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## Leisure Inequality in the US: 1965-2003<sup>1</sup>

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### Abstract

*This paper focuses on the quality of leisure time to show that a historical equalization in the distribution of leisure in terms of quantity has been counterbalanced to some extent by a simultaneous increase in the unequal distribution of leisure quality. We exploit the nature of diary data in the American Heritage Time Use Study (AHTUS) to construct three classes of indicators that capture the quality of leisure (“leisure dilution”, “leisure fragmentation” and “co-present leisure”). Complementary evidence on the instant enjoyment of activities is used to demonstrate that these indicators genuinely capture aspects of leisure quality. We deploy the leisure-quality indicators to show that highly educated individuals may now have less leisure than others, but this leisure is less fragmented, more likely to be enjoyed in the company of other adults, and is less likely to be contaminated by simultaneous non-leisure activities. By providing a more complete picture of how the unequal distribution of leisure in terms of quantity and quality has evolved in the last decades for the US, our results provide a basis for interpreting inequality in the US and for weighing the relative decline in earnings and consumption for the less educated against the simultaneous relative growth of leisure.*

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

**Keywords:** Leisure; Inequality; Income; Wages; Consumption; Time-Use; Time Budgets

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*“The basis on which good repute in any highly organized industrial community ultimately rests is pecuniary strength; and the means of showing pecuniary strength, and so of gaining or retaining a good name, are leisure and a conspicuous consumption of goods”*

Thorstein Veblen (1953), Chapter 4.

## 1. Introduction

The unequal distribution of leisure 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. Despite growing wage and expenditure inequality in the U.S (e.g., Attanasio and Davis [1996], Autor and Katz [1999], Krueger and Perri [2006]), the cross-sectional distribution of leisure time has expanded over the last 40 years (Aguilar and Hurst [2007]). While the level of leisure in 1965 was roughly equal across educational groups, the subsequent increase in leisure was greatest among low educated adults. Thus, highly educated individuals have now less leisure time than low educated individuals.<sup>1</sup> This variation in leisure across educational levels has also been documented by Gershuny [2009a]; a reversal of the previously negative relationship between human capital and work time is found in all 11 developed economies for which comparable historical time use data is available. Understanding why less-educated adults have increased their relative consumption of leisure, particularly in the last twenty years, the same period in which wages and consumption expenditures increased faster for highly educated adults, can help us in interpreting inequality in the US and in weighing the relative growth of leisure for the less educated against the simultaneous decline in relative wages and consumption.

In this paper we uncover the black box of leisure time and exploit the rich information in the time-use diary data to construct three classes of indicators that capture the quality of leisure (“leisure dilution”, “leisure fragmentation” and “co-present leisure”). In particular we look at the simultaneity of leisure activities with non-leisure activities, the presence of other individuals while the respondent is engaging in a leisure activity, and the extent to which leisure events are interrupted by other activities. We start by validating these indicators, using, for the first time, complementary evidence on the instant enjoyment of activities. Results from the validation exercise show that our indicators do genuinely capture aspects of leisure quality that contribute to enjoyment of activities beyond what is predicted by individual characteristics or the nature of the activity. Thus, even though we lack the additional information about respondents’ enjoyment of

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<sup>1</sup> A similar pattern is found by Costa [2000], who documents that low-wage workers reduced their market work hours relative to high-wage workers between 1890s and 1991. In particular, at the turn of the twentieth century, low-wage workers worked longer hours than high-wage workers. This differential disappeared by the early 1970s, and during the last thirty years high-wage workers supplied relatively more market hours.

activities across the historical period being analyzed, the diary still provides direct information that can be used in a well-crafted empirical decomposition of trends in the quantity and quality of U.S. leisure time. Based on these leisure-quality indicators, we show that the decrease in the unequal distribution of leisure in terms of *quantity* has been counterbalanced to some extent by a simultaneous increase in the unequal distribution of leisure in terms of *quality*.

By providing a more comprehensive account of leisure, our work adds to the existing literature on measuring changes in the allocation of time in the US. This literature mainly concentrates on the study of aggregate times (e.g., Ghez and Becker [1975], Juster and Stafford [1985], Robinson and Godbey [1997], and Aguiar and Hurst [2007]). However, introducing other dimensions of time in the analysis of inequality is crucial. Although the scarcity of leisure time may seem analogous to income poverty, in that both reflect the scarcity of resources, the two concepts have different dynamics. In a growing economy the goods constraint relaxes over time, whereas the 24 hours per day time constraint, does not. We propose in what follows that the time-budget constraint can however be ameliorated by adjusting the quality of leisure over time.

There are different ways of assessing the quality of leisure. One methodology is to use self-reported measures of how enjoyable activities are. This is the spirit of the related albeit distinct approaches described in the literature respectively as *process benefits* and *experienced utility*. The former uses time-diaries in combination with a separate questionnaire containing self-assessment of enjoyment of specific activities, to estimate individuals' subjective well-being (see Juster et al. [1985]). The latter uses diaries as the source of information on both activity durations and enjoyment levels (see Robinson [1993], Gershuny and Halpin [1996], Sullivan [1996a,1996b], and Kahneman and Krueger [2006] among others). The experience sampling method, which consists in asking the individual about his or her emotions at the moment or shortly after the event happens, is the optimal approach to capturing an individual's instant enjoyment of an activity, but this method imposes a considerable burden on respondents, and can only be used to capture a few disconnected activities in the course of a day. The "*yesterday*" diary method (also described as the "*day reconstruction method*" by Kahneman et al [2004]) in which respondents record their recollections of their affective responses within 24 hours of the actual events, is probably the best currently available compromise.

Though we have a historical series of representative diary samples for the US (and for many other countries), only one of the US surveys (and one similar UK survey) contains information about instant enjoyment levels for a nationally representative sample. We thus propose an approach complementary to experienced utility that uses the rich information in the existing US

time-use diary series to measure the distribution of quantity and quality of leisure across education groups in the last decades. The diary records allow us to look, beyond the total times spent in a given activity, to the event level indicators of diary quality described briefly above.

These leisure-quality indicators emerge independently from different strands in the socio-economic and psychological literature. The relationship between quality of leisure and some of these indicators, in particular those related to the presence of other individuals while the respondent engages in leisure activities, has been directly established using instant-enjoyment data of the sort proposed by the *experienced-utility* literature (Sullivan [1996a,1996b], Kahneman et al [2004]). The other two sorts of indicator are discussed in prior literature (e.g., Bittman and Wajcman [2000], Bianchi et al [2006]), but have not been directly validated through comparison with enjoyment evidence. In what follows we validate the indicators using (*inter alia*) the under-exploited diary-derived instant enjoyment rating of activities in the 1985 component of the AHTUS (e.g., Robinson [1993]). We show that these indicators very effectively capture the diary respondents' descriptions of their own enjoyment of activities. Enjoying *uncontaminated* leisure, spending leisure time in the company of the spouse and other adults, and having less fragmented leisure all emerge as contributing to higher levels of enjoyability of activities. These results hold even after controlling for individual characteristics and the type of activity being done—implying in turn that our indicators alone are capable of conveying the great majority of the information about leisure quality.

Our indicators of leisure quality show that, despite increases in the quantity of leisure over this period (as reported by Aguiar and Hurst [2007] and others, and confirmed in Section 5 below), the quality of leisure has decreased for all groups. This result may help explain the fact that, despite general increases in leisure time, Americans report an increased feeling that leisure time has become scarcer and more harried compared to forty years ago (e.g., Hamermesh and Lee [2007], Robinson and Godbey [1997], Schor [1993]). However, the focus of this paper is a comparison across educational groups over time. It emerges that, despite highly-educated individuals now having less leisure time, they enjoy a higher quality of leisure than less-educated individuals.

After controlling for demographic and socio-economic characteristics, we find that low educated men, and to a much greater extent women, have increased the quantity of leisure significantly more than highly educated individuals over this period. Leisure time increases half an hour per week more for low educated men than for highly educated men, and increases three and a half hours more for low educated women than for highly educated women. These

differences however are reversed when we look at the quality of leisure. *Leisure dilution* (the amount of leisure time that is not “contaminated” by other non-leisure activities) declined much more for low educated individuals (about one and a half hours as opposed to just one hour for highly educated individuals). *Co-present leisure* also declined less for highly educated individuals during this period. Whereas highly educated men and women experienced almost no decrease in the time spent with the spouse, low educated individuals experienced a one-hour decrease of co-present leisure time. *Leisure fragmentation* also increased more for low educated individuals than for highly educated individuals. Our results show that low educated adults are more likely to have shorter leisure spells and more leisure intervals than highly educated individuals.

We further look at whether increases in the time spent watching television may have contributed disproportionately to the unequal distribution of leisure. We focus on this activity because it represents the largest single part of total leisure time, and has increased substantially over this period, particularly for low educated individuals. TV watching also ranks particularly low in terms of our quality indicators. We show however that the pattern of change of leisure quality (and quantity) across educational groups remains very similar when TV watching is not included in the definition of leisure. We also look at other leisure activities, ‘*At Home Leisure*’ and ‘*Read/Listen*’, which also represent a significant amount of leisure time. We find that these activities cannot entirely explain the pattern in the unequal distribution of leisure quality across educational groups either.

This paper is organized as follows. Section 2 describes the time-use datasets used in the analysis. Section 3 provides a conceptualization for the quantity of leisure, and presents the theoretical and empirical underpinnings for our leisure-quality indicators. Section 4 validates our leisure-quality indicators using additional diary information on instantaneous enjoyment. Section 5 presents the empirical strategy and the main results. Section 6 looks more deeply into how the nature of specific leisure activities may have contributed to the unequal distribution of leisure in terms of quantity and quality, and Section 7 concludes.

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

We use the American Heritage Time Use Study (AHTUS) in our main analysis. The AHTUS is a harmonized dataset that covers five decades, from 1965 to 2003, over five time-use surveys. Appendix A Table A1 describes the five surveys in the AHTUS. The harmonization exercise is comprehensively documented in Fisher et al. [2006], and the resulting data is freely

downloadable from [www.timeuse.org](http://www.timeuse.org). The harmonization exercise was commissioned by Professor William Nordhaus at the Yale University Program on Non-Market Accounts, from the Centre for Time Use Research (now in Oxford University, then at the University of Essex), and funded by the Glaser Progress Foundation. The harmonization project involved a great deal of effort due to the heterogeneity of the time diary datasets, and was peer-reviewed by a multidisciplinary body of time-use scholars, whose suggestions were incorporated into the final version of the dataset.<sup>2</sup>

While the time diary studies from 1965 forward have some common elements, they vary in terms of data quality. The two best data sets for our purposes are from 1975 and 2003. The 1975 study was reasonably funded and great attention was paid to the sampling and administration of the diaries to respondents (or respondent-spouse pairs in the case of married couples). The 2003 data from the American Time Use Survey are also of high quality, although they do have the anomalous absence of secondary activities. The 1965 data were a part of a multinational study and are restricted to urban areas of the US and had very low granularity in the diary coding (i.e., the categorization of activities was broader than later surveys).<sup>3</sup> The sample is also small. The 1985 and 1993 studies were funded at low level and included sampling and data quality compromises such as the use of mail back questionnaires.<sup>4</sup> Nevertheless, we have used all these data sets; the fact that the 1975-2003 pattern of change is consistent with that including the other surveys, particularly since the paper is based on fairly specialized constructions of the underlying diary activity records, makes us confident that we have identified real changes in the quality of leisure time.

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<sup>2</sup> Among the reviewers are Dr Dorinda Allard (Bureau of Labor Statistics); Professor Michael Bittman (University of New England); Professor Barbara M. Fraumeni (University of Southern Maine); Professor Daniel S. Hamermesh (University of Texas at Austin); Professor Andrew Harvey (Saint Mary's University); Dr Diane Herz (Bureau of Labor Statistics); Professor J. Steven Landefeld (Bureau of Economic Analysis); Dr Jay Stewart (Bureau of Labor Statistics); Dr Hidde van der Ploeg (University of Sydney); and Dr Vanessa Wight (University of Maryland). See reference on the AHTUS.

<sup>3</sup> While it is true that the 1965 Szalai Surveys contain fewer categories than ATUS, for instance, it is also true that the ATUS does not have many more useful categories than Szalai - there are some about security procedures, but the myriad of sports participation codes, fine detail shopping codes, fine detail household maintenance codes and the like are not commonly used in research as so very few respondents record these precise activities in their diaries. In practice, researchers collapse to much broader categories.

<sup>4</sup> Mail-back diaries are lower quality as respondents completing them are not expert in the diary process, and they make mistakes that impact diary quality. When a survey leaves behind a diary and the interviewer comes to collect the diary and goes over the entries with the diarist in person (HETUS, the USA 1975, the Szalai 1965 surveys, for example), the interviewer can identify mistakes and clarify and fix the entries with the diarist. Web-based diary collection and CATI (as is used in the ATUS and NHAPS) achieve similar quality improvements because the script prompts correction of common mistakes - such noting to the diarist -you make no mention of eating or drinking during the day. Are you sure that you did not eat or drink anything? or you reported being at your home at 8:45, and by 9:00 you say that you were at your workplace, yet you did not report any form of travel between these two places. How did you get from your home to your workplace, and when did you make this journey? (see Szalai [1972], Juster and Stafford [1985], Staikov [1989], Kalfs and Saris [1997]).

The main instrument of all the 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 used in previous studies 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.

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). This approach also avoids possible biases from the changing proportion of retired individuals in the general population over this long period. Not including individuals out of the labor force however may be particularly problematic if low educated individuals are more likely to be non-employed and thus have a higher amount of leisure. This is a problem that we share with previous studies that look at trends in the amount of leisure. The fact that we control for total leisure time in our analysis makes this issue less problematic for our indicators of leisure quality, although a possible bias remains if low educated individuals are more likely to be retired and if leisure time during retirement is of lower quality. In that case we would be underestimating the real inequality in leisure quality and the difference between low and high educated individuals with respect to the quality of leisure would be even greater. We have conducted robustness checks including retired and non-retired individuals between 24-65 and 24-72 years old. Results do not change (available upon request).

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, i.e., the diary has 90 minutes or less missing main activity time (that is they have accounted for the majority of the day), and it has seven or more episodes. The seven episode cut-off seems realistic. Most respondents have at least one sleep or rest episode, at least two different eating or drinking episodes, at least two different personal care episodes, and at least two episodes of some other activities. The excluded diaries represent only 3 per cent of the age 21-65 sample and results are robust to their inclusion.

The final sample does not include those individuals whose diary includes some time recorded in at least three of four 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). 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). These diaries represent 7 per cent of the sample aged 21-65, and results are again robust to their inclusion.

### **3. Indicators of the Quantity and Quality of Leisure**

#### **3.1. Conceptualizing the Quantity of Leisure**

The conceptualization of time use categories is sometimes based on groupings of diary activities (such as watching television, working for pay, or doing laundry) relying on researchers *ad hoc* judgments. These introspection-based judgements may be driven by arbitrary and partial views about the pleasure to be derived from different activities. But enjoyment may be derived directly from non-leisure activities; and some leisure is duty not pleasure. So this approach is less than entirely satisfactory.

The more systematic, principle-driven approach of distinguishing *means vs. ends* might initially seem more satisfactory. The *third person criterion* excludes activities that might be carried out by some third party without losing the intended utility for the final consumer. We can either cook or pay someone to cook for us; we must watch the television for ourselves. Work time is, according to this criterion, perfectly substitutable by purchased goods and services without loss of the final utility provided by the ultimate consumption commodity. But does this really provide a more *objective* conceptualization of leisure? Unfortunately, it involves similarly questionable assumptions about the association of utilities with activities—that the enjoyment derived from work can legitimately be ignored, and that all leisure is enjoyable.

To what extent does the set of activities that are normally assumed to be leisure according to the third person criterion correspond to activities that are actually considered as leisure? Young and Willmott [1973] collected diaries which link information about activity sequences and timings to simultaneous subjective judgments about whether each activity was to be considered as leisure, work, both or neither. One quarter of time that would be considered leisure according to

the conventional implementation of the *third person criterion*, and one third of what would conventionally be considered work, is unexpectedly placed by the diarists (Gershuny [2009b]).

A further problem with the *third person criteria* is that certain activities, such as sleeping, eating, personal and medical care, or resting, do not fall comfortably into the means vs. ends classification. These activities cannot be purchased in the market, so they may not be considered leisure in the sense that they are necessary for life. They are thus 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. [2008]) and they are not included as leisure in what follows. Nonetheless, some variation in the time spent in these activities may result from conscious choice. For example using data for the Netherlands, Hamermesh [2002] shows that when moving the clocks back to standard time, the additional hour is almost entirely used for extra sleep. Similarly, Biddle and Hamermesh [1990] show that sleep time, similarly to other uses of time such as time in market work and more standard leisure activities, responds to economic incentives such as the wage. Decreasing marginal utility to sleep (and other consumption activities) is indeed shown by Gershuny [2009b] who uses (subsequent) diary reports of enjoyment to show an inverted-U shaped relationship of reported enjoyment to sleep duration.

Rather than trying to resolve this debate on theoretical grounds, we have adopted a empirical approach, exploring four commonly used, nested, definitions of leisure, ranging from the narrow (which includes activities designed to yield direct utility such as entertainment, socializing, active recreation, and general relaxation), to the broad (time spent neither in market production nor in nonmarket production). The various measures tell a consistent story, so for the sake of brevity we present here only the results regarding our narrowest measure of leisure, i.e., hours per week devoted to all activities that we cannot pay somebody else to do for us and that are not biological needs (e.g., Walker and Gauger [1973], Hawrylyshyn [1976,1977], Burda et al. [2008]).<sup>5</sup> 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, general out-of-home leisure activities, and socializing.<sup>6</sup>

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<sup>5</sup> Results for the other definitions of leisure are available upon request.

<sup>6</sup> We exclude voluntary activities from our main definition of leisure, since it really classes as work under the *third person* criterion (see Hawrylyshyn [1976]). The validity tests presented in Section 4 clearly show that voluntary activities rank with work rather than leisure activities.

### 3.2. Conceptualizing the Quality of Leisure

There are different ways of assessing the quality of leisure. One methodology is to use self-reported measures of how enjoyable activities are, in the spirit of the *process benefits* and *experienced utility* literature. Juster and Stafford [1985] define *process benefits* as the “direct subjective consequences from engaging in some activities to the exclusion of others”.<sup>7</sup> Going back to the earliest conceptions of utility, from Jeremy Bentham through Francis Ysidro Edgeworth and Alfred Marshall, the concept *experienced utility* has been proposed more recently by Kahneman et al [2004] to refer to a “continuous hedonic flow of pleasure or pain”.

Both lines of research use time-use diaries together with information on enjoyment to assess individuals’ subjective well-being. The *process benefits* approach uses *Activity Enjoyment Ratings*, where respondents are to rate on a scale from 0 to 10 how much they generally enjoyed a type of activity (e.g., Juster and Stafford [1985]). The information gathered this way offers a global and retrospective interpretation of feelings about activities, although they may not serve as a good predictor of the instantaneous satisfaction experienced in any given instance of the activity (Gershuny and Halpin [1996]). The *experienced utility* literature has proposed the *Experience Sampling* method as a superior way for collecting objective instantaneous enjoyment data. As opposed to the *Activity Enjoyment Ratings*, the *Experience Sampling* method collects information on *hedonic experiences* (or instant enjoyment) in real time. It has however never been applied to a representative population sample because it is extremely burdensome for the respondent.<sup>8</sup> Alternative methods of collecting data on hedonic experiences, such as the conventional *yesterday diary* used in time budget surveys (Szalai [1972]) or the *Day Reconstruction Method* (Kahneman et al. [2004b]) are less costly to implement. Both methods collect information on how the respondent experienced all or some of the activities he or she engaged in during the previous day, as described by a time-use diary.<sup>9</sup>

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<sup>7</sup> “For instance, how much an individual likes or dislikes the activity ‘painting one’s house,’ in conjunction with the amount of time one spends in painting the house, is as important determinant of well-being independent of how satisfied one feels about having a freshly painted house.” (Juster and Stafford [1985])

<sup>8</sup> *Experience sampling* was developed to collect information on people’s reported feelings in real time in natural settings during selected moments of the day (Csikszentmihalyi [1990], Stone and Schiffman [1994]). Participants in ESM carry a handheld computer that prompts them several times during the course of the day (or days) to answer a set of questions immediately, such as their physical location, the activities in which they were engaged just before they were prompted or the people with whom they were interacting. They also report their current subjective experience by indicating the extent to which they feel the presence or absence of various feelings, such as feeling angry, happy, tired and impatient (Steptoe, Wardle and Marmot [2005], Kahneman and Krueger [2006]).

<sup>9</sup> The *Day Reconstruction Method* has been used for example in the collection of the Princeton Affect and Time Survey (PATs). Here respondents were asked to reconstruct the previous day by completing a short diary. Then three 15-minute intervals were randomly selected from the non-sleeping portion of the diary, and respondents were then asked the extent to which they experienced six different feelings (pain, happy, tired, stressed, sad, and interested) during each

In what follows we adopt a complementary approach to the above literature. We exploit the rich information in the diary to construct three classes of indicators that capture leisure quality.

### ***Leisure dilution***

The first class of indicator is 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. The secondary activity is the activity that is done at the same time as the main activity, and 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 (see Bittman and Wajcman [2000], and Mattingly et al. [2003]). 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 and analyze 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. Although these secondary activities were imputed by the survey team, even after the imputation exercise important differences still remain. 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. This makes these surveys not comparable with the previous surveys (see Fisher et al. [2007]).

### ***Co-present leisure***

The second class of indicators relates to with whom the leisure activity is performed. We first consider leisure with the spouse (or partner). The concept of *Leisure with Spouse* draws from the empirical evidence found in the socio-economic literature on spouses’ synchronization of work and leisure activities. Sullivan [1996a] uses the 1985 UK time-use survey, a diary survey with instant enjoyment information, to show that partners report higher levels of satisfaction when they synchronize their working schedules (and thus maximize the potential time they can spend in

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interval (Krueger [2007]). Previously, the *Yesterday Diary* was used to collect information on the levels of instant enjoyment for all the episodes (not just three) in the diary in the UK Data and the US AHTUS data used in Section 4 of the present paper. Unlike the PATS, these surveys collect one dimension of instant enjoyment, which is scaled from 0 to 5 and 0 to 10 respectively.

leisure activities together).<sup>10</sup> Hamermesh [1999], Hallberg [2003], and Jenkins and Osberg [2005] find that synchronization of leisure activities between partners is indeed greater than random male-female pairing would predict. We thus use information on whether leisure as primary activity is carried out while the spouse/partner is present to look at the percentage of total leisure time of *Leisure with Spouse* (or partner) as an indicator of leisure quality. Because of demographic changes regarding the propensity to marry, which has fallen in the US during this time period due to the delay in the age of marriage and increase in divorce rates, we restrict the sample to those individuals with a partner when computing this indicator. The indicator of leisure with the spouse 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.

The second indicator in this class uses information on whether another adult was present during a leisure activity to construct the percentage of total leisure that constitutes *Leisure with other Adults*, i.e. leisure time spent with non-partner adults (neither alone nor in the presence of children).<sup>11</sup> We can calculate this indicator for the 1965, 1975, and 2003 surveys. There is evidence from instant enjoyment data, which suggests that individuals report higher levels of instant satisfaction from activities done in the company of others than by themselves (e.g., Kahneman et al [2004], Helliwell and Putnam [2005]). In fact the adverse effects of isolation on mental health is well-known in the epidemiological and psychological literature (e.g., House et al. [1988], Berkman and Glass [2000], Putnam [2000], Eng et al. [2002], Berkman et al. [2004], and Singh-Manoux and Marmot [2005] among others). Similarly, the positive externalities of synchronicity not just in leisure, but also in market work and household labor, have been often pointed out in the economics literature (e.g., Weiss [1996]). Few studies have tried to identify exogenous determinants of coordination. For example, public holidays have been 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. [2008] find that an exogenous shock to time in one area, due

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<sup>10</sup> There is extensive evidence pointing toward positive assortative mating along education (Lam [1988], Blosfeld and Timm [2003]) and it thus may well be that highly educated individuals have a higher preference for spending leisure time with a spouse, precisely because the spouse is also highly educated. This hypothesis does not seem to be ratified by the results shown in Section. We find that individual's enjoyment of leisure time when accompanied by the spouse is greater regardless of educational class.

<sup>11</sup> 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. Unfortunately, the AHTUS lacks comparable information across years on whether a child is present, and thus comparisons along these lines are not possible.

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.

### ***Leisure fragmentation***

The third class of indicators refers to the fragmentation of leisure activities. The first indicator within this class uses 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 stressed. Beyond feeling of stress, the more activities people fit into a single day, the less time they have to fully engage with each individual activity, and thus might enjoy a lower level of utility from any given amount of leisure time if they do not get what they want out of their leisure when trying to accomplish too much and not having proper time for any one activity.

To measure the fragmentation of leisure we use the *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).<sup>12</sup> The switch of method from the diary the diarist sees (1965, 1975 and 1985) to the telephone diary (1993 and 2003) seems to have resulted in a decline in the number of episodes in recent surveys. 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, which results in these surveys having more episodes. Because of this 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.

One concern with the above indicator is that fragmentation may be one measure of variety (imagine having one twelve-hour leisure episode vs. two six-hour episodes), and there is cross-section evidence that higher-income people prefer and obtain variety (Gronau and Hamermesh [2008]). In order to address this concern we construct another indicator of the fragmentation of

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<sup>12</sup> 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.

leisure by looking at those individuals with an average duration of leisure episodes below half the median duration for each year. This indicator is akin to an income poverty measure, but measures the poverty in the duration of leisure intervals instead. Practically what this means is that for each individual, this indicator takes value “1” if the average duration of leisure episodes is below half the median duration for that survey year, and “0” otherwise.

### 3.3. Unconditional Trends in the Quality and Quantity of Leisure

Table 1 shows the main summary statistics for the indicators of quantity and quality of leisure over the sample period for men and women separately.<sup>13</sup> Despite increases in the quantity of leisure for both men and women, the percentage of *Pure Leisure*, the percentage of *Leisure with Spouse*, the percentage of *Leisure with Adults*, and the two indicators related to the fragmentation of leisure seem to reflect a decrease in the quality of leisure.

For men, the quantity of leisure is similar to that found in other papers.<sup>14</sup> Total hours of leisure per week exhibit a statistically significant increase over the period of reference, from 28 hours of leisure per week in 1963 to 33 and a half hours of leisure per week in 2003 (leisure increases by 5 hours and a quarter per week).<sup>15</sup> The quality of leisure time decreases over this period however. The percentage of *Pure Leisure* out of total leisure time decreases over the period by 5 percentage points, from 89 per cent in 1965 to 84 per cent in 1985. There is also a statistically significant decrease of 14 percentage points in 2003, with respect to 1965, in the percentage of leisure time spent with the spouse, from 49 per cent in 1965 to 35 per cent in 2003. Similarly, the percentage of *Leisure with Adults* decreases by 13 percentage points in 2003, with respect to 1965, from 73 per cent in 1965 to 60 per cent in 2003. Finally, the fragmentation of leisure measured by the *normalized number of leisure intervals* and the duration 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 23 in 1965 to 25 in 2003), while the percentage

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<sup>13</sup> 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>.

<sup>14</sup> Aguiar and Hurst [2007] find that leisure for men increased by 6-8 hours per week from 1965 to 2003. Burda et al. [2008] 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.

<sup>15</sup> A p-value lower than 0.05 means a 95 per cent confidence level.

of individuals with a mean duration of leisure below half the median for the corresponding year has significantly increased between 1965 and 2003 from 4 per cent in 1965 to 7.5 per cent.<sup>16</sup>

Women's leisure time follows a similar pattern to that of men's. The quantity of leisure time significantly increases by three and a half hours over the period, from 27 hours in 1965 to 30 hours and a half in 2003.<sup>17</sup> The quality of leisure time for women tells a similar story to that of men's. The percentage of *Pure Leisure* decreases over the period by 6 percentage points, from 88 percent in 1965 to 82 percent in 1985. Despite increases in total leisure time the percentage of *Leisure with Spouse* decreases by 4 percentage points over the period, from 35 per cent in 1965 to 31 percent in 2003. There is also a statistically significant decrease of 7 percentage points in 2003, with respect to 1965, from 68 percent in 1965 to 61 per cent in 2003. There is a statistically significant increase in the *normalized number of leisure intervals* (from 20 in 1965 to 23.5 in 2003), which indicates that leisure for women is also more fragmented now than it was in 1965. Additionally, the proportion of women with an average duration of leisure intervals below half the median has increased between 1965 and 2003 from 4 per cent in 1965 to 10 per cent.

The evolution of leisure quality shown here is consistent with the results using instant enjoyment data. Krueger [2007] finds that the time spent in the sorts of activities labeled *enjoyable and engaging forms of leisure* according to a 2006 diary survey has decreased for both men and women between 1965 and 2003. Our indicators do indeed suggest that, on average, the quality of leisure that individuals enjoy is lower now than it was in 1965. This result may help explain the fact that, despite general increases in leisure time, Americans report an increased time stress now, compared to forty years ago. For example, when responding to the question "Would you say you always feel rushed, even to do the things you have to do, only sometimes feel rushed, or almost never feel rushed?", the proportion of 18-64 years old who report always feeling rushed rises from 24 percent in 1965 to 28 percent in 1975, leaps to 35 percent in 1985 and reaches its peak of 38 percent in 1992, before declining slightly in 1995 (Robinson and Godbey [1997]). The suggestions that Americans are feeling more pressured with time and have less social interaction (e.g., Schor [1993] and Hochschild [1997]), and that they feel leisure time has become scarcer

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<sup>16</sup> Median values of leisure episodes duration are 30 minutes in 1965, 1975 and 1985, 60 minutes in 1993 and 45 minutes in 2003. The last two numbers reflect the decrease in the number of episodes in the latter surveys due to a change in the survey methodology. The normalized number of intervals has been multiplied by 100 throughout the paper in order to get figures with only one decimal positions.

<sup>17</sup> Aguiar and Hurst [2007] find that leisure for women increased by 4-8 hours per week over the period 1965-03. Burda et al. [2008] 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.

and more hurried (e.g., Frederick [1995], Linder [1970]), may thus have more to do with the quality of that leisure than with the total time spent in leisure activities.

#### 4. Validating the four classes of indicator

As seen in Section 3.2, all three classes of indicators emerge independently from different strands in the socio-economic and psychological literature. The relationship between quality of leisure and some of these indicators, in particular those related to the presence of other individuals while the respondent engages in leisure activities, has already been directly established using instant-enjoyment data of the sort proposed by the *process-benefits* and *experienced-utility* literature. However, how the rest of the indicators relate to the quality of leisure has remained elusive in the literature. To avoid a black-box argument in our exposition, we first test and validate these indicators together, partly from the AHTUS itself, partly from a closely analogous dataset.

The 1985 element of the AHTUS did not include the “with whom?” diary information for each registered event. But the 1985 sample used in the AHTUS did collect an additional item of information not available elsewhere in the sequence of surveys: an activity enjoyment “rating” (on a 0-10 “dislike it”/ “like it” scale) attached to each event (see Robinson [1997]). A similar diary dataset (though rating activities on a 1-5 “like it”/ “dislike it” scale, and collecting information on a fixed 30 minute grid, rather than the open intervals used in the US survey), from a national random sample of individuals living as members of heterosexual couples in the UK in 1986, does include co-presence data (see Sullivan [1996a,1996b]).

The validation consists of a demonstration, through a simple OLS regression, that our leisure-quality indicators are indeed associated with diary respondents’ descriptions of their own enjoyment of activities.<sup>18</sup> We select the same age range from the two samples (18-72, slightly broader than that used elsewhere in this paper), and consider just those US diarists with co-resident partners, so as to produce event-level datasets with 54,854 cases for the US and 47,407 cases for the UK. We estimate the following equation on the event level datasets (i.e., case =diary event), weighting the cases by the duration of the event:

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<sup>18</sup> An alternative method would require imputations of enjoyment-levels for the other survey years (either at the activity level as in Krueger [2007] or at the individual level). A potential limitation to this method (see Krueger [2007]) is that it maintains the nature of activities relatively constant, not only over time, but also across educational groups. This latter point is particularly relevant in the current context, as different groups of individuals may rank the same activity differently, and the mix of these responses may change over time. The results from our validation exercise suggest that our indicators can still be used as a good proxy for leisure quality. We thus leave investigating this alternative method for future research.

$$E_{i,j} = \beta_1 I_{i,j} + \beta_2 D_{i,j} + \beta_3 X_i + \beta_4 A_{i,j} + \varepsilon_{i,j} \quad (4.1)$$

where  $i$  is the individual (or a diary) and  $j$  is the episode in the diary characterized by a unique primary activity. The dependent variable  $E_{i,j}$  is the activity enjoyment “rating”. A linear transformation  $((5.5\text{-rate}) * 2)$  of the UK activity rating scores produces a 5 point, 1-9 positive scale centered similarly to the US rating. Treating the rating scales (for the purpose of this validation exercise but not elsewhere in this paper) as if they have equal intervals, the transformed UK ratings mean score is of 6.86 and standard deviation of 2.13, which compares neatly with the US mean of 6.99 and standard deviation of 2.43. The UK survey collected 5 days of data from each diarist, we thus present the more conservative robust standard errors clustered at the respondent level as the basis for significance testing.

The vector  $I_{i,j}$  contains five leisure-quality indicators as described in Section 3.2. In particular the vector contains a dummy variable indicating whether the episode of leisure is being done at the same time as a work activity, whether a particular leisure episode is being done with the spouse, and whether it is being done with other adults. It also contains the number of leisure episodes and the mean uninterrupted duration of leisure episodes in the diary. Unlike the first three indicators, the latter two are constant throughout all the episodes in a given diary because they are calculated across the events of the day, and then distributed to each of those events.

The vector  $D_{i,j}$  includes two additional dummy variables, indicating respectively primary sleep or personal care, and primary paid or unpaid work, to ensure that the default state against which the 0/1 variables are compared is unambiguously identified as primary leisure activities unaccompanied by secondary work. The vector  $X_i$  includes socio-economic variables of the individual, which include age, age squared, sex, an indicator variable for part time and full time work, an indicator variable that takes value one if there is a child under 5 at home, and another indicator variable that takes value one if there is a child between 5 and 18 years old living in the household. The vector  $A_{i,j}$  includes five dummy variables indicating the nature of the leisure activity being done. These are classified into out of home leisure, active sport and exercise, read and listening to music, watch television, and writing. Table B1 in Appendix B presents a description of the variables used in the analysis in these two surveys.

We first estimate Equation (4.1) including neither the socioeconomic characteristics of the respondent nor the specific nature of the leisure activity that the respondent is engaged in at a particular period. Columns 1 and 2 in Table 2 show the associations between the leisure-quality

indicators and the enjoyment scores in the US and the UK data respectively. It emerges that these indicators are all associated with the activity enjoyment ratings in the expected directions with the single exception discussed below. Notice in particular the pairing of the positive effects of the mean uninterrupted length of leisure periods, with the negative effects of the number of distinct periods—providing strong support for the “dislike fragmentation” hypothesis. The US coefficients are also reasonably similar to the UK coefficients—with the exceptions of leisure simultaneous with work (paid or unpaid) which is substantially negative and statistically significant for the US, but positive, smaller, and not significant, for the UK. We can, with a fair degree of certainty trace this to the difference in data collection methods. This indicator captures in effect a leisure period interrupted by some form of work, and is much more likely to be recorded in the more sensitive US open interval recording scheme, than it is with the broader-brush UK 30 minute fixed intervals. We also suspect that the more negative UK evaluation of the sleep or personal care events may be related to the fact that the data were collected by the UK cosmetics-to-soap Unilever Corporation, and drew respondents’ attention specifically to recording instances of bathing, showering and other personal activities.

The standard deviations of the US and UK activity-enjoyment means are 2.43 and 2.13 respectively. So in the US, the average work event, according to Table 3, is enjoyed on average .68 of a standard deviation ( $1.66/2.43$ ) less than the average leisure event, controlling for the effects of the other independent variables, and a consolidation of leisure episodes from 6 to 4, accompanied by an increase of the mean length of a leisure episodes from 2 to 3 hours, would increase the enjoyment by one-and-a-quarter standard deviations (i.e.  $((0.05*60)+(-0.04*-2))/2.43$ ). These are not insubstantial effects.

The final column of Table 2 adds in the co-presence indicators to the regression equation for the UK sample. Leisure time with the spouse and other adults are both strongly positively associated with enjoyment of the activities, as we hypothesized. The inclusion of the co-presence indicators in the regression equation does not substantially change the effects of the fragmentation measures, which suggests that these two sorts of effects operate independently of each other. Because we lack information about the presence of children, we cannot distinguish between time alone or time with children. Nonetheless, these results seem to suggest that, as found elsewhere in the literature, leisure with other adults and/or with one’s spouse is not only more enjoyable than leisure alone, but also more enjoyable than leisure with children (Kahneman et al [2004]).

That time with adults is enjoyed more than time with children might seem opposed to the Juster and Stafford's (1985) and Flood's (1997) finding that activities with children are enjoyed more. There is a question however as to whether responses deriving from questionnaire rather than diary measures actually capture enjoyment, or instead an ex-post rationalization of beliefs about enjoyment. Sullivan [1996a,1996b] and Kahneman et al [2004] show that when respondents are asked about the enjoyment of an activity shortly after the activity has been completed, childcare ranks just above the least enjoyable activities of working, housework, and commuting.

The coefficient for the co-presence of another adult appears initially to be much stronger than that of the spouse (compare Kahneman et al [2004]). This result may however have to do with the fact that friends are more likely to be present during some activities than others. This dummy variable in Table 2 may in fact be carrying information about the different sorts of activities which are accompanied by spouses and by friends. To net out confounding effects, Table 3 includes a more detailed breakdown of leisure activities and also some socio-demographic controls. The effect of friends' co-presence during activities is much diminished, suggesting that the nature of the activity is indeed important. Though the spouse effect is strengthened in this model as compared to that in Table 2, the effect of co-presence of other adults on enjoyment remains significant and is still higher than the effect from the co-presence of the spouse. There is a very positive evaluation of leisure outside the home, and particularly of active sports and exercise, all of which are more likely to be accompanied by someone other than the spouse. Home leisure activities, less highly valued, are more likely to be accompanied by the spouse. The fragmentation effects, meanwhile, are hardly affected by the additional variables. The substantive nature of the leisure activities (at home vs. away, active vs. passive—note for example the considerably negative evaluation of television in both the US and the UK) are worthy of further attention, and we return to this issue in Section 6.

The main conclusion to be drawn from the analyses in this section is that the indicators of leisure quality we have developed for the present paper are validated by analysis of the available direct evidence of the enjoyability of activities—implying in turn that the latter indicators alone are capable of conveying the great majority of the information about leisure quality. Thus, even if we lack additional direct information about how much respondents enjoy engaging in a given activity for the entire period being analyzed, our indicators can still be used as the validated basis of a well-crafted empirical decomposition of trends in the quantity and quality of U.S. leisure time.

## 5. The Role of Demographics in Explaining the Trends in Leisure Inequality

### 5.1. Empirical Specification

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 Table C1 of Appendix C. 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:

$$Y_{it} = \alpha + \beta_{1975}D_{i,1975} + \beta_{1985}D_{i,1985} + \beta_{1993}D_{i,1993} + \beta_{2003}D_{i,2003} + \gamma_{age}Age_{it} + \gamma_{family}Family_{it} + \gamma_{day}Day_{it} + \xi_{it} \quad (5.1)$$

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  $Day_{it}$  are dummy variables for the different days of the week (ref: Friday) . The day variable is necessary, given that some of the surveys over-sample weekends for some sub-samples.

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.<sup>19</sup>

## **5.2. Results: The Quantity and Quality of Leisure by Educational Status**

### **5.2.1. Changes in the Quantity of Leisure by Educational Status**

Figures 1A and 1B show that for men and women, low-educated individuals increase the amount of leisure with respect to 1965 more than the highly-educated group.<sup>20</sup> For men, between 1965 and 2003, the increase in leisure time for the less educated is statistically significant and accounts for 5 hours and a quarter per week, while the increase in leisure time for highly educated individuals is 4 and a half hours per week. For women, these differences across educational groups are greater. In 2003, low-educated women enjoyed 5 and a half hours per week more leisure time than in 1965, whereas highly-educated women had an increase of 2 hours of leisure per week, with these increases being statistically significant at the 95 per cent level.

### **5.2.2. Changes in the Quality of Leisure by Educational Status**

#### ***Leisure dilution***

Figures 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 larger decrease in the percentage of *Pure Leisure* out of total leisure than highly-educated individuals. Figure 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 6 percentage points per week for the less educated men, and 3.5 percentage points for highly-educated men. Both decreases are statistically significant at the 90 percent level. Figure 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 7 percentage points for low educated women, while the highly-educated experienced a decrease of 4 percentage points. Both decreases are statistically significant at the 95 per cent level. A six

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<sup>19</sup> Results are available upon request.

<sup>20</sup> The coefficients on our indicators of leisure resulting from the regression in Equation 5.1 are reported in Tables D1-D3 of Appendix D.

percentage-point decrease is not a negligible figure. Given that the average leisure time over this period for men is almost 25 hours per week, and about 26 hours per week for women, these coefficients suggest that whereas low educated men and women experienced a decrease in uncontaminated leisure by about 1 and a half hours per week, highly educated men and women only experienced a decrease of around 1 hour per week.

### ***Co-present Leisure***

Figures 3A and 3B show the evolution in the percentage of *Leisure with Spouse* by gender and educational attainment for those individuals who are married or living with a partner. Trends in marriage rates and the timing of marriage have changed over time, and if marriage patterns alter behavior in daily routines they could in principle explain some patterns in the data. For example, marriage has been postponed, especially for highly-educated individuals. This trend may bias our coefficients if individuals who marry young spend different amounts of time together (in a given day) than individuals who marry later in life. To avoid this problem we limit the sample to married individuals or those individuals living with a partner for this particular analysis.

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. Figure 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 7 percentage points, low educated men had a statistically significant decrease of 13 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 5.65 percentage points from 1965 until 2003, while for highly-educated women this percentage decreased by just 1 percentage points, with only the decrease for low-educated women being statistically significant at the 95 per cent level.

Figures 4A and 4B show the evolution in the percentage of *Leisure with Adults* by gender and educational attainment. Similar to the above results, Figure 4A 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 7 percentage points for highly-educated men between 1965 and 2003, this percentage decreased by 10.5 percentage points for low educated men. The results for women are similar to those of men. Whereas the percentage of *Leisure with Adults* for highly

educated women has decreased by 5 percentage points, low educated women experienced a decrease in the percentage of *Leisure with Adults* by 5 percentage points in 2003 with respect to 1965, with both decreases being statistically significant at the 95 per cent level and statistically equal.

These percentages translate into meaningful amounts of co-present leisure. Considering that the average leisure time spent with the spouse over this period is almost 12 hours per week for men, and 9 and a half hours per week for women, it means that low educated men decreased time with their spouse by about 1 and a half hour per week, whereas highly educated men only decreased it by 1 hour per week. In the case of women, low educated women experienced a decrease in leisure time with the spouse of about half an hour per week on average, whereas highly educated women experienced no decrease at all. Similarly, the amount of leisure time spent with other adults decreases by about an hour a week for highly educated men, which is half the decrease for low educated men, since low educated men experienced an increase of about 2 hours a week. In the case of women, the amount of leisure time spent with other adults decreases by 1 hour a week for highly educated women, while the decrease for low educated women is around 1 hour a week.

These results might seem contradictory to those found in Aguiar and Hurst [2007], who find that highly-educated individuals have decreased their time socializing by 5.39 hours per week. This decrease, who is off-set in great part by an increase in TV watching of 5.45 hours per week, is still compatible with the findings above, since TV watching (for example sports) can be enjoyed in the company of other people. Thus, although highly-educated individuals are socializing less and watching television more, they seem to be doing so in the company of other adults. We come back to this issue in Section 6.

### *Leisure Fragmentation*

Figures 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. Figure 5A shows that low educated men experienced an increase in the *normalized number of leisure intervals* that doubled the increase for highly-educated men. Evaluating these increases at the mean values of leisure fragmentation, it means that the number of intervals increased by 0.24 (i.e., eight percent) for low educated men, and by 0.12 (i.e., four percent) for highly educated men.<sup>21</sup>

In the case of women, Figure 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 4, whereas highly-educated women increase the *normalized number of leisure intervals* by 3. Both increases are significant at the 95 per cent level, although they are not significantly different from each other. Thus the number of intervals increased by 0.57 (four per cent) for low educated women, and by 0.43 (three per cent) for highly educated women.

Figures 6A and 6B show the changes in poverty in the duration of leisure intervals, by gender, and educational attainment, between 1965 and 2003. Despite the general increase in the probability of falling below half the median duration of leisure intervals over the period, Figure 6A shows that, whereas low educated men are 5 percentage points more likely to fall below this poverty line, highly-educated men only experienced no statistically significant decrease. For women, Figure 6B shows that, low-educated women are 6 percentage points more likely to fall below half the median duration of leisure interval in 2003 than in 1965, and although highly-educated women increase this probability by 7 percentage points over the period, the differences across educational groups are not significant.

The above results show that the inequality in terms of the quality-adjusted leisure looks similar to the evolution in the inequality of wages and expenditure. Despite highly-educated individuals now enjoying less leisure time than low educated individuals, the trend is for highly-

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<sup>21</sup> These figures result from taking the mean number of intervals over the sampled period. For men the mean number of leisure intervals during this period is of 2.86 (with a total number of intervals of 11.89). For women the mean number of leisure intervals during this period is of 3.20 (and the total number of intervals is 14.36).

educated adults to enjoy a greater percentage of pure leisure that is not contaminated by other non-leisure activities, to spend more leisure time with the spouse and with other adults, and to have leisure that is less fragmented than that of low-educated individuals.

### 5.2.3. Working women

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

Regarding the quantity of leisure, Figure 7A 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 increased their amount of leisure by 7 hours per week, highly-educated women increased their amount of leisure by just 5 hours per week.

Regarding the quality of leisure, Figure 7B 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* was of 8 percentage points for low-educated women, although there was no statistically significant decrease for highly educated women. The average leisure time over this period for working women is 22 hours per week, which means a decrease of almost 2 hours of non-contaminated leisure per week for low educated working women.

Figure 7C and 7D show the evolution in the percentage of *co-present leisure* by educational group for working women. Both high and low-educated working women experienced non-statistically significant changes in the percentage of *Leisure with Spouse* and *Leisure with Adults* throughout the period.

Regarding the (*normalized*) number of *Leisure Intervals*, Figure 7E 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 4, highly-educated women increased the relative number of leisure episodes by 5, with both increases being statistically significant at the 95 per cent significance level. Evaluating these increases at the mean number of intervals for working women it means that the number of intervals has increased by 0.55 (four percent) for low educated women, and by 0.68 leisure intervals (five percent) for highly educated women.

Finally, Figure 7F shows that there is an increase in the probability of falling below the half of the median duration of leisure intervals. Whereas low-educated women increased this probability by 7 percentage points, the probability for highly-educated women has increased by 6 percentage points throughout the period, with both increases being statistically significant at the 95 per cent level.

The above results suggest that the less unequal distribution in terms of the quantity of leisure is not fully compensated by a more unequal compensation in terms of the quality of leisure. I.e., highly educated working women might not be fully compensating their lower increase in leisure time by having more quality of leisure. Highly-educated working women now enjoy less leisure time than low educated working women. However, despite highly educated working women now enjoying a greater percentage of pure leisure that is not contaminated by other non-leisure activities, it is not clear that highly educated working women have a less fragmented leisure or enjoy leisure in the company of the spouse and others in a greater proportion than low educated working women.

## **6. Exploring the nature of leisure activities**

Section 4 showed that, beyond our leisure quality indicators, the substantive nature of the leisure activities (at home vs. away from home, active leisure vs. passive leisure) were also important determinants of instant satisfaction deserves further attention. This section looks more deeply into how the nature of leisure activities may have contributed to the unequal distribution of leisure in terms of quantity and quality (along the dimensions of “leisure dilution”, “leisure fragmentation” and “co-present leisure”). Our test consists in undertaking the analysis developed in Section 5 without including some of the major leisure activities in the definition of leisure. If, on the one hand, the unequal distribution of quality-adjusted leisure across educational groups remains the same even after some leisure activities are taken out of the analysis, then we would conclude that these activities had little to do with the results previously found. If on the other hand, the unequal distribution in terms of leisure quality is diminished or even reversed after each of these activities is taken out of the analysis, we should conclude that these activities were responsible for the observed patterns in the unequal distribution of leisure quantity and quality.

While one could argue that any number of free time activities could be driving our results, certainly TV watching should be considered separately. Table 4 shows that “TV watching” represents the highest proportion of total leisure time (44% of leisure time for highly educated

individuals, and 52% of leisure time for low educated individuals). TV watching has also undergone major increases over this period for both highly and low educated individuals, greatly contributing to the increase in total leisure. Table 5 shows that the increases in the time devoted to watch TV have been larger for low educated individuals (7 hours per week) than for highly educated individuals (6 hours per week).<sup>22</sup> Thus, higher time increases for low educated individuals in TV watching may explain why the quality of leisure declined more for low than for highly educated adults as long as TV watching is an activity that can be considered of low-quality.<sup>23</sup>

Table 6 shows that TV watching is indeed less often enjoyed with other adults (61% of the times as opposed to 65% for the rest of leisure activities), it is more likely to be contaminated by other non-leisure activities (87% of the time versus 88% for the rest of leisure activities), and it is also a more fragmented type of leisure. Thus TV watching seems to be low quality leisure. These qualifications seem consistent with the literature. TV watching is a more passive or one-way communication medium (see Kubey and Csikszentmihalyi [1990]),<sup>24</sup> and evidence based on diary-affect data and general satisfaction surveys suggests that TV watching is not as enjoyable as other leisure activities. Consistent with what we saw in Section 4, TV watching ranks low in the level of instant enjoyment with respect to other leisure activities (Kahneman et al [2004], Robinson and Godbey [1997]). There is also a great amount of evidence showing that TV watching is also negatively linked with life satisfaction in general (Morgan [1984], Espe and Seiwert [1987], Tankard and Harris [1990], Putnam [1995], Putnam [2000], Kasser [2002], Shrum et al. [2003], Frey et al. [2007]).<sup>25</sup>

Figures 8A and 8B show that taking out “TV watching” from the analysis results in a relatively flat pattern of leisure over this period for the men sample, and a significant decrease of leisure for women. Thus, the increase in the time spent watching TV seems responsible for increases in leisure over this period (as in Aguiar and Hurst [2007]). However, the reason why low educated individuals have more leisure now than highly educated individuals cannot fully be explained by increases in TV watching. Although the difference in leisure time between low and highly educated men virtually disappears, low educated men continue to have more leisure than

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<sup>22</sup> This difference is statistically significant at the 1 percent level.

<sup>23</sup> See Appendix E for a description of the activities included in each time use category in Table 6.

<sup>24</sup> Employing a unique research methodology that enables people to report on their normal activities as they occur, the authors examine how people actually use and experience television -- and how television viewing both contributes to and detracts from the quality of everyday life.

<sup>25</sup> For instance, Frey et al. [2007] find that excessive TV viewers, on average, report lower life satisfaction and that TV watching is associated to self-control problems, lowering individual's well-being.

highly educated men. The unequal distribution of leisure time for women remains. Highly educated women experience a decrease of almost four hours of leisure per week, and leisure for low educated women decreases just two hours per week.

As is the case with the unequal distribution of leisure in terms of quantity, increases in the time watching TV cannot fully explain the unequal distribution of leisure in terms of quality either. The percentage of time spent in pure leisure actually increases for highly educated men and women over this period (see Figures 9A and 9B). However although TV watching may explain the variation in pure leisure over time, it cannot explain the relationship across educational groups. The relationship between the two educational groups remains qualitatively the same (pure leisure increased by 15 percentage points for highly educated men and women, but decreased by 6 (9) percentage points for low educated men (women)).

As before, leisure with the spouse continues to decline over time even if the time spent watching TV is not considered, and the relationship across educational groups still shows that highly educated individuals experienced a lower decline in this type of leisure than low educated individuals. Figure 10A shows that the decrease in the percentage of *Leisure with Spouse* is higher for low than for highly educated men. Whereas highly-educated men did not experienced a statistically significant decrease in the percentage of Leisure with Spouse, low educated men had a statistically significant decrease of 8 percentage points. For women, results are very similar to that of men (see Figure 10B). Less educated women suffered a greater decrease in the percentage of *Leisure with Spouse* of 7 percentage points from 1965 until 2003, while for highly-educated women this percentage decreased by just 2 percentage points, with only the decrease for low-educated women being statistically significant at the 95 per cent level.

TV watching seems responsible however for the patterns observed in leisure with other adults. It seems that if it were not for TV watching, highly and low educated individuals would be spending more or less the same amount of time in leisure with other adults. The decrease in the percentage of *Leisure with Adults* is not statistically significant at the 95 per cent level for men (see Figure 11A), and it decreases in very similar amount for high and low educated women (by 6.43 and 6.59 percentage points respectively in 2003 with respect to 1965, see Figure 11B).

Watching TV cannot explain the unequal distribution in terms of leisure fragmentation across educational groups over this period. Increases in the fragmentation of leisure continue to be greater for low educated individuals even after taking out TV watching from the analysis. Figures 12A and 12B show that once “TV Watching” is excluded from the analysis, highly-educated men experienced a statistically significant decrease in this number of normalized intervals of 2 (a

greater decrease than low educated 1.4), although differences across educational groups are not statistically significant at the 95 per cent level. Figures 13A and 13B show the changes in poverty in the duration of leisure intervals, by gender, and educational attainment, between 1965 and 2003. Figure 13A shows that, whereas low educated men are 13 percentage points more likely to fall below this poverty line, highly-educated men only experienced an increase of 4 percentage points, with differences across educational groups being statistically significant at the 95 per cent level. For women, Figure 13B shows that low-educated women are 12 percentage points more likely to fall below half the median duration of leisure interval in 2003 than in 1965, while highly-educated women increase this probability by 11 percentage points over the period, with both changes being statistically significant, and with differences between educational groups being non-statistically significant at the 95 per cent level.

TV watching is thus neither responsible for the differences in the amount of leisure between highly and low educated individuals nor entirely responsible for the changes in leisure quality as measured by our indicators of uncontaminated leisure, and leisure fragmentation. With respect to co-present leisure, only the inequality in leisure time with other adults across educational groups seems to have been driven by differential increases in the time watching TV.

We also repeat the same analysis as above taken out two other leisure activities, ‘*At Home Leisure*’ and ‘*Read/Listen*’.<sup>26</sup> Both represent a significant amount of leisure time after *TV watching* (see Table 4), and together with watching TV greatly contribute to the changes in total leisure over this period (whereas leisure time at home was the activity that increased the most over the period after TV watching, the time devoted to reading and relaxing activities decreased substantially, see Table 6). Results (available upon request) suggest that these activities cannot entirely explain the pattern in the unequal distribution of leisure quality across educational groups either, with the exception of the number of leisure intervals, which increases more for highly educated individuals once *at home leisure activities* are taken out of the analysis.

The evidence from this exercise suggests that there is no single leisure activity that can explain the unequal distribution in terms of leisure quantity and quality across educational groups over this period. These results are consistent with the evidence presented in Section 4. There we showed that, even after controlling for the nature of leisure activity, the coefficients on our indicators of *leisure dilution*, *co-present leisure*, and *leisure fragmentation*, continued to be

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<sup>26</sup> The former includes time spent in ‘general indoor leisure’, ‘imputed in-home social’, ‘receive or visit friends’, ‘other in-home social, games’, ‘play musical instrument, sing act’, ‘artistic activity’, ‘crafts’, ‘hobbies’, and ‘relax think, do nothing’, and the latter includes time spent in ‘read books’, ‘read periodicals’, ‘read newspapers’, ‘listen to music (CD etc)’ and ‘listen to radio’.

significant predictors of enjoyment of leisure activities. All these pieces of evidence put together suggest that our leisure-quality indicators genuinely capture aspect of leisure quality beyond the nature of leisure activity being undertaken, and thus convey additional information on the trends in the quantity and quality of U.S. leisure time.

## 7. 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. Stiglitz et al (2009) among others have recently proposed a broad range of measures of household economic activity, such as leisure and the instant enjoyment of leisure activities, to evaluate quality of life. By establishing a direct link between objective indicators of leisure quality and measures of subjective well-being, our work contributes to this recent broadening of focus from production to the measurement of well-being and provides a basis for interpreting inequality in the US and for weighing the relative growth of leisure for the less educated against the simultaneous decline in relative wages and consumption.

We use the richness of the diary information in the American Heritage Time Use Study (AHTUS) to construct several indicators of the quality of leisure time “leisure dilution”, “co-present leisure”, and “leisure fragmentation”. We first use complementary information on instant enjoyment rating of activities in the 1985 component of the AHTUS to directly validate our proposed leisure-quality indicators. We show that these indicators capture very well the diary respondents’ descriptions of their own enjoyment of activities. Enjoying *uncontaminated* leisure, spending leisure time in the company of other adults, and having less fragmented leisure all contribute to higher levels of enjoyability of activities. More importantly, these results hold even after controlling for individual characteristics and the type of activity being done —implying in turn that our indicators alone are capable of conveying the great majority of the information about leisure quality.

Consistent with previous studies, we find general increases in leisure time across educational groups between 1965 and 2003, especially for low educated individuals. However, although the quality of leisure has decreased over the period, this decline has been greatest for low educated adults. Thus, although highly-educated individuals now enjoy less leisure time than low-educated individuals, highly-educated adults spend 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. That is, the increase in the unequal distribution in terms of quality-adjusted leisure is smaller than the inequality observed in just the quantity of leisure.

Our findings are consistent with the quantity-quality trade-off in a standard Beckerian model where, beyond the substitution between time and market goods, it is the substitution among different dimensions of time that matters. In fact the above results suggest that not only highly-educated individuals may enjoy higher quality goods and services than lower educated individuals, but that higher educated individuals also enjoy higher quality leisure. Our results are thus consistent with highly-educated individuals substituting away from quantity of leisure in favor of not just more consumption goods and services (as the rising inequality in expenditure shows) but also more leisure quality.

A possible explanation to the unequal distribution of leisure in terms of quantity and quality may arise from a greater decrease in the relative price of quality of leisure for highly educated individuals than for low educated individuals over this period, which may have resulted in highly educated individuals better timing their leisure in order to make it less fragmented, and to be able to coordinate with others, even if it is in exchange for a lower amount of leisure. There is evidence that highly educated individuals use their earning power to work at more desirable times (despite working longer hours) than low-educated individuals (see Hamermesh [1999, 2000]). We leave a more thorough investigation of these important questions for further research.

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**Table 1 – Unconditional means for the quantity and quality of leisure by gender <sup>1,2</sup>**

<b>Men</b>												
<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> <sup>3</sup>	28.3	(0.7)	27.1	(0.6)	31.6	(0.7)	35.2	(0.5)	33.5	(0.3)	5.3	<0.01
<i>Percentage Pure Leisure</i>	89.4	(0.9)	84.5	(0.8)	84.4	(1.0)	-	-	-	-	-5.0	<0.01
<i>Percentage Leisure with Spouse</i>	49.6	(1.4)	47.3	(1.2)	-	-	-	-	35.3	(0.6)	-14.3	<0.01
<i>Percentage Leisure with Adults</i>	72.8	(1.2)	69.8	(1.1)	-	-	-	-	59.7	(0.6)	-13.1	<0.01
<i>Normalized number of Leisure Intervals</i>	23.4	(0.4)	22.5	(0.3)	24.4	(0.3)	25.7	(0.2)	24.6	(0.1)	0.0	<0.01
<i>Poverty in the Duration of Leisure Intervals</i>	4.2	(0.7)	9.3	(0.9)	2.4	(0.6)	0.0	(0.0)	7.5	(0.4)	3.3	<0.01
<i>N° Observations</i>	854		1,437		830		2,497		6,182			
<b>Women</b>												
<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>	27.2	(0.5)	31.5	(0.5)	31.0	(0.6)	32.8	(0.4)	30.7	(0.3)	3.6	<0.01
<i>Percentage Pure Leisure</i>	87.7	(0.8)	85.6	(0.6)	82.0	(0.9)	-	-	-	-	-5.7	<0.01
<i>Percentage Leisure with Spouse</i>	34.7	(1.1)	31.7	(0.9)	-	-	-	-	30.4	(0.5)	-4.4	<0.01
<i>Percentage Leisure with Adults</i>	68.1	(1.1)	67.7	(0.9)	-	-	-	-	61.2	(0.5)	-6.9	<0.01
<i>Normalized number of Leisure Intervals</i>	19.5	(0.3)	21.6	(0.2)	22.2	(0.3)	23.5	(0.2)	23.1	(0.1)	0.0	<0.01
<i>Poverty in the Duration of Leisure Intervals</i>	3.7	(0.6)	6.9	(0.6)	3.5	(0.6)	0.0	(0.0)	10.2	(0.4)	6.5	<0.01
<i>N° Observations</i>	1,048		1,921		914		2,888		7,557			

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

**Table 2 – OLS regressions on activity enjoyment ratings<sup>1,2,3</sup>**

	<i>US 1985</i>	<i>UK 1986</i>	<i>UK 1986</i>
<i>Spouse present during activity (GSG2)</i>	-	-	0.1274**
<i>Friend present during activity (GSG3)</i>	-	-	0.4274***
<i>Mean hours per leisure period (GSG4a)</i>	0.0543***	0.0241***	0.0211***
<i>Daily number leisure periods (GSG4b)</i>	-0.0368***	-0.043***	0.0436***
<i>Only leisure activity (def)</i>			
<i>Primary leisure secondary work (GSG1)</i>	-0.4062**	0.0021	0.0157
<i>Primary sleep or personal</i>	0.000	-0.0974***	0.0334
<i>Primary paid or unpaid work</i>	-1.6587***	-1.7113***	1.5815***
<i>Constant</i>	8.2462***	8.0136***	7.8894***
<b><i>Multiple R</i></b>	0.339	0.379	0.381

*Notes:* <sup>1</sup> Source: AHTUS 1985 and Unilever 1986 <sup>2</sup> We select the same age range from the two samples (18-72, slightly broader than that used elsewhere in this paper), and consider just those US diarists with co-resident partners <sup>3</sup> \*\*\*Significant at the 0.05 per cent level \*\*Significant at the 0.5 per cent level \*Significant at the 5 per cent level.

**Table 3 – OLS regressions on activity enjoyment ratings including activity types and socio- demographic controls<sup>1,2,3,4</sup>**

	<i>US 1985</i>	<i>UK 1986</i>	<i>UK 1986</i>
<b>Co-presence, fragmentation</b>			
<i>Spouse present during activity</i>	-	-	0.1974***
<i>Friend present during activity</i>	-	-	0.1505*
<i>Mean hours per leisure period</i>	0.053***	0.0174**	0.0163*
<i>Daily number leisure periods</i>	-0.038***	-0.0475***	-0.0479***
<b>Nature of activity vars</b>			
<i>Only leisure activity (def.)</i>			
<i>Primary leisure secondary work</i>	-0.2969*	0.0248	0.0324
<i>Primary sleep or personal</i>	-0.1125*	-0.142**	-0.0266
<i>Primary paid or unpaid work</i>	-1.7514***	-1.7678***	-1.6525*
<i>Primary out of home leisure</i>	0.3346***	0.3174***	0.2758***
<i>Primary active sport exercise</i>	0.5929***	0.5959***	0.6179***
<i>Primary read, listen to music</i>	-0.0077	0.0254	0.0814
<i>Primary watch television</i>	-0.2753***	-0.4100***	-0.4177***
<i>Primary writing, paperwork etc</i>	-0.4301***	-0.6333***	-0.5523**
<b>Socio-demographic vars</b>			
<i>Woman</i>	0.0684*	0.0527*	0.0514*
<i>Age/10</i>	-0.3423***	0.0456	0.0507
<i>Age squared /100</i>	0.0482***	-0.0015	-0.0019
<i>Employed full-time</i>	0.2079***	-0.0047	-0.0071
<i>Employed part-time</i>	0.0903*	-0.0291	-0.0313
<i>Has child aged under 5</i>	0.1413***	0.1701***	0.1723***
<i>Has child age 5-18</i>	0.0139	0.076***	0.0775***
<i>(Constant)</i>	8.6357***	7.8153***	7.6895***
<b>Multiple R</b>	0.348	0.390	0.390

Notes: <sup>1</sup> Source: AHTUS 1985 and Unilever 1986 <sup>2</sup> We select the same age range from the two samples (18-72, slightly broader than that used elsewhere in this paper), and consider just those US diarists with co-resident partners <sup>3</sup> \*\*\*Significant at the 0.05 per cent level \*\*Significant at the 0.5 per cent level \*Significant at the 5 per cent level.

**Table 4 – Percentage out of total leisure of leisure activities, 1965-2003** <sup>1,2,3</sup>

<i>Low Education</i>		
<i>Variables</i>	<i>1965-2003</i>	
	Mean	S.E.
<i>Tv Watching</i>	51.8	(36.3)
<i>Out of Home Leisure</i>	6.8	(19.1)
<i>Active Sport/Exercise</i>	4.1	(13.7)
<i>At Home Leisure</i>	22.9	(30.2)
<i>Read, Listen to Music</i>	8.0	(17.7)
<i>Writing, Paperwork</i>	6.4	(15.5)
<i>N° Observations</i>	11168	
<i>High Education</i>		
<i>Variables</i>	<i>1965-2003</i>	
	Mean	S.E.
<i>Tv Watching</i>	43.8	(35.4)
<i>Out of Home Leisure</i>	10.0	(21.9)
<i>Active Sport/Exercise</i>	6.7	(16.9)
<i>At Home Leisure</i>	19.4	(28.0)
<i>Read, Listen to Music</i>	10.8	(20.7)
<i>Writing, Paperwork</i>	9.3	(18.7)
<i>N° Observations</i>	12864	

Notes: <sup>1</sup> Standard errors in parenthesis <sup>2</sup> Sample consists of respondents in the AHTUS (1965-2003), who are not retired, are not students and are aged 21-65 <sup>3</sup> Definitions for each leisure category are given in Appendix E.

**Table 5 – Change in the time devoted to different Leisure Activities, 1965-2003** <sup>1,2,3,4</sup>

<i>Low Education</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>Tv Watching</i>	11.7	(0.3)	14.7	(0.4)	16.6	(0.5)	19.7	(0.4)	18.5	(0.3)	6.8	0
<i>Out of Home Leisure</i>	2.7	(0.2)	1.8	(0.1)	2.4	(0.3)	2.2	(0.2)	2.7	(0.1)	-0.1	0.81
<i>Active Sport/Exercise</i>	1.0	(0.1)	1.4	(0.1)	2.4	(0.2)	2.2	(0.2)	1.6	(0.1)	0.6	0
<i>At Home Leisure</i>	7.0	(0.3)	7.4	(0.3)	5.5	(0.3)	8.2	(0.3)	8.7	(0.2)	1.7	0
<i>Read, Listen to Music</i>	3.8	(0.2)	3.4	(0.1)	2.6	(0.2)	1.8	(0.1)	1.5	(0.1)	-2.3	0
<i>Writting, Paperwork</i>	1.9	(0.1)	2.3	(0.1)	3.0	(0.2)	1.4	(0.1)	1.4	(0.1)	-0.5	0
<i>N° Observations</i>	1,346		2,134		933		2,105		4,951			
<i>High Education</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>Tv Watching</i>	7.7	(0.4)	10.3	(0.4)	12.0	(0.4)	14.3	(0.3)	13.6	(0.2)	5.9	0
<i>Out of Home Leisure</i>	4.0	(0.4)	2.3	(0.2)	2.7	(0.3)	2.7	(0.2)	3.7	(0.1)	-0.3	0.5
<i>Active Sport/Exercise</i>	1.0	(0.2)	2.0	(0.2)	2.8	(0.3)	2.8	(0.1)	2.0	(0.1)	1.0	0
<i>At Home Leisure</i>	5.8	(0.4)	6.0	(0.3)	4.8	(0.3)	6.3	(0.2)	6.5	(0.1)	0.6	0.17
<i>Read, Listen to Music</i>	5.1	(0.3)	3.4	(0.2)	3.8	(0.2)	3.5	(0.1)	2.6	(0.1)	-2.5	0
<i>Writting, Paperwork</i>	2.6	(0.2)	2.6	(0.2)	3.8	(0.2)	3.1	(0.1)	2.4	(0.1)	-0.2	0.39
<i>N° Observations</i>	491		1,125		759		2,890		7,799			

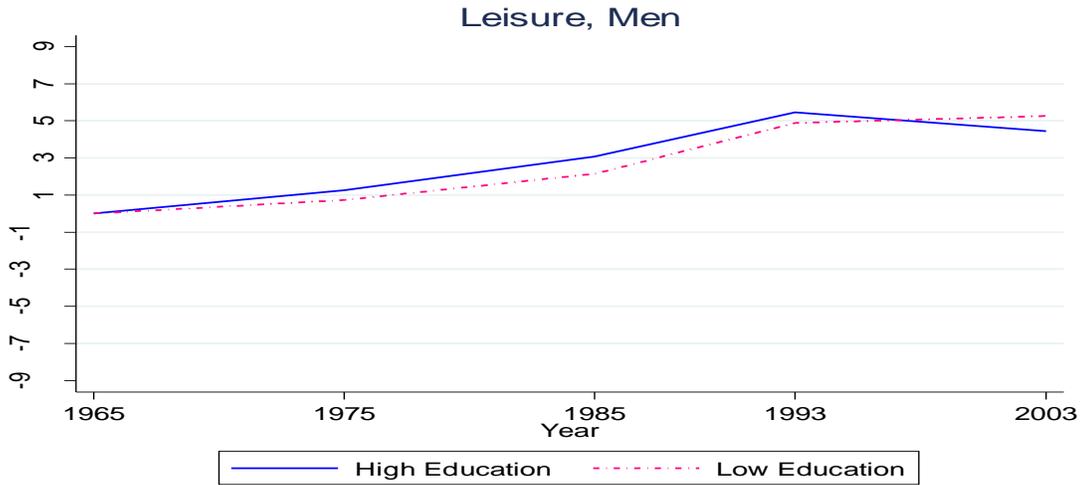
*Notes:* <sup>1</sup> Standard errors in parenthesis <sup>2</sup> Sample consists of respondents in the AHTUS (1965-2003), who are not retired, are not students and are aged 21-65 <sup>3</sup> Leisure time is measured in hours per week <sup>4</sup> Definitions for each leisure category are given in Appendix E.

**Table 6 – Quality Indicators for different Leisure Activities 1965-2003** <sup>1,2,3</sup>

<i>1965-2003</i>	<i>Percent. With spouse</i>	<i>Percent. With adults</i>	<i>Percent. Pure Leisure</i>	<i>Normalized Number Intervals</i>
<i>Tv Watching</i>	41.9 (46.2)	61.0 (44.7)	86.7 (28.5)	14.2 (8.1)
<i>Out of Home Leisure</i>	35.5 (47.0)	94.0 (23.1)	89.7 (28.1)	9.2 (4.6)
<i>Active Sport/Exercise</i>	15.8 (35.9)	54.7 (48.9)	80.9 (37.5)	8.8 (4.5)
<i>At Home Leisure</i>	31.1 (43.3)	78.7 (37.8)	89.6 (26.2)	12.2 (6.7)
<i>Read, Listen to Music</i>	25.2 (41.5)	36.1 (45.7)	90.4 (26.8)	10.2 (5.6)
<i>Writing, Paperwork</i>	24.9 (41.4)	41.2 (47.2)	88.1 (29.4)	10.3 (5.7)
<i>General Leisure</i>	36.0 (39.5)	65.0 (36.6)	87.7 (22.7)	23.5 (8.9)

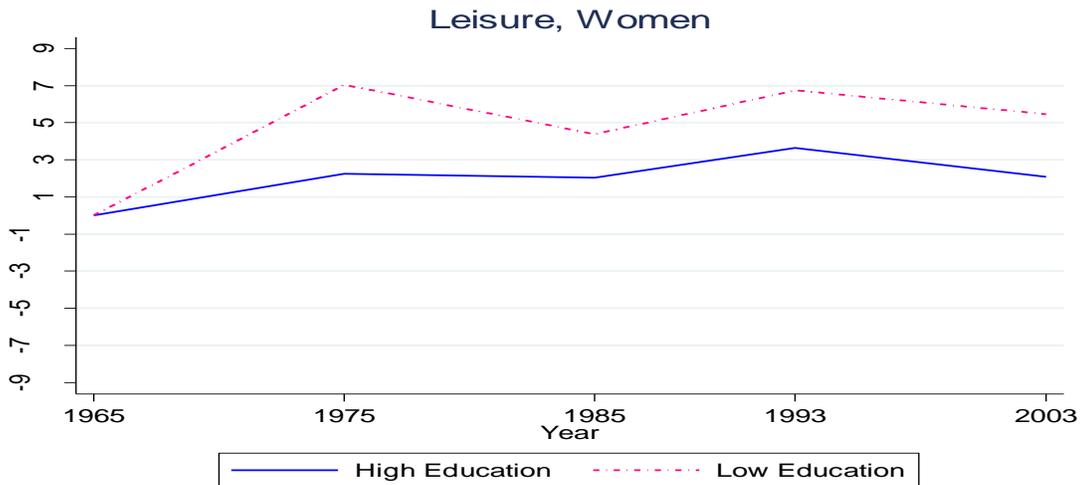
*Notes:* <sup>1</sup> Standard errors in parenthesis <sup>2</sup> Sample consists of respondents in the AHTUS (1965-2003), who are not retired, are not students and are aged 21-65 <sup>3</sup> Definitions for each leisure category are given in Appendix E.

Figure 1A – Coefficients on Year Dummies for the Quantity of Leisure, Men Sample <sup>1,2,3</sup>



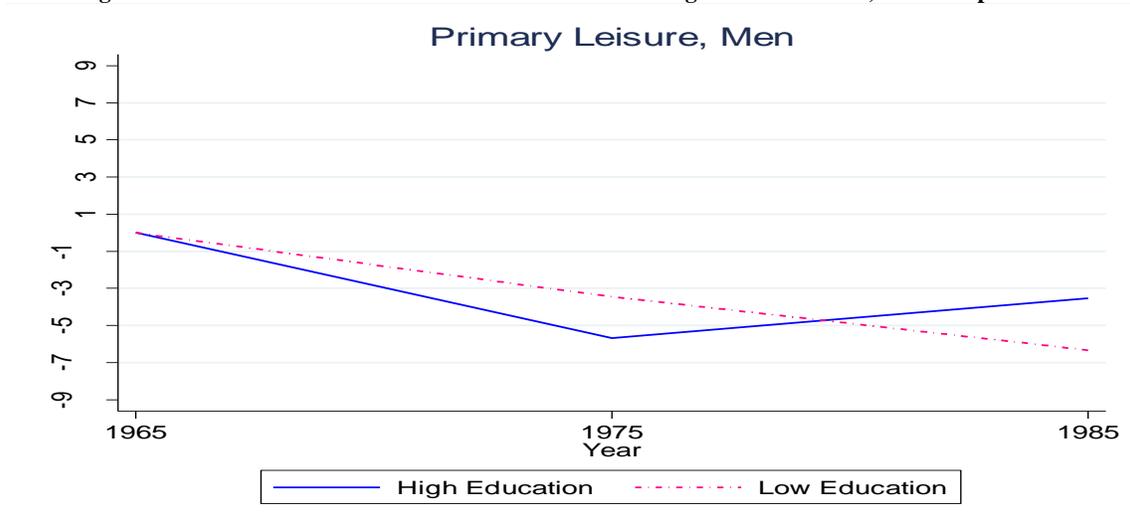
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup>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

Figure 1B – Coefficients on Year Dummies for the Quantity of Leisure, Women Sample <sup>1,2,3</sup>



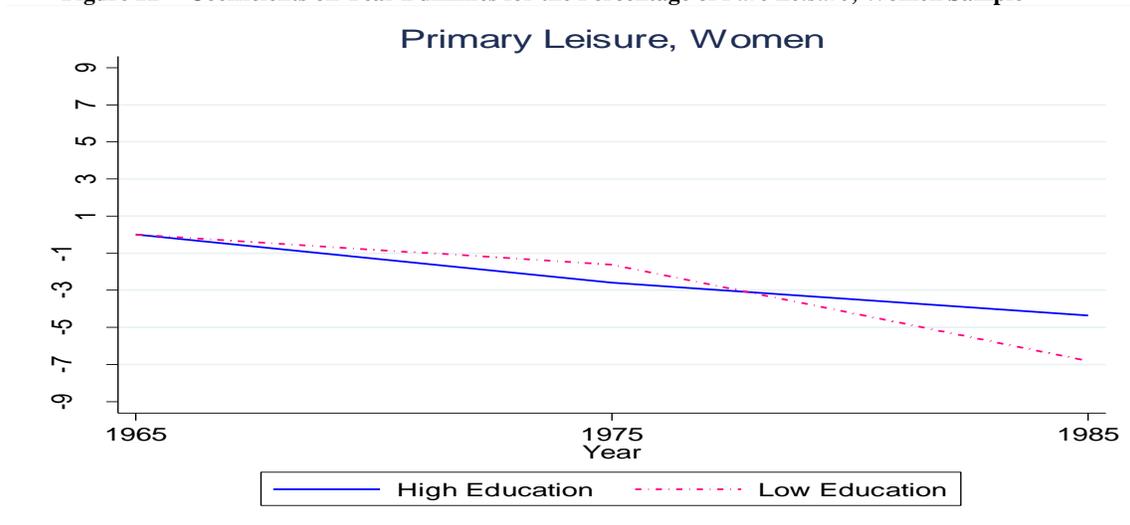
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup>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

Figure 2A – Coefficients on Year Dummies for the Percentage of *Pure Leisure*, Men Sample <sup>1,2,3</sup>



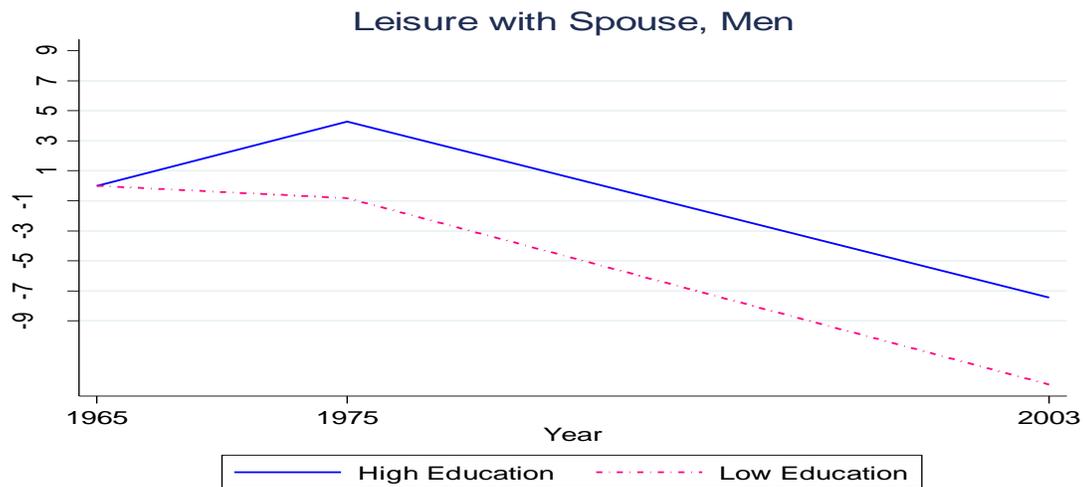
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group 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

Figure 2B – Coefficients on Year Dummies for the Percentage of *Pure Leisure*, Women Sample <sup>1,2,3</sup>



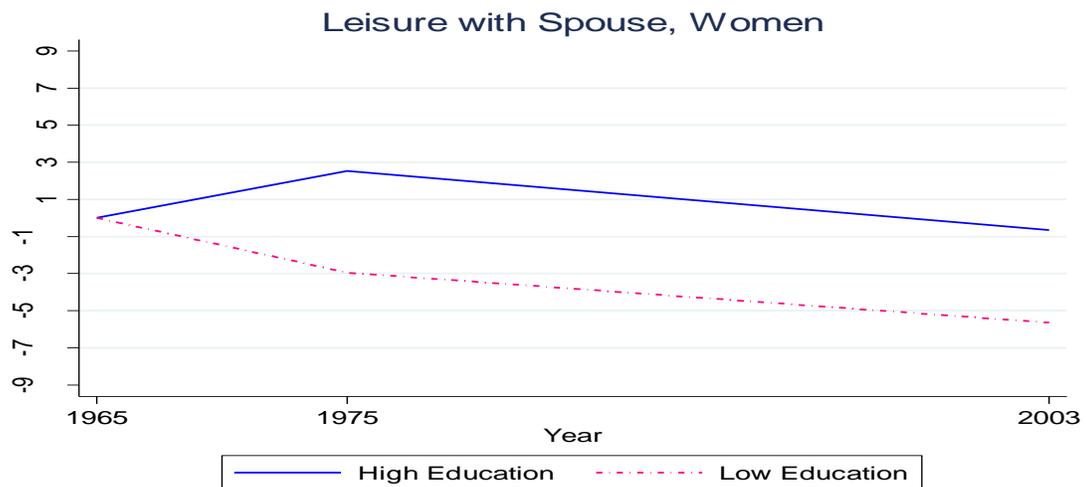
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group 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

Figure 3A – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Married Men Sample<sup>1,2,3</sup>



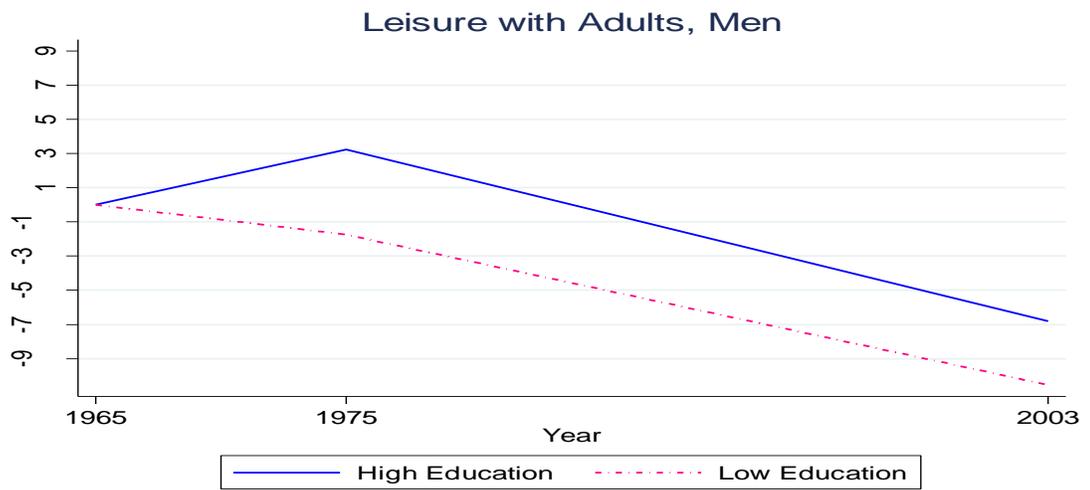
Note: <sup>1</sup>This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup>Regressions are run separately for each educational group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

Figure 3B – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Married Women Sample<sup>1,2,3</sup>



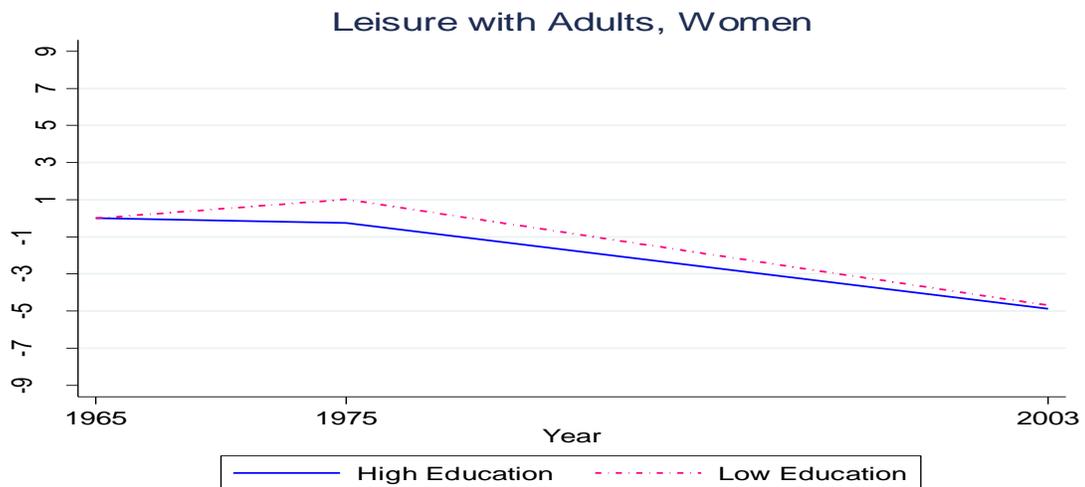
Note: <sup>1</sup>This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup>Regressions are run separately for each educational group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

**Figure 4A – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Men Sample<sup>1,2,3</sup>**



*Note:* <sup>1</sup> 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 <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as percentage-of-*Leisure-with-Adults* deviation from 1965, conditional on demographics.

**Figure 4B – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Women Sample<sup>1,2,3</sup>**



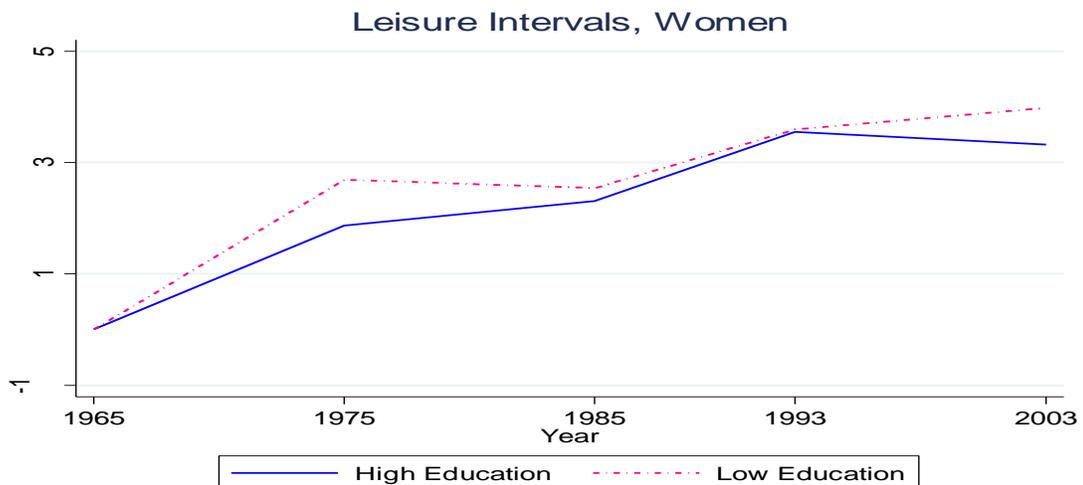
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational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

**Figure 5A – Coefficients on Year Dummies for the Number of Leisure Intervals, Men Sample** <sup>1,2,3</sup>



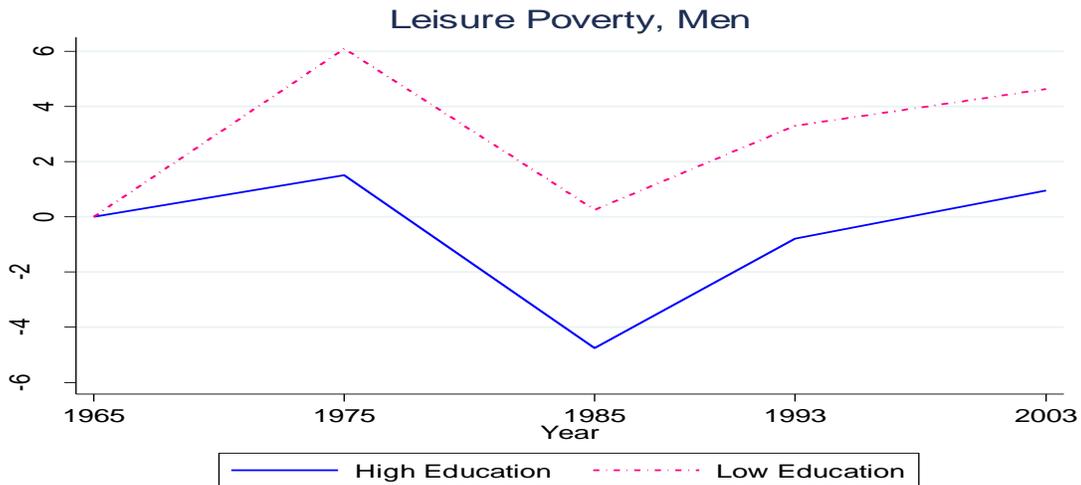
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of the normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational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

**Figure 5B – Coefficients on Year Dummies for the Number of Leisure Intervals, Women Sample** <sup>1,2,3</sup>



*Note:* <sup>1</sup> 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 <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as normalized-number-of-leisure-intervals deviation from 1965, conditional on demographics.

**Figure 6A – Coefficients on Year Dummies for the Fragmentation of Leisure, Men Sample<sup>1,2,3</sup>**



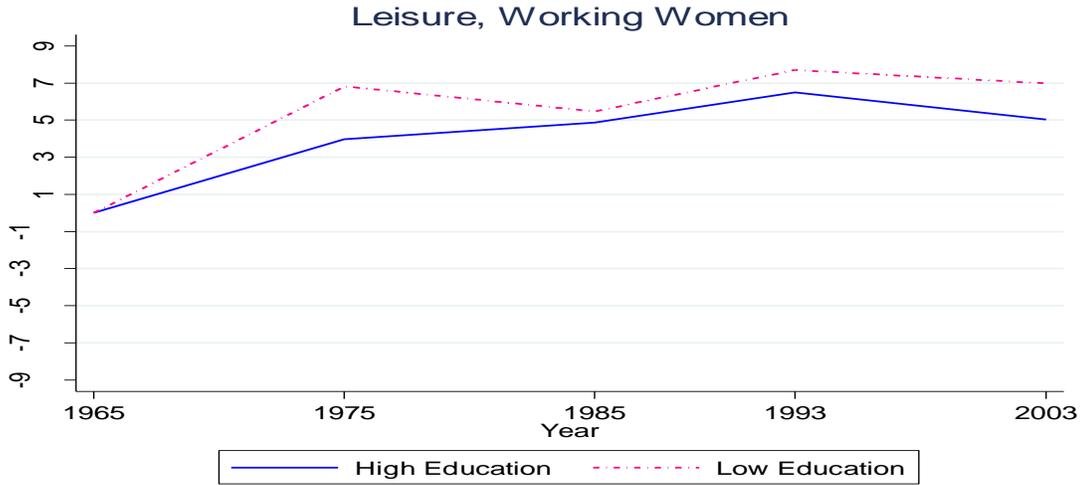
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from a linear probability model where the dependent variable is a dummy that takes value one if the average duration of leisure intervals for a given individual is below half the median duration of all the intervals in the survey-year of the respondent. The control variables are year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as the probability of falling below the a *poverty line in the duration of leisure intervals* with respect to 1965 conditional on demographics. This poverty line is defined as half the median duration of all intervals in a given survey-year.

**Figure 6B – Coefficients on Year Dummies for the Fragmentation of Leisure, Women Sample<sup>1,2,3</sup>**



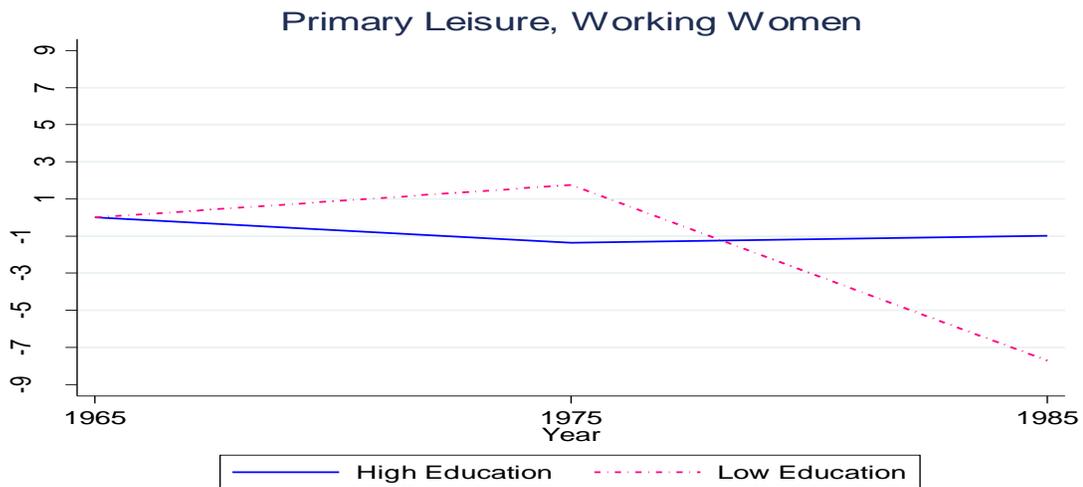
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from a linear probability model where the dependent variable is a dummy that takes value one if the average duration of leisure intervals for a given individual is below half the median duration of all the intervals in the survey-year of the respondent. The control variables are year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as the probability of falling below the a *poverty line in the duration of leisure intervals* with respect to 1965 conditional on demographics. This poverty line is defined as half the median duration of all intervals in a given survey-year.

Figure 7A – Coefficients on Year Dummies for the Quantity of Leisure, Working Women<sup>1,2,3</sup>



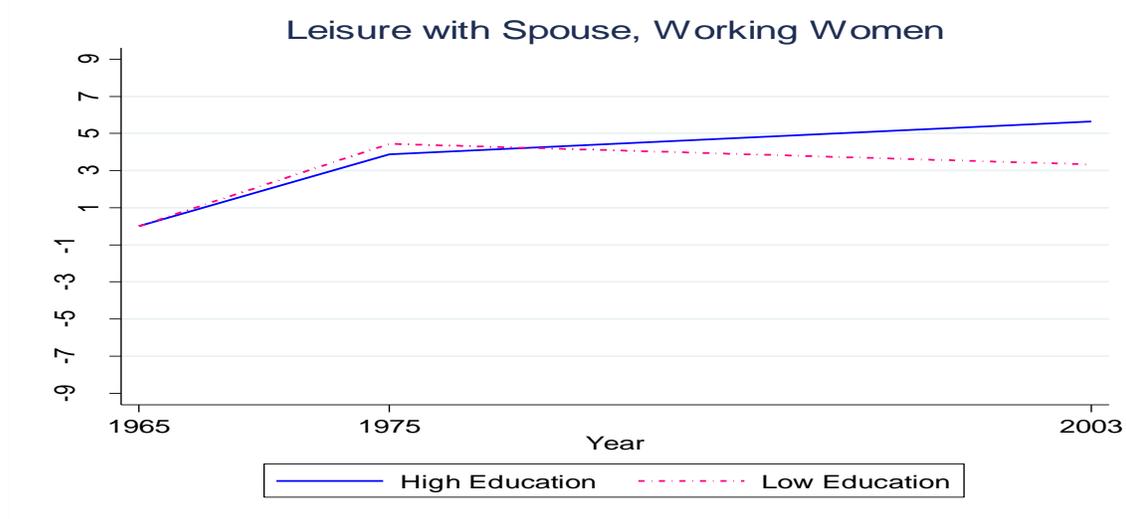
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup>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

Figure 7B – Coefficients on Year Dummies for the Percentage of Pure Leisure, Working Women<sup>1,2,3</sup>



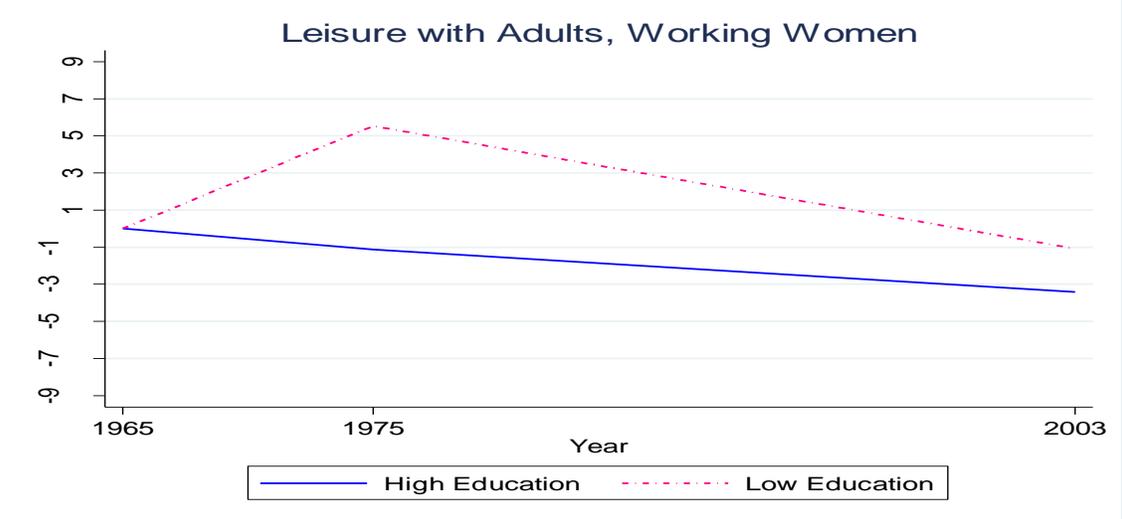
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group 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

Figure 7C – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Working Women <sup>1,2,3</sup>



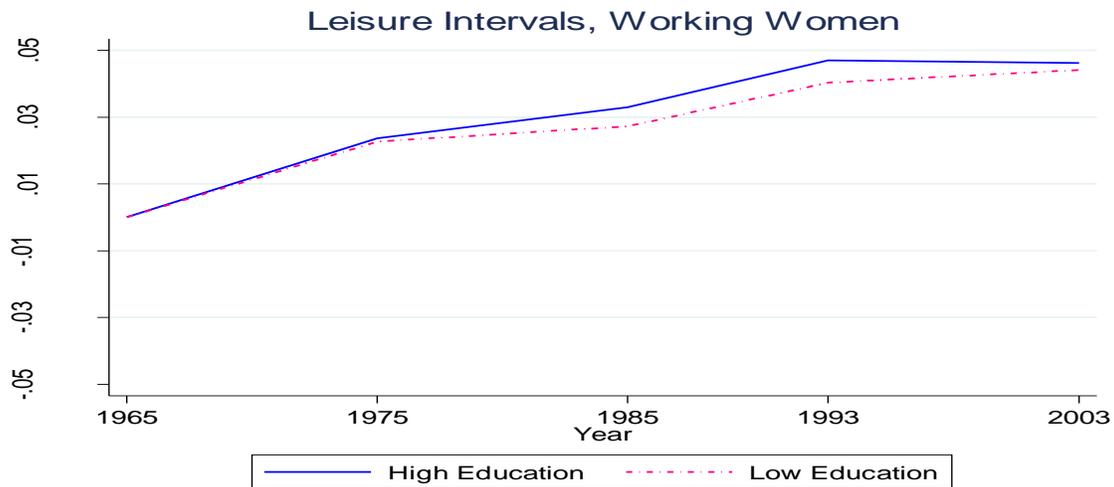
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational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

Figure 7D – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Working Women <sup>1,2,3</sup>



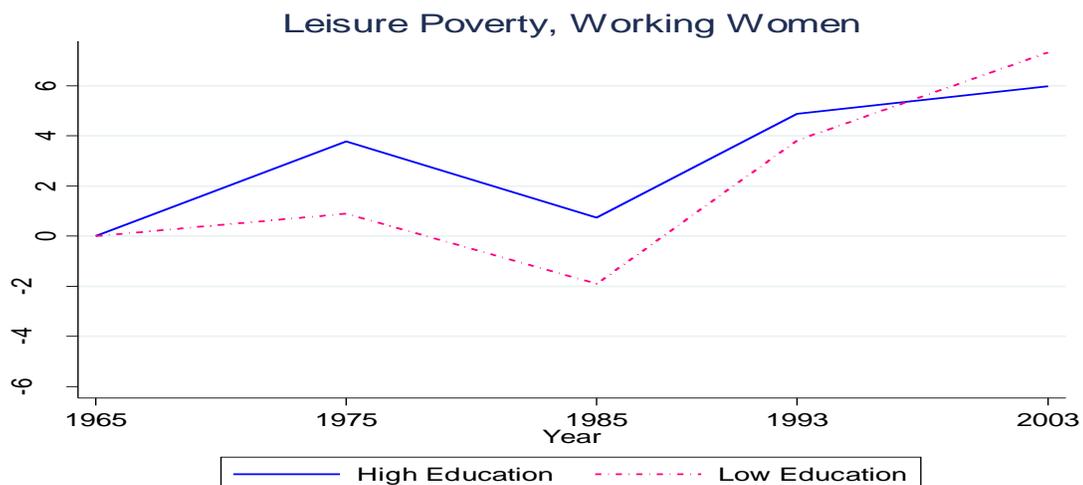
Note: <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational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

**Figure 7E – Coefficients on Year Dummies for the Number of Leisure Intervals, Working Women<sup>1,2,3</sup>**



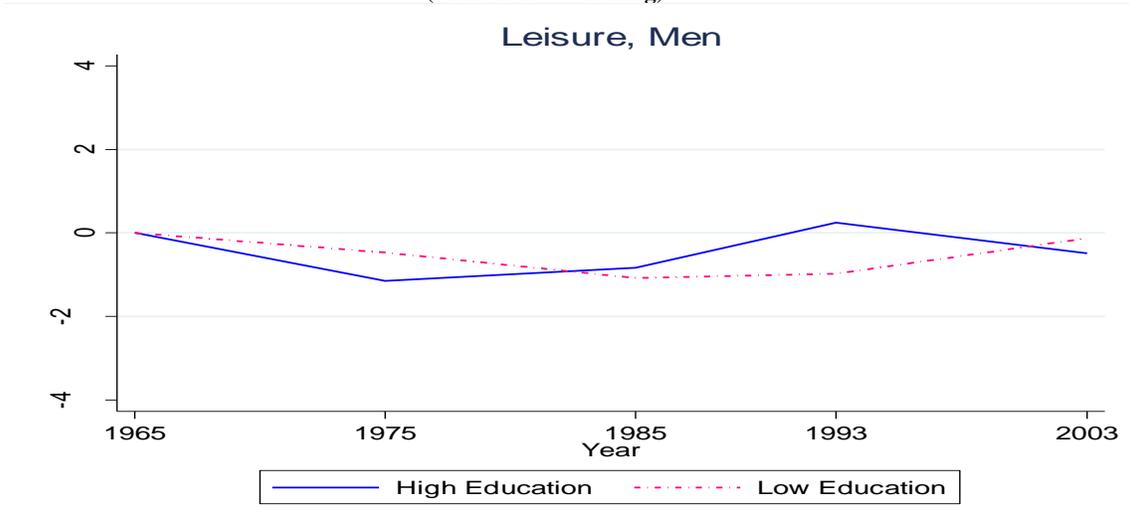
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational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

**Figure 7F – Coefficients on Year Dummies for the Fragmentation of Leisure, Working Women<sup>1,2,3</sup>**



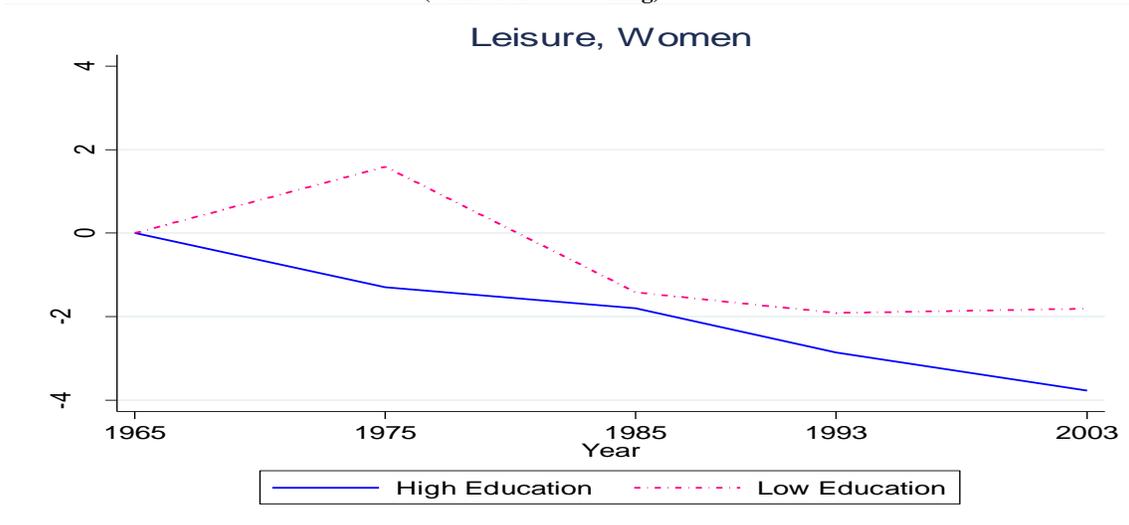
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from a linear probability model where the dependent variable is a dummy that takes value one if the average duration of leisure intervals for a given individual is below half the median duration of all the intervals in the survey-year of the respondent. The control variables are year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as the probability of falling below the a *poverty line in the duration of leisure intervals* with respect to 1965 conditional on demographics. This poverty line is defined as half the median duration of all intervals in a given survey-year.

**Figure 8A – Coefficients on Year Dummies for the Quantity of Leisure, Men Sample  
(without TV Watching)<sup>1,2,3</sup>**



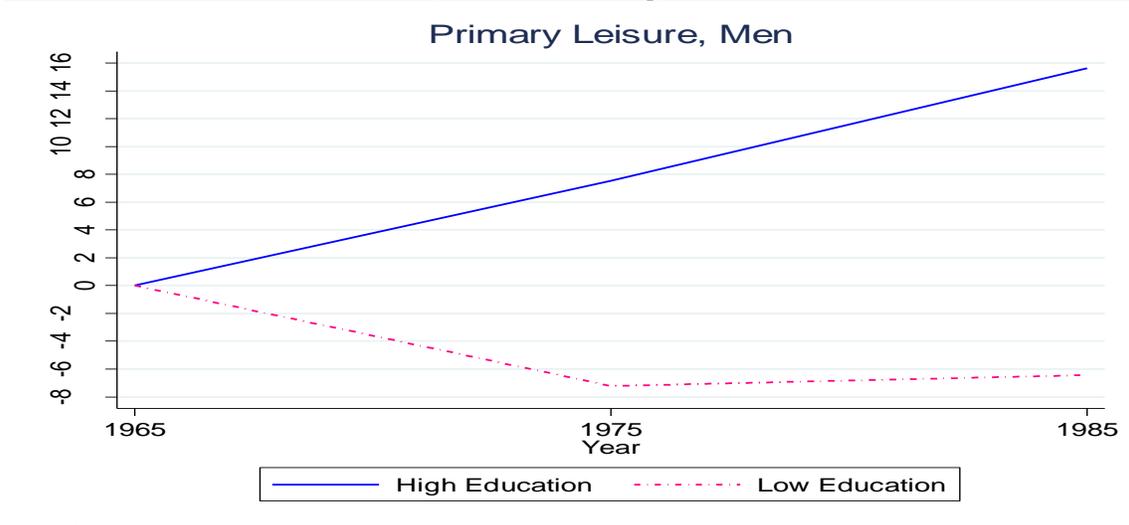
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as hours-per-week deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 8B – Coefficients on Year Dummies for the Quantity of Leisure, Women Sample  
(without TV Watching)<sup>1,2,3</sup>**



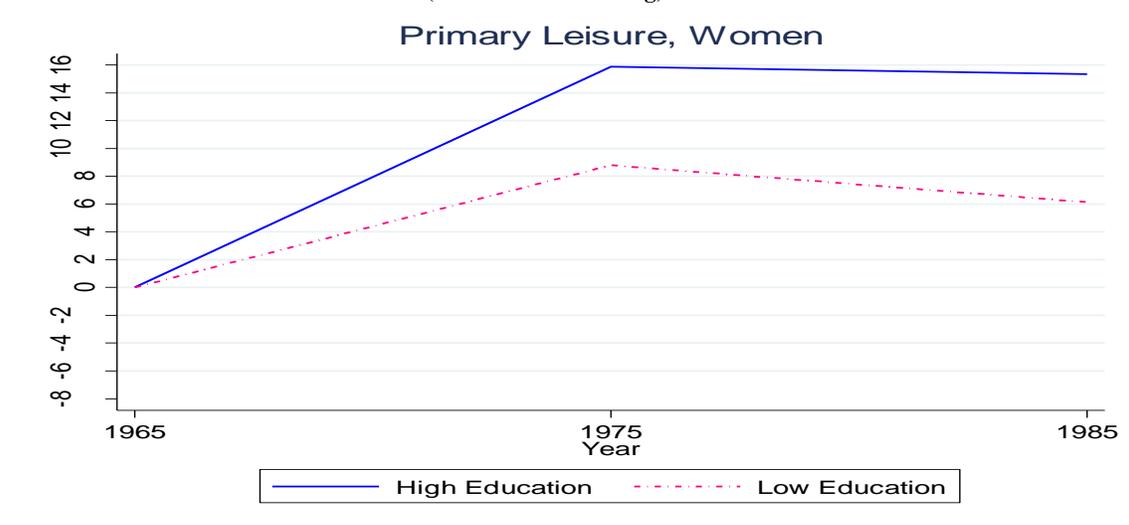
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of time spent in leisure on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as hours-per-week deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 9A – Coefficients on Year Dummies for the Percentage of *Pure Leisure*, Men Sample (without TV Watching)<sup>1,2,3</sup>**



*Note:* <sup>1</sup> 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 <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as percentage-of-*Pure-Leisure* deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 9B – Coefficients on Year Dummies for the Percentage of *Pure Leisure*, Women Sample (without TV Watching)<sup>1,2,3</sup>**



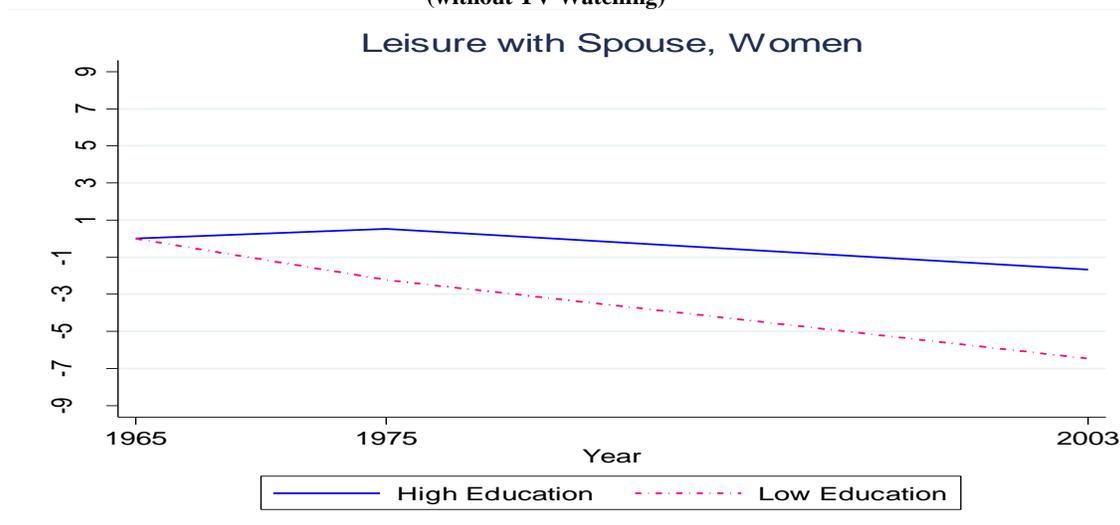
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Pure Leisure* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as percentage-of-*Pure-Leisure* deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 10A – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Married Men Sample (without TV Watching)<sup>1,2,3</sup>**



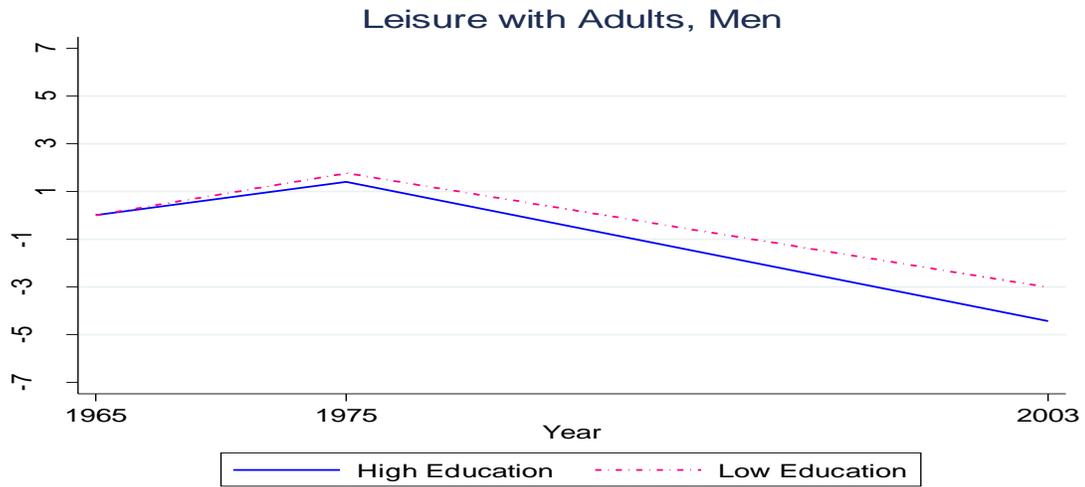
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group for those individuals who are married <sup>3</sup> The coefficients should be interpreted as percentage-of-Leisure-with-Spouse deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 10B – Coefficients on Year Dummies for the Percentage of *Leisure with Spouse*, Married Women Sample (without TV Watching)<sup>1,2,3</sup>**



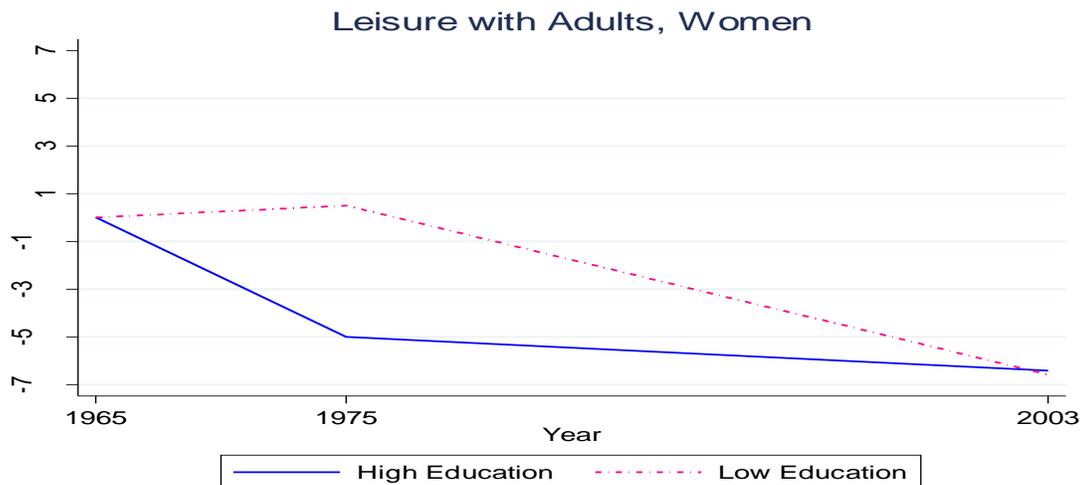
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Spouse* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group for those individuals who are married <sup>3</sup> The coefficients should be interpreted as percentage-of-Leisure-with-Spouse deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 11A – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Men Sample (without TV Watching)<sup>1,2,3</sup>**



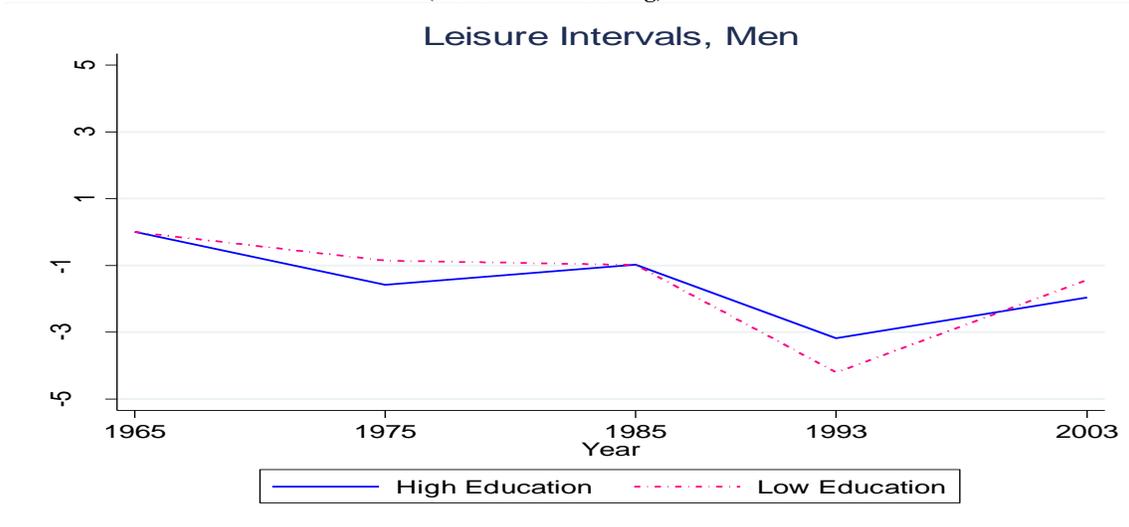
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as percentage-of-*Leisure-with-Adults* deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 11B – Coefficients on Year Dummies for the Percentage of *Leisure with Adults*, Women Sample (without TV Watching)<sup>1,2,3</sup>**



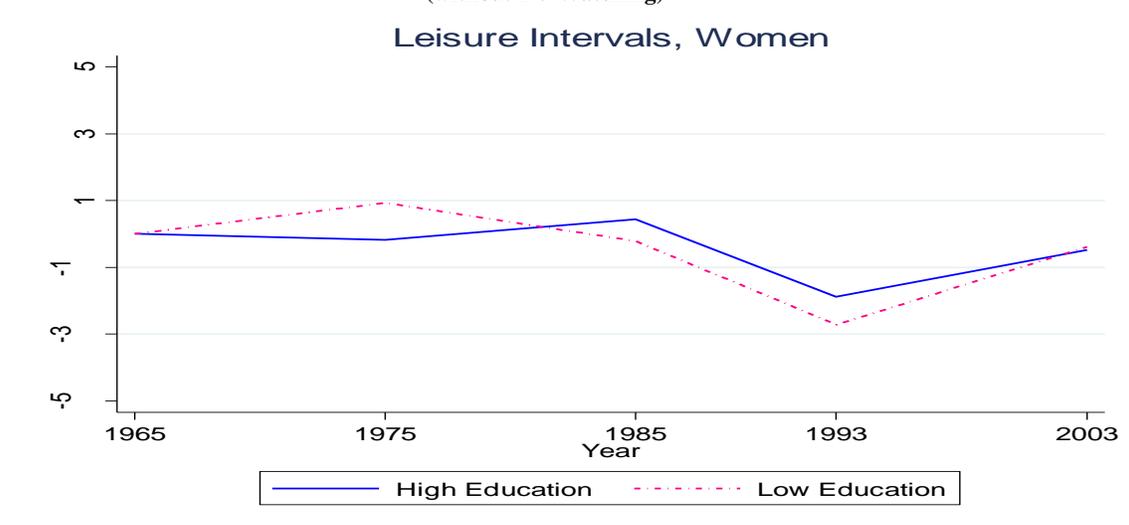
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of percentage of *Leisure with Adults* on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as percentage-of-*Leisure-with-Adults* deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 12A – Coefficients on Year Dummies for the Number of Leisure Intervals, Men Sample (without TV Watching)<sup>1,2,3</sup>**



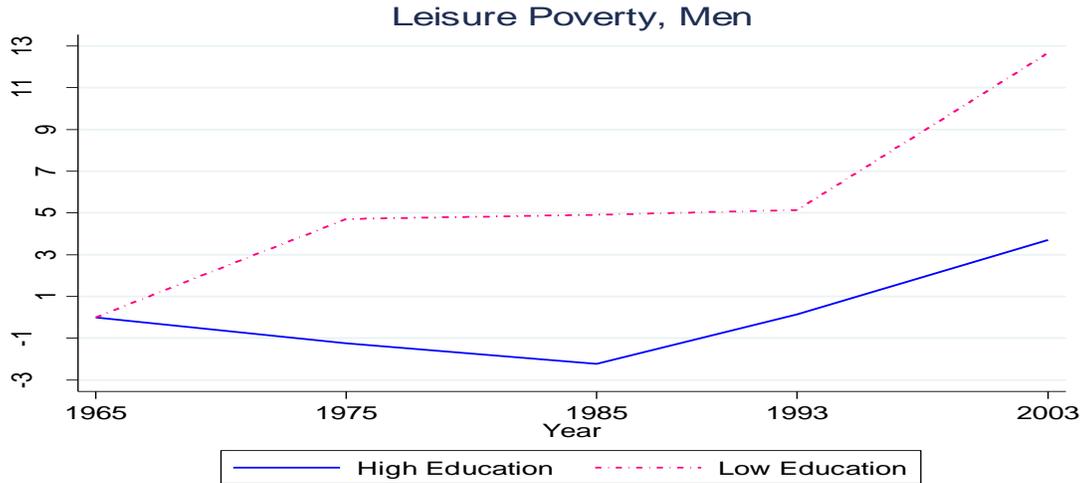
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of the normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as normalized-number-of-leisure-intervals deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 12B – Coefficients on Year Dummies for the Number of Leisure Intervals, Women Sample (without TV Watching)<sup>1,2,3</sup>**



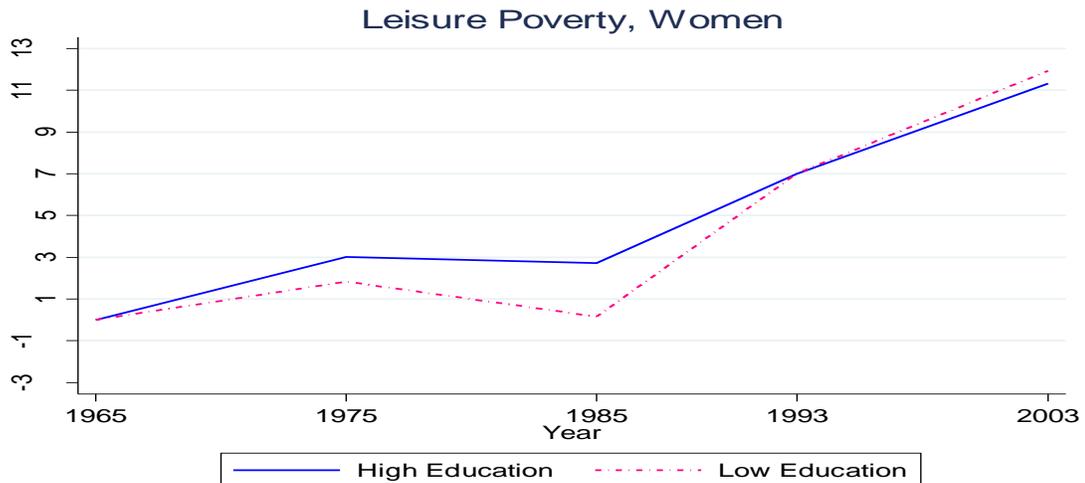
*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from regressions of normalized number of leisure intervals on year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as normalized-number-of-leisure-intervals deviation from 1965, conditional on demographics <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 13A – Coefficients on Year Dummies for the Fragmentation of Leisure, Men Sample  
(without TV Watching)<sup>1,2,3</sup>**



*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from a linear probability model where the dependent variable is a dummy that takes value one if the average duration of leisure intervals for a given individual is below half the median duration of all the intervals in the survey-year of the respondent. The control variables are year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as the probability of falling below the a *poverty line in the duration of leisure intervals* with respect to 1965 conditional on demographics. This poverty line is defined as half the median duration of all intervals in a given survey-year <sup>4</sup> The definition of leisure does not include Watching Television.

**Figure 13B – Coefficients on Year Dummies for the Fragmentation of Leisure, Women Sample  
(without TV Watching)<sup>1,2,3</sup>**



*Note:* <sup>1</sup> This figure plots the coefficients on year dummies from a linear probability model where the dependent variable is a dummy that takes value one if the average duration of leisure intervals for a given individual is below half the median duration of all the intervals in the survey-year of the respondent. The control variables are year dummies (with 1965 being the omitted year), age controls, day-of-week and family composition controls <sup>2</sup> Regressions are run separately for each educational group <sup>3</sup> The coefficients should be interpreted as the probability of falling below the a *poverty line in the duration of leisure intervals* with respect to 1965 conditional on demographics. This poverty line is defined as half the median duration of all intervals in a given survey-year <sup>4</sup> The definition of leisure does not include Watching Television.

APPENDIX A

Appendix A Table A1: AHTUS Description <sup>1</sup>

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 <sup>th</sup> 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 per cent in Jackson; 74 per cent 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 per cent in the first wave; 44.9 per cent 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 per cent overall, 51 per cent 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 not have a birthday completed the diary.	63 per cent
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 per cent

Note: <sup>1</sup> Source: Fisher et al [2006].

Appendix A Table A2: AHTUS Codes and Leisure Codes <sup>1,2</sup>

	1965	1975-76	1985	1992-94	2003
-8					
1					
2					
3					
4					
5				N/A	
6					
7					
8				N/A	
9					
10					
11					
12					
13					
14				N/A	
15	N/A				
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43			N/A		N/A
44			N/A		N/A
45			N/A		N/A
46					N/A
48					N/A
49					
50				N/A	

Notes: <sup>1</sup> 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 <sup>2</sup> Source: Fisher et al [2006].

Appendix A Table A2 (Cont.). AHTUS Codes and Leisure Codes <sup>1,2</sup>

		1965	1975-76	1985	1992-94	2003
51	attend sporting event					
52	go to cinema					
53	theater, concert, opera					
54	museums, exhibitions					
55	attend other public event					N/A
56	restaurant, cafe bar					
57	Parties or receptions					
58	imputed time away from home					
60	sports & exercise					
62	Walking				N/A	
63	Cycling	N/A			N/A	
64	outdoor recreation	N/A				
65	physical activity, sports with child					
66	hunting, fishing, boating, hiking				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		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					
98	other travel					

Notes: <sup>1</sup>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 <sup>2</sup>Source: Fisher et al [2006].

## APPENDIX B

Appendix B Table B1– Variables used in the validation exercise <sup>1,2,3,4</sup>

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<b>Leisure dilution</b>	
primary leisure secondary work	D
<b>Leisure fragmentation</b>	
mean hours per leisure period	C
daily number leisure periods	C
<b>Co-present leisure (UK only)</b>	
spouse present during activity	D
friend present during activity	D
<b>Demographic variables</b>	
Woman	DC
Age	C
age squared	C
employed full time	DC
employed part time	DC
has child aged under 5	DC
has child age 5-18	DC
<b>Leisure Activity variables</b>	
primary paid or unpaid work	D
primary out of home leisure	D
primary active sport exercise	D
primary read, listen to music	D
primary watch television	D
primary writing, paperwork etc	D
primary sleep or personal	D

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*Notes:* <sup>1</sup> Source: AHTUS 1985 and Unilever 1986 <sup>2</sup> We select the same age range from the two samples (18-72, slightly broader than that used elsewhere in this paper), and consider just those US diarists with co-resident partners <sup>3</sup> The designation D indicates 0-1 dummy variables; C indicates variable which are constant across all the events of a particular respondent's day <sup>4</sup> Definitions for each leisure category are given in Appendix E.

APPENDIX C

Appendix C Table C1 – Demographic composition of the time-diary samples in AHTUS<sup>1,2</sup>

<i>Men</i>											
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)		
	1965		1975		1985		1993		2003		
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	
<i>Age</i>	40.6	(12.3)	39.5	(12.2)	38.7	(11.6)	39.3	(11.2)	41.8	(11.3)	
<i>College</i>	0.3	(0.5)	0.4	(0.5)	0.5	(0.5)	0.6	(0.5)	0.6	(0.5)	
<i>Married</i>	0.9	(0.3)	0.8	(0.4)	0.7	(0.4)	-	-	0.7	(0.5)	
<i>Presence of Children</i>	0.6	(0.5)	0.5	(0.5)	0.4	(0.5)	0.3	(0.4)	0.4	(0.5)	
<i>Number of Children</i>	1.5	(1.6)	1.2	(1.4)	0.8	(1.0)	0.5	(1.0)	0.8	(1.1)	
<i>Working</i>	1.0	(0.1)	0.9	(0.3)	0.9	(0.2)	0.9	(0.3)	0.9	(0.3)	
<i>N° Observations</i>	854		1,437		830		2,497		6,182		
<i>Women</i>											
<i>Variables</i>	(1)		(2)		(3)		(4)		(5)		
	1965		1975		1985		1993		2003		
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	
<i>Age</i>	41.0	(12.4)	40.1	(12.7)	38.9	(12.1)	39.4	(11.4)	42.1	(11.5)	
<i>College</i>	0.2	(0.4)	0.3	(0.4)	0.4	(0.5)	0.6	(0.5)	0.6	(0.5)	
<i>Married</i>	0.8	(0.4)	0.7	(0.5)	0.7	(0.5)	-	-	0.6	(0.5)	
<i>Presence of Children</i>	0.6	(0.5)	0.6	(0.5)	0.4	(0.5)	0.3	(0.5)	0.5	(0.5)	
<i>Number of Children</i>	1.4	(1.6)	1.2	(1.3)	0.7	(1.0)	0.6	(1.0)	0.9	(1.1)	
<i>Working</i>	0.5	(0.5)	0.6	(0.5)	0.7	(0.5)	0.8	(0.4)	0.8	(0.4)	
<i>N° Observations</i>	1,048		1,921		914		2,888		7,557		

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

APPENDIX D

Appendix D Table D1. Coefficients on Year Dummies, Men Sample <sup>1,2,3</sup>

<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>	0.7	(1.1)	2.1*	(1.2)	4.9***	(1.1)	5.3***	(0.9)	4,919
<i>Percentage Pure Leisure</i>	-3.5**	(1.5)	-6.3***	(1.8)	-	-	-	-	1,820
<i>Percentage Leisure with Spouse</i>	-0.8	(2.3)	-	-	-	-	-13.2***	(1.9)	3,565
<i>Percentage Leisure with Adults</i>	-1.7	(1.9)	-	-	-	-	-10.5***	(1.6)	3,565
<i>Normalized number of Leisure Intervals</i>	-0.2	(0.5)	0.7	(0.6)	1.8***	(0.5)	1.6***	(0.4)	4,767
<i>Poverty in the Duration of Leisure Intervals</i>	6.0***	(1.3)	0.2	(1.1)	0.0	(0.0)	4.7***	(1.0)	3,995
<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>	1.2	(1.2)	3.1**	(1.4)	5.5***	(1.2)	4.4***	(1.1)	6,117
<i>Percentage Pure Leisure</i>	-5.7***	(2.0)	-3.5*	(2.1)	-	-	-	-	1,263
<i>Percentage Leisure with Spouse</i>	4.3	(2.9)	-	-	-	-	-7.4***	(2.5)	4,346
<i>Percentage Leisure with Adults</i>	3.2	(2.7)	-	-	-	-	-6.8***	(2.3)	4,346
<i>Normalized number of Leisure Intervals</i>	-0.7	(0.8)	0.9	(0.8)	1.7**	(0.7)	0.6	(0.7)	5,913
<i>Poverty in the Duration of Leisure Intervals</i>	1.5	(2.1)	-4.7***	(1.8)	0.0	(0.0)	1.0	(1.7)	4,731

Notes: <sup>1</sup> This table reports the coefficients and standard errors for the time dummies that are plotted in the Figures <sup>2</sup> See notes to the figures for full sample and methodological descriptions <sup>3</sup> \*\*\*Significant at the 1 per cent level \*\*Significant at the 5 per cent level \*Significant at the 10 per cent level.

Appendix D Table D2. Coefficients on Year Dummies, Women Sample <sup>1,2,3</sup>

<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>	7.0***	(0.8)	4.4***	(1.0)	6.7***	(0.9)	5.5***	(0.8)	6,545
<i>Percentage Pure Leisure</i>	-1.6	(1.2)	-6.8***	(1.6)	-	-	-	-	2,677
<i>Percentage Leisure with Spouse</i>	-2.9*	(1.7)	-	-	-	-	-5.6***	(1.5)	4,861
<i>Percentage Leisure with Adults</i>	1.0	(1.5)	-	-	-	-	-4.7***	(1.5)	4,861
<i>Normalized number of Leisure Intervals</i>	2.7***	(0.4)	2.5***	(0.5)	3.6***	(0.4)	4.0***	(0.4)	6,352
<i>Poverty in the Duration of Leisure Intervals</i>	1.9*	(1.0)	-1.3	(1.0)	0.0	(0.0)	5.8***	(1.0)	5,384
<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>	2.2*	(1.3)	2.0	(1.3)	3.6***	(1.2)	2.1**	(1.1)	7,142
<i>Percentage Pure Leisure</i>	-2.6	(2.0)	-4.4**	(2.0)	-	-	-	-	1,165
<i>Percentage Leisure with Spouse</i>	2.5	(2.9)	-	-	-	-	-0.7	(2.4)	5,204
<i>Percentage Leisure with Adults</i>	-0.2	(2.7)	-	-	-	-	-4.9**	(2.2)	5,204
<i>Normalized number of Leisure Intervals</i>	1.9***	(0.6)	2.3***	(0.7)	3.6***	(0.6)	3.3***	(0.5)	6,904
<i>Poverty in the Duration of Leisure Intervals</i>	4.5**	(1.9)	2.2	(1.8)	0.0	(0.0)	6.9***	(1.4)	5,588

Notes: <sup>1</sup> This table reports the coefficients and standard errors for the time dummies that are plotted in the Figures <sup>2</sup> See notes to the figures for full sample and methodological descriptions <sup>3</sup> \*\*\*Significant at the 1 per cent level \*\*Significant at the 5 per cent level \*Significant at the 10 per cent level.

**Appendix D Table D3 Coefficients on Year Dummies, Working Women** <sup>1,2,3</sup>

<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>	6.8***	(1.0)	5.5***	(1.2)	7.7***	(1.1)	7.0***	(0.9)	4,017
<i>Percentage Pure Leisure</i>	1.8	(1.8)	-7.7***	(2.3)	-	-	-	-	1,426
<i>Percentage Leisure with Spouse</i>	4.4*	(2.5)	-	-	-	-	3.3	(2.2)	2,892
<i>Percentage Leisure with Adults</i>	5.5**	(2.5)	-	-	-	-	-1.1	(2.3)	2,892
<i>Normalized number of Leisure Intervals</i>	2.3***	(0.5)	2.7***	(0.6)	4.0***	(0.6)	4.4***	(0.5)	3,860
<i>Poverty in the Duration of Leisure Intervals</i>	0.9	(1.5)	-1.9	(1.5)	0.0	(0.0)	7.3***	(1.5)	3,238
<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>	4.0***	(1.5)	4.9***	(1.5)	6.5***	(1.3)	5.0***	(1.2)	5,612
<i>Percentage Pure Leisure</i>	-1.4	(3.3)	-1.0	(3.0)	-	-	-	-	740
<i>Percentage Leisure with Spouse</i>	3.9	(3.9)	-	-	-	-	5.6*	(3.3)	4,006
<i>Percentage Leisure with Adults</i>	-1.1	(3.9)	-	-	-	-	-3.4	(3.3)	4,006
<i>Normalized number of Leisure Intervals</i>	2.4***	(0.8)	3.3***	(0.8)	4.7***	(0.7)	4.6***	(0.7)	5,394
<i>Poverty in the Duration of Leisure Intervals</i>	4.0	(2.7)	0.8	(2.5)	0.0	(0.0)	6.0***	(2.1)	4,298

*Notes:* <sup>1</sup> This table reports the coefficients and standard errors for the time dummies that are plotted in the Figures <sup>2</sup> See notes to the figures for full sample and methodological descriptions <sup>3</sup> \*\*\*Significant at the 1 per cent level \*\*Significant at the 5 per cent level \*Significant at the 10 per cent level.

## APPENDIX E

The leisure activities included in each of the leisure categories in Section 4 and in Table 6 are the following:

“TV Watching” includes the time devoted to “TV Watching”.

“Out of Home Leisure” includes the time devoted to "general out-of-home leisure", "attend sporting event", "go to cinema", "theater, concert, opera", museums, exhibitions", "attend other public event", "restaurant, cafe bar", "Parties or receptions", "imputed time away from home".

“Active Sport Exercise” includes the time devoted to "sports and exercise", "Walking", "Cycling", "outdoor recreation", "physical activity, sports with child", "hunting, fishing, boating, hiking".

“At-Home Leisure” includes the time devoted to "general indoor leisure", "imputed in-home social", "receive or visit friends", "other in-home social, games", "play musical instrument, sing, act", "Artistic activity", "Crafts", "Hobbies", "relax, think, do nothing".

“Read/Listen” includes the time devoted to "read books", "read periodicals", "read newspapers", "Listen to music (CD etc.)", "listen to radio".

“Writing, paperwork...” includes the time devoted to "writing by hand", "conversation, phone, “texting”, use computer.