

Does housework matter anymore? The shifting impact of housework on economic inequality

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Received: 8 May 2007 / Accepted: 6 September 2007 / Published online: 10 October 2007
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Abstract In recent years, American women's housework time has declined while American men's housework time has risen. We examine how these changes have affected economic inequality in the United States. Using time-diary data from the Time Use in Economic and Social Accounts, 1975–1976 ($N = 1,484$) and the American Time Use Survey, 2003 ($N = 5,534$), we value adults' housework using two alternative methodologies and assess its influence on households' real access to goods and services in both years. Results suggest that housework reduces economic inequality in both years. But, between 1975–1976 and 2002–2003, overall economic inequality rose largely because of the growing wage inequality and also, in part, because of growth in housework inequality. Socio-demographic change partially inhibited the overall growth in economic inequality.

Keywords Economic inequality · Housework · Time use

JEL Classifications D13 · D63

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1 Introduction

While the economic value of housework has been recognized by family economists for many years (Reid 1934; Warren 1940; Wiegand 1954; Wilson 1929), it was not until the path-breaking work of Becker (1965) that more mainstream economists acknowledged that households enhance their access to goods and services by spending time doing both housework and market work. Today, there is general agreement that the time spent by household members cooking meals, laundering clothing, gardening, etcetera enhances economic well-being. This recognition has led to an international literature seeking to incorporate housework and other non-market work (e.g., volunteer work) into a system of national accounts that document the economic activities of countries (see for example, Ironmonger 1996; Ironmonger and Soupourmas 2003; Landefeld and McCulla 2000; Lutzel 1996).

A smaller literature has arisen that asks whether housework, when valued monetarily and added to household income, markedly changes the distribution of economic well-being. If low income households do more housework than high income households, and if the per hour value of low income households' housework is similar to that done by high income households, then housework makes the income distribution more equal. If, on the other hand, low income households do less housework than more affluent households or if the per hour value of housework is positively correlated with money income, then housework may well exacerbate income inequalities.

While economists define economic well-being conceptually to be the household's access to goods and services, empirically it is almost always measured by money income.¹ Money income provides a fairly accurate indicator of access to goods and services that can be purchased in the marketplace, but it fails to measure access to goods and services that are a result of household production. Such an omission means that empirical estimates of household economic well-being based solely on money income are biased if money income and household production are correlated.

Money income inequality has been rising in the United States since the late 1980s (Cohen et al. 2002). If the amount of housework done has been constant through time, then adding the value of housework to money income would not affect this trend toward greater income inequality. But, researchers who have looked at trends in housework find that American women's time spent in housework has substantially declined over much of the past century while American men's housework time has risen modestly (Aguar and Hurst 2006; Bryant 1996; Robinson and Godbey 1997; Sayer 2005).

In this paper, we examine whether the decline in the total amount of housework done by American women and the rise in housework done by American men have ameliorated or exacerbated the rising inequality in money income. Using time-diary data, we compare how adults' housework time influenced households' real access to goods and services at two points in time, 1975–1976 and 2002–2003. We also assess

¹ Work has focused on valuing money and non-money assets, in-kind and other transfer payments and examining how they affect the income distribution. See, for example, Weisbrod and Hansen (1968), Garfinkel et al. (2006) and Smeeding (1982).

the extent to which any change in income inequality is associated with the socio-demographic changes that have occurred over the past quarter century. To do this, we decompose the change in economic well-being into: (a) socio-demographic shifts in marital status, race/ethnicity, age, number of minor children, and women's education levels and employment behavior, and (b) changes in preferences, household technology, and labor markets. By using data from 1975–1976 and 2002–2003, we assess change over a time period when the United States experienced considerable shifts in both these socio-demographic and economic characteristics.

2 Prior research

2.1 The growth of wage inequality

The income inequality literature provides important context for the current study. Thorough reviews of the literature on wage and earnings inequality are contained in Katz and Autor (1999) and Acemoglu (2002). They note that after some reduction in the 1970s, wage inequality trended upward throughout the 1980s and the first half of the 1990s.

Katz and Autor (1999) offer three explanations for the upward trend that are all couched in the supply-demand structure of the U.S. labor market. Skill-biased technological changes increased the demand for highly educated and more-skilled workers. Simultaneously, rising globalization pressures due to increased trade with less-developed countries and foreign outsourcing shrank the demand for less well-educated and low-skill workers especially in manufacturing. These two explanations are both demand side factors. Their third explanation draws on supply factors. Specifically, the growth in the sizes of the cohorts entering the labor force in the 1980s and 1990s slowed due to the baby bust and this reduced the relative supply of highly educated workers while the ranks of the less well educated and low skilled swelled due to increasing unskilled immigration. The combination of an increase in the relative demand for the highly educated in the 1980s and 1990s, the slower growth in the supply of the highly educated, and the swelling ranks of the unskilled thus led to increases in wage inequality throughout the 1980s and 1990s.

A fourth explanation of the growth in wage and earnings inequality relates to changes in labor market institutions, specifically the decline in unionization, the erosion of the real minimum wage, and changes in wage setting norms. Acemoglu (2002) examines how such skill-biased technical change has impacted wage inequality. He presents several models and settles on an explanation involving induced-innovation interacting with organizational change, labor market institutions and international trade.

Exacerbating the rising trend in wage inequality is evidence that increased immigration of low-skilled workers has depressed the prices of “non-traded” goods and services, prominent among which are housekeeping and gardening services (Cortes 2005). This is so because low-skilled immigrants bulk large in the supply of such “non-traded” goods and services and because such goods are purchased more by high income than by low-income people, immigration of low-skilled workers

into the U.S. over the past two decades has increased the purchasing power of high-income relative to low-income people.

2.2 Housework and economic inequality

Against this backdrop of growing wage inequality, have low-skilled individuals compensated for the reduction in their relative purchasing power by doing relatively more household work? To date, six studies have examined the impact of adding the value of household production to money income to arrive at a more complete measure of the distribution of economic well-being (Aslaksen and Koren 1996; Bonke 1992; Bryant and Zick 1985; Frazis and Stewart 2006; Gottschalk and Mayer 2002; Zick and Bryant 1990). As such, they have the potential to shed light on this question. While these studies are fairly similar in their measures of economic inequality (e.g., Gini coefficients and/or percentile distributions), they reflect a range of choices with regard to conceptually defining, empirically measuring, and assigning a dollar value to housework and these choices may have influenced their findings.

2.2.1 *Defining and measuring housework*

The debate about the conceptual definition of housework centers around what gets categorized as productive time. Many researchers (Aslaksen and Koren 1996; Bonke 1992; Frazis and Stewart 2006) use Margaret Reid's (1934) criteria for including activities—that is, they conceptualize housework as those activities that produce goods and services that could have been purchased in the marketplace had some circumstances in the home been different. This has led researchers to define home production time as time spent in meal preparation and clean up, cleaning the house, laundry and care of clothing, shopping, repair and maintenance of dwellings, care of infants, children, or adults, gardening, pet care, bookkeeping related to household management, and travel related to any of these activities.

Some time-use researchers make a conceptual and empirical distinction between “core housework” and childcare and/or shopping (Robinson and Godbey 1997; U.S. Bureau of Labor Statistics 2004). This is done because housework is typically thought to encompass those activities that enhance household economic well-being but provide little in the way of direct “process” enjoyment. While time spent in shopping and child care also enhances the household's well-being, it can be argued that for many people these activities are as much “leisure” as they are “work.” Bryant and Zick (1985), and Gottschalk and Mayer (2002) all used data from the Panel Study of Income Dynamics (PSID) where the empirical measure of housework is close to this concept of core housework.

Once housework is defined conceptually, the second key choice revolves around how to measure housework time empirically. There is general agreement in the time use literature that time diaries provide more valid and reliable measures of time use than do survey questions about typical time spent in various activities (Robinson

and Bostrom 1994; Robinson 1985; Bryant et al. 2004). Accordingly, Aslaken and Koren (1996), Bonke (1992) and Frazis and Stewart (2006) all use time diary surveys. Others (Bryant and Zick 1985; Gottschalk and Mayer 2002; Zick and Bryant 1990) use questions about typical time spent in housework in the Panel Study of Income Dynamics (PSID). Although the questions in the PSID have potential reliability and validity problems, they are appealing because the PSID is the only U.S. data set that allows one to undertake analyses of housework and income inequality over time using a panel.

2.2.2 *Measuring the economic value of housework*

The debate over the appropriate way to value unpaid work has resulted in a sizable literature extending over several decades partly because valuing housework must be done for both research seeking to add housework to GDP and research focusing on issues of income inequality. Two alternative concepts guide the construction of measures of the per hour value of housework: opportunity cost and replacement cost. Opportunity cost is the per hour value of the time a person could have been spending in alternative activities had he/she not done housework. Undergirding this concept is the assumption that individuals freely choose the hours they work and that they divide the total time working between market work and housework based on the relative productivity of the two.

The debate over the applicability of the opportunity cost concept focuses on three issues. The first is the relevance of opportunity cost for those who, for whatever reason, cannot choose alternative ways to spend time. Those who doubt the relevance point to: (a) barriers preventing people substituting market work for housework by entering the labor force or, if already employed in market work, from altering their hours of market work; (b) conditions within the household that make housework “obligatory.” The second problem with the opportunity cost concept is the difference between intra- and inter-marginal changes in time use. If there are constant returns to scale in household production, then the value of the “last hour” spent in housework equals the average value. If increasing or decreasing returns to scale apply, then the value of the last hour spent in housework under (over)-values the total housework done. The third issue is that the opportunity cost concept implies that the per hour value of housework done varies with the characteristics of the people doing it. In essence, the argument is that some people are more skilled in housework than others and, therefore, their time—and by extension the housework they do—is worth more than others. Thus, for instance, the housework done by more highly educated people is worth more per hour than that done by the less well-educated. Denials of this principle arise either from a denial that housework affords much if any scope for variance in the housework labor productivity or from ethical concerns that the opportunity cost concept values the housework of those with high labor market productivity higher than those with low labor market productivity.

In studies using sample surveys to pursue income inequality issues, as in the present case, the wage rates of otherwise identical individuals regardless of their labor force status adjusts for the demographic characteristics that importantly

determine wage rates (and presumably also the productivity of the labor in household production) but ignores the sample selection problem implicit in labor force participation. For example, in their study seeking to adjust national income account estimates of Gross Domestic Product for the value of housework, Ironmonger and Soupourmas (2003) use the national average wage rate for the year in question. This neither accounts for differences in opportunity costs due to differences in peoples' characteristics nor for the sample selection bias implicit in labor force participation that arises because much housework is done by full-time homemakers for which a wage rate is not observed. To account for this, many authors adjust for sample selection bias using a simple Heckman model (1979).

Adjusting for demographic characteristics and for sample selection bias do not altogether align the estimated wage rate measurement with the opportunity cost concept. The conceptually correct opportunity cost measure for a person fully employed in housework is the wage rate that would induce the full-time houseperson to work the "first hour" in the labor market. This is the reservation wage and is found by solving the labor supply function for the wage rate which elicits the first hour of labor market work. Bryant and Zick (1985), Zick and Bryant (1990), and Bonke (1992) employ this method. It's defect, however, is that reservation wage estimates tend to be statistically unstable because of the difficulty in identifying the labor supply function in micro statistical models of the labor market.

Turn now to the replacement cost concept. Replacement cost is the per hour cost of the labor that could be hired to do the housework the person otherwise does. This concept flows from the Reid (1934) definition of housework as the production of goods and services that could have been purchased in the marketplace. Debate over this concept focuses on the difference between the productivity of the labor used in the production of goods and services in the home versus the productivity of labor used to produce market-purchased substitutes. The difference can be either in the training of the labor or the capital which is combined with the labor in order to produce the goods and services.

In income inequality studies using the replacement cost concept, two alternative measures have been used. One, the "generalist" measure, uses the wage rate for the occupation of "housekeepers" on the assumption that a single individual performs all housework. The other, the "specialist" measure, uses the wage rates of specialists (e.g., cooks, laundry workers, housecleaners, gardeners, etc.) and applies them to the time spent in the relevant specialized activities. Neither of these measures typically include the fringe benefits received by these occupations. Furthermore, the Cortes (2005) study of the effect of immigration on "non-traded" goods and services suggests that the use of the same replacement cost measure, regardless of the income of the household, is biased because low-wage households face different costs than high-wage households, especially in those locations where low-skill immigrants are concentrated.

Virtually all of the fore mentioned valuation techniques have been used in previous studies of economic inequality and housework. Bryant and Zick (1985) and Zick and Bryant (1990) use a wage-based opportunity cost measure that corrects for selection bias. Aslaksen and Koren (1996) use a replacement cost approach. Frazis and Stewart (2006) compare both generalist and specialist replacement cost

measures. Bonke (1992) and Gottschalk and Mayer (2002) compare and contrast opportunity cost measures and generalist replacement cost measures.

2.3 Contributions of the current study

Despite the differences in the strategies used to define, measure, and value housework, the studies that have been done to date reach remarkably similar conclusions. Indeed, all but one (Zick and Bryant 1990) find that housework reduces economic inequality. This finding holds across different countries, survey years and valuation techniques used. Frazis and Stewart (2006) conclude that in the United States, the inclusion of the value of household work in a more encompassing measure of economic well-being reduces income inequality by roughly 20% in 2003. Two other diary-based studies of the impact of housework on economic inequality have been done using data from Denmark (Bonke 1992) and Norway (Aslaksen and Koren 1996). These are countries with much lower levels of money income inequality than in the United States, yet the authors of these two studies also conclude that the monetary value of housework reduces income inequality in the range of 10–30%. Gottschalk and Mayer's (2002) study is the only one to date to generate longitudinal estimates. They use data from the PSID to estimate the income distribution with and without the value of core housework for each year in the United States from 1976 to 1992. They find the addition of the value of core housework to money income reduces income inequality. But, whether measured by money income or by money income plus the value of housework, income inequality increases over these 16 years. They conclude that while the value of core housework serves to enhance income equality, it does not completely offset the general decline that occurred during this period of growing wage inequality.

The current study builds on Gottschalk and Mayer's work in several ways. First, we use time diary data which are generally considered to be more accurate than data elicited by a single retrospective question like the one used by Gottschalk and Mayer (Bryant et al. 2004; Robinson 1985; Robinson and Bostrom 1994).² Moreover, our diary based measure of housework will include the time that adults spend in shopping and childcare—time devoted to these activities has increased in recent years (Bianchi et al. 2006; Robinson and Godbey 1997), yet it is omitted from Gottschalk and Mayer's measure of core housework. If time spent in shopping and child care has varied by income level over the past quarter century, then this could have important implications for economic inequality. Second, Gottschalk and Mayer's analysis ends with 1992 and thus it does not capture the economic changes during the 1992–2001 expansion that are encompassed in our time frame. Third, when using the opportunity cost to value household production, Gottschalk and Mayer use estimated gross wage rates that do not reflect the effect income taxes have upon the value of time or the effect changes in marginal income tax rates have

² While Gottschalk and Mayer attempt to ameliorate this potential defect in one of their estimates by including all leisure as household work, this is a second best solution.

had on the opportunity costs of time over the study period. In contrast, we use estimated wage rates net of income taxes in both 1975 and 2003. Finally, we gain new insights regarding the forces behind changes in the distribution of housework by decomposing the observed change in economic inequality into the portion attributable to concurrent socio-demographic shifts and the portion attributable to changes in labor markets, household technology, and leisure preferences.

3 Methods

3.1 The data

Data used in the current study come from two nationally representative diary-based, American time-use surveys. The first survey, *Time Use in Economic and Social Accounts, 1975–1976*, (TUESA) (Juster et al. 2001) gathered 24-h diary data on a random sample of 1,519 adults aged 18 or older and the 887 spouses of the respondents who were married. The respondents and their spouses were interviewed on four separate occasions during 1975–1976. In each interview, they were asked questions about their living arrangements, employment, etcetera. In addition, at the time of each interview, they were asked to complete a 24-h time diary. Data from the four separate diaries, gathered across all four seasons and across two weekdays, a Saturday and a Sunday, were used to construct a “synthetic” or typical week of time use for each respondent and the respondent’s spouse. The TUESA data set has two distinct advantages for the current analyses. First, the use of multiple 24-h diaries enhances the validity of the TUESA measure of usual housework time. Second, the TUESA is the earliest, nationally representative time diary data collection effort.³ As such, when it is properly weighted, analyses of these data can be used to generalize to the larger U.S. population age 18 and older in 1975–1976. In all of the analyses that follow, we use the panel loss weights to insure generalizability (Juster et al. 2001).

The second data set used in the analyses is the *2003 American Time Use Survey* (ATUS) (U.S. Bureau of Labor Statistics 2007). The 2003 ATUS is the first annual American time-diary survey conducted by the U.S. Bureau of Labor Statistics. The 2003 sample of 20,070 individuals was drawn from households who had completed their final interview for the Current Population Survey. The ATUS respondent is randomly selected from among each household’s members who are age 15 or older. Respondents are asked a series of questions that focus on household composition, employment status, etcetera. They are also asked to complete one 24-h time diary. Half of the respondents complete a diary for a weekday and half of the respondents complete a diary for a weekend day. While ATUS time diary information come from 2003, some questions used in the analyses refer to 2002

³ While some authors have analyzed time diary data from the *Americans’ Use of Time, 1965–1966* survey, these data cannot be used to generalize to the nation as a whole. Approximately one-third of the sample in that study was drawn from Jackson, MI, while the remaining two-thirds were drawn from a national sample of individuals living in cities with a population between 30,000 and 280,000. See Converse and Robinson (1980) for further information regarding this study.

(e.g., income). Since we use both in the analyses that follow, we refer to this data set as the 2002–2003 ATUS.

In order to obtain more detailed income data, we restrict our ATUS sub-sample to those respondents who also participated in the 2003 March Supplement to the Current Population Survey. Approximately one-third of the sample can be linked to the March Supplement. In our analyses of the ATUS, we follow the U.S. Bureau of Labor Statistics' recommendations on weighting to insure generalizability to the larger population (U.S. Bureau of Labor Statistics 2007).

One additional restriction is placed on both data sets. Specifically, we restrict our samples to White, Black, and Hispanic respondents and their spouses (if present). The numbers of Asians, American Indians, and "others" are so small in both data sets as to preclude any attempt to control for cultural variations in their housework time. In addition, for the ATUS data, we further exclude respondents age 15–17 and respondents over age 18 who reside with their parents, to maximize comparability between the two data sets. The final household sample size for the TUESA is 1,484 and the final household sample size for the ATUS is 5,534.

3.2 Measuring housework

In the light of the literature on the definition of housework, we elect to define housework as time spent in core housework activities (i.e., interior housework, laundry and textile repair, food and drink preparation, presentation and clean-up, interior and exterior maintenance, maintenance of lawn, garden, and houseplants, animal and pet care, vehicle maintenance, appliance and tools maintenance, and household management), *plus* shopping, and child care. This measure is consistent with Reid's (1934) criterion as it includes all household activities that could have been purchased in the marketplace if a household member had not spent time doing them.⁴

A related set of measurement issues revolve around harmonizing the time diary measures in the two data sets as much as possible. Although both data sets utilize valid and reliable time diary methods for gathering time use information, they differ in terms of the number of household members who were asked to complete diaries and the number of diaries each household member was asked to complete. The TUESA survey gathered multiple diaries on both respondents and spouses if married whereas the ATUS gathered only one 24-h diary from one randomly selected individual age 15 or older in the household regardless of marital status. In the case of the TUESA data, the respondent burden was fairly high and thus only 705 of the 1,484 households in our sample have synthetic week data for both adults in the case of married couples and one adult in the case of single households. For the

⁴ As we noted earlier, some have argued that childcare and shopping should be excluded from housework because these tasks provide direct utility for many individuals. Pet lovers, hobbyists, cooking enthusiasts, and gardeners give lie to this distinction. While we readily admit that some individuals consider certain household tasks to be sources of leisure, the tasks included in our definition of housework are primarily production rather than consumption activities. Moreover, it is beyond the scope of this paper to parse out consumption from production within these categories.

ATUS data, one diary reduces the respondent burden but it makes it difficult to capture typical time use over the course of a year. In addition, if the ATUS respondent is married, the absence of time diary information on the spouse makes it difficult to get a full accounting of adult housework time.

To maximize data comparability across the two surveys, enhance the representativeness of the measures, and minimize the loss of data due to non-response, we estimate housework equations and use the parameter estimates to forecast housework time for all households in the surveys. In the TUESA survey, these equations are estimated using the 705 observations where we have synthetic week data. In the ATUS, these equations are estimated using the 5,534 respondent observations and they control for weekend versus weekday diaries. The TUESA equations are estimated using ordinary least squares because virtually no respondents report zero time spent in housework over the course of the synthetic week. The ATUS equations are estimated using tobit to account for the fact that sizable numbers of respondents report doing no housework on their single diary day. Estimation is done separately by gender and marital status in both years.

The TUESA and ATUS time use equations include slightly different sets of covariates. Specifically, the TUESA regressions include a dummy variable to control for missing information on whether or not the household is located in a metropolitan statistical area (MSA) while the ATUS does not. It also omits the dummy for Hispanic ethnicity and the dummy variable for the presence of a telephone as neither of these questions were asked in the TUESA survey. In the case of the ATUS, we include dummies for season and weekend versus weekday diary to adjust for the way in which the ATUS data were collected (e.g., a single diary). In addition, we include a dummy variable for cohabitation (in the married men's and women's equations only) to allow for differences in housework time among the significant numbers of individuals who cohabit in 2002–2003. The estimates for both sets of equations appear in the appendix.

The estimated coefficients from the TUESA OLS equations are used to generate predicted values for minutes per week spent in housework for all respondents and spouses in 1975–1976. These predicted values are multiplied by 52 and divided by 60 to arrive at an estimate of the annual hours spent in housework by each adult.

Similar to the approach taken by Frazis and Stewart (2006), we use the estimated coefficients from the ATUS tobit equations to generate predicted values for weekday and weekend housework time for all respondents and their spouses in 2003. To transform these predictions of daily time spent in housework to annual values, the predicted weekday and weekend values are multiplied by five and two respectively and then summed. This minutes per week value is then multiplied by 52 and divided by 60 to arrive at an estimate of hours per year spent in housework.

3.3 Valuing housework

An economic value must be assigned to the time spent in household production activities. We use both generalist replacement cost and opportunity cost estimates and compare the results. Our replacement cost estimates of the hourly value of

housework are derived from multiple regressions where the hourly wage rate for housekeepers is regressed on region of residence and urban/rural location to adjust for local differences in housekeepers' wages.

Data from the 1976 and 2003 March Supplements to the Current Population Survey are used to estimate the housekeeper hourly wage regressions for the 1975 and 2002 calendar years. Specifically, we estimate the 2003 regression using the March Supplement sample that has been restricted to the 1,120 respondents who identified their primary occupation in 2002 as "maid/housekeeper." The estimated equation generates a low replacement wage of \$6.33/h for individuals living in the rural south in 2002 and a high replacement wage of \$8.00/h for those individuals living in the urban northeast in 2002. Similarly, we use the 451 individuals in the 1976 March Supplement who identified "private household workers" as their primary occupation in estimating the other replacement wage regression. Based on those coefficients, we generate a low replacement wage of \$3.27/h for individuals living in the rural west and a high replacement wage of \$4.62/h for individuals living in the urban northeast (measured in 2002 dollars).⁵

Our opportunity cost measures of the value of an hour of housework are also generated using data from the 1976 and 2003 March Supplements to the Current Population Survey. We use individuals age 18 and older in the March Supplement to estimate offered wage equations that correct for sample selection bias using the techniques developed by Heckman (1979). The hourly wage rates used in the estimation are adjusted so that they reflect the after-tax marginal wage. Equations are estimated separately for each gender and marital status group in 1976 and 2003 using the appropriate CPS weights.⁶ Coefficients from these equations are used to generate predicted opportunity costs of time for each individual in the TUESA and ATUS samples. Estimates of offered wage rates provide approximate opportunity cost estimates of the value of time for employed individuals and lower-bound estimates of the value of time for non-employed individuals (Heckman 1979). For 2002–2003, the median estimated hourly wages for men and women in the ATUS are \$12.69 and \$9.09, respectively. For 1975–1976, the corresponding estimated median hourly wages are \$12.66 and \$7.98, measured in 2002 dollars.

3.4 Measuring money income

Finally, we need to harmonize the measures of money income in the two data sets. For the TUESA survey, questions about the amounts of specific income components (e.g., wage and salary income, interest income, child support and alimony) received over the past year were asked along with a categorical question about total money income. Two-thirds of the households had no missing data on the income components and thus, for them, responses on the income component questions

⁵ All 1975–1976 figures have been inflated to 2002 dollars using the Personal Consumption Expenditure Deflator (St. Louis Federal Reserve 2007). The replacement wage regressions are available from the authors upon request.

⁶ Estimated equations are available from the authors upon request.

are summed to arrive at total money income. For the remaining one-third, either some or all of the answers to the income component questions are missing. In those cases, we transform the categorical responses to the total household income question to the category midpoints and use this as the measure of total money income. In those few cases where both the categorical and component data are missing, we assign the households the mean total money income. As with the TUESA replacement wage data, the TUESA total money income data are adjusted to 2002 dollars using the Personal Consumption Expenditure Deflator (St. Louis Federal Reserve 2007). The TUESA income data have also been adjusted for federal income taxes using the 1975 federal exemptions, deductions, and marginal tax rates so that our final measure represents after-tax income for each household.

In the case of the 2003 ATUS, all household income data are asked for the 2002 calendar year and they are categorical which masks potentially important variation. There is also significant missing data on total household income in the 2003 ATUS. By linking to the households' March Supplement CPS records, we are able to retrieve more detailed income data that are used to construct the measure of 2002 total family income for our sample. Thus, our sample contains time diary measures for the 2003 calendar year and income measures for 2002. The ATUS income data have been adjusted for federal income taxes using the 2002 federal exemptions, deductions, and marginal tax rates to arrive at an after-tax income measure.

With our various measures constructed, we must select among the options for summarizing the income distribution. The Gini Coefficient has been the traditional summary measure used in the income distribution literature. More recently, scholars working in this area have used the ratio of the 10th or 20th percentile ranking to the median and the ratio of the 80th or 90th percentile ranking to the median as measures of income inequality (Frazis and Stewart 2006; Garfinkel et al. 2006; Gottschalk and Mayer 2002). While Gini Coefficients facilitate historical comparisons, percentile rankings have the advantage of eliminating extreme values that may be of questionable validity. Consequently, we choose to present both in the following analyses.

4 Empirical findings

Table 1 provides a breakdown of the socio-demographic characteristics of the two samples. Over the 27 years spanned by the two surveys, Americans' socio-demographic characteristics changed substantially. By 2002–2003, Americans were older, less likely to be white-nonhispanic, less likely to married/cohabitating, and had fewer children than in 1975–1976. In addition, women had higher levels of education and were much more likely to be employed outside of the home in 2002–2003 than they were in 1975–1976. These differences are reflected in the socio-demographic composition of the two surveys as noted in Table 1.

Table 2 shows the mean reported hours per year spent in housework for the two surveys. The statistics in this table are consistent with earlier work by Aguiar and Hurst (2006), Robinson and Godbey (1997), and Sayer (2005). That is, they confirm

Table 1 Socio-demographic breakdown of the two samples

	1975–1976 (<i>N</i> = 1,484)	2002–2003 (<i>N</i> = 5,534)
<i>Marital status</i>		
Married ^a	.65	.62
Single Female	.23	.25
Single Male	.12	.13
<i>Race/Ethnicity</i>		
White-Nonhispanic	.89	.76
Black-Nonhispanic	.09	.12
Hispanic	.02	.11
<i>Number of minor children</i>		
0	.59	.56
1	.13	.18
2	.14	.17
3	.08	.06
4 or More	.06	.03
<i>Age of respondent</i>		
<30	.26	.12
30–44	.29	.35
45–64	.27	.35
>64	.19	.18
<i>Women’s employment status^b</i>		
Employed	.44	.70
Not employed	.56	.30
<i>Women’s years of schooling^b</i>		
<12 years	.37	.23
12 years	.40	.30
>12 years	.23	.47

^a In 1975–1976 survey, cohabitating individuals would have reported their marital status as “single” and there is no mechanism that can be used to separate cohabitators from those respondents who are truly single. In the 2002–2003 data, we can identify those who are cohabitating separately from those who are married or single. For 2002–2003, we elect to group the cohabitators with the married individuals because we believe their household time use is likely to be more similar to that of married couples. This means that part of the difference in the “married” rates across the two surveys is attributable to this change in categorization

^b Calculated excluding single, male households

Table 2 Mean hours per year spent in housework for White, Black, and Hispanic households: 1975–1976 and 2002–2003

	1975–1976		2002–2003		Percentage change
	<i>N</i> ^a	Mean hours per year	<i>N</i>	Mean hours per year	
Single women	219	1,297	1,353	1,156	–10.9%
Single men	100	630	737	712	13.0%
Married women	384	1,874	1,816	1,789	–4.5%
Married men	384	735	1,628	1,046	42.3%

^a Means for the 1975–1976 sample make use of the 705 households that have synthetic week data for both adults in the case of married couples and for the one adult in the case of the single households

that over the past quarter century, women's housework time has fallen while men's housework time has risen. In absolute terms, we find that the mean increase in married men's housework offsets the mean decrease in married women's housework. In percentage terms, however, married men's housework has risen dramatically while the housework time of married women has experienced a more modest decline. The percentage changes for single men and single women parallel those of their married counterparts although the percentage increase for single men is much more modest.

Comparisons of the changes in the components of housework (not shown in Table 2) reveal that shopping and child care time increased over this historical period for everyone except single women. For married women, the rise in shopping and child care time was more than offset by a decline in core housework so that total housework time fell. For single and married men, both time spent in core housework and time spent in shopping and child care rose.

Table 3 shows the distributional breakdown of total money income, hours of housework, and the replacement value and opportunity cost values of housework for the two surveys. The first panel of Table 3 reflects the growing wage and earnings inequality between 1975–1976 and 2002–2003. Between these two time periods, real after-tax money income for the 10th percentile grew by only 29% while for the 50th percentile it grew by 40%, and for the 90th percentile it grew by 75% across the two surveys. These figures are consistent with the literature documenting the growing wage and earnings inequality across this historical era (Acemoglu 2002; Gottchalk and Mayer 2002; Katz and Autor 1999).

Although the second panel reveals growing inequality in housework time too, the percentage changes are more modest. The percentage change for the 10th percentile is 4%, whereas for the 50th and 90th percentiles it is 12 and 19%, respectively. These percentages increase when one looks at the distribution of the annual replacement value of housework because the real housekeeping wage rose by about 80% between 1975–1976 and 2002–2003. But, more unequal changes are observed when we use opportunity costs to value housework. This is not surprising given that the opportunity cost measure is based on market wage rates which grew more unequal over this time period. The last panel in Table 3 shows that the annual value of housework increases by 6% for the 10th percentile while it increases by 101% for the 90th percentile between the two surveys.

Table 4 shows the median money income, opportunity cost, and replacement values of housework by socio-demographic subgroups using each valuation technique. Focus first on the marital status panel. Here we see that over the 1975–1976 to 2002–2003 period, the median after-tax money income of married couples grew by 49% while the median income of single females increased by only 25% and the median income of single males inched up by just 6%. At the same time, the median value of housework grew substantially for married couples using either a replacement cost or an opportunity cost valuation approach. However, the replacement cost estimates for single females and single males reveal more modest growth and the median opportunity cost estimate for single females actually shows a decline. Similarly, Table 4 reveals differential changes across time in median money income and the value of housework for various race/ethnicity groups,

Table 3 Distribution of annual reported money income, predicted housework time, and the predicted value of housework: 1975–1976 and 2003

	1975–1976 ^a	2002–2003 ^b	Percentage change (%)
<i>Annual total after-tax money income^a</i>			
10th Percentile	9,275	11,928	29
50th Percentile	28,548	40,100	40
90th Percentile	54,307	94,993	75
Mean	31,891	50,357	58
<i>Annual hours of housework</i>			
10th Percentile	754	784	4
50th Percentile	2,275	2,550	12
90th Percentile	2,929	3,498	19
Mean	2,035	2,274	12
<i>Annual replacement value of housework^c</i>			
10th Percentile	2,924	5,508	88
50th Percentile	7,818	17,509	124
90th Percentile	11,489	25,017	118
Mean	7,391	16,027	117
<i>Annual opportunity cost value of housework^c</i>			
10 Percentile	4,845	5,158	6
50 Percentile	14,369	23,755	65
90 Percentile	22,377	44,911	101
Mean	14,329	24,432	70

^a Predicted values were generated for all White, Black, and Hispanic households in the data set ($N = 1,484$)

^b Predicted values were generated for all respondents and their spouses/partners, if they were married or cohabitating

^c All 1975–1976 dollar figures have been inflated to 2002 dollars using the Personal Consumption Expenditure Deflator (St. Louis Federal Reserve 2007)

number of children groups, age groups, and women's employment status and education groups.

Have shifts in the socio-demographic composition of the population coupled with shifts in the money income and housework within these sub-groups exacerbated or ameliorated the changes in economic inequality that we observe between 1975–1976 and 2002–2003? To answer this question, turn to Table 5 where we present the distribution of relative economic well-being as measured by money income plus the replacement value of housework for 2002–2003 and 1975–1976, respectively. The first panel in Table 5 shows the distribution of economic well-being for 1975–1976. The calculated Gini Coefficient for after-tax income is .343. As a benchmark comparison, the U.S. Census Bureau reports a Gini Coefficient for 1975 for *gross* household income of .397 (U.S. Census Bureau 2007).⁷ The addition of the value of

⁷ If the federal income tax system is progressive, then the Gini Coefficient associated with gross income should be larger than the Gini Coefficient associated with after-tax income.

Table 4 Median annual value of after-tax money income and housework (in 2002 dollars) by socio-demographic subgroups: 1975–1976 and 2002–2003

	1975–1976			2002–2003		
	Replacement cost estimates of housework	Opportunity cost estimates of housework	After-tax money income	Replacement cost estimates of housework	Opportunity cost estimates of housework	After-tax money income
<i>Marital status</i>						
Married	8,909	17,524	35,371	20,023	30,100	52,615
Single female	4,881	10,602	16,295	8,952	8,596	20,423
Single male	2,100	4,338	27,664	5,629	5,996	29,452
<i>Race/Ethnicity</i>						
White-Nonhispanic	7,936	14,670	29,343	18,173	26,893	45,030
Black-Nonhispanic	5,723	10,848	17,994	8,891	11,516	27,158
Hispanic	8,088	16,193	25,725	17,859	18,681	29,742
<i>Number of minor children</i>						
0	5,969	12,410	27,457	15,004	18,346	35,573
1	8,634	16,426	32,283	18,929	28,488	48,449
2	9,094	18,239	36,574	21,908	33,833	48,964
3	9,700	19,358	37,571	24,457	36,437	49,738
4 or More	10,767	20,427	35,232	27,288	37,805	36,683
<i>Age of respondent</i>						
<30	6,085	10,938	27,664	11,428	13,981	28,039
30–44	8,737	18,046	38,852	19,074	29,173	47,975
45–64	7,939	15,405	29,458	17,747	27,746	50,238
>64	7,276	13,135	17,715	17,038	15,079	23,458
<i>Women's employment status^a</i>						
Employed	8,057	15,877	34,356	18,416	28,478	50,246
Not employed	8,240	15,178	27,664	14,744	21,913	28,172
<i>Women's years of schooling^a</i>						
<12 years	6,068	11,721	22,948	6,859	8,152	24,545
12 years	8,449	17,071	34,440	18,111	24,422	35,986
>12 years	8,381	18,515	38,852	18,778	31,883	54,400

^a Calculations exclude single male households

housework in 1975–1976 reduces economic inequality, with the opportunity cost approach resulting in a somewhat larger reduction (Gini = .283) than the replacement cost approach (Gini = .300).

The second panel reveals that the distribution of after-tax money income is larger in 2002–2003 than in 1975–1976. Here the Gini Coefficient for after-tax money income is .412. Again, this is somewhat smaller than the Gini Coefficient of .462 estimated by the U.S. Census Bureau for 2002 using *gross* rather than after-tax household income (U.S. Census Bureau 2007). As points of comparison for the decile ratios, Garfinkel et al. (2006) report a P10/P50 ratio of .39 for personal

Table 5 Relative economic well-being as measured by after-tax money income plus the value of housework: 1975–1976 and 2002–2003

	After-tax income	After-tax income + Replacement value of housework	After-tax income + Opportunity cost value of housework
<i>Panel 1</i> 1975–1976 ^a			
10th Percentile	9,275	14,314	19,805
50th Percentile	28,548	36,122	42,615
90th Percentile	54,307	62,988	73,892
P10/P50	.32	.40	.46
P90/P50	1.90	1.74	1.73
P90/P10	5.86	4.40	3.73
Gini Coefficient	.343	.300	.283
<i>Panel 2</i> 2002–2003			
10th Percentile	11,928	21,504	21,336
50th Percentile	40,100	56,745	63,716
90th Percentile	94,993	115,597	135,750
P10/P50	.30	.38	.33
P90/P50	2.37	2.04	2.13
P90/P10	7.96	5.38	6.36
Gini Coefficient	.412	.346	.363
<i>Panel 3</i> 2002–2003 Adjusted for 1975–1976 Socio-Demographics			
10th Percentile	8,569	16,667	14,749
50th Percentile	28,728	40,119	42,331
90th Percentile	74,730	91,736	104,544
P10/P50	.30	.42	.35
P90/P50	2.60	2.29	2.47
P90/P10	8.72	5.50	7.09
Gini Coefficient	.440	.371	.400

^a All 1975–1976 dollar figures have been inflated to 2002 dollars using the Personal Consumption Expenditure Deflator (St. Louis Federal Reserve 2007)

disposable income in the United States in 2000. Their corresponding P90/P50 ratio is 2.10. Our estimates are larger than the Garfinkel, Rainwater, and Smeeding estimates, in part because we are looking at income for 2002 rather than 2000. In contrast, our 2002–2003 money income distribution estimates are very similar to those of Frazis and Stewart (2006) who use a somewhat different sub-sample of the 2002–2003 ATUS data. They report P10/P50 and P90/P50 ratios of .31 and 2.42, respectively, numbers quite close to the .30 and 2.37 ratios that we observe.

As in 1975–1976, the addition of the value of housework in 2002–2003 reduces economic inequality. And, the magnitude of the reduction again varies by the methodology used. This time, however, it is the use of the replacement cost approach that results in the greatest reduction in economic inequality. Since the opportunity cost approach is inherently linked to market wages, its relatively

smaller impact on economic inequality in 2002–2003 compared to 1975–1976 may be attributable to the growth in wage inequality that occurred over this historical period.

Table 5 confirms that money income inequality (first column of each panel) grew markedly over this time period primarily because of the growth in the top end of the income distribution. In 1975–1976, households in the 90th percentile had 1.90 times the median money income but by 2002–2003, they had 2.37 times the median money income. In contrast, the ratio of the 10th percentile to median after-tax income declined modestly over this time period—dropping from .32 to .30 of median household income.

In both 1975–1976 and 2002–2003, the addition of the value of housework to money income (second and third columns of each panel) reduces economic inequality. However, the reduction in economic inequality is greater in 1975–1976 than in 2002–2003 in both absolute and relative terms. For example, look at the change in the ratio of the 90th percentile to the 10th percentile in each of the years when the replacement value of housework is added to money income. For 1975–1976, the addition of the replacement value of housework reduces this ratio by 25% (from 5.86 to 4.40). In 2002–2003, the ratio of the 90th percentile to the 10th percentile is reduced by 14% when the replacement value of housework is added to money income. Similarly, the opportunity cost estimates yield reductions in the P90/P10 ratio of 36% for 1975–1976 and 10% for 2002–2003.

As a point of comparison, Frazis and Stewart (2006) calculate a Gini Coefficient for money income plus the replacement value of housework of .328 for 2002–2003. Our estimated Gini Coefficient for 2002–2003 is slightly larger at .346. But, both are consistent in that they reflect that economic inequality is reduced when the replacement value of housework is added to household income.

The last panel in Table 5 presents the measures of relative economic well-being for 2002–2003 weighted so that the sample reflects the marriage, race/ethnicity, number of children, age, and women's educational level and employment status composition of the 1975–1976 sample. It shows what economic inequality would have looked like in the 2002–2003 sample if the socio-demographic composition in 2002–2003 had mirrored that of 1975–1976 (i.e., if there had been no changes in the socio-demographic make-up of the supply of labor over that historical period). Comparisons of panels 2 and 3 provide some insight as to how socio-demographic change impacted economic inequality. In absolute terms, if the 2002–2003 sample had the socio-demographic make-up of the 1975–1976 sample, it would have served to increase economic inequality further primarily by raising the higher end of the distribution relative to the median (i.e., raising the ratio of the 90th percentile to the 50th percentile). This comparison suggests that the socio-demographic changes that took place between 1975–1976 and 2002–2003 served to dampen the growth in economic inequality that would have otherwise occurred over this time period.

It is also useful to compare panels 1 and 3. This comparison allows us to see the changes in economic inequality between 1975–1976 and 2002–2003 that are attributable to factors other than shifting socio-demographics. From an economic perspective, other factors that could precipitate changes in economic inequality

include technical changes within the household, changes in household preferences for leisure time, shifts in labor demand and/or the wage rate consequences of the changes in the socio-demographic composition of the labor supply. One or more of these factors clearly precipitated considerable growth in both after-tax income and after-tax income plus the value of housework inequality between 1975–1976 and 2002–2003. Again, the growth in inequality appears to be largely attributable to growth at the higher end of the income distribution. In the case of after-tax money income, the ratio of the 90th percentile to the 50th percentile grew by 37% (i.e., 2.60/1.90). Similarly, when the value of housework is included, the ratio of the 90th percentile to the 50th percentile grew by somewhere between 32 and 43%, depending on how the value of housework is measured.

Comparisons of Gini Coefficients and the decile ratios in Table 5 suggest that the change in economic inequality between 1975–1976 and 2002–2003 would have been even greater if there had not been a simultaneous shift in the socio-demographic composition of the population. Holding socio-demographics constant, the ratio of P90/P10 for after-tax money income increases by 49% across these two samples (i.e., 8.72/5.86). But, because the effect of socio-demographic change reduces after-tax money income inequality, the overall growth in after-tax money income inequality is only 36% (i.e., 7.96/5.86).

The picture one gets of the impact of changing socio-demographics on the overall growth in after-tax money income plus the economic value of housework depends somewhat on the valuation methodology used. With the replacement cost approach, the P90/P10 ratio would have grown by 25 (i.e., 5.50/4.40) if there had been no socio-demographic shift. But, with the socio-demographic shift, the growth in this ratio was 22% (i.e., 5.38/4.40)—suggesting that changing socio-demographics had little impact. In contrast, the corresponding figures based on the opportunity cost approach are 90% (i.e., 7.09/3.73) and 70% (i.e., 6.36/3.73) respectively—suggesting a more important contribution of shifting demographics.

Re-estimation with the 2002–2003 weights adjusted for a change in each one of the socio-demographic factors separately suggests that the largest single influence on reducing the growth in economic inequality is the shift in women's employment patterns. Specifically, the Gini Coefficient for the 2002–2003 after-tax money income increases from .412 to .436 if the women's employment structure of 1975–1976 is imposed on the 2002–2003 weighted data. Likewise the Gini Coefficient increases from .346 to .364 when housework is added to money income using the replacement cost estimates. And, it increases from .363 to .386 when the economic value of housework is added to money income using the opportunity cost approach. Thus, women's increasing labor force participation rates over this period likely slowed the growth in economic inequality both in terms of money income and in terms of the value of housework.

5 Discussion and conclusions

Does household work matter anymore? Our analyses suggest that housework serves to reduce economic inequality in the United States in both 1975–1976 and

2002–2003. In both years, the calculated Gini Coefficients and the economic distance between the 10th and 90th percentiles shrink when the value of housework is added to money income. These findings are consistent with recent cross-sectional work by Frazis and Stewart (2006) and the longitudinal work of Gottschalk and Mayer (2002). Like Frazis and Stewart (2006) and Gottschalk and Mayer (2002), we conclude that unpaid work done in the home for the benefit of household members continues to be a substantial force in reducing economic inequality in 2002–2003 despite the shifts in total housework time and changes in the larger economy that have occurred over the past quarter century. Our findings taken together with those of Frazis and Stewart and Gottschalk and Mayer also demonstrate that this conclusion is robust with respect to how housework is defined and valued.

While the present study re-affirms two earlier studies, it also provides several new insights. We find that replacement cost estimates have a marginally greater equalizing effect in 2002–2003 than in 1975–1976 at the lower end of the income distribution. If the increased immigration of low-skilled workers had depressed the price of non-traded services such as housekeeping in areas in which immigrants are concentrated (Cortes 2005), then the marginally greater equalizing effect observed in 2002–2003 is likely the result of low-income households devoting relatively larger amounts of time to housework.

In contrast, the equalizing effects of housework when measured using the opportunity cost approach are somewhat stronger in 1975–1976 than it is in 2002–2003. This is consistent with prior research that has found that higher wage males are spending more time in housework in recent years (Bonke et al. 2005). Furthermore, since the growth in wage inequality over this period also importantly impacted opportunity costs, it is, in part, likely responsible for the more modest effect that is observed when using the opportunity cost approach in 2002–2003.

Although housework continues to serve as a partially equalizing economic force, the inequality in money income plus the value of housework as measured by the Gini Coefficients and the decile ratios grew between 1975–1976 and 2002–2003. We find that this growth in economic inequality would have been even greater if there had not been concurrent shifts in marital status, age, race/ethnicity, number of children, women's education, and women's employment.

Our analyses suggest that changes in women's time allocation may have altered money income inequality and housework inequality in opposing ways. Women's greater commitment to paid work may have been important in slowing the growth in money income inequality between 1975 and 2003. Specifically, increases in women's educational attainment and their commensurately higher wage rates have likely served to dampen the more general increase in wage inequality that otherwise would have been observed over this historical period. However, given positive assortative mating with highly educated women more likely to be married to highly educated men, the increased market work of highly educated women at high wage rates could have exacerbated money inequality among married households. The rising divorce rates and the rise in the out-of-wedlock birth rate over the period both could have increased money income inequality by leading to an

increased number of households headed by low-income single women with minor children.

Women with greater labor market commitments and higher wage rates are also more likely to be the women who have reduced their housework time. In turn, this would precipitate growth in housework inequality to the extent that women with higher wages reduce their hours of housework more than women with lower wages. In the case of married-couple households, men have simultaneously increased their housework and thus partially compensated for the reduction in their wives' housework time. It may well be that the growth in housework inequality over this period would have been even greater had it not been for the concurrent increase in married men's housework.

Controlling for changes in the socio-demographic composition of the samples, we find substantial growth in economic inequality when comparing 1975–1976 to 2002–2003. This rise in economic inequality appears to be a function of modest growth in the inequality of housework coupled with more sizeable growth in after-tax money income inequality, particularly at the high end of the income distribution.

What factors are likely contributing to the growth in housework and money income inequality holding socio-demographic characteristics constant? We speculate that three forces may be at work. First, as we noted in the literature review, there have been significant labor market shifts over this historical period. Technical change in the labor market increased the demand for highly educated individuals who also typically command high wage rates and because of smaller birth cohorts, such individuals were in short supply. The demand for less educated individuals concurrently declined as manufacturers and others increasingly turned to international labor markets to fulfill their unskilled labor needs and as the pool of unskilled labor rose because of immigration.

Higher wage rates for highly educated individuals are likely to raise money income while simultaneously reducing time spent in housework because of the rising opportunity costs highly educated individuals face. At the other end of the spectrum, lower real wage rates for individuals with low levels of education will generally reduce money income and increase time spent in housework. Such shifts should increase money income inequality while at the same time producing greater equalizing effects of housework.

Second, technical change within the household may have played a significant role in changing the distribution of the economic value of housework. Economists argue that the adoption of new technologies serves to expand family choice which is likely to lead to an increase in the demand for time spent in productive activities within the home. At the same time, if the new technology is labor saving, it will precipitate a decline in housework. But if it is money saving, it will foster an increase in housework time. On balance then, the effect on housework of adopting new technologies within the home is ambiguous (Bryant 1986, 1994).

Over the past few decades, Americans have experienced considerable technical change within the household. In particular, personal computers did not even exist in 1970, but by 2003, 61.8% of American households owned at least one personal computer and 54.7% of American households had a computer with internet access (Day et al. 2005). Personal computers and access to the internet have allowed

households to change the way they shop (both in terms of gathering pre-purchase information as well as making actual purchases), manage their finances, etc. But, this important shift in household technology has not been evenly distributed across all income levels. The most recent statistics show that 92.2% of American households with incomes at or above \$100,000 per year have at least one computer with internet access in the home. In contrast, among households where the annual income is less than \$25,000 per year, computer ownership is only 41% and internet access is 30.7% (Day et al. 2005). The income related differences in computer ownership and access to the internet may have contributed to the recent growth in housework inequality. If computer ownership increases the household's demand for all goods and services (including those "produced" at home), then time spent in housework may increase. This increase in demand may offset any labor saving aspects of computer ownership.

Finally, education-related changes in the opportunity costs of, and preferences for, leisure over this historical period may play a part in this story. In their recent longitudinal study, Aguiar and Hurst (2006) find that between 1965 and 2003, the average American's leisure time increased, but it increased more for less-educated individuals and less for highly-educated individuals. Likewise, Robinson and Godbey (1997) report that between 1965 and 1985, the "free time" of high school graduates rose on average by 6.5 h per week. In contrast, the free time of college graduates rose on average by only 1.1 h per week and for individuals with advanced degrees free time did not change at all over this 20 year period. If this uneven shift in leisure time is partly a function of education-related changes in social mores about leisure activities and time, then this too may partially explain the widening economic gap between the rich and the poor.

In sum, despite the decline in women's housework time over the past quarter century, housework continues to be an important means by which households expand their access to goods and services. Ironmonger (1996) and Ironmonger and Sounpourmas (2003) document the importance in the aggregate. This study documents that the value of housework has increased between 1975–1976 and 2002–2003 as well as becoming more unequally distributed. Thus, economic inequality rose in the United States between 1975–1976 AND 2002–2003 largely because of the growth in money income inequality but also, in part, because of some modest growth in housework inequality. Demographic changes over this period, principally the rise in women's paid employment, and the growth in married males' housework time somewhat inhibited the growth. But, simultaneously, some combination of changes in the labor market forces, technology within the home, and leisure opportunity costs and/or preferences likely fueled the growth in economic inequality.

Acknowledgement We wish to thank Philip N. Cohen for sharing his SAS code used to compute Gini coefficients.

Appendix

Table A1 OLS parameter estimates of minutes per week spent in housework in 1975–1976 (standard errors in parentheses)

	Married women	Single women	Married men	Single men
Intercept	1,628.77 (280.39)**	1,951.38 (256.38)**	821.98 (181.08)**	646.56 (264.66)**
Age ^a	13.36 (3.75)**	9.80 (3.40)**	2.22 (3.01)	10.26 (4.33)**
Age-Squared ^a	-0.28 (0.23)	-0.26 (0.17)	-0.19 (0.17)	-0.12 (0.19)
Education (years)	-3.88 (20.09)	-28.50 (18.11)	3.06 (12.65)	3.91 (17.27)
Retired (1 = yes)	-32.75 (278.73)	155.46 (171.97)	411.17 (145.66)**	415.89 (203.62)**
Born outside of the U.S. (1 = yes)	-91.65 (194.03)	90.77 (345.89)	112.06 (162.00)	293.06 (293.07)
Children less than age 6 ^b (1 = yes)	652.21 (115.95)**	-	105.27 (84.42)	-
Total number of children	161.38 (35.56)**	238.44 (64.14)**	-17.33 (26.20)	174.89 (2.30)**
Northeast ^c (1 = yes)	156.23 (125.64)	-390.13 (169.54)**	98.85 (93.50)	33.39 (141.89)
Midwest ^c (1 = yes)	144.92 (111.54)	-166.59 (144.01)	15.49 (82.49)	13.73 (136.31)
West ^c (1 = yes)	56.85 (128.86)	-10.18 (154.49)	-80.54 (95.00)	-35.81 (135.50)
MSA (1 = yes)	-46.22 (93.66)	-18.14 (118.43)	-39.61 (69.59)	-168.25 (97.60)*
MSA missing (1 = yes)	33.35 (297.33)	-279.61 (236.56)	244.70 (219.78)	-551.55 (356.67)
Spouse's Earnings (\$/yr)	0.75 (0.26)**	-	-0.13 (0.19)	-
Black ^d (1 = yes)	31.59 (270.69)	-307.76 (190.82)	-391.43 (201.58)*	132.58 (189.20)
Adjusted R ²	.21	.13	.04	.32

Table A1 continued

	Married women	Single women	Married men	Single men
F-Statistic	8.48**	3.74**	2.19**	5.04**
N ^c	384	219	384	100

^a Following a strategy suggested by Glantz and Slinker (1990), Age and Age-Squared have been centered (i.e., the mean age within each sub-sample has been subtracted from each observation of age) to avoid multicollinearity problems with age and age-squared

^b This independent variable was omitted for the regressions using samples of single individuals because only a very small number of these individuals reported having one or more children under age 6 in the home

^c The omitted group in this sequence of dummy variables are those respondents who lived in the south

^d The omitted group includes White-Nonhispanics and White Hispanics. A separate dummy variable was not included for Hispanics because of their small numbers. Note that respondents who identified themselves as Asian, Native American, or Other were omitted from the sample

^e TUESA regressions make use of the 705 households that have synthetic week data for both adults in the case of married couples and for one adult in the case of single households

** $p < .05$

* $p < .10$

Table A2 Tobit parameter estimates of minutes per day spent in housework in 2002–2003 (standard errors in parentheses)

	Married/Cohabiting women	Single women	Married/Cohabiting men	Single men
Intercept	333.05 (42.82)**	129.14 (42.33)**	-38.88 (54.33)	92.88 (70.78)
Age ^a	1.87 (0.44)**	3.76 (0.46)**	0.98 (0.47)**	5.92 (1.05)**
Age-Squared ^a	-0.04 (0.02)**	-0.095 (0.018)	0.01 (0.02)	-0.11 (0.03)**
Education (years)	-6.27 (2.43)**	-1.17 (2.23)	2.69 (2.32)	5.61 (3.67)
Student (1 = yes)	-7.43 (23.11)	7.16 (20.43)	37.64 (26.55)	-36.00 (32.75)
Retired (1 = yes)	74.61 (22.11)**	19.10 (20.47)	75.36 (23.70)**	21.88 (41.02)
Born outside of the U.S. (1 = yes)	33.04 (18.27)*	-8.28 (23.55)	-20.92 (19.11)	21.46 (31.18)
Children less than age 6 (1 = yes)	88.47 (14.63)**	70.81 (23.73)**	37.37 (15.71)**	-36.19 (63.75)
Total number of children	38.91 (5.28)**	46.74 (7.71)**	14.89 (5.44)**	22.80 (15.01)
Northeast ^b (1 = yes)	8.83 (15.18)	-8.73 (18.33)	12.15 (16.30)	-21.33 (28.92)
Midwest ^b (1 = yes)	-6.79 (13.47)	-3.85 (17.65)	28.88 (15.93)*	-13.82 (27.93)
South ^b (1 = yes)	-11.18 (13.00)	9.84 (16.36)	-7.19 (14.50)	-19.83 (26.61)
MSA (1 = yes)	-1.37 (11.18)	0.09 (14.46)	7.96 (12.31)	16.21 (25.17)
Telephone (1 = yes)	-43.78 (27.96)	62.72 (21.76)**	22.68 (40.89)	-132.44 (39.40)**
Fall interview ^c (1 = yes)	-23.08 (10.80)**	-13.03 (13.60)	-17.06 (11.57)	15.00 (21.00)
Spring interview ^c (1 = yes)	73.00 (26.90)**	-36.04 (30.64)	17.17 (30.83)	17.14 (54.49)
Weekend diary (1 = yes)	10.18 (9.87)	21.52 (11.98)*	66.16 (10.83)**	46.94 (19.39)**
Spouse's education (years)	2.94 (2.11)	-	5.48 (2.63)**	-
Spouse's earnings (\$/year)	0.01 (0.01)	-	0.01 (0.01)	-
Cohabiting ^d (1 = yes)	-15.57 (19.82)	-	-34.05 (20.55)*	-
Black, Nonhispanic ^e (1 = yes)	-93.30 (18.60)**	-48.47 (14.86)**	-36.97 (19.17)*	-51.57 (25.31)**

Table A2 continued

	Married/Cohabiting women	Single women	Married/Cohabiting men	Single men
Hispanic ^c (1 = yes)	-18.62 (18.30)	4.38 (21.54)	-11.69 (19.80)	-72.28 (33.70)**
Scale	190.84 (3.24)**	176.93 (4.15)**	196.25 (3.90)**	182.82 (7.80)**
χ^2	234**	160**	118**	104**
N	1,816	1,353	1,628	737

^a Following a strategy suggested by Glantz and Slinker (1990), Age and Age-Squared have been centered (i.e., the mean age within each sub-sample has been subtracted from each observation of age) to avoid multicollinearity problems with age and age-squared

^b The omitted group in this sequence of dummy variables are those respondents who lived in the west

^c The omitted group in this sequence of dummy variables are those respondents interviewed in the summer. Note that because the sample was restricted to ATUS respondents who also participated in the March CPS Supplement, there were no respondents in the sample who were interviewed in the winter. Thus, if significant seasonal variations in household exist, we do not fully capture them (nor do Frazis and Stewart 2006). This same issue may exist in the TUESA data but because we do not know whether seasonal non-response was associated with the presence or absence of synthetic week data, we have no way of controlling for it in the TUESA regressions

^d The omitted group are those respondents who were married

^e The omitted group in this sequence of dummy variables are those respondents who identified themselves as White, Nonhispanic. Note that respondents who identified themselves as Asian, Native American, or Other were omitted from the sample

** $p < .05$

* $p < .10$

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