

# **WORK, REST, AND PLAY: EXPLORING TRENDS IN TIME ALLOCATION IN CANADA AND THE UNITED STATES\***

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We control for demographic changes to document trends in the allocation of time using time diary data for Canada (1986 to 2005) and the United States (1985 to 2003). We find that (1) average weekly hours spent on market work is higher in Canada than in the U.S., (2) market work increased by an average of 3.67 hours per week in Canada, but in the U.S., it declined by one hour, and (3) leisure has risen in the U.S. but declined in Canada. In addition, the least educated enjoy more leisure relative to the most highly educated in both countries.

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## I. INTRODUCTION

Individuals can allocate their time endowment amongst a wide range of competing activities. These competing activities fall generally into one of four main categories: market work, non-market work (or household production), leisure, and personal care (e.g. sleep).<sup>1</sup> To date, a great deal of emphasis has been placed on exploring the allocation of time to market work leaving a detailed analysis of time spent on other activities relatively sparse. However, how time is apportioned to activities outside of market work and how the apportionment has changed over time and across countries has implications for economic welfare and policy. In particular, time allocation influences the relative price of goods and services and, hence influences the distribution of income (Juster and Stafford [1991]). Furthermore, differences in time allocation across countries can not only help explain variations in economic growth, but can also elucidate the influence of institutional structures and public policy on individual and family time allocation decisions.

Recently, a detailed and rigorous analysis of trends in time allocation in the United States over the last four decades has become available. Aguiar and Hurst [2007] analyse trends in market work, non-market work, and leisure with time use data spanning 1965 to 2003. Their study is groundbreaking on three fronts. First, they report four alternate measures of leisure. Second, they report and analyse the growing inequality in leisure. That is, how time spent in leisure has changed with respect to men and women of different levels of educational attainment. Third, and probably most important, rather than report unconditional means they report trends in time use controlling for demographic changes based on age, gender, parental status, and level of educational attainment across the entire population.<sup>2</sup> They also explore the influence of changing demographics on the overall unconditional mean change in time use using the Blinder Oaxaca

decomposition. They find that time allocated to market work has remained relatively stable in the United States, but time allocated to leisure increased dramatically. The changing patterns of time use has been such that, the time allocated to market work by men decreased to support an increase in time spent on leisure, whereas women allocated more time to both work and leisure supported by a decline in the time spent on non-market work. Aguiar and Hurst [2007] document a growing inequality in leisure where the least educated (less than high school) increasingly spend more time on leisure than the highly educated (university trained). In addition, they find that changing demographics has had a role in influencing the time allocated to market work while its effect on other time use categories has been relatively insignificant.

Why control for and analyse the effect of demographic changes on trends in time use? Demographic changes in tandem with social income policy, tax policy, economic conditions, preferences (individual and household), and the opportunity costs of market work among other factors influence the allocation of time. Since World War II, major demographic changes have taken place in both Canada and the U.S. along with other developed nations. These changes include higher levels of educational attainment, the decline in single-earner families, lower levels of fertility, higher levels of immigration, and an aging population. At the same time, there has been significant growth in income and economic development. This coupled with demographic changes has lead to a dramatic rise in the labour force participation of women. In addition, in most of these countries and in particular Canada, there have been significant changes in the structure and level of taxes, social assistance, childcare benefits, maternity and parental level benefits, employment insurance, and pension plans. All these changes have contributed to changes in preferences and changes in the opportunity costs associated with the allocation of time to various activities. For policy purposes, it is important to disentangle how much of the

change in the use of time is linked to changing demographics and how much is because of policy changes and other factors.<sup>3</sup> By controlling for demographic changes, we are taking the first step in disentangling the impact of demographic, policy, and economic changes on the allocation of time.

The purpose of this paper is to build on the contribution of Aguiar and Hurst [2007] and thereby add to our knowledge of the allocation of time in two aspects. First, using Canadian data from 1986 to 2005, we analyse trends in the allocation of time to leisure, market work, and non-market work (including childcare). As in Aguiar and Hurst [2007], we control for demographic changes, report a variety of measures of leisure, and likewise assess if a growing inequality in leisure exist in Canada. Second, the results are compared with those obtained for the U.S. over a similar period, 1985 to 2003. While our primary focus will be on Canada, comparison with the U.S. provides a useful benchmark, which can serve to guide an assessment of the extent to which differences in policy, institutions, and preferences have led to differences in the apportionment of time in the two countries. To our knowledge, this is the first such analysis that has been conducted using Canadian time use data. In addition, we are not aware of any work that compares detailed time use by Canadians to their American counterparts, other than studies that compare time spent on market work. The motivation for this study is to lay a framework for future work that will provide policy prescriptions based on how time has been allocated differently in Canada and the United States. In particular, the set of broad facts that we document on the allocation of time in both countries reflect differences in culture, preferences, economic conditions, institutions, policy, and systems of taxation among other factors.

In sum, our main results are as follows. First, we find that Canadians work more hours per week than Americans do and in addition, the hours spent on market work has increased in

Canada but declined in the United States. Consistent with their rising labour force participation rate, women in both countries increased the time spent on market work. Second, the time spent on non-market work increased for Canadian men and declined modestly for American men. American and Canadian women spend less time on non-market work but they still spend about double the time on this activity compared to their male counterparts. Further, Americans generally spend more time on childcare than Canadians do and this is true across both sexes in each country. Third, the time spent on leisure defined in a variety of ways has either trended downwards or remained relatively stable in Canada. In the United States, leisure has generally trended upwards. Fourth, a leisure inequality exists in both countries, whereby the least educated spent the most time on leisure compared to the highly educated. This inequality in leisure is growing among women and men in United States. In Canada the inequality in leisure is growing for Canadian women but narrowing for Canadian men. Fifth, we find that there is a role for changing demographics and changes in the allocation of time within demographic groups in explaining the overall unconditional change in market work, non-market work and leisure in Canada.

The rest of this paper is as follows. In section II, we describe the data and the methodology. In section III, we present the trends in time use. In section IV, we report the Blinder Oaxaca decomposition for market work, non-market work and one of the leisure measures. A summary and suggestions for future research conclude.

## II. DATA AND METHODOLOGY

### II.A. Data

The data used in this paper come from time use budget surveys. Time use data are generally well suited for analysing changing patterns of time spent on a wide variety of activities. First, the time use data are rich in demographic information such as sex, age, parental status, marital status, and level of educational attainment. Second, other surveys, such as the Survey of Labour and Income Dynamics (SLID) in Canada and the Panel Study of Income Dynamics (PSID) in the U.S., do not offer the level of detail on activities outside of market work. Finally, surveys like the SLID or PSID tend to provide less accurate measure of the use of time compared to time diary data (Robinson and Godbey, [1999]). In particular, these surveys typically ask the respondent estimate the number of hours spent in an activity in some previous reference period. The problem with this is that respondents tend to recall the period when the activity was most prominent, and thus overestimating the amount of time spent on the activity (Juster and Stafford, [1991]).

The Canadian time use data were obtained from the General Social Surveys (GSS). The GSS is conducted annually and focuses on various aspects of Canadian life. Trends in time use were examined in 1986, 1992, 1998, and 2005.<sup>4</sup> The survey is conducted by telephone and the target population in each survey is the non-institutionalized population aged 15 and over living in one of the ten provinces.<sup>5</sup> Each survey is designed such that the time diary information was collected evenly over the 12 months of the year. The GSS includes survey weights that adjust for the approximately 2% of the target population without a home phone, the age and sex distribution of the population, and so that each day of the week was equally represented. The sample sizes in each survey were, 9,946 in 1986, 8,996 in 1992, 10,749 in 1998 and 19,597 in

2005.<sup>6</sup>

The U.S. data were obtained from on time use surveys conducted in 1985 and 1992-1994 by the Survey Research Centre at the University of Maryland and in 2003 by the Bureau of Labour Statistics. Following Aguiar and Hurst, we treat the 1992-1994 survey as year 1993 given that the median respondent was in 1993. Surveys are conducted by telephone interview and are nationally representative with respect to households with a phone. Survey sample weights within each survey ensure that each day of the week was equally representative and that age and sex distribution were taken into account. For comparison purposes, we make use of the compilation of the U.S. data available from the website of Aguiar and Hurst.<sup>7</sup> The sample sizes for the U.S data are 4,939 in 1985, 9,383 in 1993 and 20, 720 in 2003.

In documenting the allocation of time, it is important that we measure the same activities in both countries.<sup>8</sup> The level of time use aggregation are largely the same in both Canada and the United States rendering most our aggregate activity measures the same in both countries. Slight differences exist in some subcategories of activities but this is unavoidably due to the level of aggregation within each survey across countries and over time. In addition, it should be noted that we are comparing data from 1986 to 2005 in Canada with data from 1985 to 2003 in the United States.

In this paper, we analyse trends in the allocation of time across various subgroups of the working age population controlling for changes in demographics. The working age population has a significant bearing on the determination of economic growth and distribution of national income by virtue that they supply the most labour hours to the market. The study of their time allocation decisions is thus of some import. We restrict our working age population to be those individuals age between 20 and 64 excluding retirees, and students whose time allocation

decisions are likely to be significantly influenced by the acquisition of human capital. Our sample also excludes individuals who did not report their level of educational attainment, and whose time diary summed to a complete day.<sup>9</sup> Time diaries are collected in minutes per day, so we first convert to hours per seven-day week by multiplying by seven and dividing by sixty. We thus report the average weekly hours spent on across each activity per working age adult.

## II.B. Methodology

To estimate trends in time use conditional on demographics we apply the fixed weight procedure used by Aguiar and Hurst [2007] for each country. First, we pool the time use data and adjust the survey weights so that each day of the week and survey is represented equally. Second, demographic cells are created for each activity based on age (20-29, 30-39, 40-49, 50-59, 60-64), gender (male or female), parental status (whether at least one child under the age of 19 is present in the home or not) and level of education (less than high school, high school, some college or at least university graduate). This yields 72 demographic cells for each survey year from which we calculate 72 demographic cell means.<sup>10</sup> The demographic weight associated with each demographic cell is the percentage of the pooled sample (compilation of all surveys in a particular country) that is within each demographic cell. From this we calculate the mean weekly hours spent on an activity adjusted for demographics as the demographically weighted average of the cell means for that activity.

We report the conditional mean time spent on market work, non-market work, and leisure including their subcategories, for Canada and the United States across both sexes and with respect to levels of educational attainment. There are many ways in which to discuss the trends in time. Our approach will be present the results for each time use activity by comparing average



hours per week controlling for demographics spent in 2005 for Canada and in 2003 in the United States across the entire population and then across men and women. This is then followed by a discussion the conditional change in the average weekly hours over the approximately two decades in each country.

Our final analysis of the role of demographics in time allocation will involves assessment of how much of the unconditional change in the average hours per week from 1986 to 2005 can be explained by evolving demographics and the portion explainable by changes in the allocation of time within demographic groups in Canada. We do this by reporting a Blinder Oaxaca decomposition of for market work, non-market work, and leisure for the Canadian population as a whole and then for men and women. Following, Aguiar and Hurst [2007] the methodology of the decomposition is briefly as follows. Let  $Y_{it}$  be the average hours per week spent on activity  $i$  in survey  $t$  and  $W_{it}$  the associated survey weights. Then the unconditional average time spent on an activity adjusted by  $W_{it}$  is simply  $W_{it}Y_{it}$ . So the unconditional mean change in hours per week in an activity from 1986 to 2005 can be written as  $W_{i2005}Y_{i2005} - W_{i1986}Y_{i1986}$  which can be decomposed as  $(W_{i2005} - W_{i1986})Y_{i2005} + (Y_{i2005} - Y_{i1986})W_{i1986}$ . The term  $(W_{i2005} - W_{i1986})Y_{i2005}$  is the part of the total unconditional mean change due to changes in the demographic weights between 1986 and 2005 evaluated at the 2005 cell means. The term  $(Y_{i2005} - Y_{i1986})W_{i1986}$  is the portion of the unconditional change that is a result of changes within demographic groups between 1986 and 2005 evaluated at the 1986 demographic weights.

Alternately, unconditional mean change in hours per week in an activity from 1986 to 2005 can be decomposed as  $(W_{i2005} - W_{i1986})Y_{i1986} + (Y_{i2005} - Y_{i1986})W_{i2005}$ . The term  $(W_{i2005} - W_{i1986})Y_{i1986}$  is the part of the total unconditional change due to changes in the

demographic weights between 1986 and 2005 evaluated at the 1986 cell means. The term  $(Y_{i,2005} - Y_{i,1986})W_{i,2005}$  is the portion of the unconditional change that is a result of changes within demographic groups between 1986 and 2005 evaluated at the 2005 demographic weights. We report and discuss both decompositions.

### **III. THE ALLOCATION OF TIME**

#### **III. A. Market Work**

Total market work is the sum of the time spent on all activities related to paid employment. This includes job search, overtime work, travelling to and from work, and work related activities (commute during work, breaks and idle time, eating and snacks, and other uncodeable work activities). Core market work is the sum of time spent on work at the main job, other jobs, and overtime work. Given that there might be shifts in time use among work activities, we document subcategories of market work to ascertain what activities are responsible for trends observed. We begin by discussing time use trends at the end of the period in each country and then analyse trends over time. Table 1 reports the results for market work, core market work, and related subcategories.

In 2005, Canadians spent an average of 37.29 hours per week on market work while Americans spent 31.64 hours per week in 2003 (table 1 panel A row 1). The time spent on core market work (panel A table 1 row 2) was of 31.44 hours per week in 2005 in Canada and 28.57 hours per week in the United States in 2003. Time spent travelling to and from work was 3.37 hours per week in Canada in 2005 compared to 2.53 hours in 2003 in the U.S. (table 1 panel A row 3). In addition work related activities was only 0.30 hours per week in the U.S. in 2003 while in Canada in 2005 this was 2.71 hours per week. The sum of work related activities and

time spent commuting to and from work account for the larger difference between market work and core market work in Canada. That is, while Canadians work more than Americans do, part of that arises because Canadians spent more hours per week travelling to and from work, idling at work, and taking breaks at work.

The average hours per week across spent on market work across the entire population can potentially mask important differences between men and women. Weekly market work hours by gender are reported in panels B and C of table 1. From table 1 panel B row 1, Canadian men in 2005 spent an average of 45.15 on total market work and 38.07 hours per week on core market work. The comparative figures for 2003 in U.S. are 39.50 and 35.49 hours per week. Women in Canada in 2005 spent an average of 29.57 and 24.92 hours per week on market and core market work respectively (table 1 panel C). While, women in the U.S. spent 24.83 and 22.58 hours per week on market and core market work in 2003. What is true in aggregate is also true across gender; Canadian men and women work more than their counterparts in the United States.

Table 1 also allows us to examine trends in market work time across both countries. From panel B, in Canada, from 1986 to 2005, men increased core market work and market work by 2.55 and 1.57 hours per week respectively, but the change is not statistically significant. In contrast, American men decreased time spent on core market work and market work by 3.61 and 1.13 hours per week respectively, but again the change is not statistically significant. From panel C, Canadian women increased market and core market work hours per week by 5.9 and 5.34 respectively. On the other hand, market and core market work for American women trended up by 1.52 and 2.82 hours per week (not statistically significant).

### III. B. Non-Market Work and Childcare

Non-market work (home production) includes all the time spent on activities related to unpaid work but excluding own medical care. We separate out and examine 3 subcategories of non-market work, time spent on core-non market work, shopping for goods and services and childcare activities. Core non-market work primarily involves do-it-your self-activities that plausibly have close substitutes in the goods and services market. These activities include meal preparation, home maintenance, and routine housework such as laundry and ironing, etc. Time spent obtaining goods and services involve everyday shopping for goods, and shopping for personal and professional services (excluding medical care). Childcare is the sum of time spent on primary, recreational and educational childcare activities. Results are reported in table 2.

From panel A table 1 row 3, time devoted to non-market work plus childcare was about the same in 2005 in Canada (23.46 hours per week) as in the U.S. in 2003 (23.68 hours per week) for the entire population. However, there are differences in the apportionment of time within activity subcategories. In 2005 Canadians spent 11.34 hours per week on core non-market work while Americans spent 8.57 hours per week (panel A table 1 row 5). In addition, Canadians spent less time shopping for goods and services in 2005 than Americans did in 2003 (4.93 vs. 5.22 hours per week). When it comes to childcare, Americans spent 5.46 hours per week in 2003 while Canadians spent 4.58 hours per week (panel A table 1 row 3).

We next turn our attention to the differences across gender. The results for men and women are reported in panels B and C of table 2 respectively. Canadian and American men spent about the same time on non-market work and on shopping for goods and services in 2005 and 2003 respectively (table 2 panel B row 6). Men in Canada spent an average of 13.62 hours per week on non-market work activities of which 3.76 were devoted to obtaining goods and services.

Similarly, American men spent 13.43 hours per week on non-market work and 4.33 hours obtaining goods and services. Examining childcare, Canadian men spent 2.76 hours per week in 2005 while American men spent 3.24 hours per week in 2003.

The fact that women continue to bear the burden of labour within the household is evident from table 2 panel C. Canadian women spent 24.05 hour per week in 2005 on non-market work, which is almost double the time devoted by Canadian men. Similarly, American women spent an average of 22.5 hours per week on non-market work in 2003, which is again almost double the time spent by American men. At the end of the period Canadian and American women spent approximately 6 hours per week obtaining goods and services. In terms of childcare, American women spent 7.46 hours per week in 2003 compared to 6.35 hours per week devoted in 2005 by Canadian women. Similar to the time devoted to non-market work by men, Canadian and American women spent about double the time than men in their respective countries.

We now turn our attention to the trends in non-market work and childcare. We limit our discussion to differences across men and women. From table 2 panel B, we note that Canadian men increased non-market work by 1.7 hours per week but decreased time spent obtaining goods and services by 1.19 hours per week. At the same time core non-market work increased by 1.52 hours per week for men in Canada. On the other hand, for American men, the time spent on non-market work, core non-market work and on shopping for goods and services was unchanged over the period 1986 to 2003. With respect to time spent on childcare, men in Canada spent 0.97 hours more per week over the period (not statistically significant). On the other hand American men spent 1.58 hours more per week in 2003 relative to 1985.

From, table 2 panel C, unlike men, time spent on non-market had a strong downward trend for women in the U.S., -4.50 hours per week, and Canada, -1.25 hours per week ( both not statistically significant). A part of this decline comes from the decline in core non-market for American, -3.75 hours per week, and Canadian women, -1.82 hours per week (both not statistically significant). The time spent shopping for goods and services declined 1.03 hours per week for Canadian women and declined 0.92 hours per week for American women. On the other hand, childcare trended up by 1.22 and 2.00 hours per week for women in Canada and the U.S. respectively.

### III. C. Total Work and Childcare

Total work is the sum of non-market work and market work. The average weekly hours for Canadian and American men and women are shown in table 2 panels B and C row 2. As perhaps expected given the results so far, Canadian men spent more time in total work more in 2005 than American men in 2003 (58.77 vs. 52.96 hours per week). Similarly, Canadian women spent more time on total work than American women (53.61 vs. 47.47 hours per week). Adding the time spent on childcare to total work we find that the Canadian men and women still spent more time than their American counterparts on these activities take together, even though Americans spent more time on childcare in 2003 than Canadians in 2005. Total work increased by 3.26 and 4.24 hours per week for Canadian men and women respectively. In contrast total work declined for American women and men in (-4.36 and -3.04 hours per week respectively) though the magnitude of the decline is not statistically significant.

### III. D. Leisure

The most common definition of leisure is that it is the complement of the set of activities that are usually required to be performing during the day, such as market work, non-market work and childcare. A more narrow measure would be to define leisure as the set of activities that yield direct utility such as, gardening and pet care, socializing, entertaining, active, recreation, watching television among other related activities. Leisure can be also be defined as an individual's perception of the quality of the activity experience rather than the duration of the activity itself (see Wilson [1980]). Given the lack of consensus of a definition for leisure, we follow Aguiar and Hurst [2007] and define four alternate measures. Leisure measure 1 is the sum of time spent on entertainment and social activities, sports, hobbies, gardening and pet care, media and communication, and relaxation activities. Leisure measure 2 is the sum leisure measure 1, private activities (such as sex) and personal care activities such as eating, and personal bathing. Leisure measure 3 is the sum of leisure measure two and time spent on childcare activities. The final measure, leisure measure 4 is the time available after time to total work (market work and non-market work) has been expended.

The time spent in leisure is reported in table 3 for Canada and the United States. In all leisure measure categories, Americans in 2003 spend more time on leisure time than Canadians in 2005. In the narrowest measure, leisure 1, Canadians spent an average of 33.08 hours per week while American spent 35.53. In the broadest leisure category, leisure 4, Americans spent 118.4 hours per week, which is almost eight hours more than the time spent by Canadians per week. The fact that Americans enjoy more leisure time than Canadians per week is reflective of trends over the two decades. In Canada, the time spent on leisure measures 1, 2, and 3 has remained relatively unchanged from 1986 to 2005. However, in Canada leisure 4 the residual of

total work declined by 3.96 hours per week for the entire population and 3.27 and 4.63 hours per week for men and women respectively( panels A, B, and C respectively,). In the U.S., leisure defined in a variety of ways increased by 2.06 to 4.25 hours per week for men (table 3 panel B) and ranged from -1.02 to an increase of 2.99 hours per week for women (all changes not statistically significant).

The trends so far reported potentially mask changes in how time is allocated to various activities within leisure. We decompose and report some of the major activity subcomponents of leisure 2 and leisure 4 for Canada for men and women in tables 4 and 5. From table 4 men (panel A) and women (panel B) increased time spent sleeping and napping by 1.78 and 1.53 hours per week respectively. Personal care declined by 3.36 and 3.81 hours per week for men and women respectively. In terms of watching television, men decreased their hours by 1.63 per week while women had a modest decline of 0.49 hours per week (statistically insignificant). Men and women increased gardening and pet care by 1.3 and 1.42 hours per week respectively. With respect to hobbies men increased their average weekly hours by 1.61 while women have reduced the time they spent by 0.73 hours per week. Both men and women spent less time reading per week (decline of 1.91 and 1.27 hours respectively) while the time they spent eating (meals away from market work) declined by 2.65 and 2.70 hours per week respectively.

Time spent on active sports increased by 0.33 hours per week for men and by 0.38 hours per week for women. At the same time, the time spent on all sporting activities increased by 0.93 and 1.29 for men and women respectively. In addition, walking and hiking increased for both men and women (0.38 and 0.54 hours per week respectively). From the 1992 time use survey onwards respondents were asked to report time spent on the computer for general use and surfing the net and composing e-mails. This time use category is a subcomponent of the time spent on



games. From the 1986 to 2005, the time sent on games increased by 1.40 and 0.39 hours per week for men and women respectively. However, this change reflect that from 1992 to 2005 time spent on computer usage increased by an average of 1.51 hours per week for men and 1.01 hours per week for women.

Leisure measure 4 has had the most dramatic decline in Canada and this is true for both men and women. Leisure 4 is the residual of total work and includes leisure 3 (entertainment and recreational activities, sports active and passive, personal care and childcare) and what we call civic- medical care (civic oriented, voluntary and religious activities, own medical care, care to other adults, education and other uncodeable non-work activities including time gaps). We separate out and add together subcomponents of civic-medical care and report trends in table 5. We did not report individual subcomponents because of their relatively small economic magnitudes. From table 5 we note that civic-medical care activities declined by 2.38 and 2.93 hours per week for men and women respectively. These changes represent over fifty percent of the overall decline in leisure 4 for men and women.

### III.E. Education and Market Work

Trends in market work by gender and educational attainment are shown in tables 6 and 7 for Canada and U.S. respectively. From table 6 panel A, for men Canada, we observe that hours worked is positively related with the level of educational attainment. For example, the least educated men in 1986 worked 10.25 hours less than the mostly highly educated. However, over the last two decades the gap in hours worked between the least educated and the highly educated men in Canada has declined. In 2005, least educated men worked only 3.75 hours per week less than highly educated men. Following from this trend, over the two decades the change in market

work hours is negatively related to level of educational attainment. In 2005, the least educated increased market hours by 4.73 hours while the mostly highly educated decreased time spent in market work by only 1.77 hours per week.

In the U.S., for men the relationship between educational attainment and hours worked is not as clear as in Canada. In 1985, highly educated worked the least number of weekly hours (41.63) while those men who had some college level education worked the highest number of hours (45.3) (panel A table 7). However, by, 2003 this trend was reversed with the highly educated men working the most hours (45.06) and now the least educated men working the smallest number of weekly hours (32.88). From 1985 to 2003, hours worked decreased with level of educational attainment for men in the United States. Therefore, while highly educated men increased their weekly market hours by 3.43, least educated men reduced their hours by 10.12 hours per week.

We now turn our attention to how market work has evolved with respect to women with different levels of educational attainment in both countries. In Canada, market work increases with educational attainment for women (table 6 panel D). Women of all educational attainment, increased market work hours from 1986 to 2005, with the least educated having the smallest increase (3.58 hours per week) and women with a high school diploma having the largest increase (8.15 hours per week). While this has occurred the gap between the hours worked by the least educated and the most highly educated has not narrowed. In 1986, women who were university graduates worked 12.05 more hours per week than high school dropouts while in 2005 they worked 13.74 more hours than this group of least educated women.

Similar to Canada, the time devoted to market work increases with the level of educational attainment among American women (table 7 panel D). However, over the period the

increase in market work decreases with the level of educational attainment. In 1985, least educated women market work hours fell by 2.35 hours per week while highly educated women increased market work hours by 4.93 hours per week (table 7 panel D row 4). Given this trend, the difference between highly educated and least educated women increased from 8.35 to 15.58 hours per week over the period.

### III.F. Education and Non-Market Work

In Canada, men of all educational attainment increased their weekly hours spent on non-market work (table 6 panel B). In 1986 least educated men spent 0.44 hours fewer per week than highly educated men. However, by 2005 least educated men spent 15.03 hours on non-market work, which is 1.76 more hours than highly educated men. In the U.S., there is no clear linear relationship between non-market work and educational attainment (table 7 panel B). However, on average highly educated American men spent more time on non-market work than least educated American men. In 2003, the least educated men worked 3.73 hours per week while the most educated worked 13.73 hours (table 7 panel B row 2).

Examining trends in non-market work for women in Canada, we observe that non-market work decreases with educational attainment. However, from 1986 to 2005 the time spent on non-market work decreased with the level of educational attainment. In 1986 least educated women spent 10.04 more hours per week than highly educated women did, but by 2005, this difference diminished by 3 hours per week. In all educational categories, the time devoted to non-market work fell except for University educated women who increased the time spent on non-market work by 0.45 hours per week. The trend in the U.S. is similar to that in Canada. For American women non-market work diminishes with educational attainment. In 2005, highly educated

women spent 20.76 hours in non-market work, which is 5.46 hours less than the time devoted by least educated women. However similar to Canada, women of all educational level devoted less time to non-market work in 2003 compared to 1986.

### III.G. Education and Leisure

In this section, we characterize how educational attainment has evolved with respect to our second leisure measure, which encompasses time spent on gardening and pet care, social and recreational activities, and personal care. In Canada, leisure decreases with educational attainment for men (table 6 panel C row 1 to 4). Highly educated men spent 10.06 hours per week less on leisure than least educated men in 1986. However, by 2005 this difference had fallen to 6.47 hours per week. In fact, of the three educational groups, highly educated men increased leisure by 2.62 hours per week while leisure declined for all other educational categories with men with some college training experiencing the largest decline in leisure (2.02 hours per week). Thus while there is an inequality in leisure to the extent the least educated spend more time on leisure this gap is narrowing.

In the U.S., the leisure time spent by men also decreases with educational attainment (table 7 panel C). In addition, the leisure increase over time is negatively related to educational attainment. Therefore, in 2003 the least educated had increased leisure by 8.54 hours per week while the highly educated had in fact decreased time spent in leisure by 5.62 hours per week (table 7 panel C row 4). In contrast to the results for Canada, there is an inequality in leisure in U.S. and this has increased over time. This result mirrors the findings of Aguiar and Hurst [2007].

For women in Canada, the time spent on leisure decreases with the level of educational attainment. In 1986, least educated women enjoyed 8.14 more leisure hours than highly educated women did and by 2005, that difference was 10.05 hours per week (table 6 panel F). Over time least educated women increased leisure time by 1.88 hours per week. High school and college-trained women saw their leisure time fall by 2.57 and 3.37 hours per week, while leisure time for university educated women remained stable. The net result of these trends is that there is an inequality in leisure and this has grown over time for women in Canada.

Similar to trends reported so far, the time spent by American women on leisure generally increases with educational attainment. In 1985, least educated women spent 7.68 more hours on leisure than highly educated women (table 7 panel F). Over time this gap has widened even though women of all levels of educational attainment have decreased time spent on leisure, the largest decline has been among university women (decline of 2.78 hours per week). Thus, similar to the trends for American men and Canadian women there is an inequality in the time spent on leisure by American women and this inequality is increasing over time.

#### **IV. BLINDER OAXACA DECOMPOSITION OF THE UNCONDITIONAL CHANGE**

In this section, we analyse the extent to which changes in demographics contribute to mean unconditional changes in market work, non-market work, and leisure in Canada. We use the Blinder Oaxaca decomposition using the methodology outlined in section II.B and report the two alternate decompositions of the change in the unconditional mean weekly hours between 1986 and 2005. Table 8 reports these results.

#### IV. A. All Individuals

Panel A is the decomposition for all individuals evaluated at 2005 cell means and 1986 demographic weights, while panel B is the decomposition evaluated at the 2005 demographic weights and 1986 cell means. The first column is the total unconditional change, the second is the change due to changes in demographics, and the third column is the change due to shifts in the time allocation within demographic groups. From panels A and B, row 1 column 2, for market work, changes in demographics account for 2 to 2.26 hours per week to the overall unconditional change of 5.84 hours per week. This leaves 3.84 to 3.58 hours per week of the unconditional change explainable by changes in the allocation of time within demographic groups. These changes are consistent with a more educated and older workforce in addition to the fact they are choosing to spend more time on market work. The unconditional change in non-market work has changed modestly and there is relatively little role for changing demographics and the allocation of time within demographic groups. On the hand, the unconditional change in leisure 2 over the period fell by 2.04 hours per week with evolving demographics accounting for -0.91 to -1.27 hours of this change (row 3, column 2 of panel A and B). At the same time, changes in the time allocation with leisure activities within demographic groups ranged from -1.07 to -0.77 hours per week.

#### IV. B. Men

Panel C is of table 8 reports the decomposition for men evaluated at 2005 cell means and 1986 demographic weights while panel D is the decomposition evaluated at the 2005 demographic weights and 1986 cell means. From panel C and D the unconditional change in market work increased by 2.75 hours per week from 1986 to 2005. Of this 0.29 to 2.12 is

because of changing demographics (panels C and D column 2 and row 1 respectively). The change of 0.29 is the effect of evolving demographics on the unconditional change evaluated at 2005 cell means. On the other hand, the change of 2.12 represents how much of the unconditional change between 1986 and 2005 using 1986 cell means is a result of shifts in demographics over time. The fact that unconditional change evaluated at the 1986 cell means is 2.12 compared to 0.29 at 2005 cell means reflects that the differences in the time allocated to market work across demographic groups was larger in 1986 compared in 2005 (see discussion on education and market work above for men in Canada). These changes also reflect the fact that the population is becoming more educated, older and having fewer children.

In panels C and D column 3 and row 1, we note that market work has increased by 2.46 to 0.63 hours per week because of increases in the time allocated to market work within each demographic cell. Now, the 2.46 hours per week indicates that within demographic groups more time is allocated to market work in 2005 compared to 1986, which accounted for 0.63 hours per week of the unconditional change due to time allocation. Thus, in addition to the increase in the relative weight of more educated and older population, these individuals are also working more hours per week. With respect to non-market work for men, changing demographics add 0.39 to 0.22 hours per week. While time allocations within demographic groups add 1.66 to 1.83 to the unconditional change which was 2.05 hours per week. Shifts in demographics have thus had a very modest role in explaining trends in non-market work. The time spent on leisure 2 for men declined by 1.66 hours per week. Of this decline -0.65 to -1.71 hours per week is a result of changing demographics, while -1.01 to 0.05 is a result of decreases in the allocation of time to leisure 2 within demographic cells. The -1.01 represents that all demographic groups allocated

less time to leisure in 2005 compared to 1986, which represented 0.05 of the unconditional change due to time allocation.

#### IV. C. Women

Turning our attention now to women, we note that demographic changes are relative more significant in explaining the overall unconditional change in time use from 1986 to 2005. The unconditional change in average weekly hours spent on market work increased by 8.47 hours per week for women. Of this, changing demographics contributes to 3.32 to 1.93 hours per week (panels E and F, row 1 column 2). The 3.32 is the evaluation at the 2005 cell means and 1986 demographic weights and the 1.93 at the 1986 cell means and 2005 demographic weights. The 3.32 reflects the fact that the differences between demographic groups in the time allocated to market work is larger in 2005 compared to 1986 (see education and market work for women above). Changes in the allocation within demographic groups contributed 6.54 to 5.15 hours per week to the overall unconditional change.

The unconditional change in non-market work for women was -2.41 hours per week (panel E row 3 column 1). The portion of this change due to changing demographics over time ranged from -3.39 to -0.67 hours per week. The relative larger change of -3.39 reflects that in 1986 the difference in the time devoted to non-market work among demographic groups was larger compared to 2005. This is consistent with the trends documented on educational attainment and market work for women in Canada above. At the same time, the portion of the unconditional change resulting from changes in the allocation of time ranged from -1.74 to 0.98 hours per week. The figure of -1.74 reflects a decrease in time allocated to non-market work in 2005 women in each demographic group.



With respect to leisure 2, women spent an average of 2.4 fewer hours per week in 2005 as compared to 1986. Of this unconditional change, -1.27 to -0.81 is a result of changing demographics. The contribution of changes in time allocation within demographic groups to the overall unconditional change increased from -1.59 hours per week when evaluated at the 2005 cell means and 1986 demographic weights to -1.13 hours per week at that 1986 cell means and 2005 demographic weights.

## **V. CONCLUSION AND DISCUSSION**

In this paper, we document the allocation of time in Canada (1986 to 2005) and contrast it with the situation in the United States over a similar period (1985 to 2003). We depart from most of the existing literature by reporting how market work, non-market work, and leisure has evolved adjusting for demographic changes based on age, gender, level of educational attainment, and fertility. Our approach mirrors that of a recent study on the United States by Aguiar and Hurst [2007].

A number of interesting facts emerge in trends in the average weekly hours across leisure, market work, and non-market per working age adult in Canada and the United States. We document five set five broad set of facts. First Canadians have increased the time devoted to market work whereas the time allocated in the United States has trended downwards. The time spent by Canadian men on market work has trended upwards whereas the time spent by American men has trended downwards. Canadian women and American women have increased market work hours but the strongest work hour growth is among Canadian women. Second, women and men in Canada spent about the same time on non-market work in 2005 as their counterparts in the U.S. in 2003. In addition, the time allocated by women to non-market work is

about double that of men in each country. At the same time American women and men in 2003 spent less time on core market work than their counterparts in Canada. Generally, Americans spent more time on childcare in 2003 than Canadians did in 2005.

Third, compared to Canadians, Americans enjoy more leisure at the end of the two decades. At the same time, leisure defined in a variety of ways, has remained relatively stable, increased marginally, or declined for men and women in Canada from 1986 to 2005. However, leisure increased for American men, while American women spent about 1 hour less on entertainment and recreational, sporting and personal care activities (leisure 1 and 2) but had more free time for activities after obligatory work (market work plus non-market work). Furthermore, we find that the trends in leisure in Canada, specifically leisure 2 and 4, mask changes in the allocation of time among activities. For example from 1986 to 2005, Canadian men and women spent less time on personal care and reading but slept more and increased time spent walking and hiking. In addition, Canadians devoted less time in 2005 to civic, voluntary, own medical care, care of other adults and religious activities in compared to 1986.

Fourth, we find that an inequality in leisure exist for Canada and the United States, whereby the least educated in each country spent the most time in leisure. This inequality is growing for American men and women while it is narrowing for men in Canada but growing for Canadian women. Fifth, the Blinder Oaxaca decomposition of market work, non-market work and leisure reveals that there is a role for changing demographics and changes in the allocation of time within demographic groups in explaining overall unconditional change in average weekly hours spent on these activities in Canada.

We have not attempted to explain the trends in the allocation of time that we document for Canada and the United States. The five broad set of facts we document are a starting point to

just such a analysis. How time is allocated has a direct bearing on every aspect of human life and thus on the welfare of society as a whole. Two related questions are now open for future research: (1) what are the factors that have led to differences in the allocation of time in Canada and the United States? and (2) what policy prescriptions can follow? Answering these questions will be task of our future research.

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**Table 1 Hours Per Week: Market Work**

	CANADA					UNITED STATES				
	Panel A All Individuals					Panel B Men				
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2003-1985	
Market Work	33.54	34.31	35.56	37.29	3.75*	32.50	33.26	31.64	-0.86	
Core Market Work	27.48	28.48	29.64	31.44	3.96***	27.58	29.95	28.57	0.99	
Commuting	2.88	2.74	2.98	3.37	0.49***	3.18	3.05	2.53	-0.65*	
Overtime/looking for work	0.28	0.49	0.74	0.42	0.14	0.15	0.06	0.24	0.09*	
Work Related	3.45	3.34	3.59	2.71	-0.74	1.58	0.19	0.30	-1.28***	
Sample Size	7,013	6,137	7,021	12,902		3,187	5,373	15,191		
	Panel C Women					Panel B Men				
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2003-1985	
Market Work	43.58	42.58	44.09	45.15	1.57	43.11	42.81	39.50	-3.61	
Core Market Work	35.52	35.43	36.41	38.07	2.55***	36.62	38.56	35.49	-1.13	
Commuting	3.8	3.39	3.65	4.08	0.28	4.23	3.92	3.36	-0.87	
Overtime/looking for work	0.40	0.57	0.96	0.56	0.16	0.22	0.06	0.32	0.10	
Work Related	4.66	4.12	4.55	3.29	-1.37***	2.04	0.27	0.33	-1.71***	
Sample Size	3,148	2,821	3,283	5,737		1,430	2,493	6,706		
	Panel C Women					Panel B Men				
Activity	1986	1992	1998	2005	Change 2005-1986	1985	1993	2003	change 2003-1985	
Market Work	23.67	26.19	27.76	29.57	5.90***	23.31	24.99	24.83	1.52	
Core Market Work	19.58	21.62	22.98	24.92	5.34***	19.76	22.50	22.58	2.82	
Commuting	1.98	2.10	2.32	2.67	0.69***	2.27	2.30	1.81	-0.46	
Overtime/looking for work	0.16	0.40	0.53	0.28	0.12	0.10	0.07	0.18	0.08	
Work Related	2.26	2.58	2.65	2.14	-0.12	1.19	0.12	0.27	-0.92***	
Sample Size	3,865	3,316	3,738	7,165		1,757	2,880	8,413		

CANADA: Market work: total of all work activities. Core Market Work: work for pay at main job, other jobs, looking for work and overtime work. Commuting: travel to and from work. Overtime/looking for work: overtime work and time spent looking for other jobs. Work related: idle work commute during work, eating at work and other uncodeable work activities.

U.S.: Market work: total of all work related activities. Core Market Work: work for pay at main job, other jobs and overtime work. Commuting: travel to and from work. Job Search: time spent looking for other jobs. Work related: idle work commute during work, eat work and other uncodeable work. activities\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively

**Table 2 Hours Per Week: Non-market Work Childcare and Total Work**

	CANADA					UNITED STATES				
	Panel A All Individuals									
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2003-1985	
Total Work + Childcare	55.69	57.56	60.06	60.75	5.06***	57.04	54.61	55.32	-1.72	
Total Work	52.22	53.8	55.75	56.17	3.95***	53.42	51.51	49.85	-3.57	
Non Market Work+ Childcare	22.15	23.27	24.2	23.46	1.31	24.59	21.34	23.68	-0.91	
Childcare	3.48	3.78	4.31	4.58	1.10	3.68	3.10	5.46	1.78**	
Non Market Work	18.67	19.49	19.9	18.88	0.21	20.91	18.24	18.21	-2.70	
Core Non Market Work	11.5	11.77	11.84	11.34	-0.16	10.78	8.67	8.57	-2.21	
Shopping for Goods/Services	6.04	5.03	5.37	4.93	-1.11***	5.85	5.16	5.22	-0.63	
Sample Size	7,013	6,137	7,021	12,902		3,187	5,373	15,191	7,013	
	Panel B Men									
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2003- 1985	
Total Work + Childcare	57.3	58.28	61.17	61.54	4.24**	58.62	56.62	55.94	-2.68	
Total Work	55.51	56.03	58.39	58.77	3.26**	56.99	55.17	52.76	-4.23	
Non Market Work+ Childcare	13.72	15.7	17.08	16.39	2.67**	15.52	13.82	16.44	0.92	
Childcare	1.79	2.25	2.78	2.76	0.97	1.63	1.45	3.18	1.55***	
Non Market Work	11.92	13.45	14.30	13.62	1.70**	13.88	12.37	13.25	-0.63	
Core Non Market work	5.86	6.29	7.32	7.38	1.52***	3.79	2.88	3.35	-0.44	
Shopping for Goods/Services	4.95	4.02	4.34	3.76	-1.19**	4.59	3.78	4.29	-0.30	
Sample Size	3,148	2,821	3,283	5,737		1,430	2,493	6,706		

Core non-market work: domestic work, meal preparation home maintenance etc. Shopping for Goods/Services: everyday shopping for goods, personal and professional services. Non market work: sum of all non-market work activities. Total work: sum of non-market work and market work. Childcare: sum of primary childcare recreational childcare and educational childcare.  
 \*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively

**Table 2(continued) Hours Per Week: Non-market Work Childcare and Total Work**

Activity	CANADA					UNITED STATES			
	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2003-1985
Total Work + Childcare	54.11	56.9	58.97	59.97	5.86***	55.76	52.85	54.77	-0.99
Total Work	48.98	51.61	53.16	53.61	4.63***	50.32	48.33	47.33	-2.99
Non Market Work+ Childcare	30.43	30.71	31.21	30.4	-0.03	32.45	27.86	29.94	-2.51
Childcare	5.13	5.29	5.80	6.35	1.22	5.44	4.52	7.44	2.00
Non market Work	25.3	25.42	25.4	24.05	-1.25	27.00	23.33	22.50	-4.50
Core Non market work	17.05	17.17	16.29	15.23	-1.82	16.84	13.68	13.09	-3.75
Shopping for goods/Services	7.12	6.02	3.38	6.09	-1.03**	6.94	6.36	6.02	-0.92
Sample Size	3,148	2,821	3,283	5,737		1,757	2,880	8,413	

Core non-market work: domestic work, meal preparation home maintenance etc. Shopping for Goods/Services: everyday shopping for goods, personal and professional services. Non market work: sum of all non-market work activities. Total work: sum of non-market work and market work. Childcare: sum of primary childcare recreational childcare and educational childcare.

\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively

**Table 3: Hours Per Week Leisure**

CANADA					UNITED STATES				
Panel A All Individuals									
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2005-1986
Leisure 1	32.98	35.58	35.31	33.08	0.10	34.94	37.59	35.35	0.41
Leisure 2	106.82	107.99	106.42	105.79	-1.03**	107.99	110.09	107.82	-0.17
Leisure 3	110.3	111.78	110.72	110.37	0.07*	111.67	113.19	113.29	1.62
Leisure 4	115.78	114.2	112.25	111.82	-3.96***	114.58	116.49	118.14	3.56
Sample Size	7013	6137	7021	12902		3,187	5,373	15,191	
Panel B Men									
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2005-1986
Leisure 1	33.97	37.57	36.51	34.23	0.26	35.37	37.71	37.43	2.06
Leisure 2	106.04	108.24	105.97	105.49	-0.55	107.12	108.49	107.98	0.86
Leisure 3	107.84	110.49	108.75	108.26	0.42	108.76	109.94	111.16	2.40
Leisure 4	112.49	111.97	109.61	109.22	-3.27***	111.00	112.83	115.25	4.25
Sample Size	3148	2821	3283	5737		1,430	2,493	6,706	
Panel C Women									
Activity	1986	1992	1998	2005	change 2005-1986	1985	1993	2003	change 2005-1986
Leisure 1	32.01	33.63	34.11	31.94	-0.07	34.57	37.49	33.55	-1.02
Leisure 2	107.59	107.75	106.85	106.08	-1.51	108.73	111.48	107.69	-1.04
Leisure 3	112.72	113.04	112.66	112.44	-0.28	114.18	116.00	115.13	0.95
Leisure 4	119.02	116.39	114.84	114.39	-4.63***	117.67	119.67	120.66	2.99
Sample Size	3865	3316	3738	7165		1,757	2,880	8,413	

*Leisure 1*: entertainment social activities, sports and hobbies, media and communication relaxation activities gardening and pet care. *Leisure 2*: leisure 1 & personal care activities including sleep but excluding own medical care and care to other adults. *Leisure 3*: Leisure 2: leisure 2 & childcare. *Leisure 4*: complement of time spent on market and non-mark work.

\*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively



**Table 4: Hours Per: Week Leisure 2 by Major Activity Categories-Canada**

Panel A Men					
Activity	1986	1992	1998	2005	change 2005-1986
Leisure 2	106.04	108.23	105.97	105.49	-0.55
Active Sports	1.40	1.59	1.89	1.73	0.33*
All Sports	2.15	3.08	3.35	3.08	0.93***
Computer Use	N/A	0.20	0.79	1.71	1.51***
Eating	9.83	8.83	7.40	7.18	-2.65***
Entertainment	0.88	0.72	0.79	0.93	0.05
Games	0.60	1.03	1.43	2.00	1.40***
Garden pet care	0.29	2.00	1.64	1.59	1.30***
Hobbies	1.90	2.35	2.51	3.51	1.61***
Night sleep	54.40	53.92	54.11	56.47	2.07***
Night sleep & Naps	55.55	54.87	55.29	57.33	1.78***
Personal care	17.07	15.10	13.76	13.44	-3.63***
Personal care & Night Sleep & Naps	72.25	69.97	69.30	70.77	-1.48***
Reading	3.19	2.76	1.96	1.28	-1.91***
Socializing	6.19	6.69	7.43	6.83	0.64
Television watching	15.52	15.62	14.47	13.89	-1.63*
Walk, Hiking, Running & Jogging	0.37	0.87	0.88	0.75	0.38***

N/A: not recorded in the 1986 survey. *Active Sports*: physical exercise, golf, swimming, skiing, rowing, other sports. *All Sports*: active sports, hunting, fishing camping, walking, jogging, *Hobbies*: hobbies done mainly for pleasure sale or exchange, domestic home crafts etc. *Games*: computer use, puzzle board, arcade games, video games, compute games  
 \*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively

**Table 4(continued): Hours Per: Week Leisure 2 by Major Activity Categories-Canada**

Panel B Women					
Activity					change
	1986	1992	1998	2005	2005-1986
Leisure 2	107.59	107.74	106.85	106.08	-1.51
Active Sports	0.72	0.82	1.03	1.10	0.38***
All Sports	1.18	1.95	2.44	2.47	1.29***
Computer Use	N/A	0.07	0.37	1.08	1.01***
Eating	10.03	8.82	7.37	7.33	-2.70***
Entertainment	0.75	0.70	0.86	0.85	0.10
Games	0.65	1.13	0.97	1.04	0.39***
Garden pet care	0.24	1.01	1.56	1.66	1.42***
Hobbies	3.16	3.06	2.47	2.42	-0.74**
Night sleep	56.29	56.63	56.2	57.69	1.40***
Night sleep & Naps	57.41	57.19	57.43	58.94	1.53***
Personal care	18.61	16.25	1.64	14.80	-3.81***
Personal care & Night Sleep& Naps	76.08	73.44	72.08	73.74	-2.34***
Reading	3.12	3.21	2.52	1.85	-1.27***
Socializing	6.92	7.57	8.10	7.31	0.39
Television watching	12.65	12.00	12.00	12.16	-0.49
Walk, Hiking, Running & Jogging	0.41	0.86	0.97	0.95	0.54***

N/A: not recorded in the 1986 survey. *Active Sports*: physical exercise, golf, swimming, skiing, rowing, other sports. *All Sports*: active sports, hunting, fishing camping, walking, jogging, *Hobbies*: hobbies done mainly for pleasure sale or exchange, domestic home crafts etc. *Games*: computer use, puzzle board, arcade games, video games, compute games  
 \*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively

**Table 5: Hours Per Week: Civic-Medical Care-(Subcomponent of leisure 4)**

					Change
	1986	1992	1998	2005	2005-1986
Men	4.94	3.49	2.50	2.56	-2.38***
Women	6.54	4.36	3.74	3.61	-2.93***

*Civic-Medical Care*: time spent on civic, religious, voluntary and activities own medical care, care to other adults, and education. Included in this aggregation is residual activity code, which includes uncodeable time gaps and missing, or refused time. Excluding residual time does not alter the trends reported. \*\*\*/\*\*/\* indicate significance at the 1%/5%/10% levels respectively

**Table 6: Hours Per Week: Market Non-Market Work & Leisure By Educational Attainment  
CANADA**

	(A) Not High School	(B) High School	(C) Some College	(D) University	Change (D)-(A)
<b>Men</b>					
<i>Panel A: Market Work</i>					
1986	38.13	42.53	44.38	48.38	10.25
1992	38.92	43.83	43.14	44.2	5.28
1998	40.33	46.37	43.93	46.33	6.00
2005	42.86	45.29	45.54	46.61	3.75
Change 2005-1986	4.73	2.76	1.16	-1.77	
<i>Panel B: Non-Market Work</i>					
1986	11.99	11.22	11.92	12.43	0.44
1992	13.75	13.31	13.78	12.66	-1.09
1998	14.93	13.97	14.08	14.31	-0.62
2005	15.03	11.33	14.04	13.27	-1.76
Change 2005-1986	3.04	0.11	2.12	0.84	
<i>Panel C: Leisure 2</i>					
1986	110.20	108.85	105.79	100.14	-10.06
1992	112.63	108.38	107.22	105.58	-7.05
1998	110.87	105.23	105.84	101.92	-8.95
2005	109.23	108.16	103.77	102.76	-6.47
Change 2005-1986	-0.97	-0.69	-2.02	2.62	
<b>Women</b>					
<i>Panel D: Market Work</i>					
1986	17.48	20.46	25.58	29.53	12.05
1992	17.52	24.23	28.43	32.77	15.25
1998	20.62	28.01	28.80	33.07	12.45
2005	21.06	28.61	31.88	34.80	13.74
Change 2005-1986	3.58	8.15	6.30	5.27	
<i>Panel E: Non-Market Work</i>					
1986	30.36	27.60	23.99	20.32	-10.04
1992	28.62	27.07	24.69	21.81	-6.81
1998	28.42	26.47	25.02	21.81	-6.61
2005	27.81	23.84	23.74	20.77	-7.04
Change 2005-1986	-2.55	-3.76	-0.25	0.45	
<i>Panel F: Leisure 2</i>					
1986	111.17	109.31	107.08	103.03	-8.14
1992	115.11	109.04	105.19	103.99	-11.12
1998	113.16	105.94	105.75	103.24	-9.92
2005	113.05	106.74	103.71	103.00	-10.05
Change 2005-1986	1.88	-2.57	-3.37	-0.03	

*Not High School:* did not complete high school. *High School:* Completed Secondary education. Some college: community college, some university and other category. *University:* Completed at least a bachelor's degree.

**Table 7: Hours Per Week Market Non-Market Work & Leisure By Educational Attainment-United States**

	(A) Not High School	(B) High School	(C) Some College	(D) University	Change (D)-(A)
<b>Men</b>					
<i>Panel A: Market Work</i>					
1985	43.00	42.87	45.53	41.63	-1.37
1993	42.93	41.64	40.01	46.64	3.71
2003	32.88	39.54	39.13	45.06	12.18
Change 2003-1985	-10.12	-3.33	-6.40	3.43	
<i>Panel B: Non-Market Work</i>					
1985	13.60	13.31	13.98	14.89	1.29
1993	11.75	13.06	13.71	10.78	-0.97
2003	12.66	13.78	13.02	13.73	1.07
Change 2003-1985	-0.94	0.47	-0.96	-1.16	
<i>Panel C: Leisure 2</i>					
1985	108.03	107.54	105.61	106.99	-1.04
1993	111.94	106.17	108.01	105.06	-6.88
2003	116.57	108.79	106.07	101.37	-15.20
Change 2003-1985	8.54	1.25	0.46	-5.62	-14.16
<b>Women</b>					
<i>Panel D: Market Work</i>					
1985	17.78	23.64	25.26	26.08	8.30
1993	18.25	23.08	27.73	32.56	14.31
2003	15.43	24.55	28.36	31.01	15.58
Change 2003-1985	-2.35	0.91	3.10	4.93	
<i>Panel E: Non-Market Work</i>					
1985	28.92	27.41	26.68	24.72	-4.20
1993	24.8	24.92	22.62	19.51	-5.29
2003	26.22	22.7	20.22	20.76	-5.46
Change 2003-1985	-2.70	-4.71	-6.46	-3.96	
<i>Panel F: Leisure 2</i>					
1985	113.48	108.73	107.07	105.80	-7.68
1993	117.72	111.96	106.95	108.92	-8.80
2003	113.39	108.51	105.19	103.02	-10.37
Change 2003-1985	-0.09	-0.22	-1.88	-2.78	

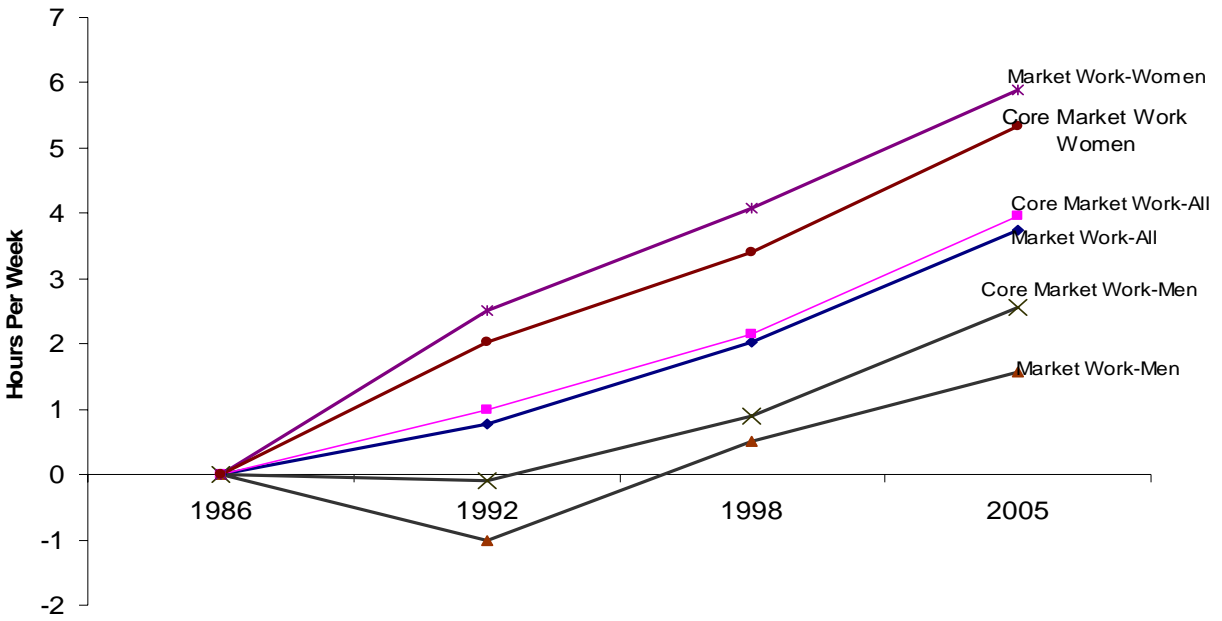
*Not High School*: did not complete high school. *High School*: Completed Secondary education. Some college: community college, some university and other category. *University*: Completed at least a bachelor's degree.

**Table 8: Decomposition of Unconditional Changes in Hours Per week-Canada**

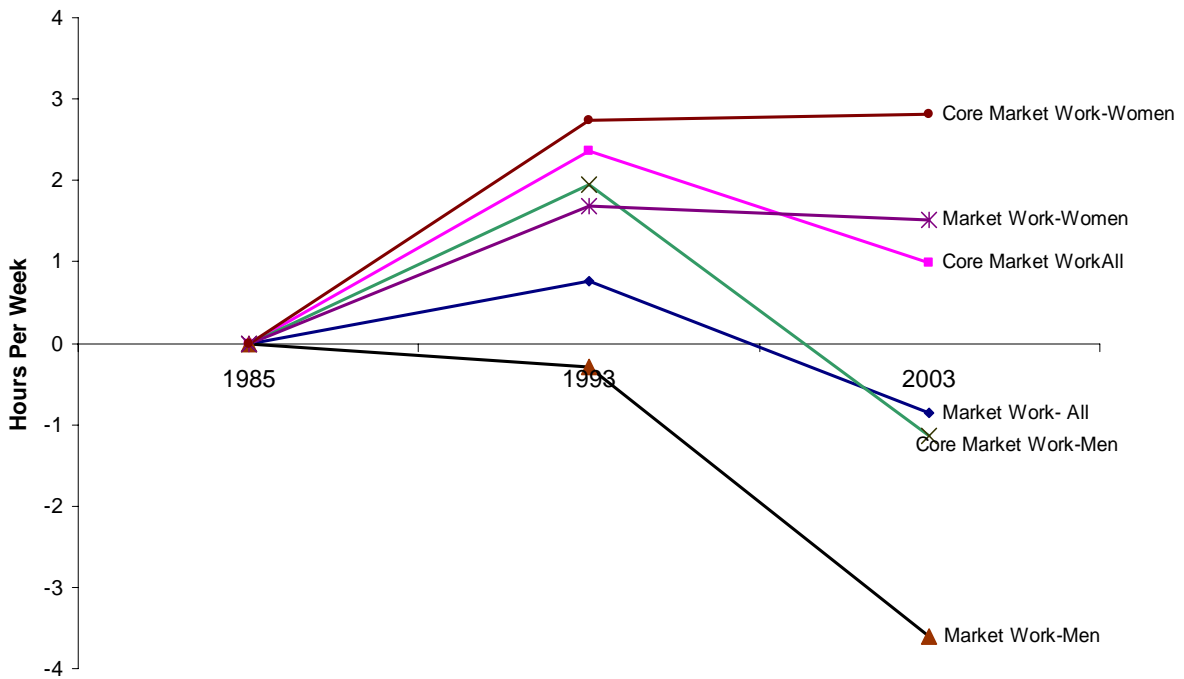
<b>All Individuals</b>			
<i>Panel A: Decomposition Evaluated at 1986 Demographic Weights and 2005 cell means</i>			
	unconditional change	change due to demographics	change due to difference in cell means
Market Work	5.84	2.00	3.84
Non-Market Work	-0.34	-0.26	-0.08
Leisure Measure 2	-2.04	-0.97	-1.07
<i>Panel B: Decomposition Evaluated at 2005 Demographic Weights and 1986 cell means</i>			
	unconditional change	change due to demographics	change due to difference in cell means
Market Work	5.84	2.26	3.58
Non-Market Work	-0.34	-0.77	0.43
Leisure Measure 2	-2.04	-1.27	-0.77
<b>Men</b>			
<i>Panel C: Decomposition Evaluated at 1986 Demographic Weights and 2005 cell means</i>			
	unconditional change	change due to demographics	change due to difference in cell means
Market Work	2.75	0.29	2.46
Non-Market Work	2.05	0.39	1.66
Leisure Measure 2	-1.66	-0.65	-1.01
<i>Panel D: Decomposition Evaluated at 2005 Demographic Weights and 1986 cell means</i>			
	unconditional change	change due to demographics	change due to difference in cell means
Market Work	2.75	2.12	0.63
Non-Market Work	2.05	0.22	1.83
Leisure Measure 2	-1.66	-1.71	0.05
<b>Women</b>			
<i>Panel E: Decomposition Evaluated at 1986 Demographic Weights and 2005 cell means</i>			
	Unconditional Change	change due to demographics	change due to difference in cell means
Market Work	8.47	3.32	5.15
Non-Market Work	-2.41	-0.67	-1.74
Leisure Measure 2	-2.40	-1.27	-1.13
<i>Panel F: Decomposition Evaluated at 2005 Demographic Weights and 1986 cell means</i>			
	Unconditional Change	change due to demographics	change due to difference in cell means
Market Work	8.47	1.93	6.54
Non-Market Work	-2.41	-3.39	0.98
Leisure Measure 2	-2.40	-0.81	-1.59

Blinder Oaxaca decomposition of unconditional change in hours per week. The first column reports the unconditional change. The second column reported the change due to demographics changes over time evaluated at 2005 and 1986 cell means. The third column reports changes in the unconditional men due to changes within demographic groups evaluated at the 1986 and 2005 demographic composition respectively.

Figures



**Figure 1 Market and Core Market Work-Deviations from 1986 Hours per Week Canada**



**Figure 2 Market and Core Market Work-Deviations from 1985 Hours per Week United States**

<b>Appendix Table A1: Time Use Classification and Demographic Variables</b>	
Activity	Description/Composition of some activities included
Market Work	work for pay at main job, searching for work, snacks at work, idle time at work travel to and from work, travel during work
Core Market Work	Paid at main job, work at secondary job, searching for work (excluded for the U.S.)
Non Market Work	cooking and washing up, housekeeping, maintenance and repair (indoor and outdoor) shopping for goods and services (excluding medical care), gardening and pet care, household administration, other household work
Core Non-Market Work	cooking and washing up, housekeeping, maintenance and repair (indoor and outdoor)
Obtaining goods	everyday shopping for goods, personal and professional services (excluding medical care)
Childcare	baby care, putting children to bed, unpaid babysitting, medical care of children, play with children, reading and talking, teaching and reprimanding
Total work	non market work & market work
Leisure 1	entertainment, social activities, sports and hobbies, play, media and communication relaxation activities, reading, garden and pet care, computer use, hunting fishing, walking hiking, coaching (excluded for the U.S.)
Leisure 2	Leisure 1 & personal care activities
Leisure 3	Leisure 2 & childcare
Leisure 4	Total time available in a day- total work
Total child care	Play with children Helping teaching, reprimanding, recreational child
Personal care	Sex, eating, sleeping essential, naps, meals at home or restaurant
Civic and voluntary actives	Professional union meetings, religious meetings, political activities, child youth and family organizations, medical care household adults, personal care household adults, care for disabled or ill, travel related to civic & voluntary activities,
Education	Full time classes other classes, leisure and special interest classes , special lectures occasional

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<sup>1</sup> A fifth category is the time spent acquiring human capital but this time use category is not explored in this paper.

<sup>2</sup> Much of the existing literature on allocation of time report trends in time use without controlling for demographic changes. We refer to such estimates as unconditional time use averages.

<sup>3</sup> For example, Fuess [2006] evaluates the success of the Japanese government's 1991 policy initiative to increase leisure time spent for leisure. Controlling for age, and labour market variables he finds that from 1986 to 2001 both men and women have not experienced an increase in leisure overall.

<sup>4</sup> Two earlier Canadian time use surveys were available; 1971/72 Dimensions of Metropolitan Activity and the 1981 Canadian Time Use Pilot Study. However, these were only available at level of aggregation of time use categories that thus was not suitable for this paper.

<sup>5</sup> The survey excludes residents of Yukon, the Northwest Territories, and Nunavut.

<sup>6</sup> Prior to 1999, the target sample size for the GSS was approximately 10,000 persons. This was increased in 1999 to 25,000 to allow for the analysis on small population groups such as disabled persons, visible minorities and seniors.

<sup>7</sup> The link to their website is [http://troi.cc.rochester.edu/~maguiar/timeuse\\_data/datapage.html](http://troi.cc.rochester.edu/~maguiar/timeuse_data/datapage.html)

<sup>8</sup> The Multination Time Use Survey project is an example of a compilation of international time use surveys, that harmonizes different levels of time use aggregation reported in surveys.

<sup>9</sup> In Aguiar and Hurst (2007), the U.S sample is restricted to individuals aged 21 to 65. The 1986 survey does not allow for a similar age range for Canada. However, the results using age range 20 to 64 for the U.S are almost identical to those reported in Aguiar and Hurst (2007). In addition, including or excluding students and retirees does not alter the results significantly.

<sup>10</sup> Given the small sample size of the age group 60 to 64, no demographic category is created for parental status for this age group.