Robinson and Godbey categorize napping with Naps/Day Sleep under Personal Needs and Care rather than free time. We have excluded Education and Training from their measure of free time.

[c] Volunteering includes Robinson and Godbey's Profession/Union, Special Interest, Political/civic, Volunteer/helping, Child/youth/family organizations, and Other organizations.

[d] Hobbies includes Robinson and Godbey's Hobbies, Domestic crafts, Art, Music/drama/dance, Games, Computer Use/other, and Writing. The Robinson and Godfrey data is from 1985 prior to the increased Internet use.

III. Leisure in National Income

Data gathered in the survey allowed estimation of leisure as an addition to national income. To the extent that national income is a measure of economic well being, it seems appropriate to measure leisure using national income accounting techniques. This estimation involved computing the average total yearly value of leisure per person in the sample and multiplying this by the population. Of course, the study's sample came from the Missoula, Montana urban area, so generalizing its results to the nation as a whole is fraught with risk. For instance, hunting and fishing are popular among Missoulians, while attending plays and concerts is constrained by a paucity of performances. Nevertheless, we generalize the results to illustrate the methodology that is applicable in other regions and to suggest the magnitudes that may exist nationally.

Columns one through three of Table 4 list the mean daily hours, daily value and yearly value added by leisure for all of the persons in the sample, including those who did not perform the activity. Multiplying the corresponding figures in the fifth and sixth columns of Table 2, which described only those who did an activity, by the ratio of the number doing an activity to the sample size yielded these figures. The daily and yearly aggregates of $43.95 and $16,040 respectively

indicate the sizeable magnitude of leisure as an economic activity. For those totals, the coefficient of variation is 1.24. The fact that this is lower than the typical figure for marginal values in Table 2 or average times in the first column of Table 2 indicates more interpersonal differences in preferences for individual leisure activities than for leisure as a whole.

Table 4
Total Values of Various Leisure Activities for All Members of Missoula, Montana Sample

Activity	Mean daily hours	mean daily value	mean yearly value	total U.S. yearly value ($billions)
Napping	.17	$1.64	$597.	$113.3
Movies, plays, concerts	.15	.11	41.	7.8
Parties, bars	.36	.21	77.	14.7
Socializing, conversation	.79	14.47	5,281.	1,002.2
Attending sporting events	.14	.30	1080.	20.5
Organized competitive sports	.08	.24	89.	16.9
Hunting, fishing	.08	.30	111.	21.1
Other outdoor activities	.32	1.96	716.	136.0
Exercising, non-organized sports	.42	2.17	795.	150.9
TV, video watching	1.55	3.80	1,387.	263.2
Reading	.67	4.89	1,786.	338.9
Relaxing, doing nothing	.28	4.48	1,636.	310.6
Volunteering	.09	.81	296.	56.1
Pets	.20	5.57	2,204.	386.0
Hobbies, crafts	.29	.89	324.	61.6
Religious, spiritual	.13	2.11	772.	146.5
	5.54	$43.95	$16,040.	$3,046.3

Multiplying the average yearly figure by the U.S. population yields an estimate of the aggregate domestic value of leisure, assuming that Missoulians approximately typify the average U.S. resident. Column four of the table shows these estimates. Their sum, which is slightly over $3 trillion, equals 42 percent of measured U.S. gross domestic product. Since the figure excludes children under 18 it understates the true total value. We suspect that children's preference functions for leisure differ substantially from that of adults', but trying to measure those differences is beyond the scope of the paper. If children were the same as adults with respect to leisure, aggregate leisure value would be $4.1 trillion, which is 56 percent of national income.

These results may be compared with the results using the labor value approach. We used two alternate approaches to compute the latter for our sample. The first multiplied the average time devoted to each leisure activity by $8.30, the estimated after tax wage rate in the Missoula area.[5] This calculation yielded $48.06 as the average daily value of leisure and $17,541 as the average yearly value. These labor value estimates are thirteen percent larger than the direct measurement estimates. This excess reflects the fact that the average after tax wage rate exceeds the marginal value of leisure on the average. Only five of the sixteen leisure values exceed the wage rate.

The alternate approach relies on data for the members of our sample who were working and assumes that this subsample typifies the total population with respect to leisure hours and the appropriate wage rate. For each currently employed sample member, we multiplied hourly take-home pay by the person's number of leisure hours. The mean of these values was $10.52 per day. The labor values estimated in this way were 25 percent larger than the direct measure estimates.

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[5]The average hourly non-agricultural wage rate adjusted by federal and Montana income and social security tax rates provided the basis for estimating this wage rate.

Regardless of the method used to estimate leisure with the study's sample data, the estimated amount of total leisure as a percentage of GDP is materially smaller than Nordhaus and Tobin's 1972 estimate. Part of this results from their use of a before-tax wage instead of the after-tax figures used in this study. Even so, the relative size of leisure appears to have fallen.

These results are the opposite of what one might expect from the accounting methods compared. The output approach includes the contribution of capital while the labor value approach does not. However, there are several reasons why this seeming inconsistency may exist. All involve the very possible existence of forces causing the quantity of leisure chosen by a householder to exceed the quantity expected at first glance. The greater the amount of leisure consumed by a person, the lower its likely marginal value. In turn, lower marginal values will yield smaller output-measured leisure values.

One of these reasons may be that a number of people may be able to find work only for less hours than preferred, thus increasing the time available for leisure. A second could be that negative enjoyment from the marginal hour of work or household production could also induce the substitution of leisure for work. Third, in making use of time, people may understate the opportunity cost of time. Anecdotal evidence suggests this may be the case. This may reflect the observation of Csikszentmihalyi (1997) that most people spend one third of their time on activities because they want to, one third because they have to and one third because they have noting better to do. Fourth, when planning certain leisure activities people may be overly optimistic about results. Likely examples are the success of a hunting or fishing trip or the quality of a movie or book. If one finds an activity better than expected, she can likely do more of it. However, if she is disappointed, she cannot undo the activity and get her time and money back. Fifth, after the fact people may feel guilty about spending too much money on leisure or wasting too much time on activities such as

television watching. Such feelings would reduce the amount of value reported for the activity.

IV. Corroboration and Testing

We performed a number of tests to corroborate and investigate the reasonableness of the data. By pooling the data we were able to use regression analysis to test for the impacts of interviewer bias, question order effects, and neighborhood effects on responses. These regressions also yielded results such as activity and socio-economic effects that illustrate the kinds of questions that may be addressed when leisure is measured with an output approach. The general form of each of the tests was to regress net marginal value (NMV) on socio-economic factors, activity dummies, and additional potential impacts. Specifically, the estimated equation is of the form:

(1) $NMV_{ij} = \alpha_0 + \beta'\ SOCIOECON_i + \gamma'\ ACTIVITY_j + \delta'\ DUMMMY_i + v_{ij}$.

where: i = 1...321 and j = 1...15 and:

NMV_{ij} = net marginal value for individual i for activity j.

$SOCIOECON_i$ = a vector of demographic and economic variables consisting of:

$MARRIED_i$ = 1 if married, 0 otherwise.

$COHAB_i$ = 1 if not married but living with someone, 0 otherwise.

$MALE_i$ = 1 if male, 0 if female.

$STUDENT_i$ = 1 if student, 0 otherwise.

$RETIRED_i$ = 1 if retired, 0 otherwise.

$UNEMP_i$ = 1 if unemployed, 0 otherwise.

$HOME_i$ = 1 if full-time homemaker, 0 otherwise.

$CHILDREN_i$ = number of children (any age) living at home.

CHILD UNDER 5 $DUMMY_i$ = 1 if there is a child under 5 years old in the household, 0 otherwise.

$GROSS_i$ = household gross income in thousands of dollars.

$PEOPLE_i$ = number of people in household.

$EDUC_i$ = number of years of schooling.

AGE_i = age.

$ACTIVITY_j$ = a vector of fifteen 0-1 dummy variables with television as the activity omitted. The included activities are napping, going to movies, parties, socializing and conversation, sports, organized sports, hunting and fishing, exercising, reading, relaxing, volunteering, playing with pets, hobbies, and religion.

$DUMMY_i$ = dummies for potential interviewer effects, question order effect, and neighborhood effects.

The base case for this regression is a single female who works outside the home and the base activity is watching TV.

Pooling data from as many as sixteen leisure activities for one individual allows for the potential that error terms could be correlated for an individual. A high response on one activity may be related to a high (or low) response on another activity for a specific individual. A random effect model (Hsiao (1986), Greene (1992)) allows the errors to vary with individuals. As long as the individual specific component of the error is uncorrelated with our independent variables, we have corrected for this potential correlation among errors and improved the efficiency of the estimates. Therefore, the error structure was specified:

$$v_{ij} = e_{ij} + u_i.$$

where e_{ij} is an pure random error and u_i is the individual specific random error.

Estimates of four versions of the random effect model are presented in Table 5. Version one is the basic model and includes socio-economic and activity effects. The Lagrange Multiplier test

(chi-square=161.19, $p<0.01$) indicates that the random effects model is justified over an OLS specification without individual effects. At the 5 percent error level household gross income had a small positive significant effect on net marginal value. This may reflect the higher value placed on leisure time due to its relative scarcity in households with higher income or work hours, or it may reflect the ability to pay more as neoclassical theory would predict. Females had a higher net marginal value for leisure, as indicated by the statistically significant negative coefficient on the MALE variable. Again, scarce time appears to be a likely reason. Traditionally, women assume a considerably larger portion of household production duties such as child care, meal preparation, and interior cleaning. Scarce time explains the significantly positive coefficient for individuals with children under 5, and abundant time explains the negative coefficient for those who are unemployed.

Table 5
Random Effects Regression Results Testing Validity
Dependent Variable = Net Willingness to Pay[a]

Variable	Mean	Version 1	Version 2	Version 3	Version 4
NWTP	6.91 (13.86)	Activities	Interviewer	Question Order	Neighbor hood
MARRIED	0.47 (0.50)	-0.04 (-0.05)	-0.39 (-0.46)	-0.04 (-0.04)	0.07 (0.08)
COHAB	0.09 (0.28)	-0.06 (-0.04)	-1.44 (-1.21)	-0.05 (-0.04)	-0.30 (-0.27)
MALE	0.52 (0.50)	-2.52* (-3.88)	-1.83* (-2.87)	-2.52* (-3.87)	-2.01* (-2.87)
STUDENT	0.16 (0.37)	-0.40 (-0.39)	-0.82 (-0.83)	-0.41 (-0.40)	-1.04 (-0.92)
RETIRED	0.12 (0.33)	-1.64 (-1.00)	-0.55 (-0.34)	-1.63 (-1.00)	-1.13 (-0.65)
UNEMPLOYED	0.02 (0.16)	-4.75* (-2.40)	-3.35* (-1.73)	-4.77* (-2.39)	-4.69* (-2.09)
HOME	0.06 (0.23)	-0.36 (-0.25)	0.97 (0.70)	-0.36 (-0.25)	-0.02 (-0.01)
CHILDREN	0.67 (1.14)	0.27 (0.48)	0.01 (0.02)	0.27 (0.48)	0.44 (0.70)
CHILD UNDER 5 DUMMY	0.12 (0.32)	1.46* (2.00)	1.40* (1.97)	1.46* (1.97)	1.03 (1.30)
GROSS HOUSEHOLD INCOME ($1000)	31.24 (20.34)	0.05* (2.52)	0.02 (1.24)	0.05* (2.54)	0.02 (0.97)
PEOPLE	2.63 (1.33)	-0.06 (-0.13)	0.24 (0.51)	-0.06 (-0.13)	-0.08 (-0.15)
EDUC	14.85 (2.34)	0.27* (2.00)	0.20 (1.50)	0.27* (2.00)	0.20 (1.34)

AGE	37.3 (16.3)	0.02 (0.42)	-0.14 (-0.39)	0.02 (0.41)	0.02 (0.63)
NAP	0.06 (0.23)	11.54* (10.98)	11.42* (10.88)	11.54* (10.98)	11.48* (11.02)
MOVIE	0.08 (0.27)	-1.23 (-1.31)	-1.24 (-1.32)	-1.23 (-1.31)	-1.24 (-1.33)
PARTY	0.07 (0.25)	-1.61 (1.63)	-1.66* (-1.68)	-1.62 (-1.63)	-1.61 (-1.63)
SOCIAL	0.09 (0.28)	13.44* (14.66)	13.43* (14.67)	13.44* (14.66)	13.45* (14.89)
SPORTS	0.06 (0.25)	-0.62 (-0.61)	-0.70 (-0.70)	-0.62 (-0.61)	-0.64 (-0.65)
ORG SPORT	0.02 (0.15)	1.56 (1.07)	1.24 (0.85)	1.56 (1.07)	1.44 (1.00)
HUNT	0.04 (0.19)	0.16 (0.113	0.05 (0.04)	0.16 (0.13)	0.10 (0.09)
OUTDOOR	0.08 (0.27)	3.15* (3.33)	3.13* (3.32)	3.14* (3.33)	3.17* (3.39)
EXERCISE	0.07 (0.26)	2.74* (2.83)	2.66* (2.75)	2.74* (2.83)	2.72* (2.83)
READ	0.09 (0.28)	3.28* (3.54)	3.26* (3.53)	3.28* (3.54)	3.25* (3.54)
RELAX	0.74 (0.26)	17.54* (18.16)	17.51* (18.16)	17.55* (18.17)	17.51* (18.31)
VOLUNTEER	0.03 (0.18)	3.01* (2.37)	2.75* (2.12)	3.01* (2.37)	2.99* (2.38)
PETS	0.04 (0.20)	15.96* (13.84)	15.97* (13.87)	15.95* (13.84)	15.93* (13.94)
HOBBIES	0.06 (0.23)	1.77* (1.70)	1.66 (1.60)	1.78* (1.70)	1.85* (1.79)
RELIGION	0.05 (0.21)	4.90* (4.41)	4.74* (4.27)	4.90* (4.41)	4.85* (4.40)
CONSTANT		-2.48 (-0.91)	0.68 (0.25)	-2.55 (-0.88)	-1.24 (-0.40)
Interview Dummies		No	Yes 6 of 23 signif.	No	No
Order dummy		No	No	Yes t=0.07	No
Neighborhood dummies		No	No	No	Yes 0 of 42 signif.
n	3568	3568	3568	3568	3568
R^2		0.23	0.25	0.23	0.25
Lagrange[b]		161.19 p<0.01	68.56* p<0.01	160.95* p<0.01	77.30* p<0.01

* Significant at the 5% error level using the appropriate one-sided test.

a Standard deviation of means and t statistics of coefficients are in parentheses.

b The Lagrange multiplier tests the null of an OLS with no individual specific effects versus the alternative of the random effects model.

The activity dummies revealed an interesting pattern, with napping, socializing, outdoor recreation, exercising, reading, relaxing, volunteering, pets, hobbies, and religion having significant positive coefficients. This indicates that holding all else constant, each of these has a higher net willingness to pay on the margin than watching television. Several of these activities may have

constraints (weather for outdoor recreation, requiring other people for socializing or volunteering) but this applies to several activities that were not significantly different than television. Each of the activities that were significantly different can be viewed as more socially acceptable than watching television. On the other hand, the very low values of movie going, partying and hunting may reflect overly optimistic expectations, pressures to suit someone else sharing the activity, and/or unanticipated over-indulgence. People may actually regret watching too much television, leading to a relatively lower value. Many of the activities with high marginal values are "low key", this may be indicative of a "stressed" society. Further work is needed to determine why responses differed so drastically by activity. Such tests will require individuals' marginal values for various leisure activities, numbers which only the direct measurement method can provide.

Version two of the model tests for interviewer bias. Dummy variables for interviewer teams were added to the basic model, and the activity effect dummies were excluded. The basic results of the model remain unchanged. Six of the 23 interviewer dummies were significantly different than zero using a 5 percent error level. In results not reported here, the regression was re-run dropping those interviews conducted by the six significant interviewer teams. The results were not materially different; the same set of variables was significant at the 5 percent error level.

Version three of the model excludes the interview dummies but includes a dummy for question order. Interviewers used one of two different orders of questions in conducting the interview. Appendix A contains the record sheets for each interview type. These results show that question order did not influence responses; the t statistic for the coefficient on the test order dummy was only 0.07.

Version four of the model excludes interviewer dummies and the question order dummy, but includes neighborhood dummies. None of the forty two neighborhood dummies were significant at

the 5 percent error level.

Tests of this sort concerning time use preferences are readily possible when leisure is valued by the direct measurement method. Such tests require marginal values, and this method provides them. On the other hand, individual's leisure value estimates from the labor value approach are marginal values only if the individual allocates time between market employment and leisure so as to maximize satisfaction. In that case, the marginal values per hour in leisure and work would be the same. Thus, under the labor value method, the wage rate becomes a proxy for marginal values. The labor method assumes away the possibility of differences among different leisure activities because there is only one wage rate per person. The data from our survey does not support this position. For those working individuals in the sample, we calculated willingness to pay minus the wage for each activity. We found the means by activity varied from a surplus of $10.07 over the wage for relaxing to a deficit of $12.15 under the wage for movies.

V. Conclusion

The economic properties of leisure and the very considerable magnitude of its value suggested by these empirical results make a case for treating leisure an adjunct to or a part of national income accounting figures. Not only would the aggregate of market production, household production, and leisure provide a complete measure of the wherewithal providing human satisfaction within a nation, it would provide an improved means of making international comparisons of living standards. For example, the authors suspect that leisure along with household production is a relatively larger component of total output in many developing nations than in the typical modern industrial economy. Including leisure might shrink the disparity between rich and poor nations in the comparison of living standards, but it might also increase the disparity if the value of leisure in poor countries is low enough.

As discussed earlier, direct measurement of leisure's value tends to increase measurement accuracy as compared with the labor value method by avoiding the inherent problems with the latter. Having direct measures available would therefore by useful for anyone with a use for leisure values, forensic economists for instance. Direct measurement also facilitates economic analysis. Such figures allow investigation of the economic behavior of leisure. Examining effects of socioeconomic characteristics on marginal leisure values is one example. Satisfaction maximization tests such as value equality of the marginal hours of various leisure types or equality between the marginal value of leisure and the marginal wage rate are other examples.

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APPENDIX A

Neighborhood_____ Leisure Study Interviewer

FORM 1

Activity	Unit	Last Unit Length	Amount Willing To Pay	Extra $$ Cost of Last Unit	D	W	M	Y	# of Acts	AVG Time
1. Sleeping	Hour	One Hour		0						X
2. Napping	1/4hr	Qtr. Hour		0						X
3. Personal Hygiene	1/4hr	Qtr. Hour		0						X
4. Movies, Plays, Concerts	Event									
5. Parties & Bars	Outing									
6. Socializing/ Conversation	1/4hr	Qtr. Hour								X
7. Eating at Home	Meal									
8. Eating Outside Home	Meal									
9.Attend Sporting Event	Event									
10. Organized Comp. Sports	Event									
11. Hunting/ Fishing	Outing							X		
12. Outdoor Activity	Hour	One Hour								X
13. Exercise Nonorg.Sport	Hour	One Hour								X X
14. Music/ Radio	1/2 hr	Half Hour		0						X
15. TV/Video	Hour	One Hour								X
16. Reading	1/2 hr	Half Hour								X
17. Relax /Nothing	1/4 hr	Qtr. Hour		0						X
18.Volunteering	Hour	Hour								X
19. Playing w/pets	1/4 hr	Qtr. Hour								X
20. Hobbies /Crafts	Hour	One Hour								X
21. Vehicular Travel	Hour	One Hour								X
22. Religous/Spiritual	Event									

Neighborhood_____ Leisure Study Interviewer

FORM 2

Activity	Unit	Last Unit Length	Amount Willing To Pay	Extra $$ Cost of Last Unit	D	W	M	Y	# of Acts	AVG Time
17. Relax/Nothing	1/4 hr.	Qtr. Hour		0						X
16. Reading	1/2 hr.	Half Hour								X
15. TV/Video	Hour	One Hour								X
14. Music/Radio	1/2 hr.	Half Hour		0						X
6. Socializing/ Conversation	1/4 hr.	Qtr. Hour								X
20. Hobbies/Crafts	Hour	One Hour								X
21. Vehicular Travel	Hour	One Hour								X
22.Religious/ Spiritual	Event									
19. Playing with Pets	1/4 Hr.	Qtr. Hour								X
18. Volunteering	Hour	Hour								X
4. Movies, Plays, Concerts	Event									
5. Parties & Bars	Outing									
1. Sleeping	Hour	One Hour		0						X X
2. Napping	1/4 Hr.	Qtr. Hour		0						X
3. Grooming	1/4 Hr.	Qtr. Hour		0						X
13. Excercise Nonorg. Sports	Hour	One Hour								X
12. Outdoor Activity	Hour	One Hour								X
11. Hunting/Fishing	Outing							X		
10. Organized Comp. Sport	Event									
9. Attend Sporting Event	Event									
7. Eating at Home	Meal									
8. Eating Outside Home	Meal									

SocioEconomic Variables

THIS INFORMATION IS STRICTLY CONFIDENTIAL AND WILL ONLY BE USED FOR RESEARCH

Household Information

Number of children at home ___ Ages

Marital Status
Married ___Single___ Cohabitating

Household gross yearly income $___ #of people in household ___(include transfer payments, such as social security, unemployment, etc.)

Individual Information

Market Employment:
Employed ___ Retired___ Unemployed(and Looking)
Non-Market Employment(eg. Housewife)___ Student

Years of Formal Education
(Include years through high school, eg. a high school graduate has 12 years)

Age

Gender
Male ___ Female

Hours worked per week ___ (Market employment only)

Individual two week take home pay (net)

Thank Your for your cooperation!

Name: Phone:

Address:

ACTIVITIES

1. SLEEPING
UNITS: Last hour spent sleeping
DEFINITION: period of slumber (excludes napping)

2. NAPPING
UNITS: Last 15 minutes spent napping
DEFINITION: Time spent asleep outside normal sleeping period

3. GROOMING
UNITS: Last 15 minutes spent maintaining grooming
DEFINITION: Includes all aspects of personal grooming (e.g. showering, shaving, brushing teeth, etc.) and going to the bathroom

4. MOVIES, PLAYS, CONCERTS, ETC.
UNITS: Last event attended
DEFINITION: Includes all non-sporting performances attended in person (not VCR viewing)

5. PARTIES AND BARS
UNITS: Last outing
DEFINITION: This category includes socializing at parties and/or taverns, night clubs and bars

6. SOCIALIZING/COMMUNICATION
UNITS: Last 15 minutes spent socializing
DEFINITION: This category is to include telephone conversations and all other means of socializing not done in conjunction with any of the other activities or as the secondary objective of the event.

7. EATING HOME PREPARED MEALS
UNITS: Last meal consumed
DEFINITION: A meal prepared at the home; includes sack and picnic lunches

8. EATING MEALS NOT PREPARED IN YOUR HOME
UNITS: Last meal consumed
DEFINITION: This category includes the consumption of all meals not prepared in one's home (.e.g. eating out, eating delivered food, eating at friends and parents, etc.)

9. ATTENDING SPORTING EVENTS
UNITS: Last event attended
DEFINITION: This involves only attending, (in person) an "official" sporting event. Not to includes practices or scrimmages.

10. ORGANIZED COMPETITIVE SPORTS
UNITS: Last event competed in
DEFINITION: Category is to include all organized (scheduled, officiated and recorded) sporting events in which interviewee competed (e.g. intramurals, golf tourneys, league bowling, etc.)

11. HUNTING/FISHING
UNITS: Last outing
DEFINITION: This category includes all times actually engaged in either hunting for game or fishing.

12. OUTDOOR ACTIVITIES
UNITS: Last hour spent
DEFINITION: Time spent in the outdoors for the primary purpose of enjoying the out-of-doors (not to include exercising). This category includes hiking, boating, bird watching, snowmobiling, etc.

13. EXERCISE AND NON-ORGANIZED SPORTS
UNITS: Last hour spent exercising
DEFINITION: This activity should include but is not limited to; club athletics (aerobics, weight training, racquetball, etc.), swimming, jogging undertaken for the primary purpose of exercise.

14. MUSIC/RADIO

UNIT: Last half hour spent listening or playing

DEFINITION: Listening to music or playing a musical instrument (to include singing). Listening to sports and news programs would be included here. Key = must be primary activity.

15. T.V./VIDEO VIEWING

UNITS: Last hour spent viewing

DEFINITION: Time spent viewing T.V. to include video rentals and home recording.

16. READING

UNITS: Last half hour spent reading

DEFINITION: Any form of reading done for pleasure i.e. periodicals, circulars, novels and picture books (not to include reading done for work or school)

17. RELAXING

UNITS: Last 15 minutes spent relaxing

DEFINITION: This activity only includes time awake spent doing absolutely nothing (e.g. suntanning & watching the grass grow) This means T.V. watching, napping and music listening are not to be included in this category.

18. VOLUNTEERING

UNITS: Last hour spent doing volunteer work

DEFINITION: This activity includes work done for the church, community, or family & friends. Be careful not to include household production with this activity.

19. PLAYING WITH PET

UNITS: Last 15 minutes spent playing with pet

DEFINITION: Total time spent playing with pet (not to include the actual maintenance of the pet)

20. HOBBIES AND CRAFTS

UNITS: Last hour spent

DEFINITION: This is a very broad category. Could include knitting, model building, ceramics, flower gardening, etc.....

21. VEHICULAR TRAVELING

UNITS: Last hour spent

DEFINITION: Time spent while traveling in any vehicle (car, bus, train, etc..) not related to work activity.

22. RELIGIOUS/SPIRITUAL

UNITS: Last religious or spiritual event

DEFINITION: This could include church, prayers, spiritual contemplation, confession, grace, bible study, etc.