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A NOTE ON LEISURE INEQUALITY IN THE US: 1965-2003

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A Note on Leisure Inequality in the US: 1965-2003¹

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Abstract

Despite the well-documented increase in the relative wages and expenditures of highly-educated individuals in the U.S. in recent decades, leisure inequality mirrors inequality of wages, i.e. we observe that highly-educated individuals have now relatively less leisure time than lower-educated individuals. What are the implications for evaluating individual welfare? This paper moves beyond the current published research, which has mostly concentrated on total time spent in leisure, and exploits the nature of diary data in the American Heritage Time Use Study (AHTUS), to provide a complementary angle to this question. We look not just at the quantity of leisure (measured as total leisure time) but also at the quality of leisure for different education groups. We provide several indicators to measure the quality of leisure, such as the number of leisure episodes, whether leisure is undertaken with the spouse and/or other adults, and whether leisure is combined with other non-leisure activities. We find that, although leisure time is greater now for less-educated individuals relative to highly-educated individuals, the quality of leisure is higher for highly-educated individuals. This finding is consistent with a model of quality-quantity of leisure, where individuals substitute quality for quantity as their income rises.

JEL Classification: C13, C23, D13, J12, J16, Z13

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1. Introduction

The evolution of leisure inequality in the US, over the last four decades, contrasts remarkably with how inequality in wages and expenditure has evolved over the same period of time. Several authors have documented growing wage and expenditure inequality in the U.S (e.g., Attanasio and Davis [1996], Autor and Katz [1999], Kruger and Perri [2007]). However, leisure inequality mirrors inequality of wages and expenditure. Aguiar and Hurst [2007] document that the cross-sectional distribution of leisure time has expanded over the last 40 years. More striking, while the level of leisure in 1965 was roughly equal across educational status, the subsequent increase in leisure was greatest among low educated adults. Thus, in 2003 (the latest year analyzed by the authors) highly educated individuals had less leisure time than low educated individuals. This variation in leisure across educational levels has also been documented by Gershuny [2005], for the UK. Using three UK time-diary studies (1961, 1983/4 and 2001) the author shows that, over this period, the negative relationship between human capital and work time is reversed, i.e., individuals with high human capital now have longer hours of work (and implicitly less leisure time) than individuals with low human capital.

What are the welfare implications of the fact that highly-educated individuals have experienced the highest increases in wages and expenditure in comparison to low educated individuals, but that highly-educated individuals now have less leisure time than the low educated? We provide a complementary explanation to this question by looking not just at the *quantity* of time spent in leisure, but also at the *quality* of this leisure time. We move beyond the current published research, which with few exceptions has mostly concentrated on total times spent in activities, and take advantage of the diary nature of data in the American Heritage Time Use Study (AHTUS) to construct several indicators to measure the quality of leisure, such as the number of leisure episodes, whether leisure is undertaken with a spouse and/or with other adults, and whether leisure is combined with other activities.

Although the scarcity of leisure time may be thought of as analogous to poverty, in that both reflect the scarcity of resources (time in the former case, goods in the latter), in a growing economy the goods constraint will relax over time, whereas the time constraint, understood as a fixed amount of time, will not (see e.g., Hamermesh and Lee [2007]). Incorporating the quality of leisure time, as well as the quantity of time spent in leisure activities, in the analysis of leisure inequality can thus generate a more comprehensive view of the welfare consequences of changes in wages, expenditure, and leisure inequality. In turn, the quality of leisure time can be thought of

as a way in which individuals relax the time constraint by increasing their utility from a given unit of leisure time.

Our results indicate that once the quality dimension of leisure is introduced as a component of leisure inequality, it is unclear that leisure inequality has, indeed, not followed a closer pattern to that of wages and expenditure inequality. We find that, despite increases in the quantity of leisure over this period (as reported by Aguiar and Hurst [2007] and others), the quality of leisure has decreased for all groups. However, although the quantity of leisure time increased relatively more among less-educated individuals, the quality of leisure decreased less among highly-educated individuals, i.e. despite highly-educated individuals now having less leisure time, highly-educated individuals now enjoy a higher quality of the time spent in leisure, compared to less-educated individuals. In other words, highly-educated adults are spending more leisure time with the spouse and with other adults, and have longer spells of leisure than low educated individuals. They also seem to enjoy a higher percentage of uncontaminated leisure, i.e., leisure that is not enjoyed simultaneously with other non-leisure activities. In an analog to Becker's model on the quantity and quality of children (Becker [1981]), this finding is consistent with a model of quality-quantity of leisure, where individuals substitute quality for quantity as their income rises.

This paper is organized as follows. Section 2 describes the AHTUS data. Section 3 presents the empirical strategy and the definitions of the indicators of the quality of leisure used in the analysis. Section 4 presents the results and Section 5 concludes.

2. The American Heritage Time Use Study (1965-2003)

We use the American Heritage Time Use Study, which is a harmonized dataset that covers five decades, from 1965 to 2003, over five time-use surveys.² Although the methodology differs across surveys, the main instrument of all surveys is an activity diary in which respondents record what they do for a consecutive period of 24 hours. The advantage of the AHTUS over other U.S. harmonized surveys for the same period is that, whereas most surveys simply cover the total minutes per day diarists recorded in the main activity columns, the AHTUS harmonizes these surveys at the episode level, so that for each respondent there is a *diary file* made up of a sequence of episodes over the 24 hour span. The AHTUS also includes harmonized information on secondary activity, location, mode of transport, and who else is present at the time of the activity.

² Appendix A Table A1 describes the five surveys in the AHTUS. More detailed information about this dataset can be found in Fisher et al. [2006a].

For the sake of comparison with previous studies, and to minimize the role of time allocation decisions that have a strong inter-temporal component over the life cycle, such as education and retirement, we restrict the sample used throughout the analysis to non-retired/non-student individuals between the ages of 21 and 65 (inclusive), so results should be interpreted as being “per working-age adult” (or per adult within the specified sub-sample, when relevant). We also restrict the sample to include only individuals who have time diaries that add up to a complete day (1440 minutes) and whose diary is not low quality. Thus, the final sample includes respondents whose diary has 90 minutes or less missing main activity time after imputation (that is they have accounted for the majority of the day), it has 7 or more episodes, it includes some time recorded in at least 3 of 4 basic activities, sleep or rest, eat or drink, personal care, and travel, as a primary or secondary activity (or in the case of travel, marked through location of means of transport) in which one would expect a diarist to have engaged on any given day.³

Indicators of the Quantity and Quality of Leisure

We follow the definition of *leisure* used in Burda et al. [2006] and measure the quantity of leisure as hours per week devoted to “all activities that we cannot pay somebody else to do for us and that we do not really have to do at all if we do not wish to”. This definition clearly distinguishes leisure from other types of non-paid home activities, such as sleeping, eating, personal and medical care, or resting. As opposed to leisure, the latter activities are considered to be necessary for life and are normally included in a different category of time use - either referred to as “personal care” (e.g., Aguiar and Hurst [2007]) or as “tertiary activities” (e.g., Burda et al. [2006]). Table A2 in Appendix A lists all the activities included in the AHTUS, as well as those activities that we consider leisure activities based on the definition above. Among the activities included in the leisure category are watching television, sport activities, volunteer activities, general out-of-home entertainment activities, socializing etc.

In order to measure the quality of leisure, we use several indicators that take advantage of the richness of the diary structure of the data. The first two indicators are related to the nature of the secondary activity that is combined with leisure as a primary activity. The primary activity constitutes the main activity the respondent engages in at a particular point in the diary. However, respondents frequently engage in more than a single activity at the same time. Thus, the secondary activity is the activity that is done at the same time as the main activity, and

³ We did note that some respondents providing child-care to multiple children, or to an infant, as well as some diarists performing adult care did not record travel and also missed a second or third basic activity. If these diaries from carers nonetheless included at least 10 episodes, then we counted these diaries as good diaries (as it may be possible the diarists ate while feeding the care recipient, for example, but did not record her or his own eating).

complements the main activity. The underlying rationale behind this indicator is that leisure activities with no “distracting” accompanying activities are associated with a higher utility than leisure activities accompanied by a secondary activity. We thus define *Pure Leisure* as leisure that is reported as primary activity whose secondary activity is also leisure, i.e., its secondary activity is not market work, home production or personal care (e.g., Bittman and Wajcman [2002]). We then construct two indicators with the amount of *Pure Leisure* and the proportion of *Pure Leisure* out of total leisure. *Pure Leisure* cannot be analyzed for 1993 and 2003 since in these surveys there are no reported secondary activities as such, and they were imputed by the survey team (see Fisher et al. [2006a]). However, even after the imputation exercise, important differences still remain, which makes these surveys not comparable with previous ones. In particular, the 1993 and 2003 surveys have no more than 4 secondary activities, compared to up to 80 secondary activities in the 1965, 1975, and 1985 surveys.

We then consider leisure with the spouse as an indicator of leisure quality, and use information on whether leisure as primary activity is carried out while the spouse/partner is present. We define the amount and the percentage of total leisure time of *Leisure with Spouse* (or partner) for those individuals with a partner. This concept draws from the empirical evidence found in the socio-economic literature on spouses’ synchronization of work and leisure activities (e.g., Hamermesh [1999], Jenkins and Osberg [2005], Hallberg [2003], Sullivan [1996], and Fisher et al. [2006b] among others). This literature finds that synchronization of leisure activities between partners is greater than random male-female pairing would predict, which seems to suggest that married or cohabiting individuals enjoy a higher utility from leisure spent with their partner than leisure alone or with another adult, at least at the margin. These indicators can be constructed for all the surveys except for those in 1985 and 1993, because information on whether the spouse or partner is present at the time the main activity is carried out by the respondent was not gathered.

Economists have often pointed out the positive externalities of synchronicity not just in leisure, but also in market work and household labor (e.g., Weiss [1996]). Few studies, however, have tried to identify exogenous determinants of coordination. For example, public holidays are found to be welfare enhancing, not only by increasing the amount of leisure to each individual, but also increasing the coordination of leisure activities among individuals (e.g., Mers and Osberg [2006]). Similarly, Hamermesh et al. [2006] find that an exogenous shock to time in one area, due to daylight-saving time, leads its residents to change their work schedule to be able to coordinate their other (leisure) activities with those in adjacent areas. They also find that workers in

industries who are expected to have a greater coordination with individuals in other areas are more responsive to exogenous changes in time zones. All these findings seem to support the psychological evidence that leisure activities are more enjoyable when people perform them simultaneously and thus leisure activities with others might be utility enhancing (e.g., Helliwell and Putnam [2005]). We use the information in the survey years 1965, 1975 and 2003, on whether another adult was present, to construct two indicators of leisure quality, the time spent in *Leisure with Adults*, i.e. leisure time spent with other adults, neither alone nor in the presence of children, as well as the percentage of total leisure that constitutes *Leisure with Adults*.⁴

Our last indicators of the quality of leisure use the episode-level information in the data to investigate to what extent leisure is fragmented during the course of the diary day. For a given amount of leisure time, those individuals with more fragmented leisure may be justifiably more rushed, and thus might enjoy a lower level of utility from any given amount of leisure time. To measure the fragmentation of leisure we use the (*normalized*) *number of leisure intervals* during the diary day. An *interval* is defined as a period of time when the individual is engaged in one of these four main activities: market work, personal care, home production and leisure. We then define a *leisure interval* as that time interval where the main activity is leisure (regardless of whether the interval contains two or more different leisure episodes).⁵ Because there is a general decrease in the mean number of intervals reported by individuals over the five surveys, we normalize this measure by dividing by the total number of intervals in the diary for each respondent.⁶

Unconditional Trends in the Quality and Quantity of Leisure

Table 1 reports the (weighted) means in each of the survey years for the indicators of quantity and quality of leisure over the sample period for the general population.⁷ Consistent with other studies (e.g., Aguiar and Hurst [2007]) the quantity of *leisure* has undergone a statistically significant increase of 5.13 hours per week between 1965 and 2003. However, despite increases

⁴ The category “other adult” is considered to be the spouse or partner, other adult from the household, a shop or professional worker, a co-worker, a person well-known, and other (adult) person present.

⁵ The diary survey is organized in episodes. Thus, two consecutive leisure activities are considered to be different episodes (i.e. reading and cycling), but these consecutive leisure episodes are considered to be the same leisure interval according to our definition.

⁶ One reason for the decline in the number of episodes in recent surveys is the switch of method from the diary the diarist sees (1965, 1975 and 1985) to the telephone diary (1993 and 2003). Also for the earlier studies (1965, 1975 and 1985) respondents are automatically assigned a new episode with a change of location, main activity or secondary activity.

⁷ We use the weights provided in the AHTUS. These weights account for population/sample distribution by age group and sex, and provide an even distribution of the days of the week. All cases with missing basic information or bad diaries are 0-weighted, and thus are excluded from the analysis. Further information on these weights can be found in the AHTUS codebook at <http://www.timeuse.org/ahtus/documentation/docs/pdf/Codebook.pdf>.

in the quantity of time spent in leisure activities, the quality of *leisure* seems to have decreased over this period. Although the amount of *Pure Leisure* and *Leisure with Spouse* increases, this increase seems to follow the general increase in leisure and thus they might not be the best indicators of the quality of leisure. In order to net out the increases in the quantity of *leisure* in our indicators of the quality of leisure, and to provide a more accurate measure of the quality of leisure, we concentrate on the percentages, rather than the totals, of our quality indicators. The percentage of *Pure Leisure* decreases by 4.52 percentage points, from 90.45 per cent in 1965 to 85.93 per cent in 1985. The percentage of *Leisure with Spouse* decreases by 9.19 percentage points, from 40.96 per cent in 1965 to 31.77 per cent in 2003, and the percentage of *Leisure with Adults* decreases by 10.07 percentage points, from 70.66 per cent in 1965 to 60.59 per cent in 2003. The (*normalized*) *number of leisure intervals* increases by 0.04, which suggests that the fragmentation of leisure is now greater (or in other words that the average length of a leisure episode has declined).

Table 2 shows the main summary statistics for the indicators of quantity and quality of leisure over the sample period for men and women separately. Results are very similar to Table 1. Despite increases in the quantity of leisure for both men and women, our indicators of the quality of leisure seem to suggest that the quality of leisure has decreased for men and women over the period. For men and women, the percentage of *Pure Leisure*, the percentage of *Leisure with Spouse*, the percentage of *Leisure with Adults*, and the fragmentation of leisure seems to reflect a decrease in the quality of leisure.

For men, the quantity of leisure is similar to what is found in other papers.⁸ Total hours of leisure per week exhibit a statistically significant increase over the period of reference, from 32.93 hours of leisure per week in 1963 to 38.73 hours of leisure per week in 2003 (leisure increases by 5.8 hours per week).⁹ Regarding the quality of leisure time, our first two indicators on *Pure Leisure* indicate that whereas the amount of *Pure Leisure* increases by 0.87 hours per week, this increase is not statistically significant and may reflect a general increase in the quantity of leisure. More relevant in measuring the quality of leisure is the percentage of *Pure Leisure* out of total time, which decreases over the period by 3.97 percentage points, from 91.03 per cent in 1965 to 87.06 percent in 1985. Despite increases in leisure, the amount of leisure time spent with the spouse significantly decreases by 2.43 hours per week, from 15.20 hours in 1965 to 12.77

⁸ Aguiar and Hurst [2007] find that leisure for men increased by 6-8 hours per week from 1965 to 2003. Burda et al. [2006] find a decrease in the amount of leisure time in 2003, with respect to 1985, of 2.7 minutes per day, while we find an increase of 9.51 minutes per day (1.11 hours per week). However, the sample used in their analysis is different (20-74 years) and the authors acknowledge that over longer periods leisure has increased.

⁹ A p-value lower than 0.05 means a 95% significance level.

hours per week in 2003. There is also a statistically significant decrease of 13.68 percentage points in 2003, with respect to 1965, in the percentage of leisure time spent with the spouse, from 47.89 per cent in 1965 to 34.20 per cent in 2003. Similarly, the amount of *Leisure with Adults* decreases by 1.46 hours per week, from 25.10 hours in 1965 to 23.64 hours per week in 2003. However, this increase is not significant at the 95 per cent significance level. The percentage of *Leisure with Adults* decreases by 13.09 percentage points in 2003, with respect to 1965, from 72.53 percent in 1965 to 59.44 percent in 2003. Finally, the fragmentation of leisure measured by the *normalized number of leisure intervals* indicates that leisure is more fragmented now than four decades ago. There is a general increase in the number of leisure intervals (from 0.25 in 1965 to 0.27 in 2003).

Women's leisure time follows a similar pattern to that of men's. The quantity of leisure time significantly increases by 4.44 hours over the period, from 32.71 hours in 1963 to 37.15 hours in 2003.¹⁰ However, the quality of leisure time for women tells a similar story to that of men's. Whereas the amount of *Pure Leisure* increases by 0.43 hours per week over the period, from 31.20 hours in 1965 to 31.62 hours per week in 2003, this increase is not statistically significant. More relevant for our analysis is the percentage of *Pure Leisure*, which has decreased over the period by 3.47 percentage points, from 89.82 percent in 1965 to 86.35 percent in 1985. Despite increases in total leisure time, leisure spent in the presence of spouse/partner decreases by 1.07 hours per week over the period, from 11.83 hours per week in 1965 to 10.76 hours per week in 2003. This decrease is significant at the 95 percent level. Similarly, the percentage of *Leisure with Spouse* decreases by 5.23 percentage points over the period, from 68.93 per cent in 1975 to 61.75 percent in 2003. The amount of time spent in *Leisure with Adults* decreases by 0.25 hours per week, from 24.20 hours in 1965 to 23.95 hours per week in 2003, although again this increase is not statistically significant. However, there is a statistically significant decrease of 7.18 percentage points in 2003, with respect to 1965, from 68.93 percent in 1965 to 61.75 per cent in 2003. Finally, there is a statistically significant increase in the *normalized number of leisure intervals* (from 0.22 in 1965 to 0.27 in 2003), which indicates that leisure for women is also more fragmented now than it was in 1965.

Our indicators suggest that, on average, the quality of leisure that people enjoy is lower now than it was in 1965. This result may explain the fact that, despite general increases in leisure time, Americans report an increased time stress now, compared to forty years ago. There is, indeed,

¹⁰ Aguiar and Hurst [2007] find that leisure for women increased by 4-8 hours per week over the period 1965-03. Burda et al. [2006] find a decrease in the amount of leisure time in 2003, with respect to 1985, of 13.3 minutes per day, while we find an increase of 7.54 minutes per day.

some evidence to suggest that Americans are feeling more stressed and pressured and have less social interaction (e.g., Short [1993] and Rothschild, [1997]). Our findings, however, are consistent with those in Krueger [2007]. This author uses the Princeton Affect and Time Survey (PATs) to assess subjects' reported experiences (feeling interested, stressed, happy, etc.) when engaging in daily activities, and finds that time spent in enjoyable and engaging forms of leisure activities has decreased for both men and women since the mid 1960s.¹¹

3. Empirical Strategy

In our empirical analysis we condition the change in the quantity and quality of leisure on demographics to see how the dependent variables have changed during the last 40 years, adjusted for demographic changes. During the last 40 years there have been significant demographic changes in the U.S. Since 1965, the average American has aged, become more educated, become more likely to be single, and to have fewer children. All of these changes may affect how an individual chooses to allocate his or her time and thus controlling for demographics is important for the analysis of the trends of the quality and quantity of leisure over time. Summary statistics of these demographic variables are shown in Appendix B Table B1.

Because we are interested in the evolution of the quantity and quality of leisure by educational status, we perform the analysis for highly- and low-educated individuals separately, where a highly-educated individual is defined as having more than a high school degree (or EGD equivalent). Thus, we estimate Equation (4.1) for each education group, and for men and women, separately:

$$Y_{it} = \alpha + \beta_{1975}D_{i,1975} + \beta_{1985}D_{i,1985} + \beta_{1993}D_{i,1993} + \beta_{2003}D_{i,2003} + \gamma_{age}Age_{it} + \gamma_{family}Family_{it} + \gamma_{day}Day_{it} + \xi_{it} \quad (4.1)$$

where Y_{it} is the dependent variable measuring the quantity/quality of leisure for individual i in survey t , D_{it} is a year dummy equal to one if the individual i participated in the time-use survey conducted in year t and zero otherwise, Age_{it} is a vector of age dummies (whether individual i is in his or her 20s, 30s, 40s, 50s or 60s in year t), $Family_{it}$ is a dummy variable that takes value one if the respondent i has at least one child and zero otherwise, and Day_{it} is a variable scaling the day of the week when the survey took place. The day variable is necessary, given that some of the surveys over-sample weekends for some sub-samples.

¹¹ See Kahneman and Krueger [2006] and Gershuny and Brendan [1966] for examples of the use by economists and sociologists of time-use surveys that combine well-being questions together with time-use diaries.

The coefficients of interest are those of the year dummies, which inform us how the average time spent on leisure activities (the quantity of leisure) and the quality of those leisure activities have changed over time, controlling for changes in key demographics. In all years except 1993, the time-use surveys asked respondents to report their marital status. Although our base results do not include this control (because they are unavailable for 1993), we reran all of our regressions, including marital status as an additional control, on a sample that excludes the 1993 survey. This modification did not alter the main findings of our paper.¹²

4. The Quantity and Quality of Leisure by Educational Status

Tables C1, C2, and C3 in Appendix C show the coefficients obtained from estimating Equation (4.1) when the dependent variables are the quantity and quality of leisure indicators defined in Section 3. In order to see how the quantity and quality of leisure time has evolved over the last 40 years for individuals with and without a high-school degree, we estimate Equation (4.1) for both educational groups and plot the coefficients on year dummies

Changes in the Quantity of Leisure

Graphs 1A and 1B show that for both men and women, low-educated individuals increase the amount of leisure with respect to 1965 more than the highly-educated group. For men, between 1965 and 2003, the increase in leisure time for the less educated is statistically significant and accounts for 5.76 hours per week, while the increase in leisure time for highly educated individuals is 4.23 hours per week. For women, these differences across educational groups are greater. In 2003, low-educated women enjoyed 6.07 hours per week more leisure time than in 1965, whereas highly-educated women had an increase of just 3.30 hours more of leisure per week, both increases being statistically significant at the 95 percent level.

Changes in the Quality of Leisure

Because of the general increase in leisure time for both educational groups, we only plot the coefficients of the percentages of total leisure time, rather than the total amount of leisure time, as more accurate indicators of the quality of leisure. The percentage of time spent in *Pure Leisure*, *Leisure with Spouse* and *Leisure with Adults* are shown in Graphs 2A-4B.¹³

Graphs 2A and 2B show the evolution in the percentage of *Pure Leisure* of total leisure, by gender and educational group. For both men and women, low-educated individuals experienced a

¹² Results are available upon request.

¹³ The coefficients for both, percentages and totals, of our indicators of leisure quality are reported in Tables C1-C3 of Appendix C.

decrease in the percentage of *Pure Leisure* of total leisure more than highly-educated individuals. Graph 2A shows a general decrease in the quality of leisure for men, with low-educated men experiencing a higher decrease in the percentage of *Pure Leisure* than highly-educated men, between 1965 and 1985. The decrease in the percentage of *Pure Leisure* is 5.05 percentage points per week for the less educated men, and 4.73 percentage points for highly-educated men. Both decreases are statistically significant at the 95 percent level. Graph 2B shows that low-educated women also experienced a higher decrease in the percentage of *Pure Leisure* than highly-educated women. In 1985, the percentage of *Pure Leisure* decreased by 5.41 percentage points for low educated women, while the highly-educated experienced a decrease of 3.99 percentage points. Both decreases are statistically significant at the 95 percent level.

Graphs 3A and 3B show the evolution in the percentage of *Leisure with Spouse* by gender and educational attainment. Although the percentage of *Leisure with Spouse* has decreased over the period analyzed for gender and education groups, the decrease has been lower for highly-educated men and women. Graph 3A shows that the decrease in the percentage of *Leisure with Spouse* is higher for low educated men. Whereas highly-educated men experienced a statistically significant decrease in the percentage of *Leisure with Spouse* by 6.95 percentage points, low educated men had a statistically significant decrease of 12.94 percentage points. For women, results are very similar to that of men. Less educated women suffered a greater decrease in the percentage of *Leisure with Spouse* of 6.19 percentage points from 1965 until 2003, while for highly-educated women this percentage decreased by just 1.29 percentage points. Both decreases are significant at the 95 percent level.

Graphs 4A and 4B show the evolution in the percentage of *Leisure with Adults* by gender and educational attainment. Similar to the above results, Graph 3A shows that the decrease in the percentage of *Leisure with Adults* is higher for less educated men. Whereas the percentage of *Leisure with Spouse* decreased by 6.95 percentage points for highly-educated men between 1965 and 2003, this percentage decreased by 10.18 percentage points for low educated men. The results for women are similar to those of men. Whereas the decrease in the percentage of *Leisure with Adults* for highly educated women is not statistically significant, low educated women experienced a statistically significant decrease in the percentage of *Leisure with Adults* by 4.27 percentage points in 2003 with respect to 1965.

Graphs 5A and 5B show the changes in the fragmentation of leisure by gender and educational attainment between 1965 and 2003. There is a general increase in the *normalized number of leisure intervals* over this period, which indicates that the fragmentation of leisure is

greater, and arguably that the quality of leisure has declined. Similar to the above results, the increase in the normalized number of leisure intervals is greatest for the least educated, at least for men. Graph 5A shows that, whereas low educated men experienced an increase in the *normalized number of leisure intervals* by 0.027, highly-educated men only experienced an increase in this number of 0.012. In other words, the fragmentation of leisure has increased the most for low educated men. Results are similar for both educational groups in the case of women. Graph 5B shows that both educational groups experienced an increase in the fragmentation of leisure over this period. Low-educated women increase the *normalized number of leisure intervals* by 0.053, whereas highly-educated women increase the *normalized number of leisure intervals* by 0.050. Both increases are significant at the 95 percent level.

The above results show that, despite highly-educated individuals now enjoying less leisure time than low educated individuals; highly-educated adults are spending more leisure time with the spouse and with other adults, enjoy a greater percentage of *pure* leisure that is not contaminated by other non-leisure activities, and have longer spells of leisure than low educated individuals. These findings are consistent with a model of quantity and quality of leisure, in which individuals substitute quality for quantity as their wage (education) rises. Once the quality of leisure is introduced in the analysis the assertion that *it is then unclear that inequality in leisure mirrors the well-documented trends in income and expenditure inequality* becomes less clear-cut. A puzzle still remains for traditional models that focus solely on income and substitution effects. As shown here and elsewhere (e.g., Robinson and Godbey [2000], Ghez and Becker [1975], and Juster and Stafford [1985]), increases in income over recent decades in the US have been followed by similar increases in leisure time across all population groups.¹⁴ We have also shown that the quality of this leisure has decreased over the same period. However, whereas the time-series evidence suggests that the income effect dominates the substitution effect, where rising wages have been accompanied by a greater quantity of leisure time and a lower quality of leisure, the recent cross-sections suggest that higher incomes are associated with lower levels of leisure and a higher quality of leisure.

Working women

This section analyzes whether the changes in the quality of leisure across education groups also hold for working women. Female labor force participation has substantially increased over

¹⁴ Unlike these studies Ramey and Francis [2006] find that leisure time has actually remained constant over the last century. They use, however, a different definition of leisure time and a longer time span than do the previous studies.

the period considered, and the fact that we have omitted employment status in our analysis could be causing some bias if increases in working hours are correlated to educational status.

Graph 6A shows that both educational groups have increased the amount of leisure over the period, although the increase is higher for low-educated than for highly-educated working women. While low-educated working women have increased their amount of leisure by 5.756 hours per week, highly-educated women have increased their amount of leisure by 4.233 hours per week, both increases being statistically significant at the 95 percent significance level.

Graph 6B shows that highly-educated working women have decreased the percentage of *Pure Leisure* less than low-educated working women. The decrease in the percentage of *Pure Leisure* is 5.055 percentage points for low-educated women and 4.732 percentage points for highly educated women, both decreases being statistically significant at the 95 percent significance level.

Graph 6C shows the evolution in the percentage of *Leisure with Spouse* by educational group for working women. It shows that low-educated and highly-educated working women have decreased the percentage of *Leisure with Spouse*. However, while low-educated working women have decreased their percentage by 12.940 percentage points, highly-educated working women have decreased the percentage by only 6.946 percentage points, both decreases being statistically significant at the 95 percent significance level. Thus, according to this measure, highly-educated working women have decreased the quality of their leisure less than low-educated working women.

Graph 6D shows that while low-educated working women have decreased their percentage of *Leisure with Adults* by 0.309 percentage points, highly-educated working women have decreased their percentage by 2.247 percentage points (however these decreases are not statistically significant at the 95 percent significance level).

Regarding our last indicator of the quality of time, Graph 6E shows that there is an increase in the fragmentation of leisure in both groups, while low-educated women increased the relative number of leisure episodes by 0.065, highly-educated women increased the relative number of leisure episodes by 0.069, both increases being statistically significant at the 95 percent significance level.

5. Conclusion

This paper moves beyond previous research, which has mostly focused on the amount of total time devoted to leisure, to provide a more comprehensive view of how leisure inequality across educational groups has evolved over the period 1965 to 2003 in the US. Consistent with previous

studies, we find general increases in leisure time across educational groups between 1965 and 2003. We also find that less-educated individuals experience the largest gains in the time they devote to leisure activities. For men, the increase in leisure time for the less-educated is 5.76 hours per week, while the increase in leisure time for highly-educated individuals is 4.23 hours per week. For women, these differences across educational groups are even greater. What are the welfare implications of the fact that this increase in the dispersion of leisure time, favoring less-educated adults, corresponds to a period in which wages and expenditures increased faster for highly-educated individuals? We provide a complementary explanation to this question by looking not just at the *quantity* of time spent in leisure, but also at the *quality* of this leisure time.

We use the richness of the diary information in the AHTUS to construct several indicators of the quality of leisure time such as the number of leisure episodes, whether leisure is undertaken with the spouse and/or other adults, and whether leisure is combined with other non-leisure activities. Our indicators of the quality of leisure show that the quality of leisure has become lowest for less educated adults. Thus, despite highly-educated individuals now enjoying less leisure time than low-educated individuals, highly-educated adults are spending more leisure time with the spouse and with other adults, have a higher percentage of pure leisure, and have longer spells of leisure, than low-educated individuals. These findings are consistent with a model of quantity and quality of leisure, in which individuals substitute quality for quantity as their wage (education) rises.

Once the quality of leisure is introduced in the analysis, it is then unclear that inequality in (the quantity and quality of) leisure mirrors the well-documented trends in income and expenditure inequality. In other words, just as highly-educated individuals may have substituted time spent in leisure for more consumption of goods, so also they may have given up leisure time to use what remains of it more efficiently. Thus, highly-educated individuals may still be equally or better off than low-educated individuals.

A puzzle still remains for traditional models that focus solely on income and substitution effects. Whereas the time-series evidence suggests that the income effect dominates the substitution effect, by which rising wages have been accompanied by greater quantity of leisure time, and lower quality of leisure, the recent cross-sections suggest that higher incomes are associated with lower levels of leisure and a higher quality of leisure.

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Table 1 – Unconditional means for the quantity and quality of leisure for the general population ^{1,2}

<i>Leisure variables</i>												
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)		(6)	
	1965		1975		1985		1993		2003		Difference 1965-2003	p-value Difference
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.		
<i>Leisure Time</i> ³	32.81	(0.58)	35.09	(0.41)	36.51	(0.59)	38.51	(0.34)	37.94	(0.22)	5.13	<0.01
<i>Pure Leisure</i>	30.50	(0.51)	31.23	(0.36)	31.73	(0.52)	-	-	-	-	1.23	0.09
<i>Percentage Pure Leisure</i>	90.45	(0.57)	87.65	(0.40)	85.93	(0.58)	-	-	-	-	-4.52	<0.01
<i>Leisure with Spouse</i>	13.45	(0.41)	12.32	(0.29)	-	-	-	-	11.76	(0.15)	-1.69	<0.01
<i>Percentage Leisure with Spouse</i>	40.96	(0.92)	37.61	(0.64)	-	-	-	-	31.77	(0.34)	-9.19	<0.01
<i>Leisure with Adults</i>	24.63	(0.51)	24.92	(0.36)	-	-	-	-	23.80	(0.19)	-0.84	0.12
<i>Percentage Leisure with Adults</i>	70.66	(0.86)	69.73	(0.60)	-	-	-	-	60.59	(0.32)	-10.07	<0.01
<i>Normalized number of Leisure Intervals</i>	0.23	(0.002)	0.25	(0.002)	0.26	(0.003)	0.26	(0.001)	0.27	(0.001)	0.04	<0.01
<i>N° Observations</i>	843		1,408		799		2,336		5,554			

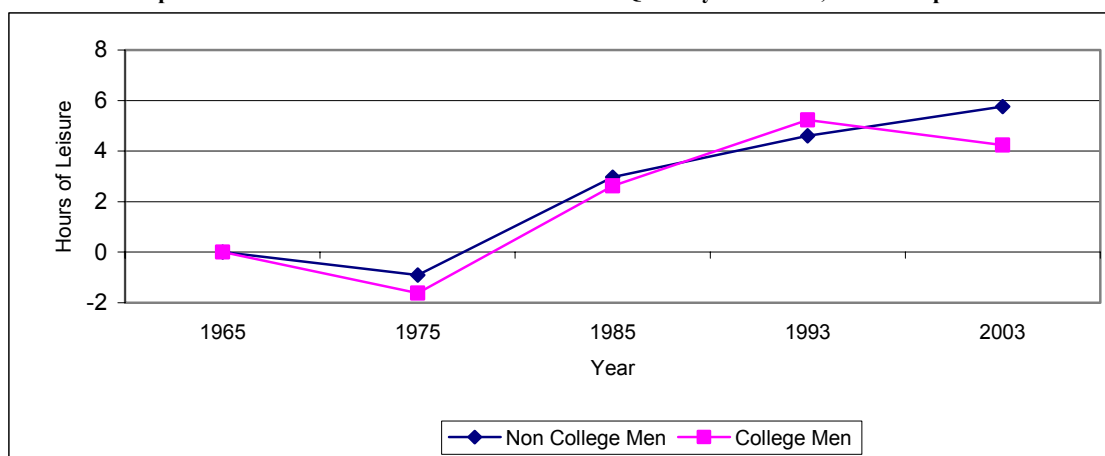
Notes: ¹ Standard errors in parenthesis. ² Sample consists of respondents in the AHTUS (1965-2003), who are not retired, are not students and are aged 21-65. ³ Leisure time is measured in hours per week.

Table 2 – Unconditional means for the quantity and quality of leisure by gender ^{1,2}

Table 2 – Unconditional means for the quantity and quality of leisure by gender												
Men												
Variables	(1)		(2)		(3)		(4)		(5)		(6)	
	1965		1975		1985		1993		2003		Difference 1965-2003	p-value Difference
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.		
Leisure Time ³	32.93	(0.91)	32.27	(0.64)	36.76	(0.92)	39.84	(0.54)	38.73	(0.33)	5.80	<0.01
Pure Leisure	30.13	(0.82)	27.43	(0.61)	31.00	(0.91)	-	-	-	-	0.87	0.48
Percentage Pure Leisure	91.03	(0.92)	88.32	(0.69)	87.06	(1.02)	-	-	-	-	-3.97	<0.01
Leisure with Spouse	15.20	(0.65)	13.64	(0.46)	-	-	-	-	12.77	(0.24)	-2.43	<0.01
Percentage Leisure with Spouse	47.89	(1.43)	45.54	(1.01)	-	-	-	-	34.20	(0.53)	-13.68	<0.01
Leisure with Adults	25.10	(0.80)	23.08	(0.56)	-	-	-	-	23.64	(0.29)	-1.46	0.09
Percentage Leisure with Adults	72.53	(1.33)	70.34	(0.94)	-	-	-	-	59.44	(0.49)	-13.09	<0.01
Normalized number of Leisure Intervals	0.25	(0.000)	0.25	(0.000)	0.26	(0.000)	0.27	(0.000)	0.27	(0.000)	0.02	<0.01
N° Observations	587		796		424		940		2,148			
Women												
Variables	(1)		(2)		(3)		(4)		(5)		(6)	
	1965		1975		1985		1993		2003		Difference 1965-2003	p-value Difference
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.		
Leisure Time	32.71	(0.74)	37.63	(0.52)	36.27	(0.76)	37.4	(0.42)	37.15	(0.28)	4.44	<0.01
Pure Leisure	31.20	(0.74)	34.41	(0.55)	31.62	(0.80)	-	-	-	-	0.43	0.70
Percentage Pure Leisure	89.82	(0.83)	87.34	(0.62)	86.35	(0.91)	-	-	-	-	-3.47	<0.01
Leisure with Spouse	11.83	(0.51)	11.12	(0.35)	-	-	-	-	10.76	(0.19)	-1.07	0.05
Percentage Leisure with Spouse	34.56	(1.17)	30.46	(0.81)	-	-	-	-	29.33	(0.44)	-5.23	<0.01
Leisure with Adults	24.20	(0.65)	26.59	(0.45)	-	-	-	-	23.95	(0.25)	-0.25	0.72
Percentage Leisure with Adults	68.93	(1.13)	69.18	(0.78)	-	-	-	-	61.75	(0.43)	-7.18	<0.01
Normalized number of Leisure Intervals	0.22	(0.000)	0.25	(0.000)	0.25	(0.000)	0.25	(0.000)	0.27	(0.000)	0.05	<0.01
N° Observations	256		612		375		1,396		3,406			

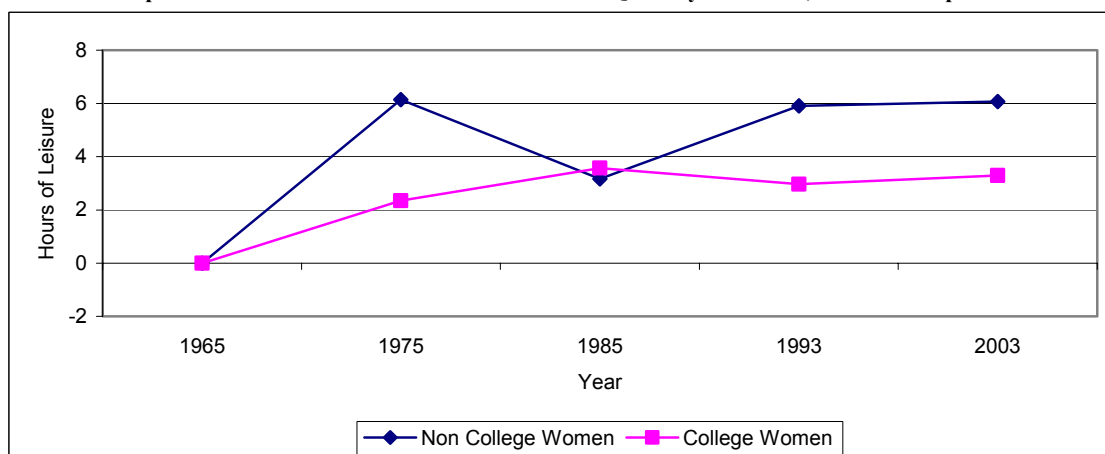
Notes: ¹ Standard errors in parenthesis. ² Sample consists of respondents in the AHTUS (1965-2003), who are not retired, are not students and are aged 21-65. ³ Leisure time is measured in hours per week.

Graph 1A – Coefficients on Year Dummies for the Quantity of Leisure, Men Sample^{1,2,3}



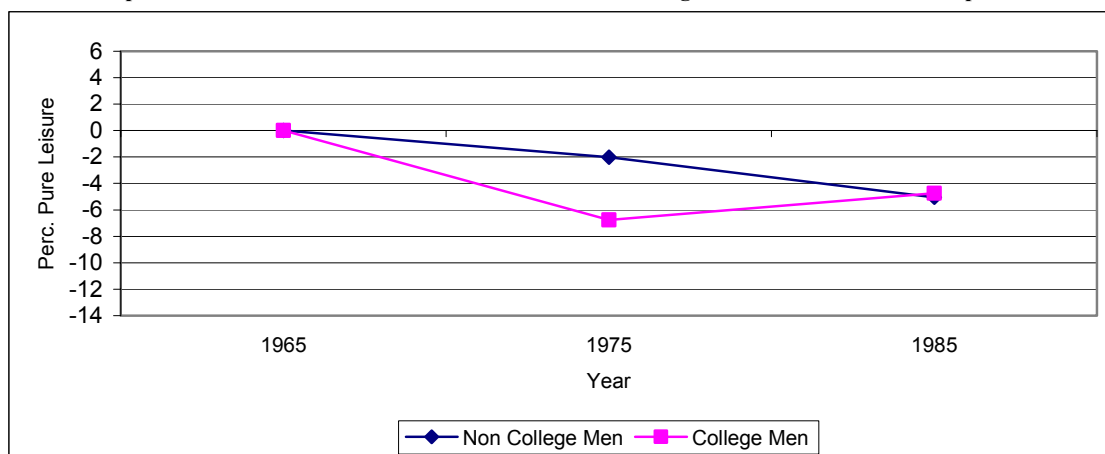
Note: ¹ This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as hours-per-week deviation from 1965, conditional on demographics.

Graph 1B – Coefficients on Year Dummies for the Quantity of Leisure, Women Sample^{1,2,3}



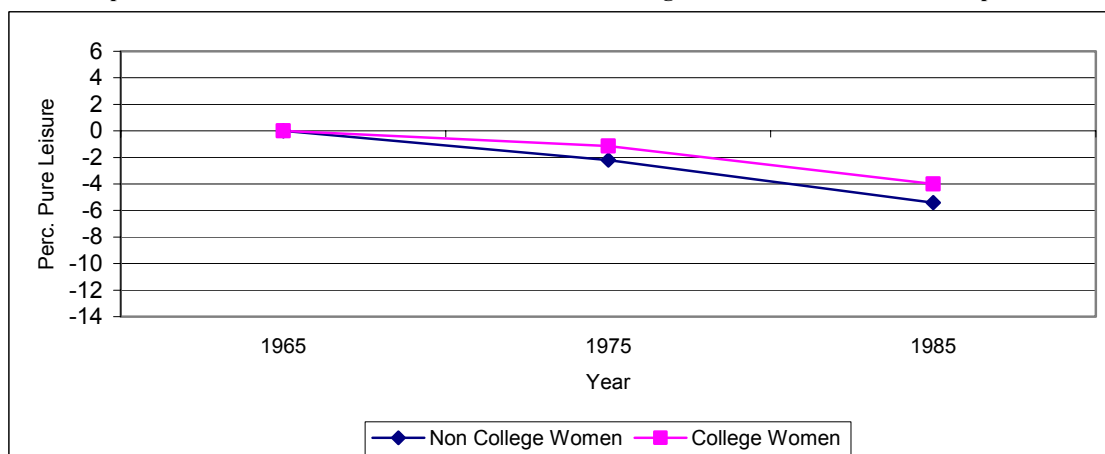
Note: ¹ This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as hours-per-week deviation from 1965, conditional on demographics.

Graph 2A – Coefficients on Year Dummies for the Percentage of *Pure Leisure*, Men Sample^{1,2,3}



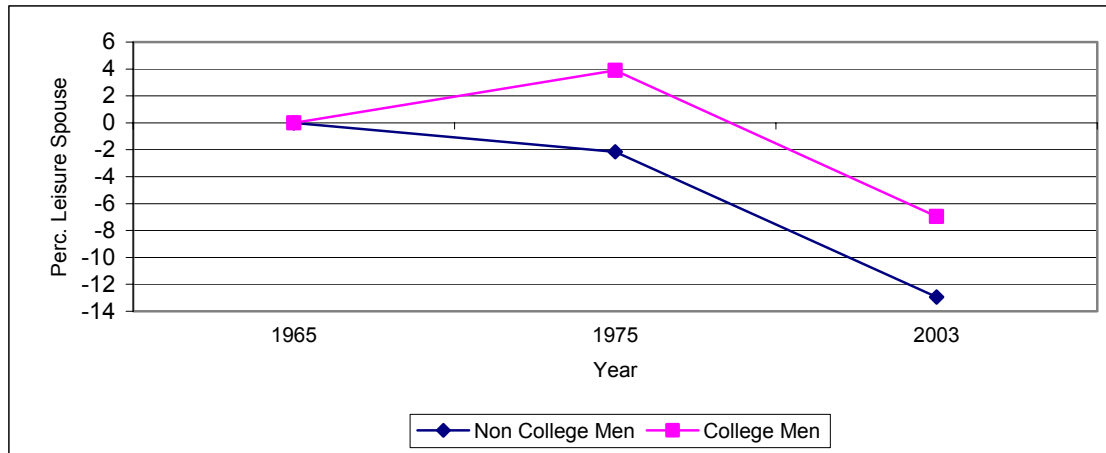
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-Pure-Leisure deviation from 1965, conditional on demographics.

Graph 2B – Coefficients on Year Dummies for the Percentage of *Pure Leisure*, Women Sample^{1,2,3}



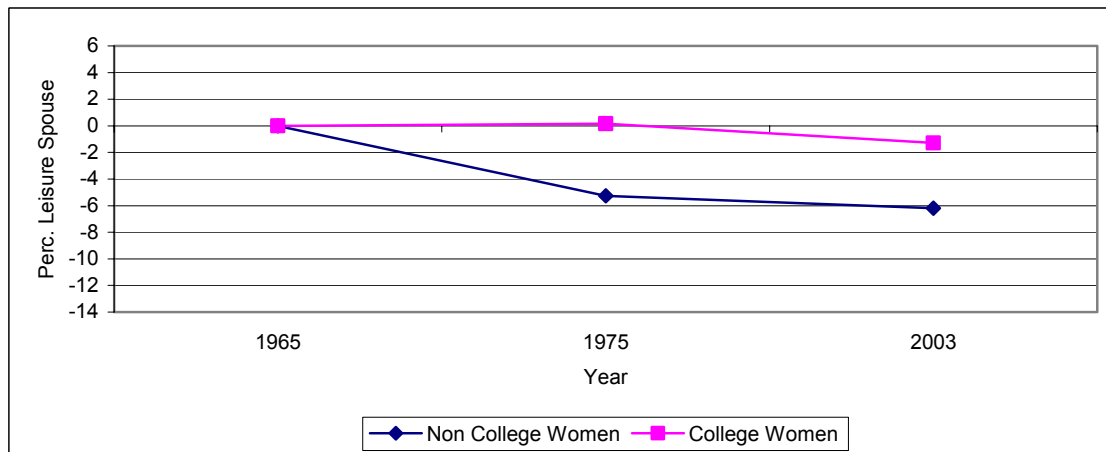
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-Pure-Leisure deviation from 1965, conditional on demographics.

Graph 3A – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Men Sample^{1,2,3}



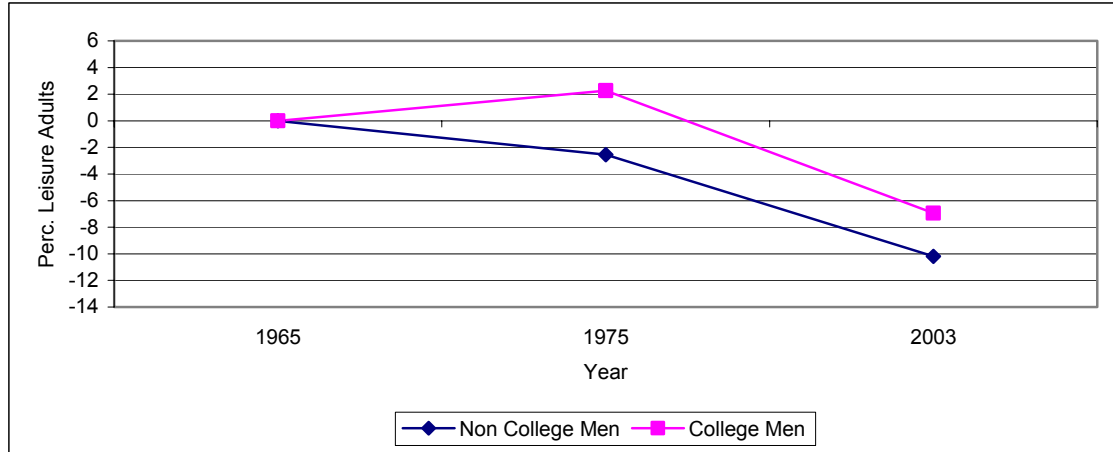
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-Leisure-with-Spouse deviation from 1965, conditional on demographics.

Graph 3B – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Women Sample^{1,2,3}



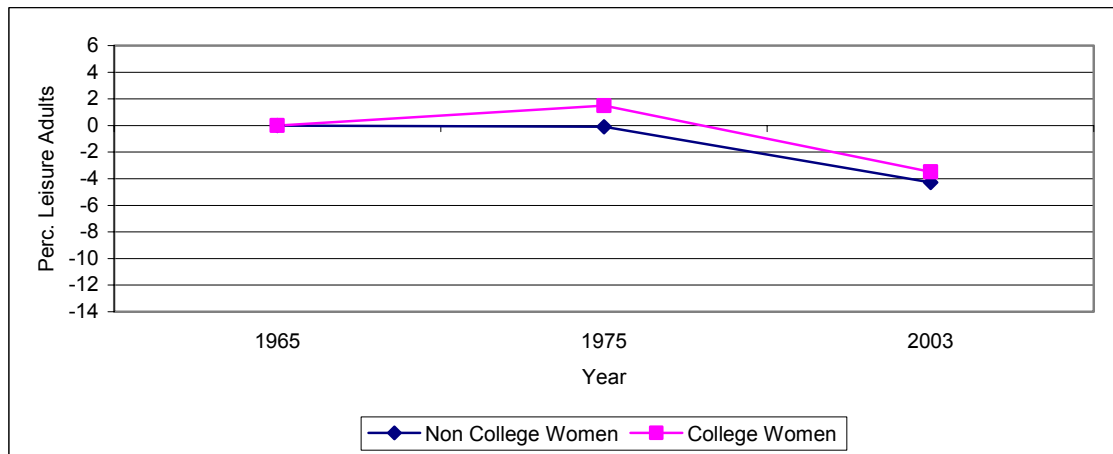
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-Leisure-with-Spouse deviation from 1965, conditional on demographics.

Graph 4A – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Men Sample ^{1,2,3}



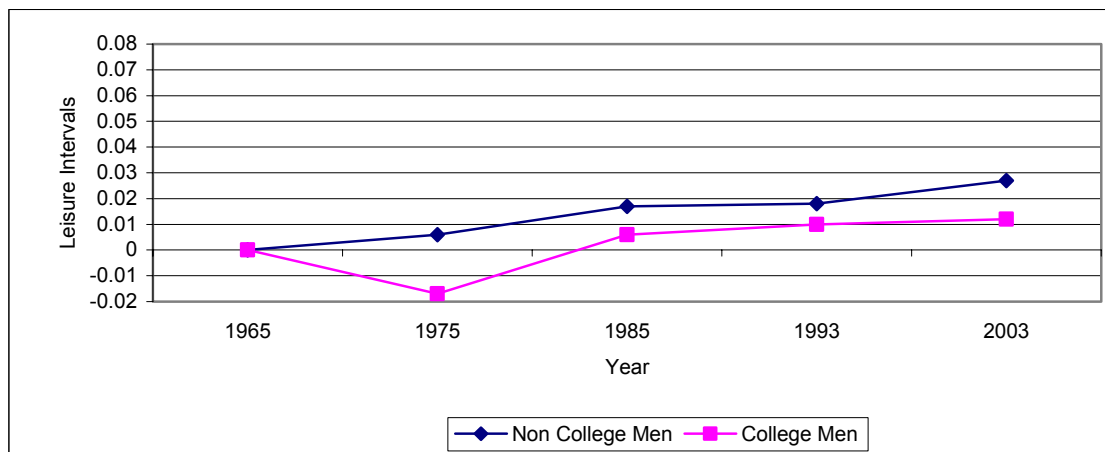
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-*Leisure-with-Adults* deviation from 1965, conditional on demographics.

Graph 4B – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Women Sample ^{1,2,3}



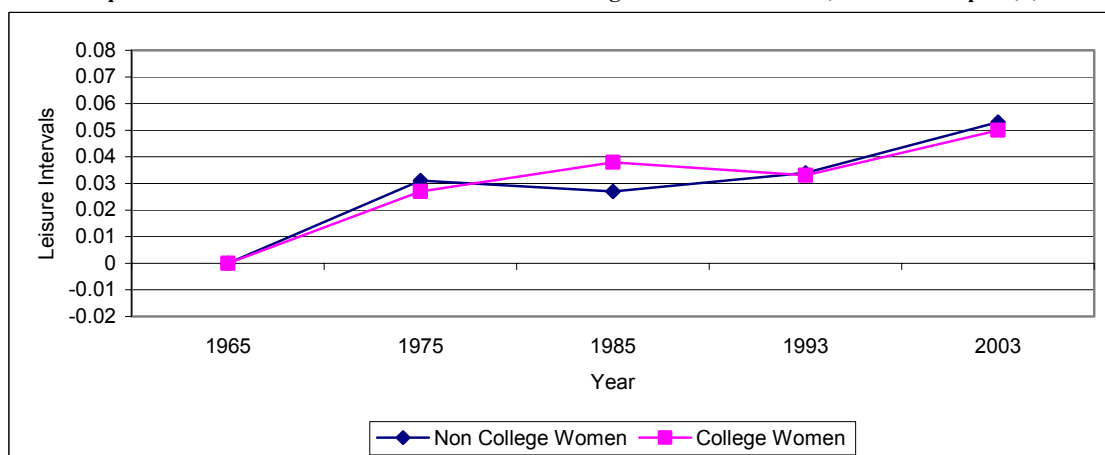
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-*Leisure-with-Adults* deviation from 1965, conditional on demographics.

Graph 5A – Coefficients on Year Dummies for the Fragmentation of Leisure, Men Sample ^{1,2,3}



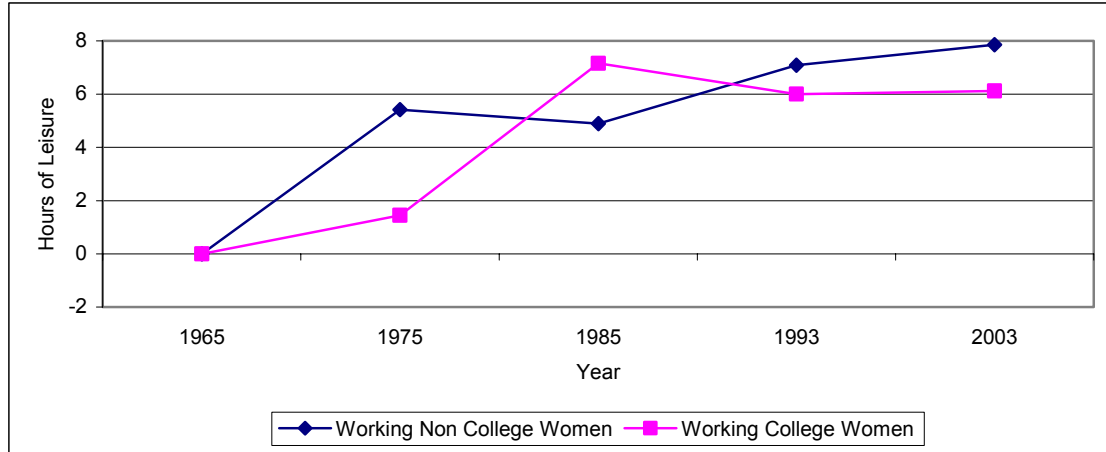
Note: ¹ This figure plots the coefficients on year dummies from regressions of normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as normalized-number-of-leisure-intervals deviation from 1965, conditional on demographics.

Graph 5B – Coefficients on Year Dummies for the Fragmentation of Leisure, Women Sample ^{1,2,3}



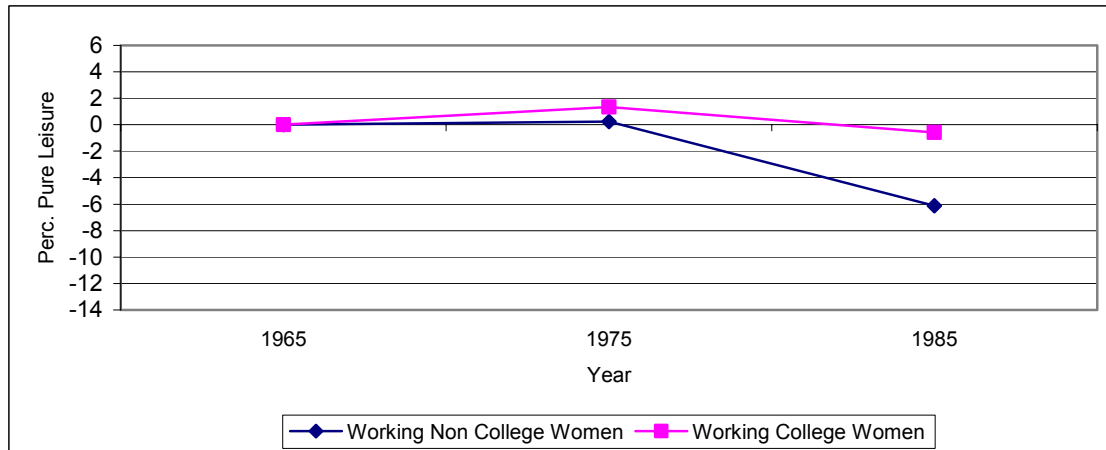
Note: ¹ This figure plots the coefficients on year dummies from regressions of normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as normalized-number-of-leisure-intervals deviation from 1965, conditional on demographics.

Graph 6A – Coefficients on Year Dummies for the Quantity of Leisure, Working Women ^{1,2,3}



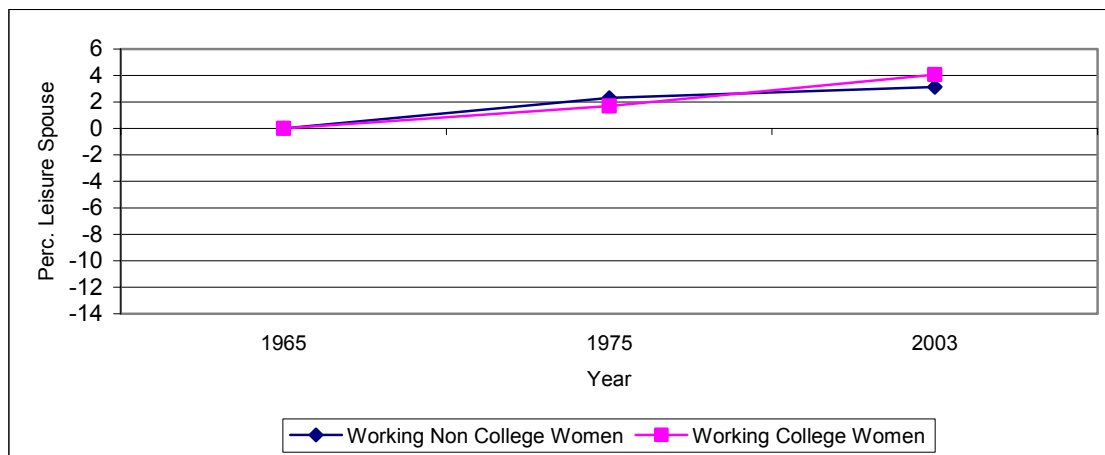
Note: ¹ This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as hours-per-week deviation from 1965, conditional on demographics.

Graph 6B – Coefficients on Year Dummies for the Percentage of Pure Leisure, Working Women ^{1,2,3}



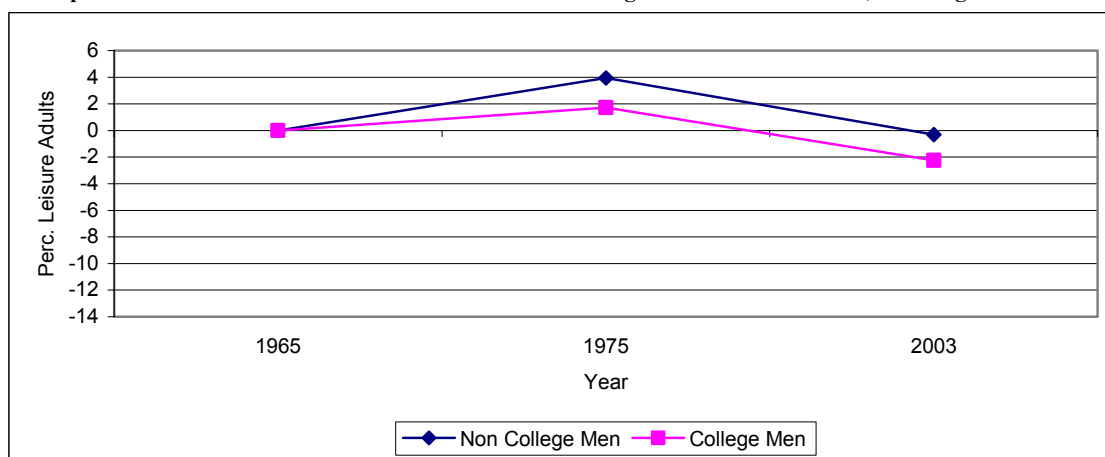
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-Pure-Leisure deviation from 1965, conditional on demographics.

Graph 6C – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Working Women^{1,2,3}



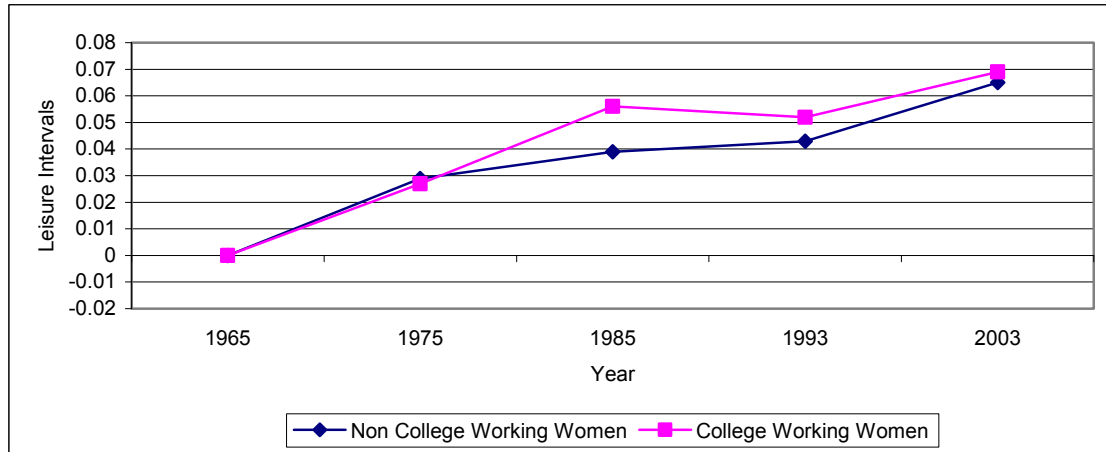
Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-*Leisure-with-Spouse* deviation from 1965, conditional on demographics.

Graph 6D – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Working Women^{1,2,3}



Note: ¹ This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as percentage-of-*Leisure-with-Adults* deviation from 1965, conditional on demographics.

Graph 6E – Coefficients on Year Dummies for the Fragmentation of Leisure, Working Women^{1,2,3}



Note: ¹ This figure plots the coefficients on year dummies from regressions of normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls ² Regressions are run separately for each educational group ³ The coefficients should be interpreted as normalized-number-of-leisure-intervals deviation from 1965, conditional on demographics.

APPENDIX A

Appendix A Table A1: AHTUS Description ¹

Study aims, target populations, and sample restrictions			
Survey years	Organizing Aims and Considerations	Target Population	Sampling Restrictions
1965-1966	Comparability with the Multinational Comparative Time-Budget project collected in 12 countries	The national working age population (19-64) of the USA (excluding families where all members worked as farmers)	Only people aged 19 to 64 (with a few older diarists), and one person per household (Alaska, Hawaii, and some smaller, rural states excluded)
1975-1976	Measure national accounts and changes in time use over the year	The national adult population	People aged 18 or older and one person plus spouse if present per household
1985	Determined how people used their time and to compare diaries collected by post-out/post-back, phone, and face-to-face interview	The national population beyond secondary school age not living in institutions	People aged 12 or older living in private households with phones (Alaska, Hawaii, and some smaller, rural states excluded)
1992-1994	The study measured time use and exposure	The national population living in private residences	1 person of any age living in sampled private households with phones (Alaska and Hawaii excluded)
2003	The study follows a sub-sample of the CPS for a 9 th wave to facilitate the study of national accounts	The national population not living in military bases or institutions	1 person aged 15 or older in the household
Relevant points in time from the sample designs			
Survey years	Fieldwork Period	Sampling of Days of the Week	When Activities Were Recorded
1965-1966	15 November -15 December 1965; 1 January - 18 February 1966; 7 March - 20 May, 1966	2/7ths of diaries were stamped for collection on a weekend day; 5/7ths were stamped for collection on a weekday	A two-stage tomorrow approach, diaries left behind for completion on diary day
1975-1976	Wave 1: 9 October 1975 - 22 November 1975; Wave 2: 6 February 1976 - 28 March 1976; Wave 3: 2 May 1976 - 19 July 1976; Wave 4: 4 September 1976 - 26 October 1976	The study aimed to collect one diary on a Sunday, one on a Saturday, and two on different weekdays from each sample member.	Diaries covered the previous 24 hour day
1985	Whole year of 1985	Mail-out after phone calls.	Diaries to be completed on a specified day in the subsequent week
1992-1994	September 1992 – October 1994	Phone calls were attempted on all days of the week.	Diaries covered the previous 24 hour day
2003	Whole year of 2003	Half of diaries were collected on weekday, half on weekend days.	Diaries covered the previous 24 hour day
Sample designs and response rates			
Survey years	Sample Frame	How Sample Drawn	Response Rate
1965-1966	Jackson, Michigan and surrounding townships, and a national sample	Jackson – random selection; National multi-stage clustered area sampling of clusters containing around 4 addresses; one individual per household	82% in Jackson; 74% in the national sample
1975-1976	Private households	Stratified, clustered and probability selection within strata. One individual was sampled per household. Data was also collected from spouses where present.	72% in the first wave; 44.9% responded to all four waves
1985	Adults 18 years or over, living in houses with telephones in the contiguous United States.	Stratified and clustered, random-digit dialing, with only private residences pursued for an interview. Information on the household collected by telephone.	55.2% overall, 51% for mail back sample
1992-1994	Potential phone numbers within lists of area codes	Random-digit dialing, only private residences pursued for interview. The person who would net have a birthday completed the diary.	63%
2003	The CPS sample	A random sub-sample of the CPS, with the over-sampling of small states dropped but families with children over-sampled. Half of the diaries are collected on week days, the other half on weekend days	57.8%

Note: ¹ Source: Fisher, Egerton, Torres, Pollmann and Gershuny [2006a].

Appendix A Table A2: AHTUS Codes and Leisure Codes ^{1,2}

		1965	1975-76	1985	1992-94	2003
-8	item missing					
1	general or other personal care					
2	imputed personal or household care					
3	Sleep					
4	imputed sleep					
5	naps and rest				N/A	
6	wash, dress, personal care					
7	personal medical care					
8	meals at work				N/A	
9	other meals & snacks					
10	main paid work (not at home)					
11	paid work at home					
12	Second job, other paid work					
13	work breaks					
14	other time at workplace				N/A	
15	time looking for work	N/A				
16	regular schooling, education					
17	Homework					
18	short course or training					
19	occasional or other education/training					
20	food preparation, cooking					
21	set table, wash/put away dishes					
22	Cleaning					
23	laundry, ironing, clothing repair					
24	home repairs, maintain vehicle					
25	other domestic work					
26	purchase routine goods					
27	purchase consumer durables					
28	purchase personal services					
29	purchase medical services					
30	purchase repair, laundry services					
31	financial/government services					
32	purchase other services					
33	care of infants					
34	general care of older children					
35	medical care of children					
36	play with children					
37	supervise child or help with homework					
38	read to, talk with child					
39	other child care					
40	adult care					
41	general voluntary acts		L			
42	political and civic activity		L			
43	union and professional activities		L	N/A		N/A
44	volunteer child/family organization		L	N/A		N/A
45	volunteer fraternal organization		L	N/A		N/A
46	other formal volunteering		L			N/A
48	acts for religious organization		L			N/A
49	worship and religious acts		L			
50	general out-of-home leisure		L		N/A	

Notes: ¹ N/A indicates that the activity is not available in that particular survey and L indicates that the activity is assumed to be a leisure activity ² Source: Fisher, Egerton, Torres, Pollmann and Gershuny [2006a].

Appendix A Table A2 (Cont.). AHTUS Codes and Leisure Codes ^{1,2}

			1965	1975-76	1985	1992-94	2003
51	attend sporting event	L					
52	go to cinema	L					
53	theater, concert, opera	L					
54	museums, exhibitions	L					
55	attend other public event	L					N/A
56	restaurant, cafe bar	L					
57	Parties or receptions	L					
58	imputed time away from home	L					
60	sports & exercise	L					
62	Walking	L				N/A	
63	Cycling	L	N/A			N/A	
64	outdoor recreation	L	N/A				
65	physical activity, sports with child	L					
66	hunting, fishing, boating, hiking	L				N/A	
67	Gardening					N/A	
68	pet care, walk dogs					N/A	
70	general indoor leisure	L					
71	imputed in-home social	L					
72	receive or visit friends	L					
73	other in-home social, games	L					
74	play musical instrument, sing, act	L					N/A
75	Artistic activity	L					N/A
76	Crafts	L					N/A
77	Hobbies	L					
78	relax, think, do nothing	L					
81	read books	L					
82	read periodicals	L					N/A
83	read newspapers	L					N/A
84	Listen to music (CD etc.)	L					
85	listen to radio	L					
86	watch television, video	L					
87	writing by hand	L					
88	conversation, phone, texting	L					
89	use computer	L	N/A	N/A			
90	imputed travel	L	N/A	N/A			
91	personal or adult care travel		N/A	N/A			
92	travel as part of paid work		N/A	N/A	N/A		
93	travel to/from work + other work travel				N/A		
94	travel related to education				N/A		
95	travel related to consumption						
96	travel related to child care						
97	travel for volunteering or worship	L					
98	other travel	L					

Notes: ¹ N/A indicates that the activity is not available in that particular survey and L indicates that the activity is assumed to be a leisure activity ² Source: Fisher, Egerton, Torres, Pollmann and Gershuny [2006a].

APPENDIX B

Appendix B Table B1 – Demographic composition of the time-diary samples ^{1,2}

General										
Variables	(1) 1965		(2) 1975		(3) 1985		(4) 1993		(5) 2003	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Age	40.814	(12.32)	39.832	(12.43)	38.798	(11.86)	39.373	(11.29)	41.940	(11.40)
College	0.269	(0.44)	0.343	(0.47)	0.442	(0.50)	0.587	(0.49)	0.614	(0.49)
Married	0.817	(0.39)	0.725	(0.45)	0.714	(0.45)	-	-	0.636	(0.48)
Presence of Children	0.596	(0.49)	0.541	(0.50)	0.430	(0.50)	0.289	(0.45)	0.450	(0.50)
Number of Children	1.416	(1.6)	1.180	(1.39)	0.741	(1.03)	0.546	(1.0)	0.845	(1.13)
Working	0.737	(0.44)	0.734	(0.44)	0.823	(0.38)	0.847	(0.36)	0.830	(0.38)
N° Observations	1,841		3,234		1,673		5,062		12,485	
Men										
Variables	(1) 1965		(2) 1975		(3) 1985		(4) 1993		(5) 2003	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Age	40.561	(12.26)	39.539	(12.16)	38.683	(11.56)	39.320	(11.19)	41.812	(11.33)
College	0.303	(0.46)	0.426	(0.49)	0.465	(0.50)	0.596	(0.49)	0.609	(0.49)
Married	0.865	(0.34)	0.770	(0.42)	0.743	(0.44)	-	-	0.664	(0.47)
Presence of Children	0.633	(0.48)	0.524	(0.50)	0.447	(0.50)	0.254	(0.44)	0.422	(0.49)
Number of Children	1.469	(1.56)	1.169	(1.44)	0.771	(1.04)	0.480	(0.96)	0.798	(1.11)
Working	0.990	(0.10)	0.924	(0.27)	0.949	(0.22)	0.924	(0.27)	0.894	(0.31)
N° Observations	843		1,408		799		2,336		5,554	
Women										
Variables	(1) 1965		(2) 1975		(3) 1985		(4) 1993		(5) 2003	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Age	41.049	(12.38)	40.096	(12.67)	38.906	(12.14)	39.418	(11.38)	42.067	(11.47)
College	0.237	(0.43)	0.268	(0.44)	0.421	(0.49)	0.579	(0.49)	0.620	(0.49)
Married	0.772	(0.42)	0.683	(0.47)	0.687	(0.46)	-	-	0.609	(0.49)
Presence of Children	0.562	(0.50)	0.556	(0.50)	0.415	(0.49)	0.318	(0.47)	0.479	(0.50)
Number of Children	1.367	(1.64)	1.190	(1.34)	0.714	(1.02)	0.601	(1.03)	0.891	(1.14)
Working	0.503	(0.50)	0.561	(0.50)	0.706	(0.46)	0.783	(0.41)	0.766	(0.42)
N° Observations	998		1,826		874		2,726		6,931	

Note: ¹ Standard errors in brackets. ² Sample consists of individuals in the AHTUS (1965-2003), who are not retired, are not students and are aged 21-65.

APPENDIX C

Appendix C Table C1. Coefficients on Year Dummies, Men Sample ^{1,2}

<i>Low Education</i>									
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)
	1975		1985		1993		2003		Number Observ.
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	
<i>Leisure Time</i>	-1.615	(1.84)	2.624	(2.05)	5.228***	(1.74)	4.233**	(1.64)	6,021
<i>Pure Leisure</i>	-3.447**	(1.60)	0.823	(1.77)	-	-	-	-	1,242
<i>Percentage Pure Leisure</i>	-6.754***	(1.82)	-4.732**	(2.02)	-	-	-	-	1,242
<i>Leisure with Spouse</i>	-0.522	(1.32)	-	-	-	-	-1.053	(1.18)	4,273
<i>Percentage Leisure with Spouse</i>	3.897	(2.89)	-	-	-	-	-6.946***	(2.58)	4,273
<i>Leisure with Adults</i>	-2.18***	(1.26)	-	-	-	-	-0.57	(1.13)	4,273
<i>Percentage Leisure with Adults</i>	-2.55	(1.98)	-	-	-	-	-10.18***	(1.76)	4,273
<i>Normalized number of Leisure Intervals</i>	0.006	(0.01)	0.017**	(0.01)	0.018***	(0.01)	0.027***	(0.01)	6,021
<i>High Education</i>									
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)
	1975		1985		1993		2003		Number Observ.
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	
<i>Leisure Time</i>	2.342	(1.78)	3.572*	(1.89)	2.965*	(1.59)	3.297**	(1.53)	6,917
<i>Pure Leisure</i>	1.928	(1.61)	1.778	(1.71)	-	-	-	-	1,100
<i>Percentage Pure Leisure</i>	-1.139	(1.85)	-3.989**	(1.96)	-	-	-	-	1,100
<i>Leisure with Spouse</i>	-0.793	(1.22)	-	-	-	-	-0.403	(1.05)	5,022
<i>Percentage Leisure with Spouse</i>	0.163	(2.85)	-	-	-	-	-1.286	(2.45)	5,022
<i>Leisure with Adults</i>	-1.19	(1.63)	-	-	-	-	-0.42	(1.45)	5,022
<i>Percentage Leisure with Adults</i>	2.27	(2.77)	-	-	-	-	-6.95***	(2.48)	5,022
<i>Normalized number of Leisure Intervals</i>	-0.017**	(0.01)	0.006	(0.01)	0.01	(0.01)	0.012*	(0.01)	6,917

Note: ¹ This table reports the coefficients and standard errors for the time dummies that are plotted in the graphs. See notes to the figures for full sample and methodological descriptions ²
 ***Significant at the 1% level **Significant at the 5% level *Significant at the 10 % level.

Appendix C Table C2. Coefficients on Year Dummies, Women Sample ^{1,2}

<i>Low Education</i>									
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)
	1975		1985		1993		2003		Number Observ.
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	
<i>Leisure Time</i>	5.418***	(1.38)	4.893***	(1.61)	7.083***	(1.36)	7.855***	(1.25)	3,955
<i>Pure Leisure</i>	3.777***	(1.19)	1.451	(1.39)	-	-	-	-	1,407
<i>Percentage Pure Leisure</i>	0.232	(1.64)	-6.119***	(1.90)	-	-	-	-	1,407
<i>Leisure with Spouse</i>	2.098**	(0.99)	-	-	-	-	3.468***	(0.89)	2,840
<i>Percentage Leisure with Spouse</i>	2.315	(2.43)	-	-	-	-	3.135	(2.19)	2,840
<i>Leisure with Adults</i>	2.89***	(0.92)	-	-	-	-	1.36	(0.86)	2,840
<i>Percentage Leisure with Adults</i>	-0.09	(1.52)	-	-	-	-	-4.27***	(1.42)	2,840
<i>Normalized number of Leisure Intervals</i>	0.031***	(0.01)	0.027***	(0.01)	0.034***	(0.01)	0.053***	(0.00)	3,955
<i>High Education</i>									
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)
	1975		1985		1993		2003		Number Observ.
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	
<i>Leisure Time</i>	1.441	(2.34)	7.154***	(2.38)	6.005***	(2.08)	6.122***	(2.03)	5,476
<i>Pure Leisure</i>	0.753	(2.10)	5.200**	(2.14)	-	-	-	-	716
<i>Percentage Pure Leisure</i>	1.357	(2.73)	-0.582	(2.78)	-	-	-	-	716
<i>Leisure with Spouse</i>	-0.820	(1.59)	-	-	-	-	2.061	(1.38)	3,894
<i>Percentage Leisure with Spouse</i>	1.750	(3.89)	-	-	-	-	4.066	(3.37)	3,894
<i>Leisure with Adults</i>	0.710	(1.58)	-	-	-	-	-0.240	(1.36)	3,894
<i>Percentage Leisure with Adults</i>	1.490	(2.71)	-	-	-	-	-3.480	(2.33)	3,894
<i>Normalized number of Leisure Intervals</i>	0.027***	(0.01)	0.038***	(0.01)	0.033***	(0.01)	0.050***	(0.01)	5,476

Note: ¹ This table reports the coefficients and standard errors for the time dummies that are plotted in the graphs. See notes to the figures for full sample and methodological descriptions ²
***Significant at the 1% level **Significant at the 5% level *Significant at the 10 % level

Appendix C Table C3 Coefficients on Year Dummies, Working Women^{1,2}

<i>Low Education</i>									
<i>Variables</i>	(1) 1975		(2) 1985		(3) 1993		(4) 2003		(5) Number Observ.
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	
<i>Leisure Time</i>	-0.909	(1.41)	2.971*	(1.71)	4.605***	(1.45)	5.756***	(1.25)	4,869
<i>Pure Leisure</i>	-1.719	(1.22)	-1.489	(1.49)	-	-	-	-	1,805
<i>Percentage Pure Leisure</i>	-2.022	(1.32)	-5.055***	(1.62)	-	-	-	-	1,805
<i>Leisure with Spouse</i>	-0.934	(1.02)	-	-	-	-	-1.937**	(0.91)	3,529
<i>Percentage Leisure with Spouse</i>	-2.15	(2.18)	-	-	-	-	-12.940***	(1.94)	3,529
<i>Leisure with Adults</i>	3.437***	(1.26)	-	-	-	-	3.763***	(1.14)	3,529
<i>Percentage Leisure with Adults</i>	3.948*	(2.30)	-	-	-	-	-0.309	(2.08)	3,529
<i>Normalized number of Leisure Intervals</i>	0.029***	(0.01)	0.039***	(0.01)	0.043***	(0.01)	0.065***	(0.01)	4,869
<i>High Education</i>									
<i>Variables</i>	(1) 1975		(2) 1985		(3) 1993		(4) 2003		(5) Number Observ.
	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	Coeff	S.E.	
<i>Leisure Time</i>	-1.615	(1.84)	2.624	(2.05)	5.228***	(1.74)	4.233**	(1.64)	6,021
<i>Pure Leisure</i>	-3.447**	(1.60)	-1.774	(1.77)	-	-	-	-	1,242
<i>Percentage Pure Leisure</i>	-6.754***	(1.82)	-4.732**	(2.02)	-	-	-	-	1,242
<i>Leisure with Spouse</i>	-0.522	(1.32)	-	-	-	-	-1.053	(1.18)	4,273
<i>Percentage Leisure with Spouse</i>	3.897	(2.89)	-	-	-	-	-6.946***	(2.58)	4,273
<i>Leisure with Adults</i>	-0.503	(2.05)	-	-	-	-	1.681	(1.78)	4,273
<i>Percentage Leisure with Adults</i>	1.725	(3.75)	-	-	-	-	-2.247	(3.26)	4,273
<i>Normalized number of Leisure Intervals</i>	0.027***	(0.01)	0.056***	(0.01)	0.052***	(0.01)	0.069***	(0.01)	6,021

Note: ¹ This table reports the coefficients and standard errors for the time dummies that are plotted in the graphs. See notes to the figures for full sample and methodological descriptions ²

***Significant at the 1% level **Significant at the 5% level *Significant at the 10 % level.