Measuring Trends in Leisure: Evidence from Five Decades of Time Use Surveys

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Abstract

In this paper, we use five decades of time use surveys to document trends in the allocation of time. We document that a dramatic increase in leisure time lies behind the relatively stable number of market hours worked (per working age adult) between 1965 and 2003. Specifically, we document that leisure for men increased by 6-8 hours per week (driven by a decline in market work hours) and for women by 4-8 hours per week (driven by a decline in home production work hours). This increase in leisure corresponds to roughly an additional 5 to 10 weeks of vacation per year, assuming a 40 hour work week. We also find that leisure increased during the last forty years for a number of sub-samples of the population, with less educated adults experiencing the largest increases. Lastly, we document a growing "inequality" in leisure that is the mirror image of the growing inequality of wages and expenditures, making welfare calculation based solely on the latter series incomplete.

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1. Introduction

In this paper, we document trends in the allocation of time over the last forty years. In particular, we focus our attention on measuring how actual leisure time has evolved within the United States. In commonly used household surveys designed to measure labor market activity (such as the Current Population Survey (CPS) and the Panel Study of Income Dynamics (PSID)), the only category of time use that is consistently measured is market work hours.[1] As a result, leisure is almost universally defined as time spent away from market work. However, as noted by Becker (1965), households can also allocate time towards production outside the formal market sector. To the extent that non-market (home) production is important and changing over time, leisure time will be poorly proxied by time spent away from market work. By linking five decades of detailed time use surveys, we are able to empirically draw the distinction between leisure and the complement of market work. In doing so, we document a set of novel facts about how home production and leisure have evolved for men and women of differing work status, marital status, and educational attainment during the last forty years.

The main empirical finding in this paper is that leisure time – measured in a variety of ways – has increased significantly in the United States between 1965 and 2003. When computing our measures of leisure, we separate out other uses of household time including time spent obtaining human capital and time spent in heath care. Given that some categories of time use are easier to categorize as leisure than others, we create four distinct measures of leisure. Our measures range from the narrow, which includes activities designed to yield direct utility such as entertainment, socializing, active recreation, and general relaxation, to the broad, namely time spent neither in market production nor non-market production. While the magnitudes differ slightly, the conclusions drawn are similar across each of the leisure measures.

[1] In some years, the PSID asks respondents to individually report the amount of time they spent on household chores during a given week. These data are exploited by Roberts and Rupert (1995) to document a decline in total work, which, for the overlapping periods, is consistent with the trends documented in this paper.

Using our preferred definition of leisure, we find that leisure has increased by 7.9 hours per week on average for men and 6.0 hours for women between 1965 and 2003 (p-value of both < 0.01), controlling for demographics. Interestingly, the decline in total work (the sum of total market work and total non market work) was nearly identical for the men and women (7.9 and 7.7 hours per week, respectively). These increases in leisure are extremely large. In 1965, the average man spent 61 hours per week and the average women spent 54 hours per week in total work. The increase in weekly leisure we document between 1965 and 2003 represents eleven to thirteen percent of the average total work week in 1965. Or, if one assumes a 40 hour work week, the increase in leisure between 1965 and 2003 is equivalent to 6.6 (narrow leisure measure) to 9.0 (broader leisure measure) additional weeks of vacation per year for the average non-retired adult.

The adjustments that allow for greater leisure while satisfying the time budget constraint differ between men and women. Men increased their leisure by allocating less time to the market sector. Conversely, leisure time for women has increased simultaneously with time spent in market labor. This is made possible by a decline in time women allocate to home production of roughly 11 hours per week between 1965 and 2003. This more than offsets the 5 hours per week increase in market labor.[2]

We also analyze changes in leisure by educational attainment. We find that men and women with more than a high school education and men and women with high school education or less all increased leisure time between 1965 and 2003. However, while the level of leisure in 1965 was roughly equal across educational status, the subsequent increase in leisure was greatest among less educated adults. Similarly, we document that the cross-sectional distribution of leisure time has fanned out over the last forty years. Given that the least educated households experience the largest gains in leisure, this growing "inequality" in leisure is the mirror image of

[2] The magnitudes we present in the introduction correspond to changes in time use conditional on demographic changes as shown in Figures 2-5.

the well-documented trends in income and expenditure inequality. The fact that the least educated experience the most leisure poses an empirical puzzle: The time series evidence suggests that rising incomes induces greater leisure, while the recent cross-sections suggest that higher incomes are associated with lower levels of leisure.

2. Empirical Trends in the Allocation of Time

To document the trends in leisure over the last forty years, we link five major time use surveys: *1965-1966 Americas' Use of Time; 1975-1976 Time Use in Economics and Social Accounts; 1985 Americans' Use of Time; 1992-1994 National Human Activity Pattern Survey;* and the *2003 American Time Use Survey*. The Data Appendix and Table 1 describe these surveys in detail. In this section we characterize four major uses of time: market work, non-market production, child care, and "leisure".

We take two approaches to document trends over the last forty years. The first is to report the (weighted) means from the time use surveys for each activity.[3] Throughout the analysis, we restrict our sample to include only non-retired individuals between the age of 21 and 65, so these averages are "per working-age adult" (or per adult within the specified sub-sample, when relevant).[4] We drop adults less than 21 years old and adults older than 65 (as well as early retirees) to minimize the role of time allocation decisions that have a strong inter-temporal component, such as education and retirement. Moreover, the 1965 time use survey excludes retired households and households over the age of 65. So, to create consistent samples across the years, we need to omit retired households and households over the age of 65. Omitting an analysis of retirees will likely imply that the increase in leisure that we document is an

[3] When reporting either the unconditional or conditional means, we weight the time diary data using the weights provided the surveys adjusted for days of the week. Furthermore, we adjust the weights so that each day of the week and each survey is equally represented for the full sample of individuals.

[4] Given the fact that average number of children has declined over the last forty years, there is a difference between mean time spent per adult and mean time spent per capita. See Ramey and Francis (2005) for an argument in favor of the "per capita" measure. Including children in the denominator of the per capita measure augments the increase (or mitigates the decrease) over the last forty years in categories that children do not typically perform as intensively as adults, such as home production and market work. Conversely, given that children take much more leisure than adults, any upward trend in leisure per adult which occurred during the last forty years will be reduced in per capita terms.

underestimate of the actual increase in leisure for adults given that individuals are living longer and spending a larger fraction of their life in retirement. Additionally, the 1965, 1975, and 1985 time use surveys exclude individuals under the age of 18 or 19 from their samples.

The second approach we take is to condition the change in time spent in various activities on demographics. During the last forty years, there have been significant demographic changes in the U.S. This is evident from the data shown in Appendix Table A1, which describes the demographic composition of the time-diary samples. Since 1965, the American population has aged, become more educated, become more likely to be single, and has had fewer children. All of these changes may effect how an individual chooses to allocate their time. For example, historically, individuals in their late 50s spend less time in market work than individuals in their early 40s. It would not be surprising to see time spent in market work per working age adult fall during the last forty years simply because the fraction of fifty year olds relative to forty year olds has increased.

By conditioning on these demographics, we are reporting how time spent in a given activity has changed during the last forty years adjusted for demographic changes. Formally, we estimate the following:

$$T_{it}^{j} = \alpha + \beta_{1975} D_{i,1975} + \beta_{1985} D_{i,1985} + \beta_{1993} D_{i,1993} + \beta_{i,2003} D_{i,2003} + \gamma_{age} \mathbf{Age}_{it} + \gamma_{family} Family_{it} + \gamma_{ed} \mathbf{Ed}_{it} + \gamma_{Day} \mathbf{Day}_{it} + \varepsilon_{it} \quad (1)$$

where T_{it}^{j} is the time spent in activity j for individual i in survey t, D_{it} is a year dummy equal to one if individual i participated in a time use survey conducted in year t, $\mathbf{Age}_{it}$ is a vector of age dummies (whether household i is in their 20s, 30s, 40s, or 50s during year t), $Family_{it}$ is a dummy variable equaling one if respondent i has a child, $\mathbf{Ed}_{i}$ is a vector of education dummies (whether i completed 12 years of schooling, 13-15 years of schooling, or 16 or more years of schooling in

year t), and $\boldsymbol{Day}_{it}$ is a vector of day of week dummies. The day of week dummies are necessary given that some of surveys over sample weekends for some sub-samples.[5]

The coefficients on the year dummies describe how average time spent on an activity has changed over time controlling for changes in key demographics.[6] In all years except 1993, the time use surveys asked respondents to report their marital status and the number of children that they had. Although our base results do not include these controls (because they are unavailable in 1993), we reran all of our regressions including marital status and the number of children as additional controls on a sample that excludes the 1993 survey. This modification did not alter the main findings of our paper.

2.1. Trends in Market Work

Trends in market work over the last half century have been well documented (see, for example, McGrattan and Rogerson 2004). The major difference between our results and those using traditional household surveys such as the CPS and PSID is that our research focuses on changes in the allocation of household time across market work, non market work, and leisure while the existing research tends to focus exclusively on changes in market hours. As we show in this paper, the conclusions about changing leisure drawn solely from time spent working in the market sector are misleading. Moreover, it has been well documented that such surveys tend to over-report market work hours relative to time diaries (see Juster and Stafford 1985 and Robinson and Godbey 1997). Given the propensity for individuals to provide focal point answers in household surveys such as the PSID, CPS or Census, it has been shown that time diaries provide a more accurate measure of actual time an individual spends working given that their total time allocation must sum to twenty four hours. As a validation exercise, in the Data Appendix, we

[5] Recall that the weights are adjusted for the full sample so that each day of the week is equally represented.

[6] Notice, when reporting the coefficients on the year dummies from a regression such as (1), we are controlling for both trends in demographics over time and for the fact that the time use surveys may not be nationally representative with respect to the demographic controls included in the regression during a given individual year. We discuss this issue more in the data appendix.

provide a detailed comparison of the PSID market work hours with market work hours reported within the time diaries and argue that while there is a level shift between the two types of surveys, the trends are broadly consistent across the two types of surveys.

We define market work in two ways. "Core" market work includes all time spent working in the market sector on main jobs, second jobs, and overtime including any time spent working at home.[7] This market work measure is analogous to the market work measures in the Census, the PSID or the SCF. The broader category "total" market work is core market work plus time spent commuting to/from work and time spent on ancillary work activities (for example, time spent at work on breaks or eating a meal).

The unconditional means of core market work and total market work for men and women during each time use survey are shown in Table 2. Given the similarity in trends between the unconditional and the conditional means, we focus our discussion on the means conditional on demographics. In Figure 1, we plot the conditional changes in hours per week relative to 1965 for all adults as well as for men and women separately. Average hours per week of core market work for working-age adults have been essentially constant between 1965 and 2003. However, as is well known, this relatively stable average masks the fact that market work hours for men have fallen and market work hours for women have increased sharply. Specifically, after adjusting for changing demographics, male direct market work hours have fallen by 6.4 hours per week between 1965 and 2003 (p-value < 0.01).[8] As seen in Figure 2, the entire decline in core market work hours for men occurred between the 1965 and 1985 surveys. This pattern is also evident in large household surveys such as the PSID (Appendix Figure A1).

Female core market work hours, conditional on demographic changes, have increased by 4.6 hours per week (p-value <0.01). The increase in core market work hours for women has occurred continuously between 1965 and 1993, before stabilizing in the last decade. These trends

[7] A discussion of all the time use categories we use in this paper are listed in Appendix Table A2.
[8] The associated point estimates and standard errors for the all figures shown in this paper are reported in Appendix Tables A3 and A4.

in male and female labor force participation and work hours have been well documented in the literature.[9]

The decline in market work for men is relatively larger using our broader measure of "total market work." Specifically, total market work declined 11.6 hours per week, as opposed to 6.3 hours per week for core work. The difference stems primarily from a decline in breaks at work, perhaps reflecting the decline over this period in unionized manufacturing jobs in which breaks are clearly delineated. For women, the increase in total market work was slightly smaller than the increase in core market work (3.0 vs. 4.2 hours per week, p-value <0.01).

2.2. Trends in Non-Market Work

Unlike the trends in time spent in market work, the trends in time spent in "non-market" work have been relatively unexplored between 1965 and 2003.[10] We define three categories of time spent on non-market production. Throughout the paper, time spent on an activity includes any time spent on transportation associated with that activity.

First, we define time spent on "core" housework. Broadly, this includes any time on meal preparation and cleanup, doing laundry, ironing, dusting, vacuuming, indoor household cleaning, indoor design and maintenance (including painting and decorating), etc. Second, we analyze time spent "obtaining goods and services." This category includes all time spent acquiring any goods or services (excluding medical care, education, and restaurant meals). Examples include grocery shopping, shopping for other household items, comparison shopping, coupon clipping, going to the bank, going to a barber, going to the post office, buying goods on-line, etc. The last category we analyze is "total non-market work" which includes time spent in core household chores, time spent obtaining goods and services, plus time spent on other home

[9] For example, using census data, McGrattan and Rogerson (2004) document an unconditional decline of 3.6 hours per week for men and an increase of 7.9 hours per week for women between 1960 and 2000. These values are similar to the change in unconditional means we report in Table 2.

[10] Recent work that utilizes micro-data on non-market production include Rupert, Rogerson, and Wright 1995 as well as Roberts and Rupert 1995 (using "housework" from the PSID) and Rupert, Rogerson, and Wright 2000 (using time use surveys).

production such as home maintenance, outdoor cleaning, vehicle repair, gardening, pet care, etc. This latter category is designed to be a complete measure of non-market work. Note that we separately discuss and analyze time spent in child care in section 2.4.

The unconditional trends in non-market work are shown in Table 2 panel A (full sample), panel B (males) and panel C (females). While total *market* work hours for the full sample have been relatively constant over the last forty years, time spent in *non-market* work has fallen sharply. Specifically, time spent in food preparation and indoor household chores has fallen by 6.4 hours per week, time spent obtaining goods and services has fallen by 0.8 hour per week, and total non-market work has fallen by 5.5 hours per week (p-value of all declines <0.01).

As with market work hours, the average trends mask differences across sexes. Male non-market work hours have actually increased by 3.9 hours per week (p-value <0.01). Female non-market work hours have fallen by almost 12.6 hours per week (p-value <0.01).

Figure 3 shows the change (conditional on demographics) in total non-market work between 1965 and 2003 for the full sample and then separately for men and women. The results conditional on demographics mimic the unconditional means displayed in Table 2. In the aggregate, total non-market work has fallen by 4.6 hours per week (p-value <0.01). For males, total non-market work increased by 3.7 hours per week and for females, total non-market work fell by 11.1 hours per week (p-value of both <0.01).

Disaggregating the changes in time spent on non-market work into its three components, we find that for women time spent on "core" housework decreased by 10.1 hours per week and time spent obtaining goods and services decreased by 1.4 hours per week (p-value of both <0.01). Women slightly increased time spent on other non-market work by 0.5 hours per week (p-value = 0.30). For men, time spent on "core" housework increased by 1.4 hours per week and time spent on other non-market work increased by 2.9 hours per week (p-values of both < 0.01). Men, however, experienced a decline in time spent obtaining goods and services of 0.6 hours per week (p-value = 0.14).

2.3. Trends in Total Work

We combine total market work with total non-market work to compute a measure of "total work." Table 2 documents the unconditional changes in total work between 1965 and 2003. Likewise, Figure 3 shows the evolution of total work conditional on demographics.

For the full sample and unconditional on demographics, total work has fallen by 6.8 hours per week (p-value <0.01). A striking result is that the decline in total market work is nearly identical between men and women. Between 1965 and 2003, conditional on demographics, males and females decreased their total work hours by 7.9 and 7.7 hours per week, respectively (p-value of both <0.01).[11] The similarity is surprising given the increase in the relative wage of women over this period and the simultaneous increase in the market work hours of women. This places a strong restriction on theories explaining the increase in female labor force participation.

Notice that the results in Table 2 and Figure 3 provide a dramatically different picture for the evolution of time allocation than one usually infers from examining standard household surveys which only measure time spent in market work. Specifically, the dramatic increase in the market work hours of women masks a decline in total work hours. Conditional on demographics, women have experienced a decline of over 11 hours per week in the time they spend on home production – an amount that is nearly three times as large as their conditional increase in time spent in market work. In other words, for women, changes in market work reveals little about changes in total work.

Another important consideration raised by the trends in total work is whether the economy is on a balanced growth path. Taken as a whole, the strong downward trend in total work (market plus non-market work) suggests that the economy may not be on a balanced growth path, although this does not rule out that the economy may asymptote to such a path. The

[11] The decline in total work is slightly mitigated for men if we also condition on marital status and the number of children in the household (and omit the 1993 survey). Specifically, total work falls 6.9 hours per week for men and 8.0 hours per week for women between 1965 and 2003.

relatively stable market work hours per adult over the last forty years (in the presence of steady increases in real incomes) is often used to justify utility functions in which the income and substitution effects of wage changes cancel.[12] If non-market work yields a disutility similar to that of market work, the downward trend in the sum of these variables suggests this assumption is inappropriate.

2.4 Trends in Child Care

We should note that none of our measures of non-market work includes child care, which we argue may be inherently distinct from housework in terms of utility. While much of the infra-marginal child care activities may be considered "work", at the margin time spent in child care arguably has a significant leisure component. This proposition is supported by the fact that hardly anyone uses market substitutes to raise their children completely. For this reason, we feel it appropriate to analyze child care separately.

Moreover, from the standpoint of empirical implementation, there appears to be a discontinuity in how child care is measured between the 2003 ATUS survey and all other surveys. The BLS has explicitly stated that collecting accurate measures of time inputs into child development as being a primary goal of the ATUS. This emphasis is reflected in the fact that the BLS tracks who is present during every activity recorded. As a result, there is a potential for there to be an increase in time spent in child care activities between the 2003 time use survey and the other surveys that results purely from a change in classification of activities across the surveys. Time spent in activities which were conducted in the presence of children that used to be coded as time spent in other activities may have been classified as child care in 2003. It should be noted that this measurement issue should not be an issue for activities where children

[12] The standard reference is King, Plosser, and Rebelo (1988), who derive the necessary restrictions on preferences to yield stationary work hours. See also Basu and Kimball (200x).

were not present such as market work or non-market work during the day when children are at school.

Table 3 shows a large increase in time spent in child care between the 2003 survey and all other surveys. We define "primary" child care as any time spent on the basic needs of children, including breast feeding, rocking a child to sleep, general feeding, changing diapers, providing medical care (either directly or indirectly), grooming, etc. Note that time spent preparing a child's meal is included in general "meal preparation," a component of non-market production. We define "educational" child care as any time spent reading to children, teaching children, helping children with homework, attending meetings at a child's school, etc. We also define "recreational" child care as playing games with children, playing outdoors with children, attending a child's sporting event or dance recital, going to the zoo with children, and taking walks with children. Lastly, we examine "total child care," which is simply the sum of the other three measures.

In Table 3, we show the unconditional evolution of hours per week spent in all four of these child care measures for three different groups: working females, non-working females, and all males. We define working as self reported having a job for pay (regardless of whether the job is full time or part time). Notice that for working women, the time they spend on all measures of child care was nearly constant between 1965 and 1993 (panel A). This occurs despite the fact that the incidence of having a child for this sub-sample fell from 46% in 1965 to roughly 38% in 1993, before increasing slightly to 46% in 2003. Moreover, conditional on having a child, the number of children in the household fell slightly from 2.3 to 1.8 between 1965 and 2003 for working women. Despite a relatively constant amount of time allocated to child care between 1965 and 1993, there was a 2.6 hours per week increase in reported time spent on child care by working women between 1993 and 2003. This recent increase in time spent in child care occurred in all categories: time spent on primary child care increased by 1.7 hours per week, time spent on educational child care increased by 0.5 hours per week, and time spent on recreational

child care increased by 0.4 hours per week. A similar pattern is observed for non-working women (panel B) and all men (panel C).

While the increase in child care between 1993 and 2003 may have resulted from an actual change in household behavior, it also likely that this increase is simply an artifact of the emphasis that the 2003 data placed on collecting the amount of time individuals spend in child care. To explore this concern, we use data from the 1997 and 2002 Child Development Supplements (CDS) of the PSID. These supplements focused on the measurement of many activities related to the children of the PSID respondents. As part of the CDS, time diaries were administered to the children in the sample. So, instead of having time diaries of parents, we have time diaries of the children. These children were asked to report whether a parent or care giver was actively participating in each of the activities recorded in the time diary. Time spent by fathers and mothers were recorded separately. If the increase in child care activities documented in the 2003 BLS time use study (relative to the other time use studies) were real, we should expect to find a similar increase in parental time spent actively engaged in the child's activities between the 1997 and 2002 PSID Child Development Survey. However, no such increase was found.[Numbers to be added]

This potential inconsistency in measurement can pose a problem for our analysis given that, as we noted above, these time use data sets ensure that the daily time budget constraint is met. If the 2003 time use survey is over estimating the amount of time individuals spend in child care relative to the previous surveys, the 2003 survey must, by definition, be under representing the amount of time that the individual is spending in other activities relative to the earlier surveys. However, as noted above, this change in measurement affects only those activities in which a child is present. For this reason, in the following section we create multiple measures of leisure

that alternatively include and exclude child care.[13, 14] Additionally, in Section 4, as a further robustness check, we will examine the changes in time use for individuals without children.

2.5 Trends in Leisure

One potential definition of leisure is as a residual of total market work. Under this definition, the results just discussed suggest that conditional on demographics leisure increased by roughly 8 hours per week for men and women. As a broad benchmark, we include this measure below as "leisure 4". However, one may consider leisure as activities that directly provide utility. That is, leisure activities may be more naturally thought of as a final good rather than an intermediate input.[15] If that is the case, many activities included in this residual measure may not be appropriate. For example, time spent on education is less leisure than an investment in human capital that generates additional consumption goods in the future. Or, at some level sleep is a biological necessity rather than pure leisure (see for example Biddle and Hamermesh 1990).

Rather than try to resolve this debate, we proceed by exploring three alternative definitions of leisure. Indeed, it turns out that our various measures tell a fairly consistent story regarding the past forty years, making much of the discussion of what actually constitutes leisure empirically unimportant. The unconditional means of our four leisure measures are reported in Table 3 and the changes relative to 1965 conditional on demographics are depicted in Figure 4.

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[13] It is possible that some of the decline in total non-market work between 1965 and 2003 was due to the coding of home production activities as child care activities in 2003. To examine this, we define a measure of total time spent on non-market work which includes time spent on child care. Conditional on demographics, this measure of total non-market work fell by about 9.2 hours per week for women and increased by 5.5 hours per week for men. These numbers should be considered upper bounds because it would imply that all of the increase in child care between 1993 and 2003 was either a true structural change in behavior or was replacing previously measured activities which were classified as home production.

[14] While less conceptually ambiguous, a similar measurement issue applies to care for other adults (i.e., care for older or sick parents or grand parents). The 2003 ATUS survey has over 25 different time use codes concerning care for household and non-household adults compared to a single "time spent at help and care" code in previous surveys. This corresponds to an increase of over one hour per week spent on "other care" between 1993 and 2003, with essentially no change between 1965 and 1993. Due to this complication, we also exclude care for other adults from our measure of non-market work.

[15] One common definition of leisure is activities one would not pay someone else to do. This does not resolve the issue. For example, one may pay someone to baby sit a child while at the same time derive utility from playing with the child.

Our first alternative measure of leisure, "leisure measure 1", sums together all time spent on "entertainment/social activities/relaxing" and "active recreation". We consider this measure closely related to the conceptual definition of activities solely pursued for direct enjoyment. These activities include television watching, leisure reading, going to parties, relaxing, going to bars, playing golf, surfing the web, visiting friends, etc. In this leisure measure, we include a subset of child care. Namely, we include "recreational" child care activities such as playing with a child, going on outings with a child, attending a child's sporting events or dance recital, etc.

We include gardening and time spent with pets in our alternative leisure measures. This is the only set of activities that is classified as both leisure and home production.[16] Pet care is akin to playing with children in the sense that it provides direct utility but is also something one can purchase on the market. Conceptually, gardening is more likely considered a hobby while cutting grass and raking leaves is more likely work (of course, this is subject to debate). However, the data do not let us draw the distinction between gardening and yard work consistently throughout the sample. In the pre-2003 surveys, yard work is included in outdoor home maintenance while gardening is a separate activity. Unfortunately, in 2003 yard work is not differentiated from gardening. The result is that the combined pet care and gardening category increases roughly 30 minutes per week between 1965 and 1993, and then increases a little more than one hour per week between 1993 and 2003.

As seen in Figure 4a-c, leisure measure 1 has increased by 5.1 hours per week for the full sample, 6.4 hours per week for men, and 3.8 hours per week for women (p-value of all <0.01). Leisure 1 increased fairly consistently for men between 1965 and 2003. However, for women, leisure 1 increased monotonically between 1965 and 1993 and then declined between 1993 and 2003. As we will show later, the entire decline between 1993 and 2003 can be explained by the increase in child care between 1993 and 2003, further suggesting that child care is measured

[16] As leisure measure 4 is the residual of market and non-market work, gardening and pet care are not included in this measure of leisure. They are included in leisure measures 1 through 3.

differently in the 2003 survey. However, regardless of such measurement issues, our basic measure of leisure increased dramatically for both men and women between 1965 and 2003.

Biddle and Hamermesh (1990) argue that certain time activities may enhance production in the market and non-market sectors. For example, they provide a model in which time spent sleeping is a choice variable that both augments productivity and enters the utility function directly. Furthermore, they provide strong empirical evidence showing that sleep time is, in fact, a choice variable over which individuals optimize. For example, individuals sleep more on the weekends and on vacations. Similar conceptual points apply broadly to time spent eating and on personal care. In this spirit, we define leisure measure 2 as activities that provide direct utility but may also be viewed as intermediate inputs. Specifically, leisure measure 2 includes leisure measure 1 as well as time spent sleeping, eating, and in personal care. While we exclude own medical care (which conceptually provides no direct utility), we include such activities as grooming, having sex, sleeping or napping, eating at home or eating in restaurants, etc.

Conditional on demographics, leisure measure 2 increases by 5.6 hours per week (p-value <0.01) between 1965 and 2003. In other words, in addition to the increase in leisure measure 1, time spent sleeping, eating and personal care time increased by an additional 30 minutes per week between 1965 and 2003 (p-value <0.01). Conditional on demographics, time spent in leisure measure 2 increased by 6.4 hours per week for men and 4.9 hours per week for women relative to 1965 (p-value of both <0.01). Note the comparable numbers for the change in leisure measure 1 were 6.4 hours per week for men and 3.8 hours per week for women. As a result, of the total increase in leisure measure 2 between 1965 and 2003, the share accounted for by sleeping, eating, and personal care was essentially zero percent for men and twenty-nine percent for women.

Our final alternative leisure category, "leisure measure 3," includes leisure measure 2 plus time spent in "primary" and "educational" child care. Recall that "recreational" child care was included in leisure measure 1. The inclusion of child care has very little effect on trends between 1965 and 1993, but does make a difference regarding the change over the last decade.

As discussed above, one should be careful in interpreting the change in child care between the prior surveys and the 2003 survey. Leisure 3 increased by 6.9 hours per week for the full sample, 7.9 hours per week for men, and 6.0 hours per week for women.

As noted above, "leisure measure 4" is the residual of total work. The difference between leisure measures three and four includes time spent in education, civic and religious activities (going to church, volunteering, social clubs, etc), caring for other adults, and own medical care. Between 1965 and 2003, civic activities fell by 30 minutes per week, education and own medical care increased by roughly 30 minutes each, and care for other adults increased by one hour per week (all of the latter increase taking place between the last two surveys, as discussed in section 2.4)

In short, since 1965 and controlling for demographics, leisure has increased by 5.1 hours per week (leisure measure 1) to 6.9 hours per week (leisure measure 3) for the average non-retired adult. It should be stressed that these magnitudes are economically large. In 1965, the average individual spent 29 hours per week in core market work (roughly 4 hours per day). The gain in total leisure between 1965 and 2003 is therefore equal to between 1.2 and 1.7 work-days per 1965 core market work week. Or, if one assumes a 40 hour work week, the increase in leisure is equivalent to 6.6 to 9.0 additional weeks of vacation per year.

Finally, we should note that increase in leisure measure 3 has been essentially monotonic over the last forty years for both men and women (with the one caveat concerning child care). This suggests that the increase in leisure measure 3 is not due to differences in measurement across the five time use surveys. It is unlikely that each successive survey became more likely to classify a given activity as being leisure as opposed to work. Moreover, while roughly one half of the increase in leisure measure 3 occurred between 1965 and 1975 (which in part reflects a recession), since 1975 the data suggest continued increases in leisure for both men and women.

3. Leisure and Educational Attainment

The previous section documented a mean decline in total work for both men and women over the last forty years. In this section, we consider how other moments of the leisure distribution evolved with the aim to documenting changes in leisure "inequality". To address this issue, we show key percentiles of the leisure distribution over time in Table 5. Specifically, for each year, we calculate that 10^{th}, 25^{th}, 33^{rd}, 50^{th}, 66^{th}, 75^{th}, and 90^{th} percentile of leisure 3, unconditional on demographics. In Figure 5, we show the change in the distribution of leisure measure 3 conditional on demographic changes.[17] As seen in Figure 5 and Table 5, there is a general fanning out of the leisure distribution over the last 40 years. Notice further, that all of the percentile points of the leisure distribution recorded increases between 1965 and 2003. In other words, besides fanning out, the entire leisure distribution also shifted upwards.

The data presented in Figure 5 suggests that the inequality in the consumption of leisure has increased during a period in which wage and expenditure inequality has also increased (see the survey by Autor and Katz 1999 for wages and Attanasio and Davis 1996 for consumption expenditures). To address the relationship between leisure and income inequality, we explore trends in leisure by educational status.

Table 6 reports the unconditional time spent in market work, total non-market work, and our leisure measures 3 and 4 for men and women broken down by educational attainment during 1965 (panel A), 1985 (panel B), and 2003 (panel C). We define highly educated as having more than a high school degree (or GED equivalent). We exclude students from the samples used to create the tables and figures presented in this section. In 1965, less educated men and highly educated men spent the same average hours per week in market work (52 hours per week for both gourps). Moreover, in 1965, the time spent in leisure was nearly identical as well: Less educated

[17] The results presented in Figure 5 were obtained by regressing leisure 3 on our demographic and day of week controls for the pooled time use sample, omitting year dummies as regressors. We then calculated the percentiles of the residual distribution year-by-year.. In Figure 5, we plot the difference between each of these percentile points and the corresponding percentile point in 1965.

men spent 104 hours per week in leisure measure 3 versus 103 for highly educated men (p-value of difference =0.52).

For women, total work (sum of total market work and total non-market work) in 1965 is roughly equal across educational attainment (54.9 vs. 55.6 hours per week for less and highly educated women, respectively). Less educated women engage in more home production (35.6 vs. 34.0 hours per week, p-value of difference 0.26) and less market work (19.3 vs. 21.7 hours per week, p-value of difference = 0.28), although the differences are not statistically different. Leisure time is nearly identical between highly and less educated women in 1965, with less educated women enjoying 1.4 hours per week more in leisure measure 3 than their highly educated counterparts (p-value=0.41).

However, the equality in leisure time observed in 1965 disappears over the subsequent four decades. Specifically, the allocation of time for less and highly educated adults starts to diverge in 1985 (panel B of Table 6) and is dramatically different by 2003 (panel C of Table 6). In Figure 5, we plot the change (conditional on demographics) in the allocation of time between 1965 and 2003 by sex and educational attainment.

As documented in Table 6, less and highly educated males both increase total non-market work by nearly identical amounts between 1965 and 2003 (4.0 hours per week vs. 3.2 hours per week). However, total market work fell by a much greater amount between 1965 and 2003 for less educated males (-14.4 vs. -8.5 hours per week). Conditional on demographics (Figure 6a and Table A4), total market work fell 14.3 hours per week for less educated men versus 8.7 for highly educated men.[18] The implication is that leisure increased relatively more for less educated men than was the case for their more highly educated counterparts.

For women, between 1965 and 2003, the change in total time spent on home production was nearly identical regardless of educational attainment. Less educated women experienced a

[18] Core market work, conditional on demographics, fell by 9.0 and 4.5 hours per week for low and high educated men, respectively.

decline of 11.5 hours per week in total non-market work versus 12.6 hours for highly educated women. However, during this time period, total market work increased much more for highly educated females than for less educated females (8.2 vs 3.5 hours per week, respectively). Conditional on demographics (Figure 6b), highly educated females increased their total market work by 7.7 hours per week and decreased their total non market work by 12.0 hours per week between 1965 and 2003 (p-value of both <0.01). At the same time, less educated women increased their total market time by 2 hours per week and decreased their total non-market work by 11.1 hours per week. As with men, the evidence suggests a smaller increase in leisure for the more educated sub-sample of women.

One concern with the results regarding educational status is that the marginal high school graduate in 1965 differs from that in 2003. In particular, 73 percent of our sample in 1965 had a high school education or less, while the corresponding figure for 2003 is 42 percent. However, the percentiles presented in Figure 5 indicate that the growing inequality occurs throughout the distribution. Therefore, the results by educational status are not simply due to the changing composition of high school graduates.

Taken together, the results of Table 6 and Figures 6a and 6b document an increase in the dispersion of leisure favoring less educated adults, particularly in the last 20 years. This corresponds to a period in which wages and consumption expenditures increased faster for more skilled adults. Moreover, this divergence generates a conflict between the time series and cross-sectional evidence on income and leisure. We have documented a general increase in leisure over the last forty years, suggesting that higher income implies greater leisure. However, the recent divergence between educational classes suggests that cross-sectionally, lower income implies more leisure (although the early surveys suggest that leisure is invariant to income in the cross section). The larger increase leisure for less educated adults is an empirical implication that any quantitative model should match. Aguiar and Hurst (2005) present an optimizing model in which the equilibrium allocation of time between market work, non market work, and leisure, matches

these empirical patterns given the observed trends in wages over the last forty years for men and women of low and high educational attainment.

4. Leisure by Work Status, Marital Status, and Parental Status

4.1 Leisure and Work Status

In this sub-section, we explore trends in leisure by work status (where we define "working" as respondents who report they are employed full- or part-time or typically work at least 10 hours per week). In this way, we can document how much of the increase in leisure was due to individuals entering or exiting the labor force. Additionally, we can explore whether non-working women experience similar declines in home production as their working counterparts.

Table 7 shows the change in leisure relative to 1965 for men and women by employment status. All means are unconditional on demographics. Employed men increased the time spent on leisure 3 by 3.6 hours per week. The corresponding increase for non-working men is 12 hours per week (conditional on demographics, the increases were 3.8 and 12.4, respectively). However, the mean for non-working men in 1965 is measured with considerable error given that there were only 17 non-working men in the 1965 sample. This small percentage is due to the exclusion of retirees and those younger than 21 from the sample (as well as the fact that the 1965 survey used household employment as a selection criteria into the survey). For this reason, we do not report means for non-working men in 1965 in Table 7. We can conclude more confidently that leisure increased for the average employed men between 1965 and 2003 by nearly four hours per week. The increase was made possible by a nearly 7 hour per week decline in market work.

The unconditional increase in leisure measure 3 for the average male between 1965 and 2003 was 5 hours per week (Table 4), which is greater than the unconditional increase for working men over the same period. The larger increase for the entire male sample reflects a sharp decline in male labor force participation over the last forty years. Within our time use surveys, a little more than 97 percent of non-retired men aged 21 through 65 were employed in

1965, while the corresponding number was 87 percent in 2003. This decline is similar to that of the same sub-sample within the PSID (see Appendix Table A1). To see how a 10 percentage point change in labor force participation impacts the trend in male leisure, consider that the differential in leisure measure 3 between working and non-working men in 2003 is 29 hours per week. Therefore, the reduction in male labor supply at the extensive margin accounts for approximately 3 hours per week in increased leisure, or roughly 60 percent of the total increase.

One of the potentially surprising results documented in Section 2 is that women have increased leisure time while simultaneously increasing market work. In Table 7, we see that while working women enjoy less leisure than their non-working counterparts, the increase in leisure over the last forty years has been roughly the same across work status for women. This parallel increase mitigates the impact of increased labor force participation. Specifically, Table 7 indicates that, unconditionally, leisure for working women increased by 9 to 11 hours per week between 1965 and 2003. The corresponding increase for non-working women was 10 to 14 hours per week. Conditional on demographics, working women increased leisure 3 by 9.6 and non-working women by 10.2 hours per week (Figure 7).

Working women achieved an increase in leisure by equally reducing time spent on market and non-market work: Specifically, conditional on demographics, working women reduced their market work hours by 5.9 hours per week and their non-market work time by 5.1 hours per week. Conversely, conditional on demographics, non-working women reduced their non-market work hours by 14.2 hours per week. The evolution of time spent in non-market production for working and non working women are shown in Figure 7. Lastly, it should be noted that working women still perform more non-market work than non-working men.

The fact that the average woman experienced an increase in leisure of about 6 hours per week (Table 4 and Figure 4c) as opposed to the roughly 10 hours per week for working and non-working sub-samples reflects the increase in female labor force participation. Specifically, the fraction of women employed in the sample increased from 48 percent to 74 percent between 1965

and 2003. Given that in 2003 working women spent 21 hours less per week in leisure 3, the increase in labor force participation of 26 points reduces leisure for the average women by 5.5 hours per week. That is, women transiting into the labor force may be experiencing declines in leisure while their continuously employed or non-employed counterparts are experiencing large increases in leisure.

4.2. Leisure and Marital Status

Table 8 reports unconditional means by sex and marital status for market work, non-market work, and two leisure measures. As with non-working men, the 1965 sub-sample of single men is too small to make useful inferences. In the 2003 sample, married men tend to work more in the market and at home than their single counterparts. This implies a difference in leisure of 6 to 9 hours per week favoring single men. The table indicates that married men experienced an unconditional increase in leisure of 4.5 to 5 hours per week during the last forty years, driven by 9 hour decrease in market work offset by a 4.7 hour increase in non-market work. Moreover, conditional on demographics, married men increased leisure 3 by 6.2 hours per week over the last forty years.

On average, married women in 1965 enjoyed more leisure than single women by a factor of 9.5 to 10 hours per week. This difference was eliminated by 2003, with single women enjoying one to two hours more leisure per week in 2003. Unconditionally, married women's leisure increased by 1.3 to 3.5 hours per week between 1965 and 2003. Conditional on demographics, the increase was 2.9 to 4.2 hours per week. This was made possible by an increase in market work of 9.3 hours per week and a decline in non-market work of nearly 13 hours per week. Unconditionally, single women reduced their market work by 9.4 hours per week and their non-market work by 5.8 hours per week to produce an increase in leisure of 12.6 to 15.2 hours per week. Conditional on demographics, the increase in leisure 3 and 4 was 14.9 and 16.1, respectively. The evolution of the change in non-market work for married and single

men and women, conditional on demographics, is shown in Figure 8. Lastly, note that married women enjoyed an increase in leisure that closely resembles that of married men and differs significantly from that of single women. In Aguiar and Hurst (2005b), we argue that complementarity in leisure between men and women is important in explaining the trends in leisure for married adults.

4.3 Leisure and Parental Status

In Section 2, we noted both conceptual and measurement concerns related to the treatment of child care. In particular, the measurement of child care was handled differently in the 2003 ATUS than in earlier time use surveys. We argued above that this may have resulted in some activities that traditionally had been included in our narrow leisure measures were coded as child care in 2003. This may lay behind the divergence between leisure measures 1 and 2 from leisure measure 3 between 1993 and 2003.

To obtain more insight into what role child care plays in leisure trends, we split our sample by parental status. In particular, if we are correct in our conjecture that the decline in leisure measure 1 between 1993 and 2003 was due mostly to the change in the measurement of child care, we should see no decline in leisure measure 1 between 1993 and 2003 for households without children. As a result, in this sub-section, we examine the trends in leisure measures 1 and 3 for households with and without children. For brevity, we only report the changes in time use conditional on demographics. The results are reported in Table 9.

Recall that leisure measure 1 includes time spent on social, entertainment, and recreational activities, while leisure measure 3 is a broad category that includes child care. Up through 1993, the trends in leisure measure 1 are fairly similar between men with and without children (increases of 7.2 and 6.0 hours per week, respectively). This similarity ends in 1993. Men without children experienced an increase in leisure measure 1 of roughly 1 hour per week between 1993 and 2003. Conversely, men with children reported an average decline of 1.4 hours

per week. During the same time period, leisure measure 3 increased by 0.4 and 0.6 hours per week for men without and with children, respectively.

For women, the patterns are similar. Up through 1993, the change in leisure measure 1 was nearly identical for women with and without children (6.84 and 6.94 hours per week, respectively). However, the trends diverge sharply after 1993. Women without children spent roughly equal amounts of time on leisure 1 in 2003 as in 1993, while women with children reduced their leisure 1 by over 5 hours per week. Collectively, the results in Table 9 are consistent with the premise that many activities with children present were coded as core leisure activities prior to 2003 but classified as child care in 2003.

6. Discussion and Conclusion

In this paper, we have documented that the amount of leisure enjoyed by the average American has increased substantially over the last forty years. This increase is observable across a number of sub-samples. In particular, women have dramatically increased their market labor force participation while at the same time enjoying more leisure. Moreover, less educated adults have experienced the largest gains in leisure. The increase in leisure time occurred during a period in which average market work hours were relatively constant.

Any definition that distinguishes "leisure" from "work" is a matter of judgment. Some work activities may generate direct utility, whether at a formal job or while cooking and shopping. Similarly, such leisure activities as reading a book or watching tv may add to one's human capital or be directly job related. Our response to this ambiguity has been to present a wide range of evidence. We paid particular attention to the conceptual and measurement issues related to child care. We also used several definitions of leisure as well as broke out particular activities. The decline in home production and the increase in leisure are generally robust to these variations. Regardless of one's preferred definition of leisure, the fact remains that large changes have occurred in the allocation of time over the last forty years. Much of these changes

concern activities away from the market, making conclusions drawn solely from observations on market work hours potentially misleading.

Appendix A: Data Appendix

To construct consistent measures of time spent in market work, time spent in non-market production, and time spent in leisure over the last forty years, we examine the following time use surveys: *1965-1966 Americas' Use of Time; 1975-1976 Time Use in Economics and Social Accounts; 1985 Americans' Use of Time; 1992-1994 National Human Activity Pattern Survey;* and *2003 American Time Use Survey*. All surveys used a 24 hour recall of the previous day's activities to illicit time diary information. Great care was taken by all surveys to make sure each day of the week is equally represented within the survey. All surveys contained demographics pertaining to the survey respondents. Below, we briefly summarize the salient features of these surveys.

The 1965-1966 Americans' Use of Time was conducted by the Survey Research Center at the University of Michigan. The survey sampled 2,001 individuals between the ages of 19 and 65 which had at least one adult person employed in a non-farm occupation during the previous year. Of the 2,001 individuals, 776 came from Jackson, Michigan. The time use data were obtained by having respondents keep a complete diary of their activities for a single 24 hour period between November 15 and December 15, 1965 or March 7 and April 29, 1966. Only one individual per household was surveyed making it impossible to compute total household time use. In our analysis, we include the Jackson, Michigan sample. However, we redid our entire analysis excluding this sample and the results are very robust to this exclusion.

The 1975-1976 Time Use in Economic and Social Accounts was also conducted by the Survey Research Center at the University of Michigan. The sample was designed to be nationally representative excluding individuals living on military bases. Unlike any of the other time use studies, the 1975-1976 study sampled households (as opposed to individuals). That is, if a husband and a wife were present, both members were surveyed. The sample included 2,406 adults from 1,519 households. The 1975-1976 survey actually interviewed its respondents up to four different times. Of all the surveys we analyze, this is the only one that has a panel

component. The first survey took place in the fall of 1975. Subsequent surveys were conducted in the winter, spring, and summer of 1976. Attrition between the original survey and the subsequent surveys was very large. As a result, we only use the fall 1975 survey in our analysis. In doing so, we forgo the panel component of the 1975-1976 survey.

The 1985 Americans' Use of Time was conducted by the Survey Research Center at the University of Maryland. The sample was nationally representative with respect to adults over the age of 18 living in homes with at least one telephone. Only one adult per household was sampled. The sample included 4,939 individuals. By design, the survey sampled its respondents from January 1985 through December 1985. In doing so, the survey contains respondents who were interviewed during each month of the year.

The 1992-1994 National Human Activity Pattern Survey was conducted by the Survey Research Center at the University of Maryland and was sponsored by the U.S. Environmental Protection Agency. The sample was designed to be nationally representative with respect to households with telephones. The sample included 9,386 individuals, of which 7,514 were individuals over the age of 18. The survey randomly selected a representative sample for each 3-month quarter starting in October of 1992 continuing through September of 1994. For simplicity, we will refer to the 1992-1994 survey as the 1993 survey (given that the median respondent was sampled in late 1993). This survey contained the least detailed demographics of all the time use surveys we analyzed. Specifically, we only have the respondent's age, sex. level of educational attainment, race, labor force status (working, student, retired, etc.), and whether they have children. We do not know whether the respondent is married or the number of children that the respondent has.

The 2003 American Time Use Survey (ATUS) was conducted by the U.S. Bureau of Labor Statistics (BLS). Participants in ATUS are drawn from the exiting sample of the Current Population Survey (CPS). Like all but the 1975 time use survey, only one individual per household is sampled (including children). The individual is sampled approximately 3 months

after they complete their final CPS survey. At the time of the ATUS survey, the BLS updates the individual's employment and demographic information. Roughly 1,800 individuals complete the survey each month yielding an annual sample of over 20,000 individuals. An advantage of the ATUS survey is that individuals can be linked to detailed earnings records from their CPS interviews. Table 1 reports a summary of the differing survey methodologies and sampling frames for the five time use surveys.

For our analysis, we pool together all five time use data sets. We restrict our sample to include only those households between the ages of 21 and 65 who are not retired and who had a completed time use survey. The non-retired requirement is necessitated by the fact that the 1965 survey restricted its sample to households where one member participated in the labor force during the previous 12 months. Furthermore, the 1965 survey did not sample anyone over the age of 65. Additionally, all individuals in our sample must have had non-missing levels for their level of educational attainment. This latter restriction was only relevant for 10 individuals in 1965, 2 individuals in 1975, 36 individuals in 1985, and 35 individuals in 1993.[19] In total, our sample included 27,566 individuals. In Table 1, the sample sizes, given our sample restrictions, for each time use survey are shown.

In appendix table A1, we show that overall the samples from the time use data sets compare well against the samples from other nationally representative surveys such as the Panel Study of Income Dynamics (PSID).[20] We restricted the PSID in a similar way as our time use data by only including non-retired individuals between the ages of 21 and 65. There are a few notable exceptions. For example, non-retired males between the ages of 21 and 65 in the 1965, 1985, 1993, and 2003 time use surveys were slightly younger than similarly defined individuals

[19] The restriction that all individuals had a complete time diary was also innocuous. Only 43 individuals in 1965, 1 individual in 1975, and 3 individuals in 1985 had a time diary where total time across all activities summed to a number different than 24 hours.

[20] The PSID only started in 1968. As a result, we compare the 1965 time use survey to the 1998 PSID. All demographic data from the time use surveys in appendix table A1 are weighted using the sampling weights provided within the survey. Likewise, the data from the PSID in appendix table A1 are weighted using the PSID core sampling weights.

in the PSID. Additionally, individuals in the 1975 time use survey are markedly less educated than individuals PSID (30 percent of individuals in the 1975 time use survey with some college education vs. 39 percent of individuals in the 1975 PSID).

For our analysis, we aggregate an individual's time allocation into 14 broad categories: core market work; total market work (which sums core market work with commuting time associated with market work and other ancillary work activities); meal preparation/indoor household chores; shopping/obtaining goods and services (excluding medical services); total non-market production (which sums together meal preparation/indoor household chores, shopping/obtaining goods and services, and all other household non-market production); eating; sleeping; personal care (excluding own medical care); own medical care; education; child care; entertainment, social, and relaxing activities; active recreation; and religious/civic activities. Travel time associated with each activity is embedded into the total time spent on the activity. For example, time spent driving to the grocery store is embedded in the time spent "shopping/obtaining goods and services" category. Table A2 provides a list of activities captured by these broad time use categories.[21]

The ability to examine different patterns in time use over time using data from the time use surveys hinges critically on the quality of data within each of the time use surveys. Specifically, we want to ensure that any trends we perceive in the time use data sets is due to actual change in behavior and not differences in measurement or sample composition across the time use surveys. Before continuing, we will benchmark one time use category from the time use surveys to the same time use category reported from another (more traditional) survey. This task is made easier by the fact that household surveys such as the PSID and the Current Population

[21] All of our data and stata codes used to create the time use categories for this paper are available at http:….. The code includes a detail description of how we took the raw data from each of the time use surveys and created consistent measures for each of the time use categories across the different surveys. Each survey up through 1993 includes nearly a 100 different sub categories of individual time use. The 2003 survey includes over 300 different sub categories of individual time use. To create consistent measures of time use over time, we harmonized the surveys sub category by sub category. Also, on that web site, we posted all the original code books (or links to the original code books) for each of the different time use surveys. Our task of harmonizing the data was made easier by the fact that the coding structure for the 1965, 1975, 1985, and 1993 data were nearly identical.

Survey (CPS) take care in measuring how much time individuals allocate to market work. Moreover, the time spent in market work from these large household surveys has been essentially the sole basis for creating stylized facts on the changes in time use across recent decades.

As noted in Table A2, we define "core market work" from the time use surveys as time spent working for pay on all jobs within the market sector. This measure also includes time spent in overtime, time spent in market work done at home, and time spent working on second (other) jobs. By design, this measures encompasses all time spent actually engaging in market production. Our definition of time spent in core market work is analogous to the time spent in market work reported within the CPS or the PSID.[22]

Figure A1 plots the average hours per week of market work reported by non-retired PSID males aged 21 to 65 (inclusive) between 1967 and 2002 against the average hours per week of core market work reported by non-retired males and females between the ages of 21 and 65 in the time use surveys for the years 1965, 1975, 1985, 1995, and 2003. Four things are of note with respect to the PSID data. First, within the PSID surveys, households are asked about their time spent working in the previous year. This implies that, for example, the 1986 survey is used to assess the amount of work in 1985. Second, we cannot compare the PSID directly to the time use surveys in 1965 and 2003 given that the PSID only began in 1968 (asking about 1967 hours) and is only currently available through 2003 (asking about 2002 hours). Third, the PSID surveyed its respondents annually between 1968 and 1997. Starting in 1997, the PSID sampled its respondents every other year. To compute the average time spent in market work for 1997, 1999, and 2001 (i.e., survey years of 1998, 2000, and 2002), we assume a linear change in work hours

[22] Both the CPS and the PSID report measures of the amount of time individuals spent in market work during the previous year. The measurement of time spent in market work differs slightly between the CPS and the PSID. Both surveys ask respondents to report how many hours they usually work during a typical week. The CPS follows that question up by asking how many weeks the respondent was employed during the previous one year. However, the PSID follows the usual weekly hours worked question with a question asking respondents to report how many weeks they actually worked during the previous year (excluding vacation time and sick leave). To the extent that there have been increases in vacation time and sick leave within the U.S. during the last few decades, the trend in work hours within the PSID and within the CPS will differ from each other. The methodology of using time diaries to measure time spent in market work is closer to the methodology followed by the PSID. For that reason, we benchmark the time use surveys to the PSID.

connecting surrounding years. Lastly, the PSID reports annual hours of work for each individual within the survey. To get hours per week, we simply take the annual number and divide by 52.

Throughout the paper, we report all time use measures in hours spent within an activity during a given week.[23] As seen in Figure A1, the level of time spent in core market work hours in the PSID is higher than that of time spent in core market work hours in the time use surveys. The fact that household surveys such as the PSID and CPS over state work hours has been documented by Juster and Stafford (1985) and Robinson and Godbey (1997). However, aside from the levels being off, the trends match up nicely between the PSID and the time use surveys. For men, the PSID shows a sharp decline in work hours between 1967 and the early 1980s of about 5 hours per week. The time use surveys show a slightly larger decline between 1965 and 1985 of about 6 hours per week. After 1985, the PSID shows that work hours are roughly constant, although there is some movement of work hours with business cycle conditions. A similar pattern is obtained from the time use surveys.

There are two things to note when comparing the time use surveys to large micro data sets like the PSID. First, as seen in Table A1, the sample coverage between the two types of surveys differs slightly. Second, and more importantly, because the time use surveys impose a time budget constraint on its respondents, the time use surveys may be more likely to capture true market work hours than large household surveys like the PSID. For the time use surveys, the time spent on all activities within the day must sum to the total time within the day. Respondents within the PSID provide approximate average work hours during a given week often providing focal point responses of 35, 40, 45, or 50 hours per week. However, the fact that the trends in the time use data sets match well the trends in the PSID instills confidence about the quality of data contained within the five distinct time diaries.

[23] The raw time use data in each of the surveys are reported in units of "minutes per day" (totaling 1,440 minutes a day). We convert the minute per day reports to hours per week by multiplying the response by seven and dividing by sixty. When presenting the means from the time use data, we weight the data using the sampling weights within each of the time use surveys. The weights account for differential response rates to ensure the samples are nationally representative. We adjust weights so that each day of the week is equally likely to be sampled. We redid all the regressions without any weighting to verify that weighting was not driving the major trends.

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Table 1: Description of Time Use Surveys

Survey	Survey Coverage	Sample Coverage	Panel	Total Sample Size	Analysis Sample Size
American's Use of Time	Fall 1965 and Spring 1966	Individuals aged 19-65. One person in family must have been employed during previous 12 months. Two samples: one that was nationally representative and one which over sampled individuals in Jackson, Michigan. Conducted at the Survey Research Center at the University of Michigan.	No	2,001 Individuals	1,862 Individuals
Time Use in Economic and Social Accounts	Fall 1975 – Summer 1976	Nationally representative excluding households on military bases. Surveys both spouses if a spouse is present. Conducted at the Survey Research Center at the University of Michigan.	Yes	2,406 Individuals	1,712 Individuals
American's Use of Time	January 1985 - December 1985	Nationally representative with respect to adults over the age of 18 living in homes with at least one telephone. Conducted by the Survey Research Center at the University of Maryland.	No	4,939 Individuals	3,283 Individuals
National Human Activity Pattern Survey	Fall 1992 - Summer 1994	Nationally representative with respect to households with telephones. Conducted by the Survey Research Center at the University of Maryland. Sponsored by the U.S. Environmental Protection Agency.	No	9,383 Individuals	5,465 Individuals
American Time Use Survey	January 2003 - December 2003	Nationally representative. Participants are drawn from the exiting sample of the Current Population Survey (CPS). Survey is conducted approximately three months after the individual's last CPS survey. Conducted by the U.S. Bureau of Labor Statistics.	No	20,720 Individuals	15,244 Individuals

Notes: Analysis sample refers to the number of observations from each survey that we will use in our main empirical analysis. We restrict the sample to include only non-retired individuals between the ages of 21 and 65 (inclusive). All surveys, except for the 1965 survey, included sample weights. Of the 2,001 individuals in the 1965-1966 American's Use of Time survey, 776 came from the Jackson, Michigan over sample. The 1975-1976 Time Use in Economic and Social Accounts survey was the only survey to follow the same individuals over time. Each household was sampled four times between 1975 and 1976 (once each quarter). The sample attrition between Fall 1975 and Winter 1976 was large. To avoid issues of sample attrition in the 1975-1976 panel time use, we only focus on the first time the household was interviewed (which occurred in Fall 1975). All other surveys only included one time diary per household. Only the 1975-1976 time use survey sampled multiple adults per household.

Table 2: Hours per Week Spent in Market and Non Market Work Over Time: Full Sample, Men and Women

Panel A: Hours per Week Market and Non-Market Work (All Individuals)

Time Use Category	1965	1975	1985	1993	2003	Difference 2003-1965	*p*-value difference
Direct Market Work	28.25	27.37	27.29	30.61	29.82	1.57	<0.01
Total Market Work	34.24	32.13	32.13	34.02	33.01	-1.23	0.02
Food Preparation and Indoor Household Chores	14.42	11.55	10.55	8.23	8.01	-6.41	<0.01
Shopping/Obtaining Goods and Services	6.09	5.26	5.97	5.35	5.27	-0.82	<0.01
Total Non Market Work	23.52	20.30	20.64	17.94	18.00	-5.52	<0.01
Direct Market Work Plus Total Non Market Work	51.76	47.67	47.93	48.54	47.81	-3.95	<0.01
Total Market Work Plus Total Non Market Work	57.76	52.43	52.77	51.96	51.01	-6.75	<0.01
Sample Size	1,862	1,712	3,283	5,465	15,244		

Panel B: Hours per Week Market and Non-Market Work (Men)

Time Use Category	1965	1975	1985	1993	2003	Difference 2003-1965	*p*-value difference
Direct Market Work	42.07	38.75	35.69	38.08	35.87	-6.20	<0.01
Total Market Work	51.42	45.36	41.88	42.35	39.94	-11.49	<0.01
Food Preparation and Indoor Household Chores	1.97	1.98	3.83	2.85	3.46	1.50	<0.01
Shopping/Obtaining Goods and Services	4.73	4.32	4.64	3.90	4.39	-0.34	0.07
Total Non Market Work	9.77	10.71	13.67	12.22	13.66	3.89	<0.01
Direct Market Work Plus Total Non Market Work	51.84	49.46	49.36	50.30	49.53	-2.31	<0.01
Total Market Work Plus Total Non Market Work	61.20	56.07	55.55	54.56	53.60	-7.60	<0.01
Sample Size	840	776	1,465	2,533	6,752		

Table 2 (continued): Hours per Week Spent in Market and Non Market Work Over Time: Full Sample, Men and Women

Panel C: Hours per Week Market and Non-Market Work (Women)							
Time Use Category	1965	1975	1985	1993	2003	Difference 2003-1965	*p*-value difference
Direct Market Work	16.90	17.06	20.51	24.25	23.94	7.04	<0.01
Total Market Work	20.14	20.13	24.28	26.94	26.30	6.16	<0.01
Food Preparation and Indoor Household Chores	24.65	20.23	15.96	12.81	12.43	-12.22	<0.01
Shopping/Obtaining Goods and Services	7.20	6.12	7.05	6.58	6.12	-1.08	<0.01
Total Non Market Work	34.80	29.00	26.26	22.80	22.21	-12.59	<0.01
Direct Market Work Plus Total Non Market Work	51.23	45.48	46.04	46.28	44.56	-5.55	<0.01
Total Market Work Plus Total Non Market Work	54.47	48.56	49.80	48.97	46.91	-6.44	<0.01
Sample Size	1,022	936	1,818	2,932	8,492		

Notes: This table presents unconditional means for each time use category in each survey year. See Table A2 for a description of time use categories. Sample includes all individuals from the pooled time use survey between the ages of 21 and 65 who report not being retired. We also restrict the sample to include only those households who had time diaries that summed to a complete day (i.e., 1440 minutes). Lastly, we excluded any household who did not report their level of education. All data weighted to be nationally representative using the weights within each time use survey. Additionally, we weighted the data to ensure that each day of the week was equally likely to be sampled.

Table 3: Time Spent in Child Care By Category: Working Females, Non-Working Females, and Males

Panel A: Working Women (Hours Per Week)							
Child Care Category	1965	1975	1985	1993	2003	Change 65-93	Change 93-03
Total	2.89	3.47	3.67	3.13	5.74	0.24	2.61
Primary	2.38	2.66	2.89	2.36	4.04	-0.02	1.68
Educational	0.30	0.48	0.46	0.33	0.83	0.03	0.50
Recreational	0.21	0.34	0.33	0.44	0.87	0.23	0.43
Sample Size	497	474	1,203	2,196	6,264		

Panel B: Non-Working Women (Hours Per Week)							
Child Care Category	1965	1975	1985	1993	2003	Change 65-93	Change 93-03
Total	9.75	7.17	7.91	7.12	11.36	-2.63	4.24
Primary	8.17	5.69	6.00	5.38	8.02	-2.79	2.64
Educational	0.91	0.78	0.71	0.46	1.48	-0.45	1.02
Recreational	0.67	0.70	1.20	1.28	1.86	0.61	0.58
Sample Size	525	462	615	736	2,228		

Panel C: Men (Hours Per Week)							
Child Care Category	1965	1975	1985	1993	2003	Change 65-93	Change 93-03
Total	1.17	1.51	1.59	1.41	3.1	0.24	1.69
Primary	0.94	1.18	1.01	0.81	1.84	-0.13	1.03
Educational	0.17	0.12	0.16	0.21	0.41	0.04	0.24
Recreational	0.60	0.21	0.41	0.39	0.81	-0.21	0.42
Sample Size	840	776	1,465	2,533	6,752		

Notes: This table presents unconditional means for different measures of child care activities in each survey year for working women, non-working women, and all males. Working women are defined as any women who self reports her employment status as having a job. We restrict all samples to include non-retired individuals between the age of 21 and 65. See the note to Table 3 for additional sample restrictions. Primary child care include activities such as feeding a child, nursing, bathing a child, taking a child to the doctor, and rocking a child to sleep. Educational child care includes activities such as reading to the child, helping with homework, and attending parent teach conferences. Recreational child care includes activities such as playing with the child. Total child care is just the sum of primary, educational and recreational child care. See text for full details of child care measures.

Table 4: Hours per Week Spent in "Leisure" Over Time: Full Sample, Males and Females

Panel A: Hours per Week in Leisure (All Individuals)

Time Use Category	1965	1975	1985	1993	2003	Difference: 2003-1965	*p*-value difference
Leisure Measure 1	30.65	33.05	34.79	36.52	33.79	3.14	<0.01
Leisure Measure 2	102.29	106.95	107.76	108.88	105.63	3.34	<0.01
Leisure Measure 3	106.07	110.08	110.77	111.29	109.83	3.77	<0.01
Leisure Measure 4	110.24	115.57	115.23	116.04	116.99	6.75	<0.01

Panel B: Hours per Week in Leisure (Males)

Time Use Category	1965	1975	1985	1993	2003	Difference: 2003-1965	*p*-value difference
Leisure Measure 1	31.19	33.18	35.36	37.17	35.37	4.17	<0.01
Leisure Measure 2	101.59	105.39	107.15	107.70	105.61	4.02	<0.01
Leisure Measure 3	102.70	106.70	108.32	108.72	107.85	5.15	<0.01
Leisure Measure 4	106.80	111.93	112.45	113.44	114.40	7.60	<0.01

Panel C: Hours per Week in Leisure (Females)

Time Use Category	1965	1975	1985	1993	2003	Difference: 2003-1965	*p*-value difference
Leisure Measure 1	30.21	32.94	34.33	35.97	32.27	2.06	<0.01
Leisure Measure 2	102.87	108.36	108.26	109.89	105.66	2.79	<0.01
Leisure Measure 3	108.83	113.14	112.75	113.47	117.76	2.93	<0.01
Leisure Measure 4	113.06	118.87	117.46	118.26	119.50	6.44	<0.01

Notes: This table presents unconditional means different measures of leisure in each survey year. The samples are exactly the same as those used in Table 3. See Table 3 for relevant sample sizes for each cell. "Leisure Measure 1" refers to the time individuals spent socializing, in passive leisure, in active leisure, volunteering, in political and religious activities, in pet care, gardening, and recreational child care. "Leisure Measure 2" refers to the time individuals spent in leisure measure 1 plus time spent sleeping, eating, and in personal activities (excluding own medical care). "Leisure Measure 3" includes leisure measure 2 plus time spent in basic and educational child care. "Leisure Measure 4" is defined as anytime not allocated to market or non market work.

Table 5: Unconditional Distribution of Leisure Measure 3 by Year

Percentile	1965	1975	1985	1993	2003	Change 1965 - 2003
10th	77.00	80.50	80.50	77.58	77.58	0.58
25th	88.90	91.00	91.00	90.65	90.42	1.52
33rd	93.33	94.50	96.25	94.50	96.35	2.92
50th	102.55	106.17	107.10	106.17	106.98	4.43
66th	114.92	122.50	123.08	124.02	123.67	8.75
75th	124.25	130.08	131.83	134.75	133.93	9.68
90th	141.17	149.33	150.50	157.50	154.00	12.83
Sample Size	1,862	1,712	3,283	5,465	15,244	

Notes: This table presents the percentile points of leisure measure 3 within each survey year. See note to Table 3 for the full description of leisure measure 3.

Table 6: Unconditional Mean Levels of Time Use in 1965 and 2003 by Sex and Educational Attainment Reported in Hours per Week

	Males				Females			
Time Use Category	Education ≤ 12	Education > 12	difference	*p*-value of difference	Education ≤ 12	Education > 12	difference	*p*-value of difference
Panel A: 1965								
Total Market Work	51.92	51.85	0.06	0.98	19.30	21.67	-2.37	0.28
Total Non-Market Work	9.69	10.57	-0.88	0.37	35.62	33.97	1.64	0.26
Leisure Measure 3	104.09	102.75	1.34	0.52	110.07	108.64	1.44	0.41
Leisure Measure 4	106.39	105.58	0.81	0.71	113.08	112.36	0.73	0.69
Sample Size	576	222			763	226		
Panel B: 1985								
Total Market Work	42.90	44.26	-1.36	0.46	22.83	27.06	-4.23	0.01
Total Non-Market Work	13.30	14.60	-1.30	0.15	27.64	25.42	2.22	0.02
Leisure Measure 3	109.89	107.98	1.91	0.22	115.65	111.96	3.69	<0.01
Leisure Measure 4	111.81	109.14	2.67	0.09	117.53	115.53	2.00	0.12
Sample Size	754	614			1,029	654		
Panel C: 2003								
Total Market Work	37.54	43.39	-5.85	<0.01	22.81	29.82	-7.01	<0.01
Total Non-Market Work	13.65	13.91	-0.26	0.69	24.09	21.36	2.73	<0.01
Leisure Measure 3	114.04	107.24	6.81	<0.01	116.47	112.04	4.43	<0.01
Leisure Measure 4	116.81	110.70	6.10	<0.01	121.09	116.82	4.27	<0.01
Sample Size	2,570	3,972			3,060	5,030		

Table 7: Unconditional Mean Levels of Time Use in 1965 and 2003 by Sex and Work Status Reported in Hours per Week

	Males				Females			
Time Use Category	Working	Non-Working	difference	*p*-value of difference	Working	Non-Working	difference	*p*-value of difference
Panel A: 1965								
Total Market Work	52.48	N/A	N/A	N/A	40.69	0.62	40.07	<0.01
Total Non-Market Work	9.52	N/A	N/A	N/A	25.46	43.68	-18.22	<0.01
Leisure Measure 3	102.56	N/A	N/A	N/A	98.64	119.43	-20.79	<0.01
Leisure Measure 4	106.00	N/A	N/A	N/A	101.86	123.70	-21.84	<0.01
Sample Size	823	17			497	525		
Panel B: 2003								
Total Market Work	45.54	3.80	41.74	<0.01	35.30	1.43	33.87	<0.01
Total Non-Market Work	12.85	18.91	-6.06	<0.01	19.76	28.97	-9.21	<0.01
Leisure Measure 3	106.13	135.33	-29.20	<0.01	107.6	128.99	-21.40	<0.01
Leisure Measure 4	109.62	145.29	-35.67	<0.01	112.94	137.59	-24.65	<0.01
Sample Size	5,902	850			6,264	2,2228		

Notes:

Table 8: Unconditional Mean Levels of Time Use in 1965 and 2003 by Sex and Marital Status Reported in Hours per Week

	Males				Females			
Time Use Category	Married	Single	difference	*p*-value of difference	Married	Single	difference	*p*-value of difference
Panel A: 1965								
Total Market Work	51.80	N/A	N/A	N/A	14.98	38.74	-23.76	<0.01
Total Non-Market Work	9.79	N/A	N/A	N/A	37.90	23.66	14.24	<0.01
Leisure Measure 3	102.71	N/A	N/A	N/A	111.47	101.51	9.96	<0.01
Leisure Measure 4	106.41	N/A	N/A	N/A	115.13	105.61	9.52	<0.01
Sample Size	729	111			801	221		
Panel B: 2003								
Total Market Work	42.59	35.44	7.15	<0.01	24.31	29.35	-5.04	<0.01
Total Non-Market Work	14.46	12.31	2.14	<0.01	25.02	17.89	7.12	<0.01
Leisure Measure 3	107.82	113.82	-5.99	<0.01	112.75	114.11	-1.35	0.02
Leisure Measure 4	110.95	120.24	-9.29	<0.01	118.67	120.76	-2.09	<0.01
Sample Size	4,340	2,412			4,885	3,607		

Notes:

Table 9: Change in Time Use (Relative to 1965) By Sex and Parental Status, Conditional on Demographics (Hours per Week)

Time Use Category	*1975*	*1985*	*1993*	*2003*
Panel A: Men without Children				
Leisure Measure 1	1.12	5.00	7.18	8.01
Leisure Measure 3	4.16	7.32	8.84	9.24
Total Non-Market Work	1.70	3.10	2.48	3.37
Total Market Work	-6.48	-9.85	-10.67	-12.98
Sample Size	347	856	2040	3401
Panel B: Men with Children				
Leisure Measure 1	1.50	3.42	6.01	4.60
Leisure Measure 3	2.75	5.49	6.25	6.84
Total Non-Market Work	-0.01	5.00	2.61	4.02
Total Market Work	-3.89	-9.19	-8.74	-10.74
Sample Size	429	609	493	3351
Panel C: Women without Children				
Leisure Measure 1	3.95	6.04	6.94	6.20
Leisure Measure 3	7.75	7.81	8.57	7.69
Total Non-Market Work	-1.16	-1.30	-4.47	-6.62
Total Market Work	-6.19	-5.63	-3.14	-2.26
Sample Size	377	1012	2175	3666
Panel D: Women with Children				
Leisure Measure 1	1.82	3.52	6.84	1.65
Leisure Measure 3	1.53	4.18	6.12	4.91
Total Non-Market Work	-7.85	-10.28	-13.36	-14.16
Total Market Work	3.99	5.81	7.45	7.13
Sample Size	559	805	757	4826

Notes: This table presents change in time use for men and women with and without children conditional on demographic changes. All changes are reported as hours per week relative to 1965.

Appendix Table A1: Comparing Males in PSID with Males in Time Use Data Sets

Variable	1965 Time Use Survey	1968 PSID	1975 Time Use Survey	1975 PSID	1985 Time Use Survey	1985 PSID	1993 Time Use Survey	1993 PSID	2003 Time Use Survey	2003 PSID
Age 21 – 29	0.25	0.21	0.27	0.30	0.28	0.23	0.26	0.18	0.21	0.15
Age 30 – 39	0.23	0.25	0.28	0.22	0.31	0.33	0.30	0.33	0.25	0.25
Age 40 – 49	0.26	0.27	0.20	0.24	0.20	0.20	0.26	0.28	0.27	0.30
Age 50 – 59	0.19	0.19	0.19	0.18	0.16	0.18	0.14	0.15	0.26	0.23
Age 60 – 65	0.07	0.08	0.06	0.05	0.05	0.05	0.04	0.05	0.06	0.06
Education > 12	0.30	0.31	0.30	0.39	0.47	0.48	0.58	0.53	0.56	0.59
Married	0.87	0.92	0.85	0.85	0.68	0.76	N/A	0.73	0.63	0.69
Have Child	0.65	0.64	0.55	0.60	0.42	0.51	0.36	0.46	0.42	0.44
Number of Children	1.57	1.66	1.24	1.30	0.76	0.96	N/A	0.89	0.80	0.86
Employed	0.97	0.96	0.93	0.93	0.86	0.90	0.87	0.90	0.87	0.90
Sample Size										

Notes: This table compares the means of different demographic variables within the time use sample to the corresponding year of the PSID. Sample includes only non-retired males between the ages of 21 and 65 from each survey. Given that the PSID only started in 1968, we compare the 1965 time use survey to the 1968 PSID. The 1993 time use survey did not ask marital status or number of children of its respondents. All data are weighted using the survey's sampling weights. See the text for details. <<Comparison of women coming soon…..>

Appendix Table A2: Time Use Classifications

Time Use Classification	*Examples of Activities Included*
"Core Market Work"	Work for pay, main job (including time spent working at home); Work for pay, other jobs;
"Total Market Work"	"Direct market work" plus other work related activities such as: Commuting to/from work; Meals/breaks at work; Searching for a job; Applying for unemployment benefits.
"Food Preparation and Indoor Household Chores"	Food preparation; Food presentation; Kitchen/food cleanup; Washing/drying clothes; Ironing; Dusting; Vacuuming; Indoor cleaning; Indoor painting; etc.
"Shopping/Obtaining Goods and Services"	Grocery shopping; Shopping for other goods; Comparison shopping; Clipping coupons; Going to bank; Going to post office; Meeting with lawyer; Going to veterinarian; etc. (excluding any time spent acquiring medical care).
"Total Non-Market Work"	"Food preparation and Indoor Household Chores" plus "Shopping/Obtaining Goods and Services" plus all other home production including: Vehicle repair; Outdoor repair; Outdoor painting; Yard work; Pet care; Gardening; etc.
"Education"	Taking classes for degree; Personal interest courses; Homework for coursework; Research for coursework; etc.
"Sleeping"	Sleeping; Naps
"Personal Care"	Grooming; Bathing; Sex; Going to the bathroom; etc (excluding any time spent on own medical care).
"Own Medical Care"	Visiting doctor's/dentist's office (including time waiting). Dressing wounds. Taking insulin.
"Eating"	Eating meals at home; Eating meals away from home; etc.
"Child Care"	Feeding children; Reading to children; Changing diapers; Rocking child to sleep; Teaching children; Helping with homework; Taking child to doctor; etc.
"Entertainment/Social Activities/Relaxing"	Going to movies; Going to theater; Watching television; Reading (non coursework); Hobbies; Thinking; Resting; Playing games; Using computer (non work); Talking on the telephone; Going to parties; Conversing; Visiting relatives; Gardening; Pet care; Playing with children; etc.
"Active Recreation"	Playing sports; Walking; Exercise
"Religious/Civic Activities"	Religious practice/participation; Fraternal organizations; Volunteer work ; Union meetings; AA meetings; etc.

Note: Aside from commuting to work; travel times are embedded in the activity. See text for additional details.

Appendix Table A3: Coefficients on Year Dummies Displayed in Figures 2-5 (Standard Errors in Parenthesis)

	Coefficient on Year Dummy (Hours Per Week Relative to 1965)			
Regression	1975	1985	1993	2003
Direct Market Work (Figure 2)				
All	0.61	-2.40	-0.19	-0.18
	(0.52)	(0.54)	(0.52)	(0.53)
Men	-2.26	-6.11	-4.46	-6.40
	(0.74)	(0.79)	(0.76)	(0.75)
Women	0.28	1.11	4.18	4.63
	(0.63)	(0.64)	(0.63)	(0.65)
Total Non Market Work (Figure 3)				
All	-2.93	-1.70	-4.02	-4.55
	(0.36)	(0.38)	(0.37)	(0.37)
Men	0.72	3.89	2.60	3.71
	(0.42)	(0.45)	(0.43)	(0.43)
Women	-5.35	-6.59	-9.59	-11.06
	(0.48)	(0.49)	(0.48)	(0.50)
Total Work (Figure 4)				
All	-4.75	-5.42	-6.70	-7.76
	(0.48)	(0.50)	(0.49)	(0.49)
Men	-4.10	-5.25	-6.94	-7.93
	(0.85)	(0.89)	(0.86)	(0.85)
Women	-5.24	-5.34	-6.43	-7.65
	(0.62)	(0.63)	(0.62)	(0.64)

Notes: These are the coefficients and standard errors for the time dummies that are plotted in Figures 2, 3, 4 and 5. See notes to the figures for full sample and methodological descriptions.

Appendix Table A3 (continued): Coefficients on Year Dummies Displayed in Figures 2-5 (Standard Errors in Parenthesis)

Regression	Coefficient on Year Dummy (Hours Per Week Relative to 1965) 1975	1985	1993	2003
All (Figure 5a)				
Leisure Measure 1	2.08	4.40	6.52	5.13
	(0.40)	(0.42)	(0.41)	(0.41)
Leisure Measure 2	4.16	5.96	7.57	5.63
	(0.46)	(0.48)	(0.46)	(0.47)
Leisure Measure 3	3.64	5.92	7.19	6.88
	(0.47)	(0.49)	(0.47)	(0.48)
Leisure Measure 4	4.74	5.42	6.70	7.76
	(0.48)	(0.50)	(0.49)	(0.49)
Males (Figure 5b)				
Leisure Measure 1	1.18	4.18	6.57	6.33
	(0.62)	(0.66)	(0.64)	(0.63)
Leisure Measure 2	2.86	5.77	7.16	6.42
	(0.71)	(0.75)	(0.72)	(0.72)
Leisure Measure 3	3.20	6.13	7.45	7.85
	(0.71)	(0.75)	(0.73)	(0.72)
Leisure Measure 4	4.10	5.25	6.94	7.93
	(0.74)	(0.79)	(0.76)	(0.75)
Females (Figure 5c)				
Leisure Measure 1	2.68	4.59	6.58	3.80
	(0.54)	(0.53)	(0.52)	(0.54)
Leisure Measure 2	5.28	6.09	8.05	4.88
	(0.60)	(0.61)	(0.59)	(0.61)
Leisure Measure 3	3.97	5.55	6.95	5.98
	(0.60)	(0.61)	(0.60)	(0.62)
Leisure Measure 4	5.24	5.34	6.43	7.65
	(0.62)	(0.63)	(0.62)	(0.64)

Notes: These are the coefficients and standard errors for the time dummies that are plotted in Figures 2, 3, 4 and 5. See notes to the figures for full sample and methodological descriptions.

Appendix Table A4: Coefficients on Year Dummies Displayed in Figures 7a, 7b, 8 and 9 (Standard Errors in Parenthesis)

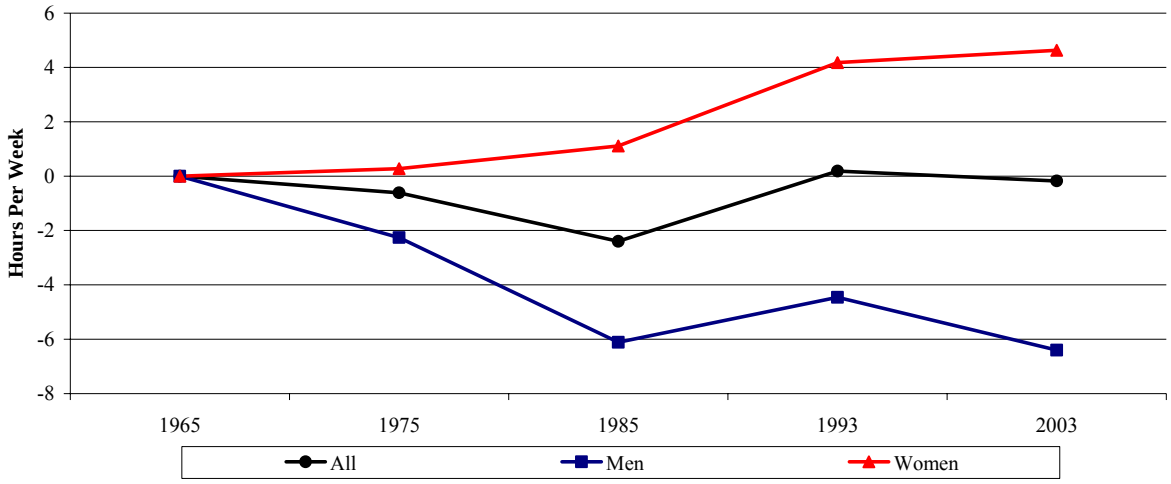
Regression	Coefficient on Year Dummy (Relative to 1965) 1975	1985	1993	2003
Men with Education ≤ 12 (Figure 7a)				
Total Market Work	-4.32	-9.25	-10.17	-14.26
	(1.13)	(1.29)	(1.32)	(1.28)
Total Non-Market Work	0.93	3.76	3.34	4.02
	(0.58)	(0.66)	(0.67)	(0.65)
Men with Education > 12 (Figure 7a)				
Total Market Work	-3.57	-7.02	-7.41	-8.70
	(1.34)	(1.24)	(1.13)	(1.13)
Total Non-Market Work	0.23	3.83	1.61	3.20
	(0.74)	(0.68)	(0.62)	(0.62)
Women with Education ≤ 12 (Figure 7b)				
Total Market Work	0.07	1.41	1.45	2.01
	(0.94)	(1.03)	(1.08)	(1.15)
Total Non-Market Work	-5.62	-6.57	-8.99	-11.06
	(0.65)	(0.71)	(0.75)	(0.80)
Women with Education > 12 (Figure 7b)				
Total Market Work	3.25	3.28	7.99	7.71
	(1.30)	(1.15)	(1.05)	(1.05)
Total Non-Market Work	-5.63	-6.80	-10.76	-12.02
	(0.87)	(0.77)	(0.70)	(0.70)

Notes: These are the coefficients and standard errors for the time dummies that are plotted in Figures 7a and 7b. See notes to the figures for full sample and methodological descriptions.

Appendix Table A4: Coefficients on Year Dummies Displayed in Figures 7a, 7b, 8 and 9 (continued) (Standard Errors in Parenthesis)

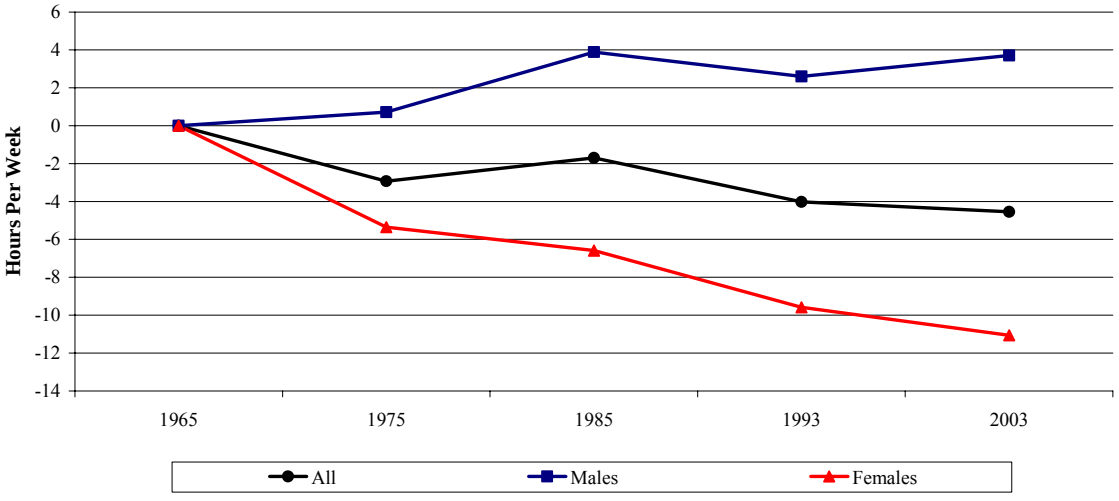
	Coefficient on Year Dummy (Relative to 1965)			
Regression	1975	1985	1993	2003
Working Women (Figure 8)				
Total Non Market Work	-3.94	-2.26	-4.75	-5.05
	(0.57)	(0.54)	(0.52)	(0.54)
Leisure Measure 3	6.98	8.00	10.17	9.55
	(0.77)	(0.73)	(0.71)	(0.72)
Non-Working Women (Figure 8)				
Total Non Market Work	-5.60	-8.31	-10.94	-14.19
	(0.76)	(0.86)	(0.88)	(0.93)
Leisure Measure 3	2.07	7.85	9.39	10.15
	(0.81)	(0.92)	(0.94)	(1.00)
Single Men (Figure 9)				
Total Non Market Work	2.15	3.94		3.17
	(0.92)	(0.82)		(0.76)
Married Men (Figure 9)				
Total Non Market Work	0.44	4.08		4.24
	(0.64)	(0.53)		(0.52)
Single Women (Figure 9)				
Total Non Market Work	-2.23	-0.50		-4.00
	(0.78)	(0.72)		(0.70)
Married Women (Figure 9)				
Total Non Market Work	-6.13	-7.33		-11.68
	(0.58)	(0.62)		(0.65)

Figure 1: Time Spent in "Core Market Work" By Sex Conditional on Demographics, Change in Hours Per Week Relative to 1965



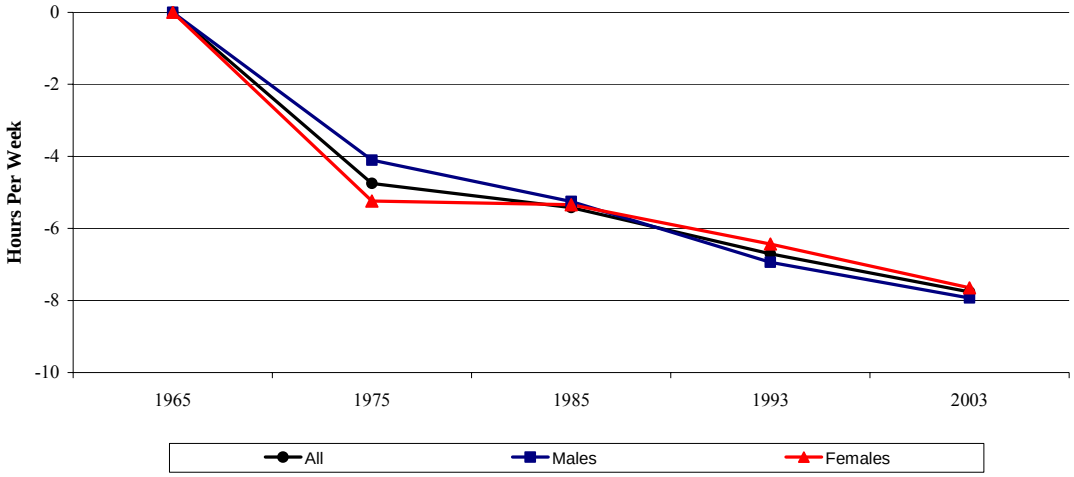
Notes: This graph plots the coefficients on year dummies from a regression of time spent in core market work on year dummies (with 1965 being the omitted year), age controls, education controls, and family composition controls. The coefficients should be interpreted as hour per week deviations from 1965. To get the conditional trends in core market work hours by sex, we re-estimated the regression separately restricting the sample to include only men or women (13,814 and 11,407 observations, respectively). Table 3 for a description of the sample and the definition of core market work.

Figure 2: Time Spent in "Total Non-Market Work" By Sex Conditional on Demographics, Change in Hours Per Week Relative to 1965



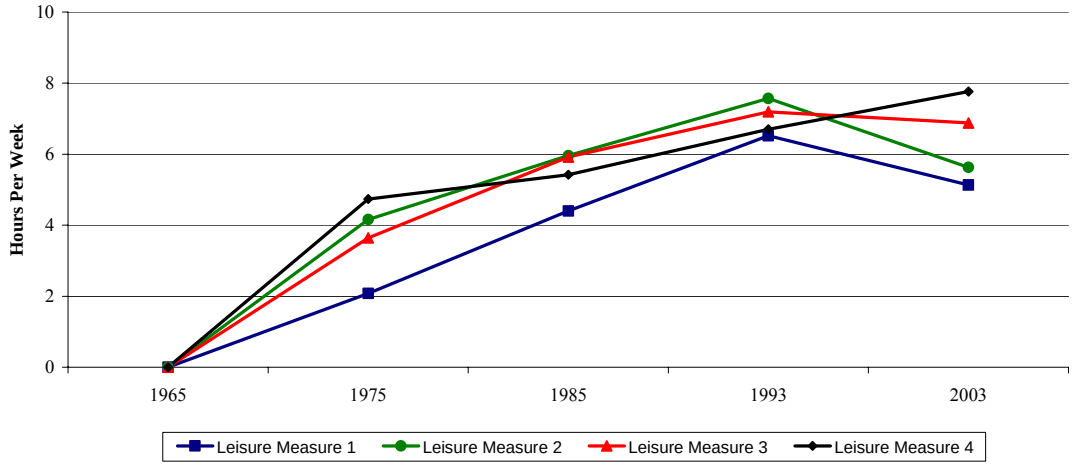
Notes: This graph plots the coefficients on year dummies from a regression of time spent in total non market work on year dummies (with 1965 being the omitted year), age controls, education controls, and family composition controls. The coefficients should be interpreted as hour per week deviations from 1965. To get the conditional trends in total non-market work hours by sex, we re-estimated the regression separately restricting the sample to include only men or women (13,814 and 11,407 observations, respectively). Table 3 for a description of the sample and the definition of total non-market work.

Figure 3: Time Spent in "Total Work" By Sex Conditional on Demographics, Change in Hours Per Week Relative to 1965



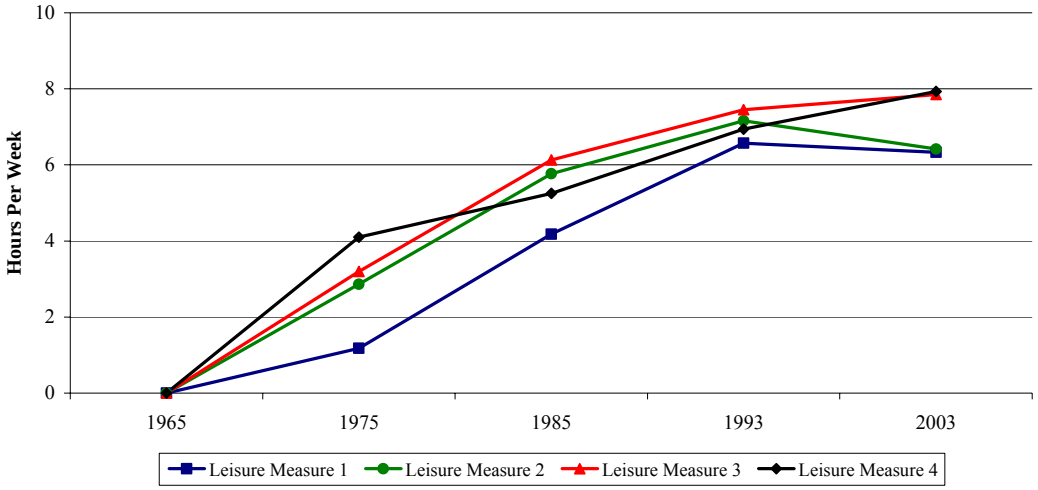
Notes: This graph plots the coefficients on year dummies from a regression of time spent in total work on year dummies (with 1965 being the omitted year), age controls, education controls, and family composition controls. The coefficients should be interpreted as hour per week deviations from 1965. To get the conditional trends in total work hours by sex, we re-estimated the regression separately restricting the sample to include only men or women (13,814 and 11,407 observations, respectively). Table 3 for a description of the sample and the definition of total work.

Figure 4a: Time Spent in "Leisure" Conditional on Demographics Change in Hours Per Week Relative to 1965



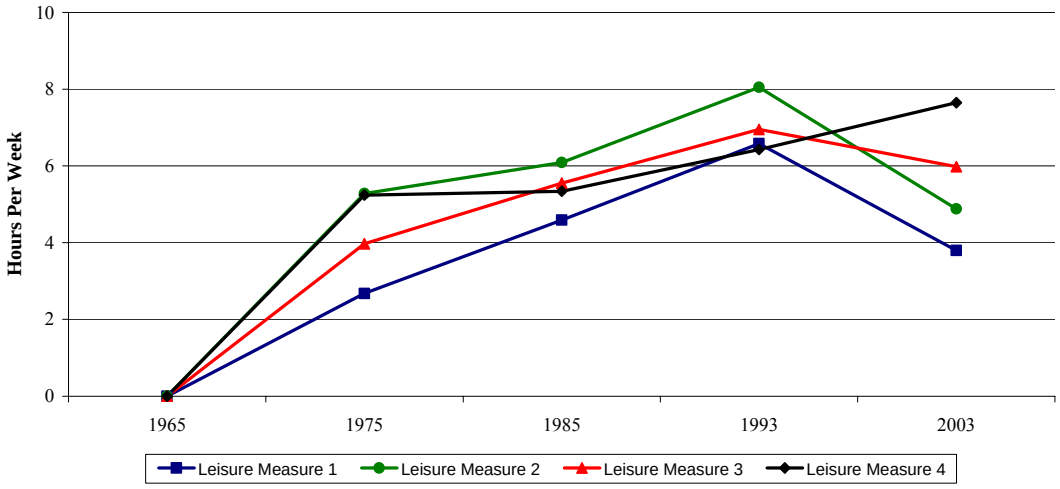
Notes: This graph plots the coefficients on year dummies from a regression of time spent in various measures of leisure on year dummies (with 1965 being the omitted year), age controls, education controls, and family composition controls. The coefficients should be interpreted as hour per week deviations from 1965. See Table 5 for a description of the sample and the definitions of leisure measures 1- 4.

Figure 4b: Time Spent in "Leisure" for Males Conditional on Demographics
Change in Hours Per Week Relative to 1965



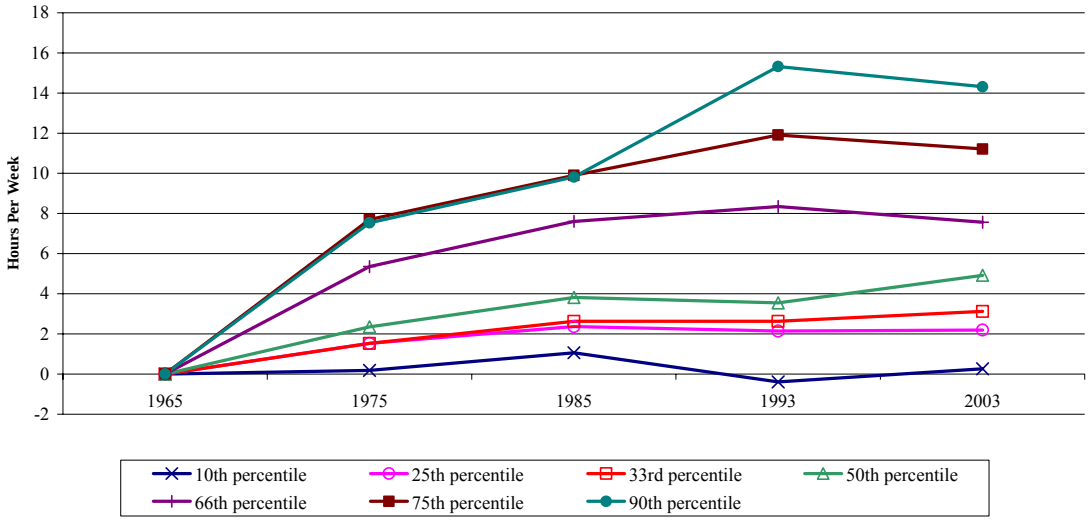
Notes: This graph plots the coefficients on year dummies from a regression of time spent in various measures of leisure on year dummies (with 1965 being the omitted year), age controls, education controls, and family composition controls. The coefficients should be interpreted as hour per week deviations from 1965. See Table 5 for a description of the sample and the definitions of leisure measures 1- 4.

Figure 4c: Time Spent in "Leisure" for Females Conditional on Demographics
Change in Hours Per Week Relative to 1965



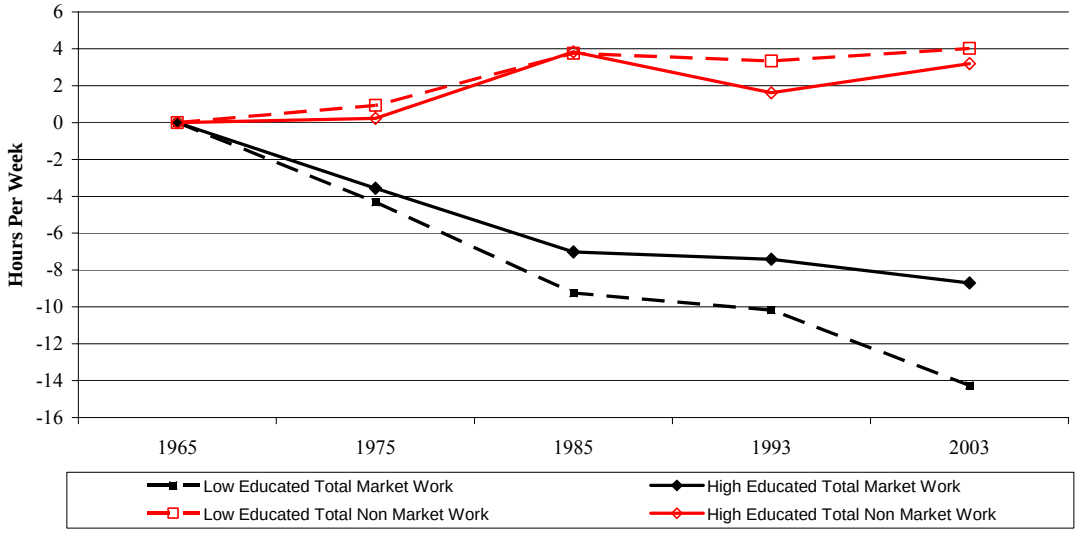
Notes: This graph plots the coefficients on year dummies from a regression of time spent in various measures of leisure on year dummies (with 1965 being the omitted year), age controls, education controls, and family composition controls. The coefficients should be interpreted as hour per week deviations from 1965. See Table 5 for a description of the sample and the definitions of leisure measures 1- 4.

Figure 5: Change in Distribution of Time Spent in "Leisure Measure 3"
Change in Hours Per Week Relative to 1965



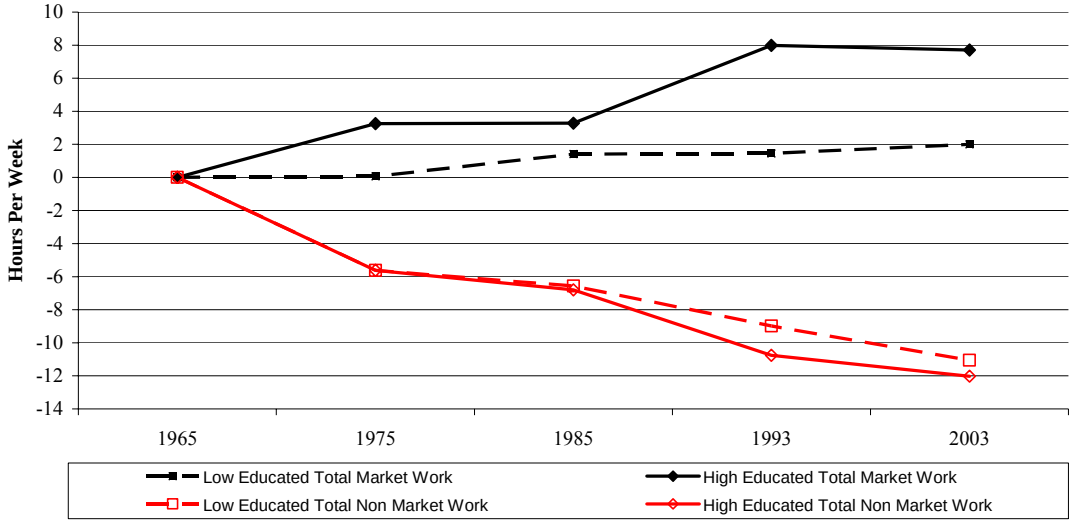
Notes: To contruct this plot, we ran a regression of leisure measure 3 on age, education and family composition controls on our pooled time use data set. We then took the residuals of this regression by year and compute the percentile points of the residual leisure distribution. The distribution points for survey years 1975, 1985, 1993, and 2003 are all relative to the distribution points in 1965. As a result, the graph plots deviations of percentile points from the 1965 time use survey over time.

Figure 6a: Male Time Spent in "Total Market Work" and "Total Non Market Work"
By Educational Attainment Conditional on Demographics



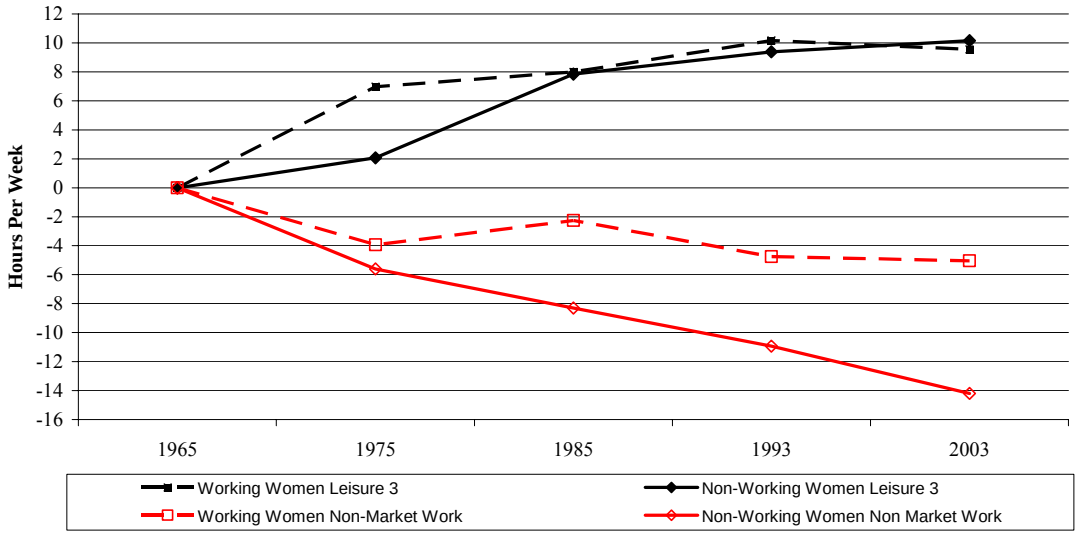
Notes: This graph plots the coefficients on year dummies from regressions of time spent in either total market work or total non-market work on year dummies (with 1965 being the omitted year) and demographic controls. The sample either included low educated or high educated males who were non-retired and non-students between the age of 21 and 65. The coefficents can be interpretted as hour per week deviations from 1965. See the notes to Table 6 for a full description of the sample.

Figure 6b: Female Time Spent in "Total Market Work" and "Total Non Market Work" By Educational Attainment Conditional on Demographics



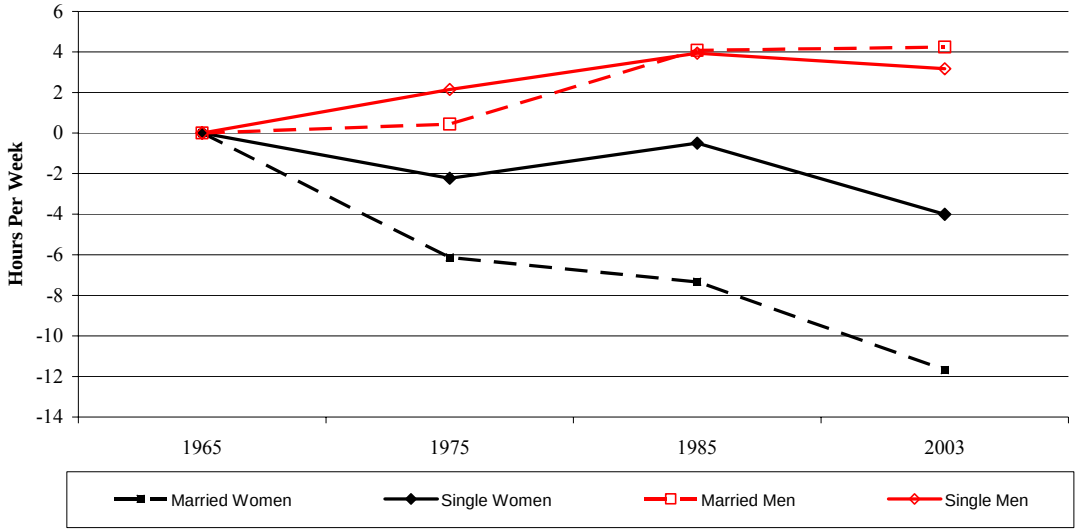
Notes: This graph plots the coefficients on year dummies from regressions of time spent in either total market work or total non-market work on year dummies (with 1965 being the omitted year) and demographic controls. The sample either included low educated or high educated males who were non-retired and non-students between the age of 21 and 65. The coefficents can be interpretted as hour per week deviations from 1965. See the notes to Table 6 for a full description of the sample.

Figure 7: Time Spent in "Total Non Market Work" and "Leisure Measure 3" Women By Employment Status Conditional on Demographics



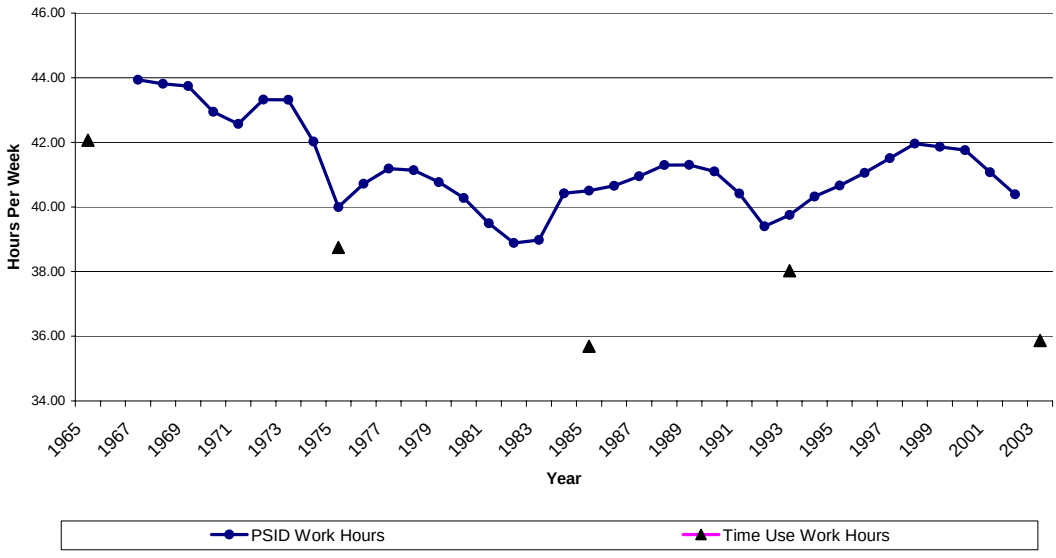
Notes: This graph plots the coefficients on year dummies from regressions of time spent in either total non market work or leisure measure 3 on year dummies (with 1965 being the omitted year) and demographic controls. The sample either included working or non working women wbetween the age of 21 and 65. The coefficents can be interpretted as hour per week deviations from 1965.

Figure 8: Time Spent in "Total Non Market Work"
By Sex and Marital Status Conditional on Demographics



Notes: This graph plots the coefficients on year dummies from regressions of time spent in total non market work on year dummies (with 1965 being the omitted year) and demographic controls. The sample either included either married women, single women, married men or single men who were non-retired and between the age of 21 and 65. The coefficents can be interpretted as hour per week deviations from 1965.

Figure A1: Comparison of Weekly Core Market Work Hours in PSID and Time Use Surveys: Sample: All Non-Retired Men Between Ages of 21 and 65



Notes: Figure shows hours per week in core market work for non-retired males between the ages of 21 and 65 in the PSID (solid line) and the time use surveys (triangle). The time use surveys are only from 1965, 1975, 1985, 1992-1994, and 2003. The PSID asks respondents about work hour during a typical week and how many weeks they were at work during the previous year. We multiply these two numbers and divide by 52 to get annual work hours in the PSID.