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Abstract

In this paper, we use time-use surveys to examine trends in the allocation of time in five industrialized countries over the last thirty years. Adjusting for changing demographics, we find that leisure time across countries has converged over this period. Specifically, leisure time has declined five to eight hours in countries with high leisure levels thirty years ago and has increased around one hour in the other countries. For men the reduction in leisure was driven by an increase in nonmarket work, while women dramatically increased time allocated to market work and decreased nonmarket work time. Lastly, we show that like in the USA leisure inequality increased in all countries of our sample.

Keywords

Time Use, Leisure Inequality, Cross-Country Comparison, MTUS

JEL Classification

D12, D13, J22

1 Introduction

In a recent article Aguiar and Hurst (2007) write: "How changes in the time spent in leisure experienced in the United States compares to changes in time spent in leisure in a broad group of other industrialized countries remains an important area for further research" (p. 1001). By studying trends in the allocation of time in five industrialized countries over the last thirty years, this paper addresses just this aspect of current research. Our analysis focusses on two questions. First, we examine differences in the evolution of market work, nonmarket work, and leisure across countries net of demographically driven changes. A Blinder-Oaxaca type decomposition allows us to break down the the cross-country differences into demographic and behavioral components. Second, we analyze how the dispersion of leisure within a country has changed over time and investigate to what extent observed trends can be attributed to changes in the distribution of leisure across educational groups.

According to Becker (1965), time is a necessary input in nearly all economic activities. Hence, the allocation of time essentially determines the relative price of goods and services. However, the allocation of time is important from a welfare perspective. Provided that leisure activities generate utility, focussing on income only to measure economic well-being is potentially misleading. Therefore, a country's leisure distribution is another aspect to take into consideration when examining the dispersion of living standards. Most of the existing time-use studies are based on labor force survey data to document trends in market work hours (see, e.g., McGratten and Rogerson (2004)). Apart from being plagued with measurement errors (Juster and Stafford (1991)), labor force surveys typically do not distinguish between nonmarket work and leisure. However, a substantial part of the production activities takes place outside the market. Moreover, given that home production can mostly be substituted by market goods, distinguishing nonmarket work from leisure is important in understanding how changes in the real wage affect market labor supply.

In contrast, the Multinational Time Use Survey (MTUS) data used in this study contains detailed records on each activity carried out during the day, which allows us to disentangle leisure from nonmarket working activities, thereby obtaining a more appropriate picture of the effective workload borne and leisure

time enjoyed. In addition, since the variables recorded in the MTUS are cross-nationally harmonized, observed trends in the allocation of time are comparable across countries.

Our results indicate that leisure time across countries has converged over time. The countries with the highest leisure levels thirty years ago (Canada, the UK and the Netherlands) experienced a decline in leisure time of five to eight hours, while leisure increased by about one hour in the USA and Norway. For men, the reduction in leisure was driven by an increase in nonmarket work, except for the USA and Norway, where the increase in nonmarket work was compensated by a decline in market work hours. Women increased market work by four to nine hours per week and decreased nonmarket work time up to twelve hours. Decomposing the differences in market work, nonmarket work and leisure into demographic and behavioral components suggests that cross-country convergence is the result of decreasing differences in the allocation of time within demographic groups rather than decreasing differences in demographics.

We analyze trends in market work, nonmarket work and leisure separately for three groups of different levels of education. In all countries less educated adults enjoy more leisure than their high educated counterparts. Moreover, the gain (drop) in leisure is significantly larger (smaller) for less educated adults than for those with at least a secondary level of education, resulting in a growing dispersion of leisure time across educational categories. Given that education is closely linked to a person's income potential, this suggests that the disproportionate income gains of the highly skilled over the last few decades documented by Katz and Autor (1999) came at the expense of a relative loss in leisure time. Hence, the welfare gap across different income groups may be less pronounced than the evolution of the income distribution alone implies.

The growing leisure gap across different educational categories contributed to an overall increase in leisure inequality in all countries. However, this is only part of the story, given that the leisure inequality within educational categories increased as well. Interestingly, the increase in leisure inequality occurred simultaneously with the well documented dispersion of the wage distribution (see Katz and Autor (1999) and Blau and Kahn (1996)).

Our work adds to the existing literature in several ways. While the literature on time-use trends is rich for the USA (see Robinson and Godbey (1999), Bianchi

et al. (2000), Sayer et al. (2004), Fisher et al. (2007)), evidence on European countries is rare and the findings ambiguous see Chenu (2003) for France, Burda et al. (2006) for Germany and Italy and van den Broek et al. (2004) for the Netherlands). Even yet rarer are time-use studies that compare different countries over time. Juster and Stafford (1991) and Gershuny (2000) document convergence in time-use in a cross-country context. However, aside from examining trends over a longer time horizon, none of these studies adjusts for demographic changes. Potentially, these changes could have a large effect on the results in that the average individual thirty years ago was on average younger, less educated and more likely to have children.

One exception is the article by Aguiar and Hurst (2007), which is most closely related to the present study. Using time use data for the USA over the period 1965 to 2003, they find that adjusted for demographics, leisure time in the USA increased by five to eight hours per week. In addition, they document a growing dispersion of leisure time over the same period. We show that in other countries demographically adjusted leisure time evolved differently, while over the same period leisure inequality increased in all countries. Moreover, by applying a Blinder-Oaxaca decomposition, we can examine the origins of cross-country differences with regard to how time is used.

This paper is structured as follows. In the next section we discuss our data and describe our strategy to adjust for demographic changes. In Section 3 we present the trends in market work, nonmarket work and leisure over time and examine the determinants of cross-country differences in these aggregates. We continue the empirical analysis with an examination of the leisure distribution in Section 4. Section 5 concludes.

2 Data

We use data from the Multinational Time Use Survey (MTUS) to analyze the allocation of time across different countries.[1] The MTUS, located at the University of Essex, provides cross-nationally harmonized time-use data for fifteen countries. The activities of one day (1440 minutes) are recorded by 41 harmonized variables. We use these harmonized variables to create time-use aggregates

[1]The data can be obtained from the following page: http://www.timeuse.org/mtus/

of interest such as core and total market work, core and total nonmarket work and different measures of leisure . In addition, the MTUS registers the respondent's age, sex, education, employment status (including retirement and student status), as well as the number of children in the household, and the year the diary was completed. Education is harmonized based on the International Classification of Education (ISCED) and takes on three values: uncompleted secondary or less, completed secondary, and above secondary education. To ensure that the data is representative of the total population and that each day of the week is equally represented, we use the survey weights contained in the MTUS.

Table 1 provides an overview of the countries and surveys used in this paper. Given that our aim is to examine cross-country trends in the allocation of time over a long period of time, our main sample consists of all countries, for which we have data over a period of 25 years or more. This restriction leaves us with five countries: the USA, Canada, the UK, the Netherlands and Norway. For each country, the first survey is conducted in the seventies and the most recent around the year 2000. Our sample restrictions are as follows. We exclude all individuals that are younger than twenty or older than sixty-five as well as students and retirees. We require that the respondents' diary adds up to 24 hours (1440 minutes) and has no more than 15 minutes of unclassified time. Moreover, we drop all individuals with missing information on education or on the day the survey was conducted. The forth and fifth column of Table 1 list the sample size for each survey before and after imposing the restrictions.

As the last column of Table 1 shows, the number of time-use categories in the original survey varies considerably across surveys and countries, which potentially affects the comparability across countries and over time. The 2003 USA survey, for example, includes 406 different categories whereas the 1995 UK survey consists of only 31 categories. The MTUS team makes a great effort to recode these time-use categories into the 41 harmonized variables. Moreover, in most of the cases we focus on broad time aggregates, which are relatively invariant to the number of time-use categories in each survey.

Over the last twenty years, the population structure in all sample countries has undergone significant changes. Today, the average respondent is older, more educated, and has less children. Since these changes most likely affect the allocation of time, we hold the demographic composition constant for most of the

Table 1: Description of Time-Use Data

Country	Survey coverage	Length of observed time period per respondent	Total sample size	Analysis sample size	Time-use categories
USA	1975	24 hours	1'895	1'811	87
	1985	24 hours	3'467	3'205	88
	1992	24 Hours	5'817	5'331	91
	2003	24 Hours	14'722	13'708	406
Canada	1971	24 Hours	1'958	1'942	100
	1981	24 Hours	2'076	1'965	272
	1986	24 Hours	7'140	6'794	99
	1992	24 Hours	6'518	6'187	167
	1998	24 Hours	7'951	7'054	178
UK	1975	24 Hours	10'941	9'537	73
	1983	24 Hours	6'708	6'247	185
	1995	24 Hours	1'362	1'175	31
	2000	24 Hours	6'133	5'175	268
Netherlands	1975	7 Days	972	909	354
	1980	7 Days	2'043	1'930	354
	1985	7 Days	2'453	2'398	354
	1990	7 Days	2'361	2'272	354
	1995	7 Days	2'540	2'424	354
	2000	7 Days	1'230	770	354
Norway	1971	24 Hours	2'253	2'182	97
	1981	24 Hours	2'491	2'377	97
	1990	24 Hours	2'342	2'175	123
	2000	24 Hours	2'720	2'080	265

Notes: The analysis sample size indicates the number of observations of each survey we use in our analysis. It deviates from total sample size in that we exclude all individuals who are younger than twenty or older than sixty-five as well as students and retirees. We require that the respondents' diary adds up to 24 hours and has no more than 15 minutes of unclassified time. Moreover, we drop all individuals with missing information on education or on the day the survey was conducted.

analysis. In doing so, we separate out simple demographic or structural effects on average time use and gain insight into the *behavioral* changes in time allocation.

To adjust for changes in the demographic structure we follow Aguiar and Hurst (2007) and construct a set of demographic cells defined by certain attributes. Specifically, we divide our sample into subgroups defined by five age groups (20-29, 30-39, 40-49, 50-59, 60-65), two sex categories and whether or not there is a child present in the household (except for the age group 60-65). This gives us a total of 18 demographic cells. We pool together all surveys per country and calculate the percentage of each demographic cell in the population. To calculate demographically adjusted means for activity j, we multiply these 18 country-specific weights, which are constant across time, with the cell means for activity

j in year t. When calculating means for subsamples (e.g. only women or men), we adjust the weights accordingly to sum up to one.

3 Trends in the Allocation of Time

To get a general idea, we first examine the three main time-use aggregates market work, nonmarket work, and leisure.[2] Subsequently, we focus in more detail on the evolution of different subcategories contained in nonmarket work and leisure.

Market work encompasses working hours in paid main and second jobs, including overtime and time spent working at home. In addition, it contains job-related activities such as commuting time, meal and other breaks during working hours, as well as job seeking activities. In the tradition of Reid (1934), nonmarket work includes all unpaid production outside the labor market, which could be substituted by paid goods and services.[3] It reaches from routine tasks such as cooking, washing clothes, and cleaning (referred to as core nonmarket work) over child care, shopping, and gardening to "odd jobs" like repair work or paperwork (see Table 7 in the Appendix for a detailed description of the time-use categories). The first broad measure for leisure is defined as residual hours per week after subtracting total market and total nonmarket work.

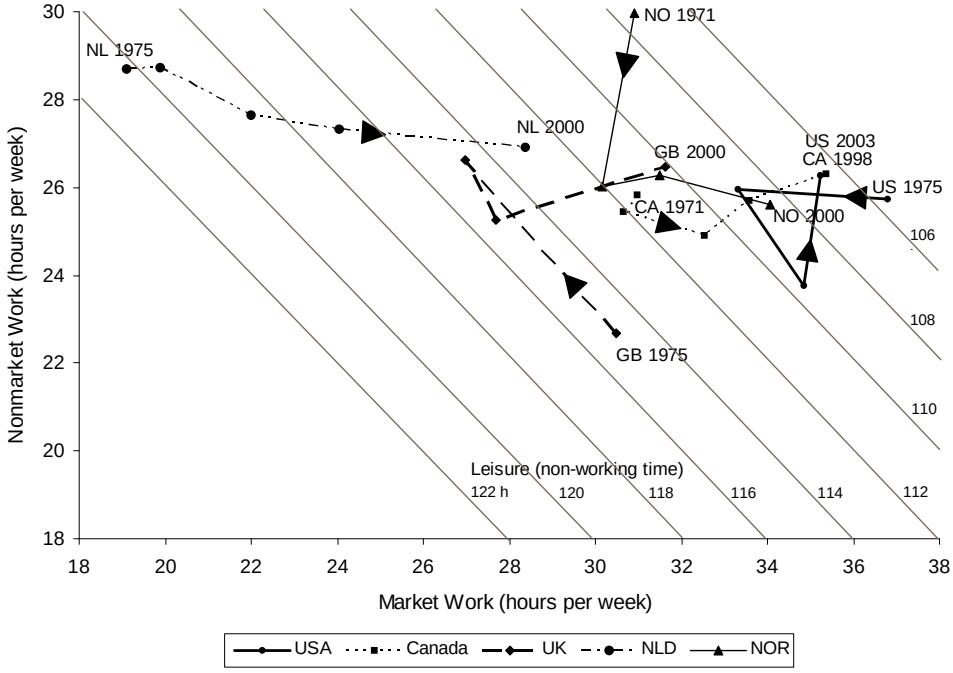
Figure 1 presents the hours per week spent in total market work on the horizontal axis and the hours per week spent in total nonmarket work on the vertical axis. The dotted lines represent loci with a constant total workload and indicate the level of leisure. The farther the loci are situated from the origin, the higher is the combined market and nonmarket workload, and the lower is the leisure time.

The figure demonstrates that since the early seventies the USA and Norway have been able to slightly increase their leisure level by about one hour. In the USA, this is due to a reduction in market work time, while in Norway it comes from a reduction in nonmarket work of four hours which compensated the increase in market work by three hours. However, leisure has decreased by five to eight hours in Canada, the UK and the Netherlands. The decline was driven by an increase in total market work in the case of Canada and the Netherlands, and by

[2]If not stated differently, we report figures adjusted for demographic changes as described in the previous Section.

[3]In the following, nonmarket work is also referred to as unpaid work or home production.

Figure 1: Trends in Main Time-Use Aggregates, Average Hours per Week



Notes: This figure demonstrates country-specific paths of leisure, market and nonmarket work time over the last thirty years. The falling straight lines represent loci with constant leisure time. The greater the distance from the origin, the higher the combined market and nonmarket workload is, and the lower the leisure time is.

an increase in nonmarket work in the UK.

These findings contrast sharply with the notion of a "leisure-bent Europe", which dominates a broad thread in literature on working hour differences between the USA and Europe (see, e.g., Alesina et al. (2005), Prescott (2004), or Bell and Freeman (2001)). It also stands in contrast with Schor (1991) and Hochschild (1997) who argue that the USA tended towards longer working hours in the second half of the twentieth century, which ultimately led to increasingly exhausted individual, family, and occupational routines. Instead of using the productivity gains to free up time, i.e. producing the same output in less time, the USA – unlike Western Europe – chose to steadily increase the output per unit of time (Schor (1991)).

On closer inspection, however, these inconsistencies are not surprising. First, most of the existing articles use data from labor force surveys to analyze market work. Given that this data usually does not contain information on nonmarket work, leisure is necessarily defined as all time outside of paid work. But, clearly,

this notion is not accurate, as not all unpaid activities have a leisure character. Time-use surveys, on the other hand, collect detailed data on the different nonmarket activities and therefore allow us to disentangle nonmarket work from leisure activities.

Second, there is also evidence that in the case of market work, time-use surveys provide more reliable information than conventional surveys. The reason for this is that time-use survey data is not collected with stylized questions[4], but instead by the means of an activity diary as a memory-supporting, as well as disciplining device. According to Chenu and Lesnard (2006), this approach reduces the respondents' tendency to overestimate the duration of more desirable activities and to underestimate less popular tasks. Moreover, labor force surveys tend to reduce the true variance in hours of market work as respondents tend to report the common, contractually agreed hours of work per week (Juster and Stafford (1991)).

Third, and maybe most important, changes in the demographic structure across countries and over time have to be taken into account. Jacobs and Gerson (2001), for example, argue that while the average working time of the economically active population has hardly changed since the 1970s, the average working time of the overall population may well have increased, given the shift from the single breadwinner family to the double income and single-parent families who have always been subject to greater workload. Similarly, a slower population aging process in the USA as compared to Europe, implies higher average working hours in the USA, due to the greater share of working individuals in the overall population.

Table 2 shows the main time-use aggregates for the full sample as well as differentiated by sex. By comparing the first observation (period 1970-1975) with the last observation (period 1998-2003), we observe several things. First, male market work fell considerably in the USA, the UK, and Norway and increased in the other countries. Today, male core market work, i.e. working hours without commuting time, lies between 35.6 to 40.2 hours per week and total market work between 40.0 to 44.6 hours per week. Among women, market work has risen substantially in all countries over time, demonstrating the growing female labor

[4]Stylized questions ask for time use in the form "How much time did you spend in activity X during the last week/the last month?"

market participation. In UK and Norway, the increase was great enough to compensate for the decline in male market work. Generally, female total market work today ranges between 24.8 and 29.1 hours per week, with the exception of the Netherlands where, despite the rapid growth during the last decades, women still perform less than 20 hours per week of paid work.

Second, as with market work, the average trend in nonmarket work in the full sample masks differences across sexes. Inspecting Table 2 reveals that total male nonmarket work has increased by 2.1 to 8.5 hours per week, whereas for women nonmarket work fell up to 11.8 hours per week, primarily due to the substantial withdrawal from core nonmarket work (cooking, washing clothes, and cleaning). In the USA and Norway, the increase in male nonmarket work was compensated by the decline in total market work, while the rise of female market work was counterbalanced by the decrease in nonmarket work, both leading to a higher level of leisure time. In Canada, the UK, and the Netherlands, on the other hand, the increase in male nonmarket and female market work, respectively, was accompanied by a drop in leisure time.

Third, for men and women, leisure time - as market and nonmarket work - has converged across countries over the last decades. What remains, however, is a gender gap. Despite the large increase in total market work, women today still have 107.2 to 114.5 hours leisure time per week which means that they enjoy 0.5 (USA) to 6 (the Netherlands) hours more work-free time per week than their male counterparts.

Aguiar and Hurst (2007) find an increase of residual leisure time of 2.6 hours for men and 0.6 hours for women over the period 1975 to 2003.[5] With an increase of 2.2 hours male leisure time and an unchanged amount of leisure for women, our results for the USA are very similar. For the remaining differences there are several reasons: First, as the original population weights are not included in the MTUS, we rely on the self-constructed population weights by the MTUS team, which are potentially less precise, given that they only adjust the surveys to represent the age-gender distribution. Second, MTUS time-use categories are

[5]Note that these numbers relate to Table III (p. 977) in Aguiar and Hurst's paper, but are net of child care time (reported in Table II, p. 976). As Aguiar and Hurst (2007) do not include child care in nonmarket work, their residual leisure time, referred to as Leisure Measure 4, contains child care time.

Table 2: Average Hours per Week Spent in Main Time-Use Aggregates

	USA	Canada	UK	Netherlands	Norway
Panel 1: Full Sample					
Core market work					
first obs.	33.69	28.33	27.52	16.50	28.38
last obs.	32.44	31.98	27.84	24.79	30.92
change	-1.25	3.66	0.32	8.29	2.54
Total market work					
first obs.	36.78	30.98	30.49	19.10	30.92
last obs.	35.22	35.37	31.63	28.37	34.05
change	-1.56	4.38	1.13	9.28	3.13
Core nonmarket work					
first obs.	12.43	13.58	13.27	14.97	18.09
last obs.	8.33	11.19	12.17	11.84	12.09
change	-4.10	-2.38	-1.10	-3.13	-6.00
Total nonmarket work (without child care)					
first obs.	23.12	22.53	20.87	25.35	26.59
last obs.	21.92	21.47	22.66	21.79	20.95
change	-1.19	-1.07	1.79	-3.56	-5.65
Total nonmarket work					
first obs.	25.74	25.83	22.66	28.68	29.95
last obs.	26.29	26.31	26.46	26.90	25.59
change	0.55	0.47	3.80	-1.78	-4.36
Leisure (residual)					
first obs.	105.46	111.17	114.84	120.16	107.13
last obs.	106.47	106.33	109.83	112.16	108.28
change	1.01	-4.84	-5.01	-8.00	1.15
Panel 2: Men					
Core market work					
first obs.	46.64	40.08	41.40	30.66	41.62
last obs.	39.03	40.23	35.61	38.00	37.43
change	-7.61	0.15	-5.78	7.34	-4.19
Total market work					
first obs.	51.06	43.94	45.59	35.75	45.30
last obs.	42.63	44.59	39.96	43.46	41.04
change	-8.43	0.65	-5.63	7.71	-4.26
Core nonmarket work					
first obs.	2.57	3.58	1.92	3.76	4.32
last obs.	4.29	5.64	6.38	5.32	7.43
change	1.72	2.06	4.46	1.56	3.11
Total nonmarket work (without child care)					
first obs.	12.43	12.89	9.19	11.85	14.65
last obs.	17.19	15.27	16.33	12.93	17.19
change	4.76	2.38	7.14	1.09	2.54
Total nonmarket work					
first obs.	13.55	14.02	9.84	13.48	16.01
last obs.	19.76	18.15	18.37	15.60	19.61
change	6.21	4.13	8.52	2.12	3.59
Leisure (residual)					
first obs.	103.38	110.02	112.57	118.70	106.69
last obs.	105.60	105.26	109.59	108.51	107.28
change	2.21	-4.75	-2.97	-10.19	0.60
Panel 3: Women					
Core market work					
first obs.	22.95	18.43	16.18	7.33	16.05
last obs.	26.97	25.04	21.50	16.23	24.86
change	4.02	6.61	5.31	8.90	8.81
Total market work					
first obs.	24.95	20.07	18.17	8.30	17.52
last obs.	29.08	27.60	24.82	18.59	27.54
change	4.14	7.53	6.65	10.29	10.02
Core nonmarket work					
first obs.	20.60	21.99	22.54	22.23	30.91
last obs.	11.67	15.87	16.90	16.06	16.42
change	-8.93	-6.12	-5.65	-6.17	-14.49
Total nonmarket work (without child care)					
first obs.	31.97	30.65	30.41	34.11	37.72
last obs.	25.85	26.68	27.83	27.53	24.45
change	-6.12	-3.97	-2.58	-6.57	-13.27
Total nonmarket work					
first obs.	35.85	35.78	33.14	38.53	42.94
last obs.	31.71	33.17	33.07	34.23	31.17
change	-4.14	-2.60	-0.06	-4.30	-11.77
Leisure (residual)					
first obs.	107.18	112.13	116.70	121.11	107.54
last obs.	107.19	107.22	110.02	114.54	109.21
change	0.01	-4.91	-6.68	-6.58	1.67

Notes: This table presents the means of the main time-use aggregates adjusted for changes in the demographic structure, as described in Section 2. 'First obs.' refers to the first available survey per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003). For the definitions of the time-use categories, see Table 7 in the Appendix.

in general more aggregated than the time-use categories of the original survey, thereby preventing the exact imitation of the time-use aggregates Aguiar and Hurst (2007) used in their paper. Finally, our baseline demographic adjustment does not take into account education, as we would have to exclude Norway in this case.

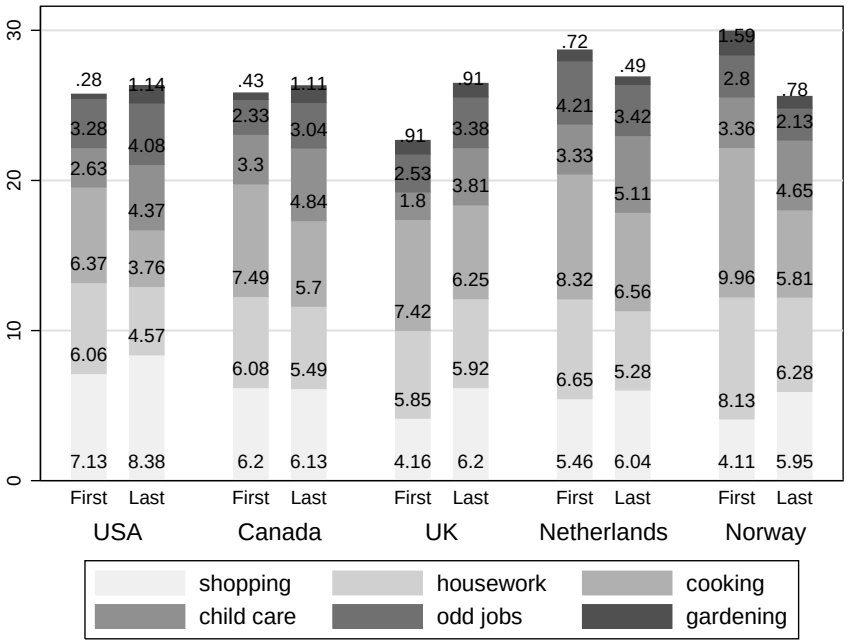
3.1 Trends in Nonmarket Work

This section analyzes the composition of nonmarket work in greater detail. Figure 2 illustrates the evolution of the different nonmarket activities over time. Gender specific time trends are reported in Table 8 in the Appendix. Several aspects are apparent. First, independent of gender, the amount of time spent on child care has grown in all countries. Cooking, on the other hand, has strongly decreased for women by 3.6 to 8.7 hours per week and slightly increased for men by 0.7 to 2.3 hours. A similar gender pattern is apparent for housework, which overall has barely changed over time. Yet, women nowadays spend 1.6 to 5.8 hours per week less on housework than they did 30 years ago, while men increased their involvement in housework by 0.4 to 2.4 hours per week. Shopping is an important component of nonmarket work. This holds particularly true for the USA. But also in the other countries, a non-negligible amount of time is spent on shopping, which, except for Canada, has grown over time.

Freeman and Schettkat (2005) argue that USA households spend less time on nonmarket activities compared to their European counterparts, because they are more inclined to substitute household work by paid domestic services, which in turn allows women to participate in the labor market. Indeed, as Table 8 indicates, women in non-US countries spend 16 to 17 hours per week on cooking and housework, whereas in the USA they spend only 12 hours per week. The corresponding numbers for men are 5 to 7 versus 4 hours. However, if all the components of nonmarket work are taken into consideration, total nonmarket hours in the USA and Europe are approximately the same, not least because in the USA the time gained on cooking and housework is invested in shopping.

Overall, the opposite trends in cooking and housework for men and women, together with the dissemination of labor-saving domestic technologies, have lead to smaller gender differences in nonmarket work, a point which is also made by Sullivan and Gershuny (2001). However, today women still spend 11.6 (Norway)

Figure 2: Nonmarket Activities, Full Sample



Notes: This figure shows the average hours per week spent in different nonmarket activities, adjusted for changes in the demographic structure as described in Section 2. 'First' refers to the first survey available per country (period 1970-1975), 'Last' to the last survey (period 1998-2003).

to 18.6 (Netherlands) hours per week more in nonmarket work than men.

3.2 Trends in Leisure

To analyze how time spent on different leisure activities has evolved across countries over time, we construct an alternative leisure measure denoted *leisure II*. This measure is narrower than the residual leisure measure and contains watching TV, reading, following one's hobbies, sleeping, relaxing, eating (at home) and personal care.[6] Thus, leisure II omits activities with little recreational character, such as completing an education, undergoing medical treatment, or religious, political, and voluntary engagement.

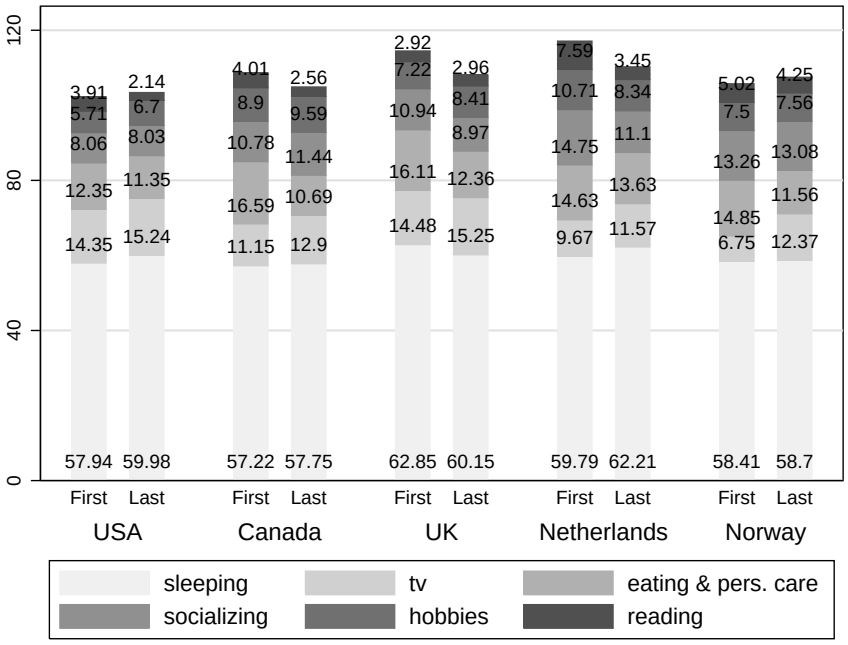
Figure 3.2 presents the evolution of the different subcategories summarized in leisure II over time.[7] Nowadays, the average worker enjoys between 103.4 (US) to 110.3 (Norway) hours of leisure per week. Leisure time for women and men

[6]This corresponds to leisure measure 2 in Aguiar and Hurst's paper (2007).

[7]Leisure data separated by gender can be found in Table 9 in the Appendix.

differs by approximately two hours, except for the Netherlands, where women enjoy about 5 hours more leisure time than men do.

Figure 3: Leisure Activities, Full Sample



Notes: This figure shows the average hours per week spent in different leisure activities, adjusted for changes in the demographic structure as described in Section 2. 'First' refers to the first survey available per country (period 1970-1975), 'Last' to the last survey (period 1998-2003).

Across countries several common time-use patterns are observed. First, except for the UK, sleeping (which includes relaxing, sunbathing and having sex) has increased over time by 0.3 to 2.4 hours per week, amounting to a total of around 60 hours per week. Yet the activity that has increased most over time is TV consumption (between 0.9 to 5.6 hours per week), which was accompanied by a simultaneous decrease in reading of up to 4.1 hours per week. Subtracting sleeping from the leisure time, individuals spend nowadays 24.1% (the Netherlands) to 35.1% (US) of their leisure time in front of the TV. Apart from reading, people in general also spend less time on eating and personal care (by 1.0 to 5.9 hours per week). Changes in time-use pattern across countries are more diverse for hobbies and socializing.

In general, trends go in the same direction for men and women, although they differ in magnitude. Leisure time, as reported by leisure measure II, has decreased for men and women, except for the USA (men) and Norway (women).

Despite the predominant decline in leisure time, both sexes spend more time on TV consumption than in the seventies. All of the other activities, except for sleeping, have mostly fallen over time. On average, women sleep longer and tend to spend more time on eating and personal care as well as socializing, but less time on hobbies and TV consumption than their male counterparts. The amount of time spent on reading is comparable for men and women across countries.

In his seminal work Linder (1970) coined the term of the "harried leisure class", which reflects the idea that individuals try to pack ever more activities into their disposable free time, thereby striving to imitate the growing yield of market work. Robinson and Godbey (1996) speak in this context of "time-deepening", meaning that activities today are generally speed up, longer lasting activities are more often replaced by activities that take less time, or several activities are done simultaneously. However, our analysis suggests that there is predominantly more time spent on passive leisure activities, notably TV consumption and sleeping. Therefore, leisure may be perceived more stressful not because the number of potential leisure activities has increased in first place, but rather because the disposable time for active leisure activities has decreased.

3.3 Demographic vs. Behavioral Differences between Countries

Until now, we have reported the developments of time aggregates adjusted for demographics *within* countries. While time-use trends are similar across countries, there is still considerable variation in the allocation of time, which could be caused by differences in the allocation of time within demographic groups or by differences in the demographic structure *between* countries. To examine the underlying causes of cross-country differences, we use a Blinder-Oaxaca type decomposition similar to Aguiar and Hurst (2007)) and separate for each country the differences in the main time-use aggregates (market work, nonmarket work, and leisure) compared to the USA into demographic and behavioral components as follows

$$W_i^F Y_i^F - W_{US}^F Y_{US}^F = (W_i^F - W_{US}^F) Y_{US}^F + (Y_i^F - Y_{US}^F) W_i^F \tag{1}$$

for the first survey, and

$$W_i^L Y_i^L - W_{US}^L Y_{US}^L = (W_i^L - W_{US}^L) Y_{US}^L + (Y_i^L - Y_{US}^L) W_i^L \tag{2}$$

for the last survey. Y_i^F is a vector of cell (demographic group) means for a specific time-use aggregate (e.g. market work) in the first survey F in country i. W_i^F is a vector of weights for each demographic cell in country i in the first survey. The term $(W_i^F - W_{US}^F) Y_{US}^F$ therefore represents the time-use difference between country i and the USA that is explained by a different demographic structure, while $(Y_i^F - Y_{US}^F) W_i^F$ corresponds to the time-use difference due to behavioral differences. The decomposition of time aggregates in the last survey is done in an analogously.

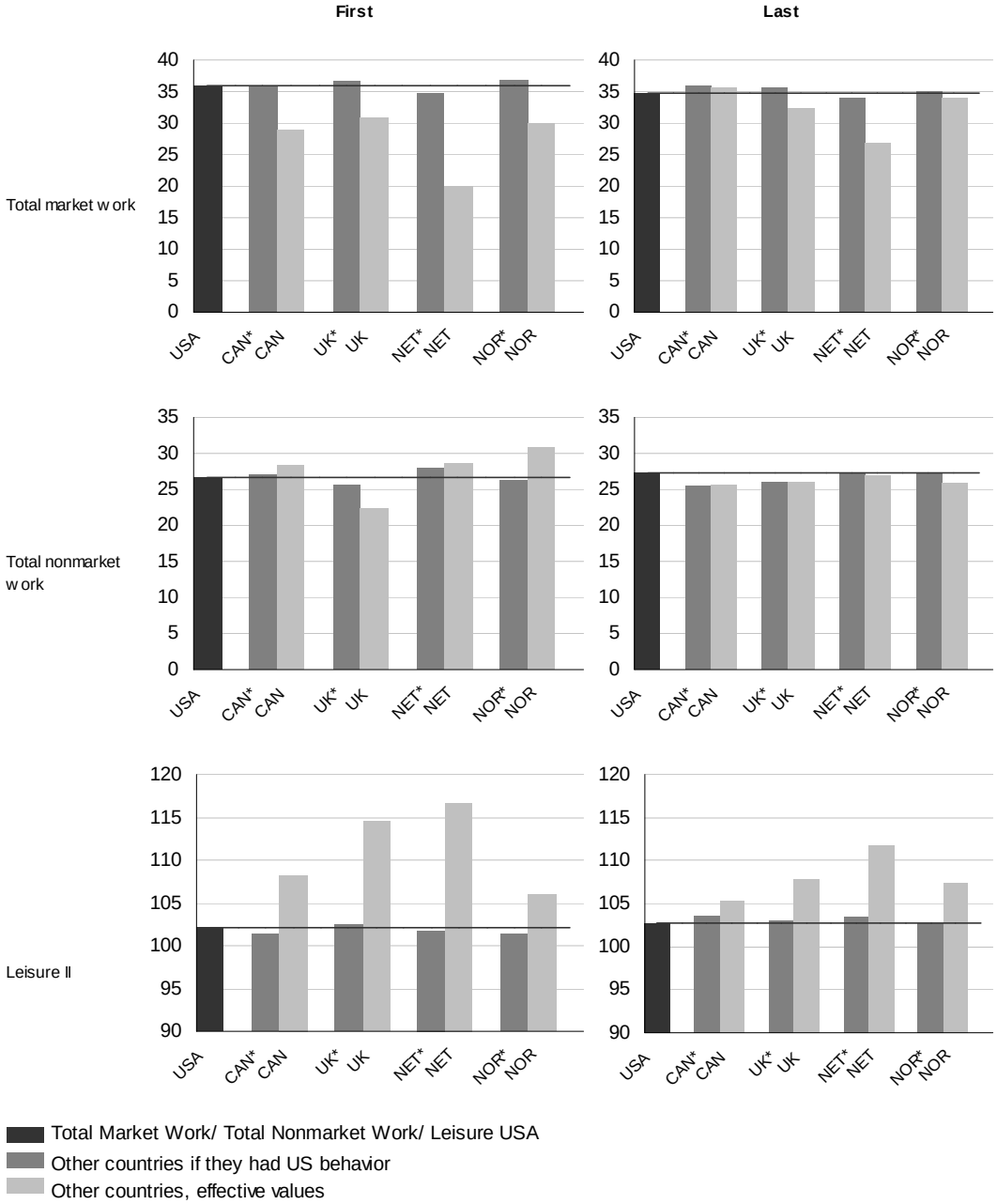
Figure 4 illustrates the decompositions of the main time-use aggregates for the first (left) and the last survey (right).[8] The first bar in each diagram presents the (demographically unadjusted) level of total market work, total nonmarket work, and leisure for the USA (i.e. $W_{US}^F Y_{US}^F$ for the first and $W_{US}^L Y_{US}^L$ for the last survey). The dark-gray bars illustrate the hypothetical levels in the other countries if they had the same demographic cell means as the USA and differed only in the demographic structure ($W_i^F Y_{US}^F$, $W_i^L Y_{US}^L$). Clearly, the demographic differences are not the main driver of the cross-country time-use variation; neither in the first nor in the last survey period are the deviations substantial. However, the light-gray bars, which reflect the effective time aggregates for the non-US countries ($W_i^F Y_i^F$, $W_i^L Y_i^L$), differ considerably from the US level.

In the first survey, the behavioral differences amount to -5.8 (UK) to -14.8 hours per week (the Netherlands) in total market work, -3.4 (UK) to 4.7 hours (Norway) in total nonmarket work, and 4.5 (Norway) to 14.8 hours (the Netherlands) in leisure II. In the last survey, the behavioral differences are smaller, but they still add up to 1.6 (Canada) to 8.5 more hours (the Netherlands) of leisure time per week.

The persistence of behavioral differences leading to less market work and more leisure time in Europe brings back the issue of leisure-bent Europe. Controlling for cross-country demographic differences, European countries (as well as Canada), today as in the past, appear to enjoy more leisure than the USA. This holds true even if, as reported in the previous sections, the working-age popula-

[8] The numeric results can be found in Table 10 in the Appendix.

Figure 4: Composition of the Time-Use Differences between the USA and the Non-US Countries



Notes: The first bar in each diagram presents the USA's demographically unadjusted number of hours per week in total market work, total nonmarket work, and leisure. The dark-gray bars represent the hypothetical levels in the other countries if they had the same demographic cell means as the USA and differed only in the demographic structure. The light-gray bars show their effective time use. The diagrams in the left column are based on the first survey period, those in the right column on the last.

tion in Europe increased market work hours and reduced leisure time since the seventies. Yet, only in the Netherlands the inclination towards more leisure is reflected in a low level of market work hours, primarily due to the relatively low female labor market participation. In the UK and Norway, in contrast, total market work hours today no longer deviate from the US level.

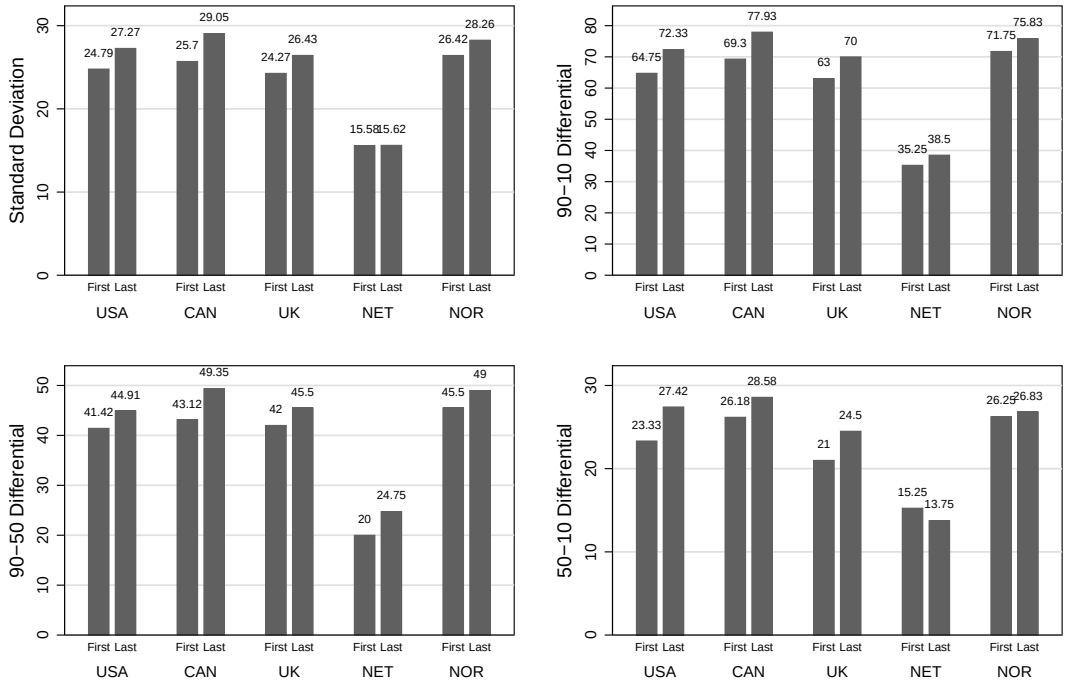
Nevertheless, one could argue that leisure time in Europe is higher, given that individuals in the USA spend more time on activities that are neither part of leisure measure II, nor market work or nonmarket work, such as religious, political, and voluntary activities, completing an education, or undergoing a medical treatment. Despite the fact that these activities have only partly a recreational character, equating a higher participation in these activities with lower leisure time is clearly exaggerated. Therefore, also in a more differentiated view, Europe cannot generally be characterized as leisure-bent.

4 The Distribution of Leisure

In this section, we analyze how the leisure distribution within a country has changed over time. Given that leisure contributes to individual well-being, the leisure distribution is important as it provides an alternative estimate of the welfare distribution, which is usually approximated by the income or wealth distribution. Zeckhauser (1973) argues that time is the ultimate source of utility and thus attaches more weight to it than to household income. The allocation of time to market work results in earnings, which make goods and services accessible in the first place, but, in many cases, only the remaining time after market and nonmarket work allows their consumption and beneficial use. According to Zeckhauser (1973), a good can be of value only to the extent that it can be combined with time.

Rice et al. (2006) argue that an assessment of the individual welfare solely based on income is potentially misleading. If high-income earners, for example, spend more hours in market work and less time on leisure than their low-income counterparts, their welfare level is lower than one would expect solely based on their earnings and might be even lower than the low-income earners' welfare. Therefore, Rice et al. (2006) rely on an augmented individual welfare function that includes leisure time in addition to disposable financial resources.

Figure 5: Evolution of Leisure II Distribution



Notes: All measures are reported in hours per week. The 90-10 Differential refers to the difference between the 90th and the 10th percentile of leisure II. Accordingly, the 90-50 (50-10) Differential refers to the difference between the 90th percentile and the median (the median and the 10th percentile).

To capture distributional trends in leisure over time, Figure 5 reports several inequality measures for the first and last survey in each country. Focussing on the standard deviation and the 90-10 differential, it can be observed that leisure inequality has unambiguously increased. For the Netherlands, the difference between the 10th percentile and the median has slightly declined. But this effect is outweighed by the strong increase at the top of the distribution, so that the overall leisure distribution, as measured by the standard deviation and the 90-10 differential, has become more unequal. The strongest fanning out of the leisure distribution has occurred in Canada, which now has the most unequal leisure distribution among the countries in our sample. But, except for the Netherlands, differences are fairly small across countries, which stands in contrast with the large discrepancies in the wage distribution across countries reported by Blau and Kahn (1996). Note, however, that the Netherlands is the only country that reports weekly averages in the time-use surveys, which certainly diminishes the leisure dispersion to some extent, given that single-day outliers are smoothed out.

To gain insight into the driving forces behind the growing leisure dispersion over time reported in Figure 5, we follow Aguiar and Hurst (2007) and apply the methodology developed by Juhn et al. (1993) to decompose the country's leisure distribution. In particular, we first estimate the following equation separately for each survey in each country

$$Y_{it} = X_{it}\beta_t + \varepsilon_{it}, \tag{3}$$

where Y_{it} corresponds to the time in leisure II for respondent i in survey year t and X is a vector of 54 demographic cells dummies, which are obtained by subdividing our 18 demographic groups according to the level of education (uncompleted secondary or less, completed secondary, above secondary education). We choose this finer set of demographic cells to capture changes in educational levels, which would otherwise be summarized in the error term ε_{it}. However, for this exercise and in what follows, we had to exclude Norway from the sample because the country recorded education starting only in 1990.

Given that the residual term ε_{it} can be written as $\varepsilon_{it} = F_t^{-1}(\theta_{it}|X_{it})$, where θ_{it} is the percentile of individual i in the leisure distribution and $F_t^{-1}(\theta_{it}|X_{it})$ is the inverse of the residual distribution function, we can rewrite (3) as follows

$$Y_{it} = X_{it}\overline{\beta} + \overline{F}^{-1}(\theta_{it}|X_{it}) + X_{it}(\beta_t - \overline{\beta}) + (F_t^{-1}(\theta_{it}|X_{it}) - \overline{F}^{-1}(\theta_{it}|X_{it})), \tag{4}$$

where $\overline{\beta}$ is the coefficient vector of the demographic cell dummies from a pooled regression of all surveys per country and $\overline{F}^{-1}(\theta_{it}|X_{it})$ is the inverse of the corresponding cumulative distribution function of the residuals. Note that the average cell means $\overline{\beta}$ and the inverse average residual distribution $\overline{F}^{-1}$ do not directly depend on time, therefore all variation in $X_{it}\overline{\beta} + \overline{F}^{-1}(\theta_{it}|X_{it})$ is due to demographic changes, X_{it}. On the other hand, $X_{it}(\beta_t - \overline{\beta})$ contains the additional variation that is driven by changes in demographic cell means over time. Finally, $(F_t^{-1}(\theta_{it}|X_{it}) - \overline{F}^{-1}(\theta_{it}|X_{it}))$ captures changes in the distribution of unobservables.

Table 3 reports how important each of these components – demographics, different cell means, and unobservables – is in explaining changes in the leisure distribution over time. The first column lists for each country the total change of the different inequality measures from the first to the last survey. Demographic changes (reported in the second column) and changes in the cell means (reported

Table 3: Decomposition of the Change in the Leisure II Distribution

	Total Change	Demographic Effect	Cell Means	Unobservables
Standard Deviation				
USA	2.48	-0.07	-0.11	2.65
CAN	3.36	-0.10	0.13	3.32
UK	2.15	0.02	0.18	1.95
NET	0.04	0.29	0.93	-1.18
90-10 Differential				
USA	7.58	-0.75	0.48	7.85
CAN	8.63	0.24	-0.01	8.41
UK	7.00	0.84	-0.53	6.69
NET	3.25	-0.63	6.10	-2.22
50-10 Differential				
USA	4.08	0.23	0.39	3.46
CAN	2.40	-0.95	0.81	2.54
UK	3.50	-0.70	0.17	4.03
NET	-1.50	-2.03	1.66	-1.13
90-50 Differential				
USA	3.50	-0.99	0.10	4.39
CAN	6.23	1.19	-0.83	5.87
UK	3.50	1.54	-0.70	2.66
NET	4.75	1.40	4.44	-1.09

Notes: This table decomposes changes in the country's distribution of leisure 2, measured by the Standard Deviation, the 90-10 Differential, 50-10 Differential and the 90-50 Differential, using the methodology of Juhn et al. (1993) described in the text. The first column shows the total change not adjusting for demographics, the second column reports the portion of the change explained by demographic changes, the third column reports the portion due to changing demographic cell means, and the last column is the remainder of the change due to unobservables.

in the third column) explain a small fraction of the leisure dispersion in the US, Canada, and the UK. In these countries, the bulk of the growing leisure inequality is explained by unobservables (reported in the forth column). Only in the Netherlands changes in demographics and in cell means explain much of the change in leisure inequality. Nevertheless, unobservables also play a substantial role.

4.1 Leisure Differences between and within Educational Categories

The average number of years an individual spends on education have increased dramatically since the seventies. In the US, for example, 27 percent of the survey respondents in 1975 did not complete secondary school and 41 percent had an education above secondary school, while in 2003 the corresponding numbers were 10 percent and 60 percent, respectively. Similar trends can be observed for the other countries. Aguiar and Hurst (2007) argue that if leisure differs across educa-

tional categories, changes in the educational attainment may have contributed to the growing leisure inequality. To examine this hypothesis, we report in Table 4 demographically adjusted time spent on leisure measure II and its subcategories, total market work and total nonmarket work broken down by level of education. Trends in the allocation of time for men and women, according to their level of education, can be found in Table 11 in the Appendix.

Table 4: Time Allocation by Educational Attainment

	USA			Canada			UK			Netherlands		
	I	II	III	I	II	III	I	II	III	I	II	III
Leisure II												
first obs.	108.09	101.88	98.07	108.64	110.81	108.27	114.87	113.42	115.99	117.97	114.81	115.03
last obs.	112.68	105.88	100.97	110.02	104.84	103.47	110.73	107.59	105.06	111.86	108.13	109.94
change	4.59	4.00	2.90	1.38	-5.97	-4.80	-4.14	-5.83	-10.93	-6.12	-6.68	-5.10
Sleeping												
first obs.	59.86	57.50	56.26	57.19	57.60	57.01	62.77	62.79	64.49	60.00	58.58	59.40
last obs.	65.83	61.17	58.57	60.00	58.47	56.94	61.65	60.15	58.13	62.20	60.60	62.56
change	5.97	3.67	2.31	2.82	0.87	-0.06	-1.12	-2.64	-6.35	2.20	2.02	3.16
TV												
first obs.	17.44	14.76	10.99	12.49	9.74	9.86	16.31	12.22	10.50	10.48	7.44	6.65
last obs.	20.59	17.49	13.46	15.96	13.67	11.67	17.90	15.36	12.15	14.30	10.99	9.24
change	3.15	2.73	2.46	3.47	3.94	1.81	1.59	3.14	1.64	3.83	3.55	2.59
Reading												
first obs.	3.20	4.08	4.47	3.28	4.54	4.81	2.70	3.40	3.70	7.58	7.45	7.63
last obs.	1.40	1.52	2.54	1.94	2.24	2.93	2.52	2.94	3.62	2.97	3.18	4.39
change	-1.80	-2.56	-1.93	-1.34	-2.30	-1.88	-0.18	-0.47	-0.08	-4.60	-4.27	-3.24
Hobbies												
first obs.	5.99	5.01	6.33	8.60	9.19	9.30	6.02	8.19	10.85	10.59	10.02	12.64
last obs.	6.22	6.61	6.81	9.56	8.74	9.88	7.58	8.21	9.25	8.21	8.64	8.40
change	0.23	1.60	0.48	0.95	-0.45	0.58	1.56	0.03	-1.60	-2.39	-1.38	-4.25
Socializing												
first obs.	9.96	7.92	7.42	10.39	12.57	11.39	11.12	10.52	9.99	14.66	16.21	14.10
last obs.	7.60	7.93	8.10	11.88	11.05	11.36	8.26	8.70	9.87	10.73	10.99	11.20
change	-2.36	0.01	0.69	1.49	-1.52	-0.03	-2.86	-1.82	-0.13	-3.93	-5.22	-2.90
Eating & personal care												
first obs.	11.65	12.61	12.60	16.69	17.17	15.90	15.95	16.30	16.45	14.66	15.12	14.62
last obs.	11.05	11.16	11.49	10.68	10.66	10.68	12.82	12.23	12.04	13.44	13.74	14.15
change	-0.60	-1.45	-1.12	-6.01	-6.51	-5.22	-3.13	-4.07	-4.41	-1.23	-1.38	-0.47
Total market work												
first obs.	32.16	37.09	39.81	30.85	28.80	31.87	30.60	31.63	27.38	17.61	22.35	23.66
last obs.	27.28	33.74	36.96	31.73	36.12	36.40	28.39	32.16	34.63	23.55	31.06	29.52
change	-4.88	-3.36	-2.85	0.88	7.32	4.53	-2.21	0.52	7.25	5.95	8.71	5.86
Total nonmarket work												
first obs.	25.44	26.05	26.05	26.89	25.55	24.17	22.23	22.95	24.14	29.50	26.90	25.98
last obs.	25.68	26.01	26.54	25.73	26.15	26.28	27.55	26.91	25.19	30.85	26.33	25.07
change	0.24	-0.03	0.49	-1.16	0.61	2.11	5.32	3.96	1.05	1.35	-0.57	-0.91

Notes: This table reports the hours per week spent in different leisure activities, total market work and total nonmarket work separately for the three levels of education, uncompleted secondary or less (I), completed secondary (II), and above secondary education (III). All means are adjusted for changes in the demographic structure, as described in Section 2. 'First obs.' refers to the first survey available per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003). For definitions of time-use categories, see Table 7.

Several relationships are apparent. First, today individuals with little education enjoy more leisure than their highly educated counterparts. The leisure gap between individuals without secondary education and individuals with more than a secondary education ranges from 1.9 (the Netherlands) to 11.7 (USA)

hours per week. Second, except for the Netherlands, the leisure gap between those with a lower level of education and those with a higher level of education has increased in all countries over time. This result is due to the fact that less educated individuals reduced (increased) total market work more (less) than highly educated individuals, while total nonmarket work is fairly similar across educational categories, except for the Netherlands.

Interestingly, less educated individuals spend their additional leisure time mainly on sleeping and TV consumption. In the US, for example, this group watches 7.1 hours, or 53 percent, more TV per week than individuals in the highest education category. The difference is smaller in the other countries, but with a range of 4.3 (Canada) to 5.8 (UK) hours per week still sizeable. The lower TV consumption among the highly educated is partially offset by more reading time. Differences in time spent on hobbies, socializing and eating and personal care are in general small and follow no consistent pattern.

As Table 11 shows that the leisure gap across educational categories persists when breaking down the sample by gender. Within a given educational category, the time spent on different leisure activities is very similar for men and women in all countries, except for the Netherlands, where women have 4 to 6 hours more leisure time than their male counterparts with the same education. Lastly, the result from Table 2 that men spend more time on market work and less time on nonmarket work than women is preserved when breaking down the sample by education. However, for the highly educated the gender gap in total market work and total nonmarket work is around 2 to 4 hours lower compared to the less well educated.

One potential concern is that the growing leisure dispersion by education is the result of differences in employment status across educational categories. In particular, Aguiar and Hurst (2008) document for the USA a decline in employment of less educated men relative to more educated men, which suggests that leisure time for less well educated individuals is higher because they are involuntary out of work.

To address this issue, we report in Table 12 in the Appendix the demographically adjusted time spent in different leisure activities, total market work and total nonmarket work according to the level of education for employed individuals only. Comparing the results for employed individuals with the full sample

in Table 4 reveals that the values are very similar. More importantly, the growing leisure dispersion across educational categories persists when restricting the sample to employed individuals only. The largest differences can be observed among the less-educated individuals in the USA, where market work increases by around two hours and leisure time decreases by the same amount. In the other cases, however, time-use aggregates for the employed differ at most by one hour as compared to the full sample. These findings are perfectly in line with Aguiar and Hurst (2008) who show that the increase in non-employment accounts for less than thirty percent of the increasing leisure gap in the US.

Given the great differences in leisure time across educational categories, one question of interest is to what extent leisure trends documented in Figure 3.2 are driven by changes in levels of education. To examine this issue, we perform a Blinder-Oaxaca decomposition similar to Section 3.3. In particular, let Y_j^t denote the demographically adjusted (not for education) time spent in leisure of educational category j (j=low, middle, high) at time t, where t is the year of the first or last survey. Let W_j^t be the share of the jth educational category relative to the total population at time t. By construction, average leisure time at time t is given by $Y^t = W_L^t Y_L^t + W_M^t Y_M^t + W_H^t Y_H^t$ and the difference in leisure over time can be decomposed in two ways

$$Y^L - Y^F = \sum_{j=L,M,H} (W_j^L - W_j^F) Y_j^L + \sum_{j=L,M,H} W_j^F (Y_j^L - Y_j^F) \quad (5)$$

$$= \sum_{j=L,M,H} (W_j^L - W_j^F) Y_j^F + \sum_{j=L,M,H} W_j^L (Y_j^L - Y_j^F) \quad (6)$$

where in both cases the first term reflects changes in leisure due to different weights assigned to the educational categories and the second term represents changes in leisure within educational groups.

Table 5 presents for each country the two alternative decompositions of the change in leisure. The first column reports the demographically adjusted leisure difference. The second and the third column show the results applying decomposition method 1 (equation 5), while the fourth and the fifth column report the results using decomposition method 2 (equation 6). However, the results only differ in magnitude and are as we expected. From Table 4 we know that in the USA leisure increased for all educational categories, therefore the difference in leisure within educational groups over time (column 3 and 5) is positive. But due

Table 5: Decomposition of Differences in Leisure II Due to Changes in Education

Leisure II	Demographically adjusted difference $Y^L - Y^F$	Method I: Different Demographics $\sum(W_j^L - W_j^F)Y_j^L$	Method I: Different cell means $\sum W_j^F(Y_j^L - Y_j^F)$	Method II: Different Demographics $\sum(W_j^L - W_j^F)Y_j^F$	Method II: Different cell means $\sum W_j^L(Y_j^L - Y_j^F)$
USA	1.13	-2.86	3.98	-2.35	3.48
CAN	-3.72	-2.13	-1.59	-0.17	-3.55
UK	-4.99	0.10	-5.09	1.35	-6.34
NET	-7.10	-0.98	-6.11	-2.12	-4.98

Notes: This table reports for each country the two alternative Blinder-Oaxaca decompositions of leisure II described in Section 4.1. The first column reports the demographically adjusted change in leisure II between the first and the last survey. The second and fourth column report the differences in leisure due to different weights assigned to the educational categories. The third and fifth columns represent the difference in leisure time due to differences in leisure time within educational groups.

to the increase in education over time, leisure time decreased by 2.4 (column 4) to 2.9 (column 2) hours. In the other countries, changes in levels of education are less important in explaining differences in leisure. Rather, the bulk of the leisure difference is the result of changes in leisure time within educational categories.

The growing leisure dispersion documented above is the mirror image of the increase in wage inequality over the same period reported by Katz and Autor (1999). This parallel trend of leisure and wage inequality is consistent with the finding that less-educated adults increased their leisure time and decreased total market work hours in comparison to highly educated adults. The relative growth in leisure of the less educated is important from a welfare perspective, as it offsets to some extent the simultaneous decline in relative wages. Moreover, Aguiar and Hurst (2008) suggest that the lower wages of less educated adults potentially reflect an endogenous choice to acquire less human capital, provided that less educated adults value time more than expenditure in comparison to their highly educated counterparts.

We conclude from the analysis above that the increase in the leisure inequality is driven to some extent by the growing leisure gap across educational categories. However, it is possible that changes in the leisure inequality *within* educational categories contributed to the growing leisure inequality as well. To address this issue, we report in Table 6 for each country the standard deviation and the 90-10 differential of the leisure distribution within a given educational group for the

first and the last survey. The numbers clearly indicate that the leisure dispersion within educational categories has increased. Only among highly educated adults in the UK is leisure time today distributed more equally than in the past. Except for the second education group in Canada and the Netherlands, the increase inthe leisure gap between the 90th and the 10th percentile is sizeable and ranges from 5.7 to 11.4 hours.

Table 6: Leisure II Distribution Within Different Educational Categories

	USA			Canada			UK			Netherlands		
	I	II	III	I	II	III	I	II	III	I	II	III
Standard Deviation												
first obs.	25.97	24.40	23.81	26.94	26.74	26.28	23.94	24.02	26.28	16.15	12.25	13.11
last obs.	29.14	27.93	26.22	30.82	28.11	28.60	26.60	26.39	26.04	16.59	13.64	15.38
change	3.17	3.52	2.40	3.88	1.37	2.33	2.66	2.36	-0.24	0.44	1.39	2.27
90-10 Differential												
first obs.	65.57	63.93	58.92	71.75	71.98	69.42	63.00	63.00	73.50	37.25	32.25	30.00
last obs.	77.00	74.08	69.07	81.67	72.92	76.65	70.00	70.00	68.83	43.00	32.00	36.75
change	11.43	10.15	10.15	9.92	0.93	7.23	7.00	7.00	-4.67	5.75	-0.25	6.75

Notes: The distributional measures are reported in hours per week and calculated separately for the three levels of education, uncompleted secondary or less (I), completed secondary (II), and above secondary education (III). The 90-10 Differential refers to the difference between the 90th and the 10th percentile of leisure II. 'First obs.' refers to the first survey available per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003).

5 Conclusion

In this paper, we have documented time trends in total market work, nonmarket work and leisure in the US, Canada, the UK, the Netherlands and Norway over the last thirty years. To the best of our knowledge, our paper is the first to compare time trends across countries over such a long period while adjusting for demographic changes. Adjusting for demographics is important due to the changes in the age distribution and family structure over this period. A second innovation is the focus on the dispersion of leisure time, which has been analyzed in the existing literature only for the USA by Aguiar and Hurst (2007). Moreover, the time-use survey data used in this paper allows us to clearly distinguish leisure from nonmarket work activities, which was typically not done in existing studies using labor force survey data.

The allocation and dispersion of time is important for a number of reasons. First of all, Becker (1965) argues that time is an essential input to transform

intermediate goods (e.g. groceries) into the final consumption good (e.g. the prepared meal), from which utility is ultimately derived. Hence, how time is allocated directly affects the relative price of goods and services and vice versa, given that in most cases intermediate time inputs can be substituted by market inputs. Secondly, a country's leisure distribution is another aspect to take into consideration when examining the dispersion of living standards.

Our results indicate that, firstly, over time leisure (as well as total market work and total nonmarket work) has converged across countries. Leisure time has dramatically decreased in countries that had high leisure levels thirty years ago and has slightly increased in the other countries. This finding is robust to different leisure measures. Using a Blinder-Oaxaca type decomposition we show that the unconditional convergence across countries is due to decreasing differences in the allocation of time within demographic groups rather than differences in demographics.

Secondly, breaking down time-use aggregates by levels of education reveals that on average higher earnings of highly educated individuals come at the expense of less leisure and more work hours relative to less educated individuals, potentially reducing welfare differences based on income comparisons. Highly educated individuals could increase their leisure time by substituting nonmarket work with market goods. However, nonmarket work is virtually identical across all education categories.

Lastly, we document an increase in leisure inequality in all countries, despite completely different trends in mean leisure levels. The growing leisure dispersion is the mirror image of the well-documented divergence in wages over time and is partly driven by the growing leisure gap across educational categories. However, we show that in all countries leisure inequality within educational categories increased as well.

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Appendix

Table 7: Time-Use Categories

Time use category	Examples of activities included
Core market work	Paid work in main and side jobs, including overtime and time spent working at home
Work-related activities	Commuting to and from work, meal and other breaks at work, job seeking activities
Total market work	*Core market work plus work-related activities*
Cooking	Food preparation, food preservation, kitchen cleanup
Housework	Washing and ironing clothes, dusting, vacuum cleaning, tidying, outdoor cleaning
Core nonmarket work	*Cooking plus housework*
Child Care	Care of babies, reading to, or playing with children, helping with homework, supervising children
Shopping	Everyday shopping, shopping for durable goods, going to bank or post office, going to other service providers (excl. personal services as medical care, hairdresser, etc.), travel from/to shopping
Gardening	Gardening
Odd Jobs	All other home production like repair and maintenance work, do-it-yourself work, home paperwork, pet care, unpaid work/help/care for others (excl. volunteering)
Total nonmarket work	*Core nonmarket work plus child care, shopping, gardening, odd jobs*
Sleeping	Main sleep, short naps, relaxing, sunbathing, sex
Eating, personal care	Eating at home, personal hygiene and self-care, dressing
TV	Watching broadcast TV and video tapes/DVDs
Reading, listening	Reading papers, magazines, and books, listening to radio, listening records
Hobbies	Traveling for leisure, excursions and trips, playing sports, watching sporting events, handcraft, artistic and music activities, playing games, writing
Socializing	Going to the movies/theatre/concert, eating out at restaurants, going to a pub, going to parties, visiting and meeting friends, telephoning
Leisure, measure I (residual)	*Available time (168 h per week) minus total market and total nonmarket work*
Leisure, measure II	*Sleeping, personal care, watching TV, reading, pursuing hobbies, socializing, gardening* *= Leisure I minus time spent in education, receiving personal services (medical, dental, paramedical care, hairdresser), religious/ political/community/voluntary activities; plus gardening*

Table 8: Average Hours per Week Spent in Different Nonmarket Activities

	USA	Canada	UK	Netherlands	Norway
Panel 1: Full Sample					
Total Nonmarket Work					
first obs.	25.74	25.83	22.66	28.68	29.95
last obs.	26.29	26.31	26.46	26.90	25.59
change	0.55	0.47	3.80	-1.78	-4.36
Cooking, Washing Up					
first obs.	6.37	7.49	7.42	8.32	9.96
last obs.	3.76	5.70	6.25	6.56	5.81
change	-2.61	-1.79	-1.18	-1.76	-4.16
Houswork					
first obs.	6.06	6.08	5.85	6.65	8.13
last obs.	4.57	5.49	5.92	5.28	6.28
change	-1.49	-0.59	0.07	-1.38	-1.85
Shopping					
first obs.	7.13	6.20	4.16	5.46	4.11
last obs.	8.38	6.13	6.20	6.04	5.95
change	1.25	-0.07	2.04	0.58	1.83
Gardening					
first obs.	0.28	0.43	0.91	0.72	1.59
last obs.	1.14	1.11	0.91	0.49	0.78
change	0.87	0.67	0.00	-0.22	-0.80
Odd Jobs					
first obs.	3.28	2.33	2.53	4.21	2.80
last obs.	4.08	3.04	3.38	3.42	2.13
change	0.80	0.71	0.85	-0.79	-0.68
Child Care					
first obs.	2.63	3.30	1.80	3.33	3.36
last obs.	4.37	4.84	3.81	5.11	4.65
change	1.74	1.54	2.01	1.78	1.29
Panel 2: Men					
Total Nonmarket Work					
first obs.	13.55	14.02	9.84	13.48	16.01
last obs.	19.76	18.15	18.37	15.60	19.61
change	6.21	4.13	8.52	2.12	3.59
Cooking, Washing Up					
first obs.	1.16	2.06	1.27	2.41	2.68
last obs.	1.87	3.15	3.60	3.52	3.44
change	0.70	1.10	2.33	1.12	0.76
Houswork					
first obs.	1.40	1.53	0.65	1.35	1.64
last obs.	2.42	2.49	2.79	1.79	3.99
change	1.02	0.96	2.14	0.44	2.36
Shopping					
first obs.	5.85	5.93	2.35	3.73	3.69
last obs.	7.18	4.89	4.83	3.78	5.54
change	1.33	-1.04	2.48	0.06	1.85
Gardening					
first obs.	0.22	0.32	1.29	1.02	1.80
last obs.	1.49	1.20	1.22	0.63	0.86
change	1.28	0.88	-0.07	-0.38	-0.95
Odd Jobs					
first obs.	3.80	3.05	3.62	3.34	4.83
last obs.	4.24	3.53	3.90	3.20	3.35
change	0.43	0.48	0.27	-0.14	-1.48
Child Care					
first obs.	1.11	1.13	0.66	1.63	1.36
last obs.	2.57	2.88	2.04	2.66	2.42
change	1.45	1.75	1.38	1.03	1.06
Panel 3: Women					
Total Nonmarket Work					
first obs.	35.85	35.78	33.14	38.53	42.94
last obs.	31.71	33.17	33.07	34.23	31.17
change	-4.14	-2.60	-0.06	-4.30	-11.77
Cooking, Washing Up					
first obs.	10.68	12.07	12.45	12.15	16.74
last obs.	5.32	7.85	8.41	8.53	8.01
change	-5.36	-4.23	-4.04	-3.62	-8.73
Houswork					
first obs.	9.93	9.91	10.10	10.09	14.17
last obs.	6.35	8.02	8.49	7.53	8.41
change	-3.57	-1.90	-1.61	-2.55	-5.76
Shopping					
first obs.	8.19	6.42	5.63	6.58	4.51
last obs.	9.37	7.17	7.31	7.51	6.33
change	1.19	0.75	1.68	0.93	1.82
Gardening					
first obs.	0.33	0.53	0.60	0.52	1.39
last obs.	0.86	1.03	0.67	0.40	0.71
change	0.53	0.50	0.07	-0.12	-0.67
Odd Jobs					
first obs.	2.85	1.72	1.64	4.77	0.91
last obs.	3.95	2.62	2.95	3.56	0.99
change	1.10	0.90	1.32	-1.21	0.07
Child Care					
first obs.	3.88	5.12	2.73	4.43	5.22
last obs.	5.86	6.49	5.25	6.70	6.73
change	1.98	1.36	2.52	2.27	1.51

Notes: All means are adjusted for changes in the demographic structure, as described in Section 2. 'First obs.' refers to the first survey available per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003). For the time-use category definitions, see Table 7.

Table 9: Average Hours per Week Spent in Different Leisure Activities

	USA	Canada	UK	Netherlands	Norway
Panel 1: Full Sample					
Leisure II					
first obs.	102.34	108.63	114.53	117.14	105.79
last obs.	103.44	104.93	108.10	110.30	107.52
change	1.10	-3.71	-6.42	-6.84	1.73
Sleeping					
first obs.	57.94	57.22	62.85	59.79	58.41
last obs.	59.98	57.75	60.15	62.21	58.70
change	2.04	0.54	-2.71	2.43	0.28
TV					
first obs.	14.35	11.15	14.48	9.67	6.75
last obs.	15.24	12.90	15.25	11.57	12.37
change	0.89	1.75	0.77	1.91	5.62
Reading					
first obs.	3.91	4.01	2.92	7.59	5.02
last obs.	2.14	2.56	2.96	3.45	4.25
change	-1.78	-1.45	0.04	-4.14	-0.77
Hobbies					
first obs.	5.71	8.90	7.22	10.71	7.50
last obs.	6.70	9.59	8.41	8.34	7.56
change	0.98	0.69	1.19	-2.37	0.06
Socializing					
first obs.	8.06	10.78	10.94	14.75	13.26
last obs.	8.03	11.44	8.97	11.10	13.08
change	-0.03	0.66	-1.96	-3.66	-0.18
Eating & pers. care					
first obs.	12.35	16.59	16.11	14.63	14.85
last obs.	11.35	10.69	12.36	13.63	11.56
change	-1.00	-5.89	-3.75	-1.00	-3.29
Panel 2: Men					
Leisure II					
first obs.	100.59	107.55	112.76	116.09	105.66
last obs.	103.18	104.42	108.42	107.11	106.23
change	2.59	-3.13	-4.34	-8.98	0.57
Sleeping					
first obs.	56.62	55.67	61.23	58.49	57.59
last obs.	58.65	56.50	58.88	61.32	58.18
change	2.03	0.83	-2.35	2.83	0.59
TV					
first obs.	14.92	12.25	15.36	10.54	7.71
last obs.	16.66	14.24	17.05	12.38	13.92
change	1.74	1.99	1.69	1.84	6.21
Reading					
first obs.	4.15	4.49	3.51	8.42	5.84
last obs.	2.01	2.40	3.20	3.26	3.90
change	-2.14	-2.08	-0.31	-5.16	-1.94
Hobbies					
first obs.	5.11	8.46	7.30	10.59	8.01
last obs.	7.80	10.29	9.35	7.88	7.87
change	2.69	1.83	2.05	-2.71	-0.14
Socializing					
first obs.	7.85	11.10	10.19	14.39	12.31
last obs.	7.29	10.95	8.48	10.11	11.53
change	-0.56	-0.15	-1.70	-4.27	-0.78
Eating & pers. care					
first obs.	11.94	15.58	15.17	13.67	14.21
last obs.	10.77	10.04	11.46	12.15	10.84
change	-1.17	-5.54	-3.71	-1.51	-3.37
Panel 3: Women					
Leisure II					
first obs.	103.78	109.55	115.97	117.82	105.92
last obs.	103.65	105.35	107.84	112.38	108.72
change	-0.13	-4.19	-8.13	-5.45	2.81
Sleeping					
first obs.	59.03	58.52	64.18	60.63	59.18
last obs.	61.09	58.81	61.18	62.79	59.19
change	2.06	0.29	-3.00	2.16	0.00
TV					
first obs.	13.88	10.22	13.77	9.10	5.85
last obs.	14.07	11.77	13.79	11.05	10.93
change	0.19	1.55	0.02	1.95	5.08
Reading					
first obs.	3.72	3.60	2.44	7.05	4.26
last obs.	2.24	2.69	2.76	3.56	4.58
change	-1.48	-0.91	0.32	-3.49	0.32
Hobbies					
first obs.	6.21	9.27	7.15	10.79	7.03
last obs.	5.78	9.00	7.64	8.64	7.27
change	-0.43	-0.27	0.48	-2.15	0.24
Socializing					
first obs.	8.24	10.50	11.55	14.99	14.15
last obs.	8.64	11.85	9.37	11.74	14.52
change	0.40	1.35	-2.18	-3.26	0.38
Eating & pers. care					
first obs.	12.69	17.43	16.88	15.25	15.44
last obs.	11.82	11.24	13.11	14.59	12.24
change	-0.87	-6.19	-3.77	-0.66	-3.21

Notes: All means are adjusted for changes in the demographic structure, as described in Section 2. 'First obs.' refers to the first survey available per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003). For the time-use category definitions, see Table 7.

Table 10: Blinder-Oaxaca Decomposition of Changes in Time Use

	First Sample			Last Sample			Difference
	Unconditional difference $W_i^F Y_i^F - W_{US}^F Y_{US}^F$	Different demographics $(W_i^F - W_{US}^F) Y_{US}^F$	Different cell means $(Y_i^F - Y_{US}^F) W_i^F$	Unconditional difference $W_i^L Y_i^L - W_{US}^L Y_{US}^L$	Different demographics $(W_i^L - W_{US}^L) Y_{US}^L$	Different cell means $(Y_i^L - Y_{US}^L) W_i^L$	
Total market work							
USA	35.97			34.86			-1.11
CAN	-6.86	0.03	-6.89	0.89	1.01	-0.12	7.76
UK	-5.12	0.71	-5.83	-2.39	0.87	-3.26	2.73
NET	-16.05	-1.23	-14.82	-8.02	-0.73	-7.29	8.02
NOR	-6.09	0.99	-7.08	-0.83	0.25	-1.08	5.25
Total nonmarket work							
USA	26.64			27.35			0.71
CAN	1.62	0.49	1.13	-1.75	-1.93	0.19	-3.37
UK	-4.43	-1.02	-3.40	-1.40	-1.26	-0.14	3.03
NET	1.90	1.37	0.53	-0.47	-0.02	-0.45	-2.36
NOR	4.29	-0.43	4.72	-1.56	-0.08	-1.48	-5.85
Leisure Measure II							
USA	102.04			102.74			0.70
CAN	6.18	-0.55	6.73	2.56	0.94	1.62	-3.62
UK	12.59	0.49	12.10	5.09	0.42	4.66	-7.51
NET	14.61	-0.21	14.82	9.14	0.64	8.50	-5.47
NOR	3.85	-0.67	4.52	4.65	-0.09	4.74	0.80

Notes: This table reports the Blinder-Oaxaca decomposition of the differences in total market work, total nonmarket work, and leisure II between the USA and the other countries. For the first survey the first column presents the unadjusted number of hours per week spent in each activity for the USA, and the deviations of the other countries. The second and third columns decompose these deviations to differences due to different demographic structures and due to different means within demographic cells, respectively. Columns four to six report the analogous calculations for the last survey period.

Table 11: Time Allocation by Educational Attainment for Men and Women

	USA			Canada			UK			Netherlands		
	I	II	III	I	II	III	I	II	III	I	II	III
Panel 1: Men												
Leisure II												
first obs.	104.71	99.76	97.52	106.36	113.56	107.31	112.54	113.13	114.24	117.03	113.80	114.34
last obs.	113.00	105.64	100.43	108.95	104.07	102.93	110.97	108.42	105.92	108.11	103.73	107.84
change	8.28	5.88	2.90	2.59	-9.49	-4.37	-1.56	-4.71	-8.31	-8.93	-10.07	-6.50
Sleeping												
first obs.	58.46	56.36	55.28	55.30	57.51	55.28	61.37	61.47	60.61	58.37	58.52	59.90
last obs.	63.89	59.73	57.26	57.74	57.55	55.64	60.27	59.23	56.78	59.80	57.95	64.25
change	5.44	3.37	1.98	2.43	0.03	0.36	-1.10	-2.24	-3.83	1.42	-0.58	4.35
TV												
first obs.	18.57	15.24	12.08	12.71	11.69	11.54	16.83	13.19	12.57	11.37	10.07	7.60
last obs.	22.17	18.64	14.91	17.85	14.99	12.72	19.32	17.36	14.14	15.83	12.58	9.18
change	3.61	3.40	2.83	5.15	3.29	1.18	2.48	4.17	1.57	4.46	2.51	1.58
Reading												
first obs.	2.98	4.64	4.48	3.35	5.60	5.50	3.15	4.52	4.30	8.37	8.19	8.55
last obs.	1.22	1.36	2.42	1.94	1.81	2.82	2.77	3.20	3.78	2.78	2.80	3.93
change	-1.76	-3.28	-2.05	-1.42	-3.79	-2.68	-0.38	-1.32	-0.52	-5.59	-5.39	-4.62
Hobbies												
first obs.	4.38	4.60	5.71	8.32	7.78	9.00	6.13	8.32	11.10	10.72	8.77	11.37
last obs.	8.31	7.98	7.67	9.84	9.17	10.79	8.85	9.19	10.25	7.50	8.03	8.17
change	3.93	3.38	1.96	1.52	1.38	1.79	2.72	0.87	-0.85	-3.22	-0.74	-3.20
Socializing												
first obs.	8.94	6.91	7.86	10.86	14.86	10.90	10.06	10.16	10.04	14.32	14.50	14.13
last obs.	6.95	7.20	7.33	11.62	10.70	10.87	8.14	7.95	9.62	8.90	9.96	10.56
change	-2.00	0.29	-0.53	0.76	-4.16	-0.03	-1.93	-2.21	-0.42	-5.42	-4.55	-3.57
Eating & pers. care												
first obs.	11.39	12.01	12.12	15.82	16.12	15.09	15.00	15.48	15.61	13.88	13.74	12.79
last obs.	10.45	10.73	10.83	9.96	9.86	10.09	11.63	11.50	11.35	13.30	12.42	11.75
change	-0.93	-1.29	-1.29	-5.85	-6.26	-5.00	-3.37	-3.98	-4.27	-0.58	-1.33	-1.04
Total market work												
first obs.	48.73	50.58	53.11	46.33	35.17	43.27	46.69	45.21	41.78	34.81	36.42	38.36
last obs.	35.96	41.94	44.03	42.17	46.22	45.02	37.39	40.29	41.44	38.25	47.52	42.07
change	-12.77	-8.64	-9.08	-4.16	11.05	1.75	-9.29	-4.92	-0.33	3.44	11.10	3.71
Total nonmarket work												
first obs.	11.77	15.01	14.23	13.76	15.78	13.94	9.11	10.64	11.08	13.77	14.99	11.22
last obs.	17.35	19.20	20.39	16.90	16.91	18.83	18.66	18.45	18.17	20.36	15.01	15.40
change	5.58	4.18	6.15	3.15	1.13	4.89	9.55	7.81	7.09	6.59	0.02	4.18
Panel 1: Women												
Leisure II												
first obs.	110.89	103.63	98.52	110.56	108.50	109.08	116.77	113.65	117.42	118.58	115.47	115.50
last obs.	112.42	106.08	101.42	110.92	105.49	103.92	110.53	106.91	104.36	114.29	110.98	111.30
change	1.53	2.45	2.90	0.36	-3.01	-5.16	-6.24	-6.74	-13.06	-4.29	-4.49	-4.21
Sleeping												
first obs.	61.02	58.44	57.07	58.77	57.68	58.46	63.92	63.87	67.65	61.06	58.61	59.07
last obs.	67.44	62.37	59.67	61.91	59.25	58.04	62.78	60.90	59.24	63.77	62.31	61.47
change	6.41	3.93	2.59	3.14	1.58	-0.42	-1.14	-2.97	-8.42	2.71	3.70	2.40
TV												
first obs.	16.51	14.36	10.09	12.31	8.09	8.44	15.88	11.43	8.81	9.89	5.73	6.00
last obs.	19.28	16.53	12.25	14.37	12.57	10.78	16.73	13.72	10.52	13.31	9.96	9.28
change	2.77	2.17	2.16	2.07	4.48	2.34	0.85	2.30	1.71	3.42	4.22	3.29
Reading												
first obs.	3.38	3.63	4.47	3.22	3.66	4.23	2.33	2.49	3.22	7.06	6.97	7.00
last obs.	1.54	1.65	2.64	1.95	2.60	3.02	2.31	2.72	3.50	3.10	3.42	4.69
change	-1.83	-1.97	-1.84	-1.27	-1.06	-1.21	-0.01	0.23	0.27	-3.97	-3.55	-2.31
Hobbies												
first obs.	7.32	5.34	6.83	8.85	10.37	9.55	5.93	8.08	10.64	10.51	10.83	13.51
last obs.	4.49	5.48	6.09	9.32	8.38	9.11	6.54	7.41	8.43	8.66	9.04	8.54
change	-2.83	0.13	-0.74	0.47	-1.99	-0.44	0.61	-0.66	-2.22	-1.85	-1.79	-4.97
Socializing												
first obs.	10.80	8.76	7.05	9.99	10.65	11.80	11.99	10.81	9.95	14.89	17.31	14.07
last obs.	8.14	8.53	8.75	12.09	11.35	11.78	8.36	9.31	10.07	11.92	11.66	11.61
change	-2.67	-0.23	1.70	2.10	0.70	-0.03	-3.63	-1.49	0.12	-2.96	-5.65	-2.47
Eating & pers. care												
first obs.	11.86	13.10	13.00	17.42	18.05	16.59	16.73	16.97	17.14	15.17	16.01	15.86
last obs.	11.54	11.52	12.03	11.28	11.34	11.18	13.80	12.83	12.61	13.53	14.59	15.71
change	-0.32	-1.58	-0.97	-6.15	-6.72	-5.41	-2.93	-4.14	-4.53	-1.64	-1.42	-0.15
Total market work												
first obs.	18.43	25.92	28.79	17.82	23.44	22.27	17.46	20.54	15.62	6.45	13.23	13.66
last obs.	20.09	26.94	31.10	22.95	27.62	29.14	21.03	25.51	29.06	14.02	20.40	21.39
change	1.66	1.02	2.31	5.12	4.18	6.87	3.57	4.97	13.44	7.57	7.16	7.73
Total nonmarket work												
first obs.	36.76	35.19	35.84	37.94	33.77	32.77	32.94	33.00	34.81	39.70	34.62	36.03
last obs.	32.58	31.66	31.63	33.16	33.94	32.55	34.80	33.81	30.93	37.65	33.67	31.34
change	-4.18	-3.53	-4.20	-4.78	0.16	-0.23	1.86	0.81	-3.88	-2.04	-0.96	-4.69

Notes: This table reports the hours per week spent in different leisure activities, total market work and total nonmarket work for men and women according to levels of education (uncompleted secondary or less (I), complete secondary (II), and above secondary education(III)). All means are adjusted for changes in the demographic structure, as described in Section 2. 'First obs.' refers to the first survey available per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003). For time-use category definitions, see Table 7.

Table 12: Time Allocation by Educational Attainment for Employed Individuals

	USA			Canada			UK			Netherlands		
	I	II	III	I	II	III	I	II	III	I	II	III
Leisure II												
first obs.	105.36	101.25	97.85	103.63	107.29	102.63	114.57	113.18	115.80	116.83	114.46	113.87
last obs.	110.99	105.06	100.38	109.16	103.93	102.64	110.03	106.82	104.25	111.02	107.58	109.70
change	5.63	3.80	2.53	5.52	-3.36	0.02	-4.54	-6.36	-11.54	-5.81	-6.88	-4.17
Sleeping												
first obs.	59.40	57.50	56.15	56.65	57.23	54.67	62.76	62.78	64.58	59.79	58.89	58.30
last obs.	65.44	60.93	58.43	59.47	58.36	56.78	61.55	60.11	58.01	62.20	60.36	62.44
change	6.04	3.43	2.28	2.83	1.12	2.12	-1.21	-2.66	-6.57	2.41	1.47	4.14
TV												
first obs.	17.53	14.48	10.98	11.07	8.46	9.10	16.12	12.14	10.42	10.24	7.79	6.71
last obs.	19.94	17.17	13.22	16.07	13.18	11.44	17.45	15.07	11.92	13.89	10.93	9.20
change	2.41	2.69	2.24	4.99	4.72	2.34	1.32	2.94	1.49	3.65	3.15	2.49
Reading												
first obs.	2.77	3.91	4.47	3.12	4.17	5.04	2.67	3.33	3.65	7.30	7.07	7.51
last obs.	1.41	1.53	2.51	1.76	2.19	2.86	2.48	2.85	3.47	2.94	3.08	4.35
change	-1.36	-2.38	-1.96	-1.35	-1.98	-2.18	-0.19	-0.48	-0.17	-4.36	-3.99	-3.16
Hobbies												
first obs.	5.35	4.95	6.22	7.62	8.64	7.89	5.97	8.16	10.72	10.45	9.88	12.48
last obs.	5.88	6.41	6.69	9.25	8.65	9.82	7.59	7.96	9.08	8.13	8.53	8.31
change	0.53	1.46	0.47	1.63	0.01	1.93	1.62	-0.20	-1.64	-2.32	-1.35	-4.17
Socializing												
first obs.	8.42	7.80	7.35	9.23	12.27	10.71	11.12	10.44	9.96	14.42	15.61	14.31
last obs.	7.19	7.82	8.03	12.00	10.91	11.13	8.14	8.63	9.69	10.57	10.90	11.18
change	-1.24	0.02	0.69	2.76	-1.36	0.42	-2.97	-1.81	-0.27	-3.85	-4.71	-3.13
Eating & pers. care												
first obs.	11.88	12.62	12.67	15.94	16.51	15.23	15.93	16.33	16.47	14.62	15.23	14.56
last obs.	11.12	11.20	11.49	10.61	10.64	10.61	12.81	12.19	12.08	13.27	13.78	14.22
change	-0.76	-1.41	-1.18	-5.34	-5.88	-4.62	-3.11	-4.14	-4.39	-1.35	-1.45	-0.34
Total market work												
first obs.	34.86	38.04	40.27	42.14	37.90	42.03	30.67	31.67	27.15	18.22	22.53	24.07
last obs.	29.39	34.93	38.06	32.86	37.54	37.60	29.27	32.97	35.70	23.87	31.38	29.32
change	-5.47	-3.12	-2.21	-9.29	-0.36	-4.43	-1.40	1.30	8.55	5.65	8.85	5.25
Total nonmarket work												
first obs.	25.39	25.72	26.07	20.50	20.55	19.39	22.44	23.12	24.55	29.92	26.96	26.75
last obs.	25.04	25.64	26.06	25.46	25.67	25.89	27.47	26.84	25.03	31.29	26.59	25.50
change	-0.35	-0.08	-0.00	4.96	5.12	6.51	5.03	3.72	0.47	1.37	-0.37	-1.25

Notes: This table reports the hours per week spent in different leisure activities, total market work and total nonmarket work for employed individuals according to levels of education (uncompleted secondary or less (I), complete secondary (II), and above secondary education(III)). All means are adjusted for changes in the demographic structure, as described in Section 2. 'First obs.' refers to the first survey available per country (period 1970-1975), 'last obs.' to the last survey (period 1998-2003). For the definitions of the time-use categories, see Table 7.