Essays on Divorce, Marriage, Time Allocation and Employment

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

Katherine Rose Genadek

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Elizabeth Davis

August 2012

ACKNOWLEDGMENTS

I would like to thank my dissertation advisor, Elizabeth Davis, and my committee members: Phyllis Moen, Colleen Manchester, Steven Ruggles, and Aaron Sojourner, for their helpful comments and feedback. I am also thankful for help and advice from supportive faculty at the University of Minnesota: Morris Kleiner, Ross MacMillan, Joseph Ritter, Eric Grodsky, Glen Meeden, Robert King, Kay Husbands Fealing and Elaine Tyler May. My research was also helped by my master's thesis committee members, Rob Fleck and Christina Stoddard, and my first research assistantships under Dean Lueck and Randy Rucker. I am so grateful to have worked under my Master's thesis advisor, Wendy Stock, because without her I would not have finished, or likely started, my dissertation.

Throughout my time at the University of Minnesota (UM), I have been fortunate enough to be a graduate assistant at the Minnesota Population Center (MPC) working on the IPUMS projects. This work was helpful for my research, and the community of employees and affiliates of the MPC could not have been more encouraging. It is bittersweet to pass on the dissertation dove – it has been good to me. I am especially thankful for the support from my managers, Cathy Fitch and Trent Alexander. I am also grateful for the financial support from the Minnesota Population Center and the UM Graduate School Doctoral Dissertation Fellowship.

The APEC labor economics dissertation support group (or Kristine West) was essential for my dissertation progress. I also received crucial data support and feedback from the Sarah Flood and additional members of the MPC's Time-Use Working Group. The informal interdisciplinary fellows writing workshop was great, thanks to Rachelle Hill and Margaret Charleroy. I would also like to acknowledge the participants at UM's Work, Family, and Time Workshop, the International Perspectives on Time Use conference, the Population Association of America Conference, the International Divorce Conference, and the MPC Seminar Series.

I am sincerely grateful for the support of all of my family, especially my husband, Erin Austin.

DEDICATION

This dissertation is dedicated to my late grandfather, Donald “Shorty” Layton, who studied time allocation more than fifty years before I did.

ABSTRACT

This dissertation consists of three essays in the areas of labor economics and economic demography. The first essay builds on previous research, which has analyzed the economic impacts of divorce using various methods and outcomes, and from this research it is clear that divorce has economic consequences for women. One consequence of divorce that has not been explored is changes time allocation. Time allocation, specifically time spent in leisure, is directly related to the well-being of individuals, and it is expected to change with divorce when time-use gains from joint household production are no longer realized. The results show that divorced women spend more time in market work, and less time in housework than their married counterparts. Divorced women with children are found to have less leisure time than married women, and divorced women are found to spend the same amount of time in primary childcare yet significantly less time with children while doing other activities. The second essay is on the decision to enter the labor force for women with children. This decision is based on a variety of factors that includes characteristics of spouses. Husband's work schedules, work hours, and flexibility of work time will play an important role in this decision to enter the labor force, and additionally, in the decision to work part-time or a set number of hours. This paper uses detailed time-dairy and work schedules data to investigate the relationship between husband's work schedules and maternal employment. The results show married women with children are less likely to participate in the labor force when their husbands finish work after 6:00pm when compared to husbands that finish work before 6:00pm, even while controlling for simultaneous relationship between husband's work stopping time and wife's labor force participation. Finally, the third essay of this dissertation analyzes the effect of state-level changes in divorce law on the time allocation of married men and women. The results show that married men's time allocation is not impacted by the change in divorce law, yet women are found to be spending more time in leisure and less time in household production in states with unilateral divorce law.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

This dissertation is collection of three essays on marital instability, time allocation, maternal employment and divorce law change. While the scope of the papers range from analyzing household dynamics to determining the effect of policy changes, all three essays are primarily focused on the economics of the family and more generally in the areas of economic demography and labor economics. Understanding how families and individuals allocate time and resources is the unifying theme behind these essays.

The three following chapters are: 1. "The Impact of Divorce on Women's Time Allocation", 2. "Spousal Work Schedules and Maternal Employment", and 3. "The Impact of Divorce Legislation on Time Allocation".

The first chapter investigates the impact of divorce on time allocation for women. With the large increase in divorce rates between 1950 and 2000, there has been extensive previous research on the economic impacts of divorce for women (Spain and Bianchi 1996, Waite 1995, Peters 1993, Holden and Smock 1991). Even with the possible plateauing of divorce rates over the past ten years, research on the outcomes of divorce continues as the United States currently has one of the highest divorce rates in the world. The previous research suggests that divorced has significant economic consequences for women, especially women with lower socio-economic status, and divorced women are consistently found to be working more than married women (Bedard and Deschenes 2005, Ananat and Michaels 2008).

An economic consequence of divorce that has not been considered is leisure time. The increased hours of work for divorced women must be associated with decreased hours spent in other activities, and this reallocation of time could impact the divorcee's well-being. This chapter builds on the previous research by examining the impact of divorce on the time allocation of women. In addition to time allocation outcomes, time spent with children is also examined. Previous research suggests time spent in childcare is related to children's intellectual and social development, thus time available to care for children has important consequences for children's outcomes.

The impact of divorce on the time allocation of married and divorced women is analyzed using the 2003-2010 American Time Use Survey (ATUS) data. The ATUS is a large, nationally representative time-diary survey in which respondents report what they were doing, where they were, and who they were with for a twenty-four hour period. The yearly dataset is cross sectional and only given to one person per household. Respondents' daily activities are segmented into four time allocation categories: market work, household production, leisure, and sleep. For the broad time allocation analysis, primary childcare is included in household production, but a supplementary analysis is performed for primary childcare, secondary childcare, and all time spent with children. Ordinary least squares regression (OLS) and propensity score matching (PSM) are used to estimate the impact of divorce on time spent in the four time allocation categories, as well as the impact of divorce on the supplementary childcare measure. All OLS and PSM analyses are performed using two model specifications; the first includes basic demographic characteristics, while the second also includes additional controls for employment and additional household members.

The results show divorced women, with and without children, spend more time in market work and less time in household production than married women, regardless of the estimation method or the model specification used. The specific activities that make up household production are also analyzed and show that divorced women are primarily cooking less than married women, followed by other types of core housework such as cleaning and laundry. Also, divorced women with children are found to be spending less time in leisure, while divorced women without children are not found to spend less time in leisure than married women. College educated mothers are also spending significantly less time each day in leisure than there married counterparts. The relationship between divorce and mothers' time with children show that divorced and married mothers are spending similar amounts of time in primary childcare. However, divorced women spend significantly less time with children while performing other activities than do married women.

The second chapter in this dissertation investigates the relationship between spousal work schedules and maternal employment. The beginnings of this essay were informed while overhearing women discuss their reasons for exiting the labor force. A reason cited was that with a husband's typical work schedule, he could not help get his son to soccer practice, so the wife left her job. While this is likely one of many reasons she decided to exit the labor force, it is possible that many women with children consider their husband's work schedule while making labor market decisions. This is not unreasonable following previous research that suggests dual-earner couples synchronize their work schedules, and dual-earner parents will desynchronize schedules for childcare purposes (Hammermesh 2002, Hallberg 2003, Jenkins and Osberg 2005, Barnet-Verzat et

al 2011). Building on the previous research, this paper estimates the effect of husband's work schedules on his wife's employment outcomes for couples with children.

Two datasets are used for to determine the effect of husband's work timing on his wife's labor force participation and usual hours worked. The first data source is the Current Population Survey's (CPS) May 2004 Work Schedules Supplement. This data includes detailed employment data from the monthly CPS, and information on the usual work schedules of respondents. The second data source is the ATUS, which is the same data used in the first chapter. Unlike the first chapter, in this analysis the wife is not the ATUS respondent. Rather, the husband is the diary day respondent, so his work stopping time is determined from the daily time diary and the wife's characteristics are obtained from the ATUS questionnaire and the final month of the CPS (from which the ATUS respondents are drawn).

Couple-level analyses of the time a husband stops working and the labor market outcomes of the wife are performed. Results from both single equation analyses and simultaneous equations models show that spousal work schedules do influence labor force participation and hours worked of married women with children. Having a husband that works past 6:00pm reduces the probability of the wife being in the labor force by between 16-28%. These results are robust to including controls for husbands' work starting time, usual hours worked, commuting time, flexible work hours and working from home. The simultaneous equations results are remarkably similar; for couples with children, the effect of a husband working past 6:00pm reduces the probability his wife is in the labor force by 17-23%. The reciprocal relationship is not found to be statistically

significant, so the wife's employment does not impact the work stopping time of the husband.

The analyses are also performed for dual-earner couples estimating the impact of husband's work stopping time on the usual weekly hours worked for working women with children. The single equation results for the hours worked analysis are less robust than the labor force participation results, but show that a husband working later is associated with working slightly fewer hours worked for the wife than if her husband finishes work earlier in the day. The simultaneous equation results are much more significant, and show that the impact of a wife working more hours prolongs the work day of the husband, and the husband working after 6:00pm decreases the hours worked of the wife by 2-3 hours per week.

Finally, the third chapter of this dissertation examines the adoption of unilateral divorce laws, which took place throughout the United States in the 1970s and 1980s, and the effect of this law on the time allocation of married men and women. There is an abundance of previous research investigating the effects of the adoption of unilateral divorce laws. Most of the research has focused on the how unilateral divorce effects divorce incidences and female labor supply (Peters 1998, Allen 1998, Wolfers 2006, Gray 1998, Genadek et al. 2007), yet research has found that unilateral divorce laws are associated with children's outcomes, domestic violence and investment in marriage-specific capital (Gruber 2004, Stevenson and Wolfers 2008, Stevenson 2007). There are a few studies that look directly at unilateral divorce and time allocation (Gray 1998, Parkman 1998). This paper adds to the previous literature on the effects of divorce laws

by examining whether men and women alter their time allocation in response to divorce law change.

The analyses in this paper use data from the American Heritage Time Use Study (AHTUS) for the years 1975-1976, 1992-1995. The data are from two separate studies, both of which included detailed time diaries for respondents, and some demographic information for respondents and household members they live with. Three empirical strategies are used with this data to analyze the impact of unilateral divorce law on five time allocation outcomes (hours in market work, home production, child care, leisure, and sleep) for married men and women. The three specifications are used to analyze unilateral divorce and time allocation, starting with a basic analysis that includes a binary indicator for living in a state with unilateral divorce at the time of the survey. The second analysis estimated the impact of unilateral divorce law combined with three different state level property laws, while the third method categorized states with unilateral divorce law by how long the law had been in place.

The estimates show that women in states with unilateral divorce law spent more time in leisure and less time in household production than women in states without unilateral divorce law, regardless of the underlying property law or the number of years the unilateral divorce law had been in place. In addition, most of the analyses show that unilateral divorce is not associated with changes in men's time allocation.

The three chapters of this dissertation have been presented and reviewed at various public venues. Helpful feedback was obtained at the Minnesota Population Center's Time-Use Working Group, University of Minnesota's Work, Family, and Time Workshop, the International Perspectives on Time Use conference, the International

Divorce Conference, Population Association of America Annual Meeting, and the Minnesota Population Center's Seminar Series.

All of the essays presented in this dissertation are fundamentally about time – time spent in market work, time spent with children, time spent in housework and time spent in leisure. One of the basic questions in labor economics is the choice between time spent in labor and leisure, and these essays examine a more complex version of that decision. This dissertation provides insights into the decisions that individuals and families make regarding the allocation of time, and the essays identify significant elements that influence time allocation decisions.

CHAPTER 2

THE IMPACT OF DIVORCE ON WOMEN'S TIME ALLOCATION

2-1 Introduction

Divorce rates have increased in the United States over the last 40 years, and single parenthood following divorce has become more common throughout this time. Previous research suggests divorce is associated with lower economic status for women. However, in terms of understanding the impact of divorce on the well-being of women and families, we should not simply look at income and assets, e.g., who gets the house and whether the woman re-enters the labor force. Changes in the availability of time and how it is allocated also affect well-being. Economists have often associated time spent in leisure and well-being (Dow and Juster 1985), and have found that inequality in leisure mirrors wage and expenditure inequality (Aguiar and Hurst 2007). This study investigates the impact of divorce on time allocation for women. In addition to time allocation outcomes including leisure, time spent with children is also examined. The time spent in childcare has been found to be related to children's intellectual and social development, thus time available to care for children has important consequences for children's outcomes (Hill and Stafford 1974, Del Boca et al. 2010).

The relationship between divorce and time allocation is analyzed using the 2003-2010 American Time Use Survey (ATUS) data, a nationally representative time-diary survey containing detailed information on what people are doing throughout the day. This complex data set provides the ability to identify the tradeoff between labor and

leisure following divorce. Respondents' activities are grouped into four time allocation categories: market work, household production, leisure, and sleep. Ordinary least squares regression (OLS) and propensity score matching (PSM) are used to estimate the impact of divorce on time spent in the four time allocation categories. The overall findings show that divorced women, with and without children, spend more time in market work and less time in household production than married women. Also, divorced women with children are found to be spending less time in leisure, while divorced women without children are not found to spend less time in leisure than married women. The relationship between divorce and mothers time with children is also investigated using these methods, and the results show that divorced and married mothers are spending similar amounts of time in primary childcare. However, divorced women spend significantly less time with children while performing other activities than married women.

2-2 Previous Research

In this paper the relationship between divorce and time allocation is investigated, and there are three areas of previous theoretical and empirical research reviewed that situate this study. The first area of research covered is on the economic consequences of divorce for women, as changes in time allocation following divorce is one of many economic implications of divorce. Research on time spent with children is also reviewed because daily time allocation impacts total time spent with children and this is an important outcome for parents. There is a large body of recent literature on family structure and the time spent with children, which provides insights into the time allocation of single women. Finally, there is a small amount of research on how household time allocation

varies across family structures. This literature will be reviewed because the effect of divorce on time allocation is building on the literature regarding changes in family structure and how people alter their time allocation.

Consequences of Divorce

Social scientists have been interested in the economic consequences of divorce for women as the prevalence of divorce increased over the past half of century. Using data from the Panel Study of Income Dynamics, Duncan and Hoffman (1985) and Weiss (1984) both found 30% declines in economic status for women following divorce. Weiss and Willis (1993) showed that lack of efficient transfers from husbands to wives following divorce reduces the economic status of divorced women. Studies have also compared divorced and married women using descriptive statistics. The studies generally show that married women are economically better off than divorced women (Spain and Bianchi 1996, Waite 1995).

The results from analyses of cross sectional data do not identify the causes behind the substantial economic differences between married and divorced women. Peters (1993) found that differing unobservable characteristics across married and divorced people are correlated with economic well-being, while Holden and Smock (1991) also found significant selection effects driving variation in economic well-being between divorced and married women. Thus, it is likely that if divorced women had stayed married, their economic situation may still be below their currently married counterparts. In order to understand the causal effect of divorce on economic outcomes for women, researchers have used instrumental variables techniques. Smock et al. (1999) used an

endogenous switching regression model with the National Survey of Families and Households data to simultaneously predict the probability of divorce and economic well-being following that divorce. They find that divorced women would be economically better off if they had remained married, but they would not be as well off as those that do remain married. More recently, Bedard and Deschenes (2005) and Ananat and Michaels (2008) used the sex of the first born child as an instrumental variable to control for selection into divorce. Both papers use the 1980 US census because the data contains information on age at marriage and age of children. Using this instrument in a two stage least squares model, Bedard and Deschenes (2005) found that divorced women have, on average, more income per person within the household than married women. To determine the effect of divorce across the income distribution, Ananat and Michaels (2008) utilize a Quantile Treatment Effect method. Their findings suggest that divorce results in very high income for some women, while divorce causes large declines in income for women at the lower end of the income distribution.

Following these results it is possible the lack of income loss found in some of the previous literature may occur because divorced women are increasing their time spent in the market for income. Bedard and Deschenes (2005) showed that divorce causes women to increase their hours in paid employment. It is possible these women are reducing time spent in leisure and other activities to increase the time spent in the labor force. Additionally, for women whose divorce causes a decline in economic status, they may change their time allocation habits with the reduction in income, such as cleaning instead of hiring a cleaning service. For these women divorce may also lead to a decrease in the time available for leisure activities and time spent with children.

Time Spent with Children

Time allocated to caring for children can be a large part of the day for parents, especially those with young children. Childcare time has been researched extensively as married women's labor force participation has increased over the last few decades, possibly reducing the time available for parental child care (Presser, 1989). Yet, previous research indicates time spent by mothers in child care has been increasing in recent decades (Bianchi et al. 2006, Sayer et al. 2004), and, similarly, time parents spend in child care has been rising sharply since the 1990s (Ramey and Ramey, 2010). While increases in childcare time are found on average, previous research suggests this is not the case for all parents. Ramey and Ramey (2010) demonstrated that highly educated parents drive the largest increases. Studies have also shown that single parents actually spend more time in primary childcare than married parents (Kalenkoski et al. 2007). However, research on passive childcare, or childcare as a secondary activity, have shown that single parents spend less time with children than married parents (Sandberg and Hofferth, 2001). Recent research by Kendig and Bianchi (2008) concludes that single mothers spend less time with their children than married mothers, but this difference is not found when socioeconomic status is controlled for in their model. The variation in the amount of time allocated to childcare across marital status suggests that the presence of children will have an effect on the time allocation of divorcees.

Household Time Allocation

Little research has been performed directly looking at structural changes within the household and how time is allocated. El Lahga and Moreau (2007) used German

panel data to study the transition from cohabitation to marriage. They find that once married, women specialize in home production and spend less time in leisure. Vernon (2010) investigated the time gains arising from marriage using OLS regression on the cross-sectional ATUS data. This analysis showed that married women gain about 30 minutes of daily leisure when compared to single women, and married men allocated more time to work and less time to home production when compared to single men. Following these findings, it is possible that the reverse holds and when women divorce, some of the time gains occurring from marriage will no longer be realized. This analysis will build on this household time allocation literature by analyzing union dissolution and time allocation.

2-3 Underlying Behavioral Model

To analyze the impact of divorce on mothers, consider a basic utility maximization model of a married woman's time allocation decisions. This model is based on theory developed by Becker (1965), Gronau (1977), and Connelly and Kimmel (2007). For women without children, individuals maximize household utility based on own time spent in leisure (t_{Lf}), husband's time spent in leisure (t_{Lm}), and household consumption goods (G):

(2-1) $\textit{maximize } U = U(t_{Lf}, t_{Lm}, G)$

Consumption goods are produced with purchased goods (X) and total time spent in home production ($t_{Hf} + t_{Hm}$). Utility is maximized subject to the following set of constraints, which includes a budget constraint and time constraints for both the wife and husband:

(2-2) Budget Constraint: $P_X X = w_f t_{Ef} + w_m t_{Em} + V$

(2-3) Wife Time Constraint: $T = t_{Ef} + t_{Hf} + t_{Lf} + t_{Sf}$

(2-4) Husband Time Constraint: $T = t_{Em} + t_{Hm} + t_{Lm} + t_{Sm}$

The household budget constraints include purchased goods (X) multiplied price of purchased goods (P_X) on the left hand side. This must be less thank or equal to total income, or the wages of wives and husbands (w_f and w_m) multiplied by their hours worked (t_E), respectively, and V the non-labor income the household receives. The daily time constraints are the sum of all time spent in market work (t_E), household production (t_H), and leisure (t_L), as well as time spent in personal care and sleeping (t_S). Solving this maximization problem leads to individual demand functions for the time allocation categories for women:

(2-5) $t_{Jf} = f(w_f, w_m, t_{Jm}, V \,|Z, O, D)$ *for* $J = H, E, L, S$

The demand for time spent in an activity for married women is based on their wage rate, non-labor income, wage rate of their spouse, and the amount of time spent in that activity by their spouse given characteristics of the wife, Z, characteristics of the household, O, and characteristics of the day, D. When a couple divorces, the wife's maximization problem changes because it no longer includes the husband's leisure and wages. Also, the non-labor income for the wife may change, and the characteristics of the household will change. The new maximization problem is:

(2-6) *maximize* $U = U(t_{Lf}, G')$

where $G' = G(t_{Hf}, X)$

Subject to the following set of constraints:

(2-7) Budget Constraint: $P_X X = w_f t_{Ef} + V'$

(2-8) Wife Time Constraint: $T = t_{Ef} + t_{Hf} + t_{Lf} + t_{Sf}$

The new demand for time of divorced women is:

(2-9) $t_{Jf} = f(w_f, V' | Z, O', D)$ *for J = H, E, L, S*

The expectation of the effect of divorcing on the time spent in activities is not clear from the model because of the changes in income and household characteristics. The loss of husband's wage would act as a reduction in household income, which may cause the wife to spend more hours in market work to remain at the same level of household income. Some divorce arrangements require income transfers between the spouses in the form of child support and alimony, and this will also change the amount of non-labor income in the household. The change in household characteristics, including the number of people within the household, will alter the demand for household goods (*G'*) and the demand for household production. According to the model, these changes in household composition will then impact the women's choice of time spent in market work and household production, yet the direction of this impact is not clear. This ambiguous prediction for time spent in market work and household production will also influence the amount of time available for sleep and leisure.

This utility maximization problem becomes more complex with the addition of children and childcare into the model. The parent's utility function includes child services (*CS*), which is comprised of childcare services and goods for children. Childcare

is also included in the time constraints for mother and father, and there is an additional constraint of child's time.[1] The effect of divorce on time spent in childcare in this model is also ambiguous. The lack of a clear prediction in this model occurs because in the child's time constraint, care must be given at all times. Thus, married parents can have two parents dividing the time necessary for childcare. In a one parent household, the parent may perform the childcare that would have been performed by their spouse solely, increasing the amount of time spent with the child. The single parent may also use childcare services performed by someone other than a parent, leaving their amount of time with children the same. It is also possible in this model that a divorced mother will reduce her time spent in childcare following a divorce because of the changes in her own time constraint. In addition to the time constraint changes following divorce, the utility function may also change as one parent's preferences for child services may be different than the combined preference of the couple.

This model shows that the change in family structure occasioned by divorce leads to direct changes in the time allocation behavior of individuals. Yet, the model does not provide clear predictions on how divorce will effect time allocation. The empirical examination of this underlying model will provide insight into the impact of divorce on time allocation by analyzing divorced women's time allocation decisions.

2-4 Data

The relationship between divorce and time allocation is empirically analyzed using data from the American Time Use Survey (ATUS). The Bureau of Labor Statistics collects

[1] For more information on the addition of children into the model see Connelly and Kimmel (2007) and Connelly and Kimmel (2010).

this nationally representative time diary survey, where respondents retrospectively report what activity they were doing, where they were, and who they were with for the previous 24 hours. Data are collected all days of the week, weekends are oversampled, and sample weights are used to correct for the survey design. ATUS response rates are over 50% for each year (Bureau of Labor Statistics and U.S. Census Bureau 2009), and recent research suggests that nonresponse bias in the ATUS is not problematic except in the case of volunteering (Abraham et al. 2009). In addition to the time-use data, the survey contains demographic and employment information for the respondent and their family members. The sample used for this analysis is restricted to female respondents that are married and living with their spouse, or are divorced and living without a partner, and are between the ages of 22 and 65. The final sample size is 29,668, and more than 20% of the sample respondents are divorced.[2] Table 2-1 reports the means for demographic characteristics of this sample by marital status.

The time diary data is used to create time allocation outcome variables, consisting of minutes spent in major activity categories throughout a day. Respondents' primary daily activities are classified into one of four areas: market work, household production, leisure, and sleep. Table 2-2 shows how the ATUS daily activity codes are distributed across the four allocation categories.[3] The activities are allotted to the time allocation categories based on previous research (Aguiar and Hurst 2007). All work related activities are included in market work. Household production refers to all work related to the home and family, and this includes cleaning, cooking, household maintenance and

[2] Separated respondents are not included with the divorced respondents because they look significantly different from the divorced respondents in regard to time allocation.
[3] Tables with the exact ATUS codes in each category are available upon request from the author.

caregiving for children and adults. Educational activities are also included in household production for this analysis. The leisure category contains all time spent relaxing, socializing, watching television, as well as time spent in religious activities and volunteering, and the sleep category combines sleep and personal care.

The mean daily minutes spent in the time allocation categories by marital status are presented in Figure 2-1. The graphs are broken down by weekday and weekend, and for women with and without children. As expected, the mean daily minutes show that on weekdays more time is spent in market work and less time is spent in leisure than on weekends. The figures also show that women without children spend less time in household production, which includes childcare, and more time in leisure than women with children. Married and divorced respondents also vary in their mean time allocation. For example, on weekdays divorced women without children spend on average 5.24 hours on market work and 3.19 hours on household production, while married women spend on average 4.76 hours on market work and 4.05 hours on household production. Similar average differences are found for women without children on the weekend days, and for women with children.

Previous research suggests childcare should be distinguished from household production and leisure (Connelly and Kimmel 2007). However, the average amount of time spent in childcare as a main activity is relatively small when compared to the amount of time spent in childcare while doing other activities, and previous studies have highlighted the importance of including passive care of children when measuring childcare (Folbre et al. 2005). In the ATUS, this type of childcare is called secondary childcare, and includes all time that the respondent reports taking care of a child under

the age of 13 while engaged in other activities.[4] In the time allocation analysis, primary childcare is included in household production, and a supplementary analysis is performed for childcare that incudes secondary childcare and total time with children. The total time spent with children is calculated separately using records from the ATUS that specify who was with the respondent for most activities during the day (excluding personal care, sleep, and market work). A benefit of using this measure is that it includes all time spent with children under age 18, unlike the secondary childcare measure.

Table 2-3 displays the mean daily hours spent in childcare or with children for parents with children under the age of 13 and 18.[5] Comparing married and divorced mothers, on average married women spend more time in primary childcare with their children than divorced women, regardless of day of week or age of children. This is also found when the 'total time with children' measure is used, and it is found for the secondary childcare measure for parents with children under the age of 13. However, these differences are likely explained by socioeconomic factors, as previous research has suggested (Kendig and Bianchi 2008). These factors will be controlled for in the empirical analysis.

[4] Primary childcare is identified in the ATUS when the primary activity is time spent caring for children and the child is under the age of 18. Secondary childcare is any time spent caring for children while performing for a different primary activity, yet secondary childcare is only calculated to childcare of children under the age of 13.

[5] For the analysis of children under the age of 13, the respondents with children are identified as those that live with own children in the household, and those that spend time with their own children living outside of the household that day. For the analysis of parents with children under the age of 18, these respondents are identified as those that live with own children under the age of 18, and those that have a child under the age of 18 that does not live in their household.

2-5 Empirical Strategy

In order to analyze the relationship between divorce and time allocation, ordinary least squares regression (OLS) and propensity score matching (PSM) are employed. Both of these methods control for variation in observable demographic and diary day characteristics in estimates of the difference between divorced and married women's time allocation. The demographic covariates controlled for include: age, race, education, number of children, and having children under age five. Four additional independent variables; year, season of the year, holiday, and geographic region, control for economic variation across years, diary day characteristics, and geographic variation in daily time use. These covariates are included in this base model and the full model, which also contains the following covariates: number of additional adults in the household, employment status, working part time and adjusted per-person family income[6]. Two models are used because the additional variables in the full model have been shown in previous research to be impacted by divorce. Women are more likely to be working, living with other family members, and have lower income following a divorce. The results from the base model are the total impact of divorce on time allocation, because it is not controlling for the variables that divorce affects itself. The full model controls for these attributes of divorced women, and thus provides time allocation results occurring in addition to the employment, household and income impacts of divorce.[7]

[6] Adjusted per-person family income is the reported income for the family divided by the square root of the number of people in the home. This measure is commonly used because it is similar to poverty measures that adjust for the declining marginal cost of having more people in the household.

[7] The sample size for the full model is smaller than the sample size of the base model because about 11% of respondents did not report family income and were not included in the analyses using the full model. The

The control variables are represented by X_i in Equation 2-10. The variable of interest is *divorced*, an indicator variable equal to 1 if the respondent is divorced. The dependent variable, Y_i, takes on the various time allocation measures.

(2-10) $Y_i = \beta_0 + \beta_1 divorced + \beta_i' X_i + e_i$

The coefficient on *divorced*, β_1, measures the number of daily minutes, more or less, that divorced people spend on average in an activity when compared to their married counterparts. The outcome time allocation categories are the same as the four categories described in the previous section: market work, household production, leisure, and sleep. Additional regressions are used to estimate the time spent in primary childcare, secondary childcare, and total time spent with children. All regressions are estimated separately for weekdays and weekend days.

Previous research suggests that married and divorced individuals are significantly different across observable characteristics (see Holden and Smock 1991, Bedard and Deschenes 2005). As shown in Table 2-1, in the sample used for this analysis, the divorced respondents are less likely to be Hispanic and less likely have gone to college. On average the divorced respondents are also older and have fewer children. With these differences in observable characteristics between the two groups, propensity score matching will produce more reliable estimates than the OLS analysis (Rosenbaum and Rubin 1983). The propensity score for divorce is generated using the probit model described in equation 2-11 with the same set of control variables that are used for the

---

composition of the smaller sample is similar to that of the full sample and summary statistics for this group can be obtained from the author.

OLS estimations. The PSM analyses are performed using the base model with the limited control variables and with the full model.

(2-11) $P(divorced_i = 1) = 1 - \Phi(-\beta_0 - \beta_i' X_i)$

Following the propensity score estimation, nearest neighbor matching with replacement is used to match divorced and married respondents. In order to balance the sample, observations are dropped where the estimated propensity score was less than the minimum estimated propensity score or higher than the maximum estimated propensity score of married respondent.[8]

2-6 Results

Time Allocation

Table 2-4 shows the results from the OLS and PSM estimates of the relationship between divorce and time allocation. The overall findings mirror the mean time allocation presented in section 4; even after controlling for differences in covariates, divorced women spend more time in in market work and less time in non-market work than married women. Most of the differences between divorced and married women in the time spent in market work and home production are statistically significant and occur for both weekdays and weekend days. The OLS results in column 1a of Table 2-4 show the coefficients on divorce from the estimation of the time allocation categories for women without children from the base model. The coefficients displayed in column 1b

[8] Table 2-13 shows the base model covariate means for the matched and unmatched samples for women without children on weekdays. The matching was similar across groups; most variable comparisons had large bias reductions following the matching. The matched sample characteristics for the remaining matched samples can be obtained from the author.

are the results from the full model, which includes controls for employment, income, and additional adults in the household. The results in column 1a show that divorced women work 42 more minutes per day then married women on weekdays and 26 minutes more on weekends. Divorced women's time spent in household production is almost 60 minutes less than married women on weekdays and 30 minute less on weekends. After controlling for employment characteristics, divorced women are still found to be working more, about 20 minutes, on weekends and weekdays and doing significantly less housework, 40 minutes on weekdays. Additionally, the full model shows that divorced women without children are actually spending 13 minutes more time in leisure and 14 minutes more time in sleep than married women without children.

The PSM estimates reported in Table 2-4 are the average treatment on the treated effect, with bootstrapped standard errors. The average treatment on the treated effect is the difference in outcomes (time allocation) between the divorced women and married women conditional on the control variables. This is called the treatment on the treated because the difference is estimated only for divorced individuals, and the married individuals that are most similar to them via propensity score matching, or what the divorced individuals would have looked like when they were married. The results are similar in magnitude to the OLS coefficients in the models, and in general the finding is the same; divorce is associated with less time in market work and more time in household production for women. The only variation between the two estimation strategies occurs in the full model (column 2b), where the PSM estimates show divorced and married women without children do not look significantly different from one another in terms of their time allocated to market work on the weekdays. However, this model continues to

show less household production for divorced women on weekdays, and divorced women are found to spend almost 20 minutes more in leisure and 15 minutes more in sleep on weekdays.[9]

The results for women with children are shown in columns 3a-4b of Table 2-4, and the findings show divorced women with children are working more and doing less home production than married women with children. The difference between married and divorced women's time spent in market work is much less when employment controls are added to the model (findings in columns 3b and 4b), yet divorced women with children are still found to be working almost 25 minutes more per day and doing less housework.[10] Unlike women without children, divorced women with children are found to be spending significantly less time in leisure than married women with children.

The overall results presented in Table 2-4 show that divorce is associated with more hours work for women, and less time spent in household production. While the decrease in household production is consistent across models and groups, the increase in time spent in market work declines with the addition of the employment control variables. These results are likely driven by the increased probability of divorced women to be in the labor force. As can be seen in the means presented in Table 2-1, in this sample 72% of divorced women are working, compared to 64% of married women. This variation between the two groups could affect the previous results because more married women will report zero hours of market work. This is addressed by performing the same

[9] The standard errors in the PSM analysis are consistently smaller than the standard errors in the OLS analysis. This suggests that the non-parametric approach of PSM, with the reduced sample size from matching, is more precise than the OLS analysis which is parametric and includes all the observations.
[10] The results from the PSM estimation with the full set of controls are not significant but the magnitudes are similar to that of the OLS estimation.

analysis for only women that are working and the results are presented in Table 2-5. For employed married and divorced women, the OLS results show that divorce is associated with about 20 minutes less home production for working women without children and almost 15 minutes less on weekdays. Employed divorced and married women look more similar in regard to hours worked, but the results show divorced women spending slightly more minutes in market work for women with and without children. There are no significant differences between the leisure and sleep between the employed divorced and married respondents.

Across models and groups, divorced women are consistently doing significantly less household production than their married counterparts. The ATUS provides detailed information on the time spent in activities throughout the day; thus it is possible to look more closely at the difference in household production and find which activities the divorced women are spending less time in. Table 2-6 shows the OLS coefficients for regressions estimating the minutes spent in the specific household production activities.[11] The analysis shows that across groups and days of the week, the household production difference is primarily driven by time spent cooking. After controlling for demographic and economic characteristics, divorced women with and without children do 15-20 minutes less cooking per day than married women. On weekdays, divorced women with and without children also do significantly less cleaning, laundry, and shopping than married women.

[11] The household production activities with the greatest amount of time spent on them (on average) were selected for the outcome activities, the other category includes the household production activities with smaller amounts of time spent in them, on average. These activities include: interior maintenance, exterior maintenance, law care, pet care, vehicle care, appliances, household management, household services, and other services.

Educational Attainment and Time Allocation

The findings from the time allocation analysis generally show that divorce is associated with more time spent in market work and less time in household production. The results also show that women without children actually have more time to devote to leisure and sleep when divorced, while divorced women with children are spending less time in leisure than married women. Following previous research that has found divorce impacts women differently depending on their socioeconomic status (Ananat and Micheals, 2008), the analysis is performed by educational attainment categories. Table 2-7 shows the OLS coefficients for the time allocation outcomes for those with less than a high school diploma[12], high school graduates and those with some college (including associates and vocational degrees), and those with a bachelors' degree or more education. This analysis is performed for women with and without children, and columns 1a and 2a do not include the employment controls, while columns 1b and 2b are the coefficients on divorce from the full model.

For women with less than a high school education, divorced women with and without children are devoting between 30-90 minutes less on household production depending on the day and model. This difference is larger than the average effect found for the total group. The divorced women with children in this educational category are also found to be spending 45 more minutes to sleep and personal care than the married women with children.

[12] The 'less than high school' category contains those with a GED following research that suggests GEDs have similar outcomes to high school dropouts, and sensitivity analysis with the ATUS suggests that those with a GED are more similar to respondents with less than high school than others.

Unlike the findings for women with less than a high school degree, the divorced high school and college graduates are found to be devoting significantly more time to market work than married high school and college graduates. The coefficients are especially large for both groups for women with children on weekdays. The negative coefficient on household production is found across these two groups as well, but the difference is smaller in magnitude for the college educated group. Also, the divorced college graduates are spending significantly less time in leisure than their married counterparts.

The results by education groups show that divorced women do less household production than their married counterparts. These results also suggest that divorce impacts the time allocation of women differently based on educational attainment. The largest time allocation differences, across time allocation categories, are found for the most educated women. This result is similar to the findings of Ananat and Micheals (2008) that suggest women making more income are less likely to be disadvantaged by divorce. The time allocation results show that the divorced women with more education, spend much more time working than their married counter parts, likely sustaining their economic status. These women are forgoing leisure time and home production time in order to work more.

Time with Children

The time allocation analysis included primary childcare in household production, but as discussed previously, childcare is different from other forms of household production because parents value caring for children. Section 2-3 showed the impact of

divorce in the underlying behavior model, which suggests that a spouse leaving the household will impact the amount of time devoted to childcare. The direction of this impact is not clear from this model. Childcare can also be performed while doing other activities, thus as divorced mothers change their allocation of time across activities, this will also impact time spent with children. Table 2-8 displays the results from the analysis of divorce and time spent with children for a restricted sample of respondents with children under the age of 13 and with children under the age of 18. The overall findings are similar to what previous research has found; divorced and married women do not look different from one another in terms of the amount of time spent in primary childcare. The only statistically significant differences between divorced and married women are found in the OLS estimation of the full model for mothers with children under the age of 13. Divorced mothers are found to spend 10 minutes more with their children on weekends the married mothers. For women with children under the age of 18, the model without employment controls shows that divorced women are spending 10 minutes less with their children in primary childcare activities on weekdays. However, once the controls for employment are added to the model this finding is reversed and divorce women spend 10 minutes more with their children on the weekend days. The PSM estimates do not show any significant differences between divorced and married mothers, thus the findings overall show very little differences in the primary time devoted to children across marital status.

The results for secondary childcare and total time with children show that, even after controlling for demographic and economic differences, divorced women with children under the age of 13 spend less time in with their children than married women.

Specifically, the OLS and PSM results in columns 1b and 2b of Table 2-8 show that divorce is associated with about 40 minutes less time spent in secondary child care for women on weekdays and 95 less minutes of secondary childcare on weekend days. The differences in total time with spent with children are not as large as the findings for secondary childcare, and the differences in total time with children on weekdays are not statistically significant with the full model. The results do show that divorced and married women spend significantly different amounts of time with their children, especially on the weekends when divorced mothers spend between 40-75 minutes less with their children than married women.

The results for childcare are consistent with the time allocation analysis because time spent in household production is conducive to secondary childcare. The findings for childcare are also consistent with previous research; on average, divorce and married women are spending the same amount of time in primary childcare, and married women spend more time in secondary childcare than divorced women.

Recent Divorcees

The ATUS data does not contain information on respondents' marital histories, thus it is not possible to distinguish between women who have been divorced for many years and those who were divorced in the past few years.[13] It is likely that the time allocation decisions of recent divorcees are different than that of long-term divorcees. To address this issue, recent divorcees are identified and compared to married respondents, and to long-term divorcees, using the Current Population Survey (CPS).

[13] It is also not possible to distinguish between first and second marriages.

The ATUS sample is drawn from the CPS participants. The CPS is a household survey of the civilian, noninstitutionalized population, and it includes basic demographic and employment information on a monthly basis. The households are surveyed for four continuous months, followed by an eight-month break, and then are surveyed for an additional four months. Two to five months following their exit from the CPS, a respondent may be asked to participate in the ATUS. The sampling structure of the ATUS and the CPS allows for the creation of a panel data set consisting of up to 8 months of CPS data and a time-use diary for ATUS respondents.[14] This panel only contains one time diary per respondent, and that time diary is always taken after the completion of the CPS. This sample is used to identify and analyze respondents who have remained married, remained divorced, or divorced from their spouses over the CPS panel.[15]

The percent of the total matched ATUS-CPS sample that divorced over the CPS panel period is 0.5%. This is smaller than the estimates form the 2009 American Community Survey (ACS), which asked respondents if they were divorced in the last year[16]. The difference is expected because the divorced couples where both spouses moved out of the residence would not be captured in this sample.

The CPS and ATUS panel allows for the analysis of individuals who have divorced within 18-21 months. To further understand the effect of divorce on time

[14] The household nature of the CPS creates a sample of non-movers, thus a household is in the survey for up to eight months, but the survey does not follow the individuals that move out. Rather, information is collected on the new members of the household.
[15] Sample characteristics for the respondents that have remained married, remained divorced, or divorced from their spouses over the CPS panel are in the Appendix Table 2-12.
[16] Using IPUMS-ACS data, the estimated percent of the female population that of divorced in the last year are 1.4% (Ruggles et al 2010).

allocation, PSM estimation is used to compare the recently divorced women to married women and to the respondents who have been divorced for at least 18-21 months.[17] In both analyses, the reference category is the recently divorced. The PSM estimation followed is the same as that used with the full ATUS sample, and the model is described in section 2-5. The probit model in equation 2-11 is used to estimate the propensity to divorce, and the control variables from the base model and the full model are also used in this analysis.

The results for the PSM estimation for the recently divorced sample are presented in Table 2-9. This analysis combines women with and without children because of the small sample sizes, and the time allocation results of recently divorced women compared to married women are presented in columns 1a and 1b. The overall finding is similar to that of all divorced women on weekdays; divorced women spend more time in market work and less time in household production. However, in this analysis most of the differences are not statistically significant in either the base model or the full model, which is likely caused by the small sample size. The results for weekends show that recently divorced women are spending considerably less time in leisure than married women, and this was not the case for all divorced women. The difference between divorced and married women when estimating time spent in leisure on a weekend is -76.81 minutes, and when the employment controls are added the difference is no longer statistically significant, yet the difference is still almost an hour.

[17] The sample of recently divorced women is so small compared to the number of married and long term divorced women that OLS is not used for this analysis.

The PSM results for the analysis matching the recently divorced to the longer term divorcees is presented in columns 2a and 2b of Table 2-9. Again, most of the results are not statistically significant, but this is most likely due to the small sample sizes. The differences between the two groups are large in magnitude for household production and leisure, which show that recent divorcees do more household production, especially on weekends, than the long-term divorcees. They also spend less time in leisure than women who have been divorced for more than 18 months, yet the differences are not statistically significant. Additional research is needed with larger sample sizes to confirm these results.

2-7 Instrumental Variables Analysis

The methods used in this paper to analyze divorce and time allocation control for variation in observable characteristics across married and divorced respondents. However, there may also be unobservable differences between married and divorced respondents driving the variation in the time allocation behavior. In order to control for these unobservable differences, and attempt to estimate the causal effect of divorce on time allocation, analyses using instrumental variables methods are performed. Instrumental variables methods account for possible reverse causation between the dependent variable (time allocation) and the independent variable of interest (divorce) by instrumenting for the endogenous variable (divorce). Sex of first born child is an instrument that is often used for divorce, as couples with a female first born child are more likely to get divorced than couples with male first born children. This instrument is problematic for this analysis for a few reasons; the most important being time allocation

is the outcome of interest. The previous research using sex of first born child as an instrumental variable used income as the outcome, and sex of children is not related to earnings. Time allocation, on the other hand, is affected by the sex of children because single mothers spend more time with female children (Lundberg et al 2007). Instruments must satisfy two criteria in order to provide valid results, the first is that the instrument must have a strong relationship with the endogenous variable (divorce) and it must not be correlated with the error term of the original regression estimation. While sex of first born child does not qualify as a valid instrument, three different instruments will be used independently for this analysis. These instruments are state political climate (Republican or Democrat voting majority), county-level divorce rates, and smoking status. The instruments are discussed below, and the results from the instrumental variable analyses are presented.

The first instrument used is the state-level voting majority, which is either Republican or Democrat. Previous research suggests that people are more likely to get divorced in states that are more conservative (Lesthaeghe and Neidert, 2006). The state level political categorization is performed using the state's presidential voting from 2004.[18] The first stage analysis, presented in Column 1 of Table 2-10, shows that women living in a Republican voting majority state are 1.6% more likely to be divorced in the sample from weekdays. The weekend sample shows that living in a red state is associated with a .4% greater likelihood of being divorced, yet this result is not statistically significant. The F-test statistic for the first stage of the weekday results is

[18] The state political categorization was done using all presidential elections from 1992-2008. The categorization from 2004 had the strongest relationship to divorce and was during the ATUS time frame, yet the other red states from the other elections were also associated with a greater probability of being divorced.

4.07 with P-value of 0.044, which suggests that the instrument is possibly weak. The F-test statistic for the weekend sample is very small, and this combined with the first stage results suggest that this instrument is weak.[19] Weak instruments will bias the results and the results may not be consistent. However, for comparison purposes, the analysis will be performed.

County-level divorce rate is the second instrument used in this analysis. The ATUS data does not actually include the county of residence, but this information is available in the CPS for some of the respondents. The county is only identified for respondents living in a county with a large enough population and enough sample members residing in it to not violate confidently constraints of the public data. Thus, the ATUS respondents were linked back their final CPS interview and county was obtained about 45% of respondents. The county-level divorce rates were obtained from the National Center for Family and Marriage Research. The divorce rates were collected by contacting individual counties and retrieving actual divorce rates for the year 2000.[20] For this analysis, the adjusted divorce rate provided is used, which is the number of divorces per 1000 marriages.[21] The divorce rate data is not complete, although more than 90% of counties have divorce rate information. Respondents living in counties that did not provide divorce rate information were not included in the analysis. The relationship between the county-level divorce rates and the likelihood of divorce is shown in the first stage results presented in column 2 of Table 2-10. The first stage analysis does show a

[19] The C-D F-statistic and the Stock-Yogo tests confirm that this instrument is weak, but the K-P LM-statistic does show that the equations are identified.
[20] Divorce rates are currently not collected at a national level. See Ruggles and Kennedy (2011) for more information on divorce rates.
[21] The analysis was also performed using the crude divorce rate, which is the number of divorces per 1000 people.

relationship between the county-level divorce rate and divorce incidence in the weekday sample, specifically a 1% increase in the divorce rate increases the likelihood of divorce by 2%. The F-test statistic is 4.56 with a P-value of 0.033. Similarly, the C-D F-statistic of 2.82 and the Stock-Yogo weak identification test suggests that the instrument is not weak, but not particularly strong. For the weekend sample, the county-level divorce rate instrument is weak. The second requirement for valid instrument is not possible to test – that the instrument is not correlated with the error term in the original analysis. For county-level divorce rates, there is no reason to believe that this would be correlated with the error term in the time allocation analysis because theoretically it should not be related to time allocation decisions.

Finally, the third instrument used for this analysis is smoking status. There is some previous research suggesting that smoking is related to increases in the probability of divorce (Doherty and Doherty 1998). The ATUS does not contain information on smokers or history of smoking. However, there is a supplement to the CPS called the Tobacco Use Supplement (TUS) that was given in three months of the CPS between 2002 and 2005. Thus, some of the ATUS respondents were also respondents in the TUS supplement. The ATUS data was merged with the CPS TUS supplement data and only the respondents in both samples were retained for this analysis.

The first requirement for a valid instrumental variable is easily shown with the first stage results presented in Column 3 of Table 2-10. The first stage analysis shows a strong relationship between smoking and divorce; smokers are 9.9% more likely to be divorced than nonsmokers in the weekday sample, and in the weekend sample smokers are 14% more likely to be divorced. The data is cross sectional, so it is possible that

divorced women began smoke after divorcing. In order to account for this possibility, the sample is limited to people who started smoking in their teens and early 20s and to those who have never been smokers. Because there is not information about marital histories, the measure using the age the respondent started smoking is not perfect, but it is likely that most of the women in this sample were smoking prior to marriage and divorce.

While smoking is not randomly assigned across individuals, it does not appear to be related to the outcome variables of interest: market work, leisure and sleep. Intuitively, while smoking may affect how many breaks a person takes at work, it will likely not affect time allocation when looking at these large groups of activities. Empirically, this second requirement was tested using a method described by Levitt (1996) where he uses longitudinal data to show that the current instrument should not predict a previous outcome. Using the longitudinal nature of the ATUS/CPS panel, usual hours worked last week is predicted from the most recent CPS with the indicator of smoking. This analysis shows that smoking does not predict hours worked. This is only one of the four outcomes, but smoking status was also added to the original equations to see the impact on divorce. For market work and sleep hours, smoking status does not seem to be related to the outcomes. This does not prove the second part of validity for the instrument, but it does give some indication that smoking may not be related to the error of equation estimating market work and sleep. The relationship between smoking and household production, as well as leisure, is less clear. The analysis with smoking status in the original estimating equations show that smoking is weakly associated with a fifteen minute decrease in time spent in household production and the equivalent increase in time spent in leisure. This may be driven by time spent with children, where smoking

has been found to be related to the amount of time mothers spend with children (Pabilonia and Song 2011).

The results from the instrumental variable analyses are presented in Column 3 of Table 2-11. Each instrument was used in an independent analysis, estimated using maximum likelihood methods.[22] For market work, the results are similar to the previous findings; divorce increases the number of minutes women spend working each day. This is estimated to be between 22 and 32 minutes depending on the sample day and the analysis. The results are also similar for leisure and sleep time, with most analyses suggesting no statistically significant relationship with divorce. The most interesting finding, across all of the instrumental variable analyses, is the large effect of divorce on household production. In contrast to the previous findings, each of these analyses show divorced women spending 200 minutes more in household production than married women on weekdays. As mentioned, this result is consistent across the analyses, but it does not seem consistent with the other time allocation outcomes. While the minutes spent across the four activities do not always add up to the total minutes per day (1440), most get very close. It is not realistic for divorced women to be spending almost three hours more per week day in household production, and not be spending significantly less time in the other time allocation categories than married women. This result may be a byproduct of the poor instruments, or driven by outliers.

In conclusion, the instrumental variable analysis supports the previous findings for the market work, leisure, and sleep outcomes. The political state and county-level divorce rate instruments were weak in some of the samples (weekends in particular), and

[22] The Stata treatreg command was used for this estimation.

the smoking instrument may be correlated with the error of the time allocation analysis with some of the outcomes (household production and leisure). Future research could include better instruments to test for a causal relationship between divorce and time allocation.

2-8 Conclusion

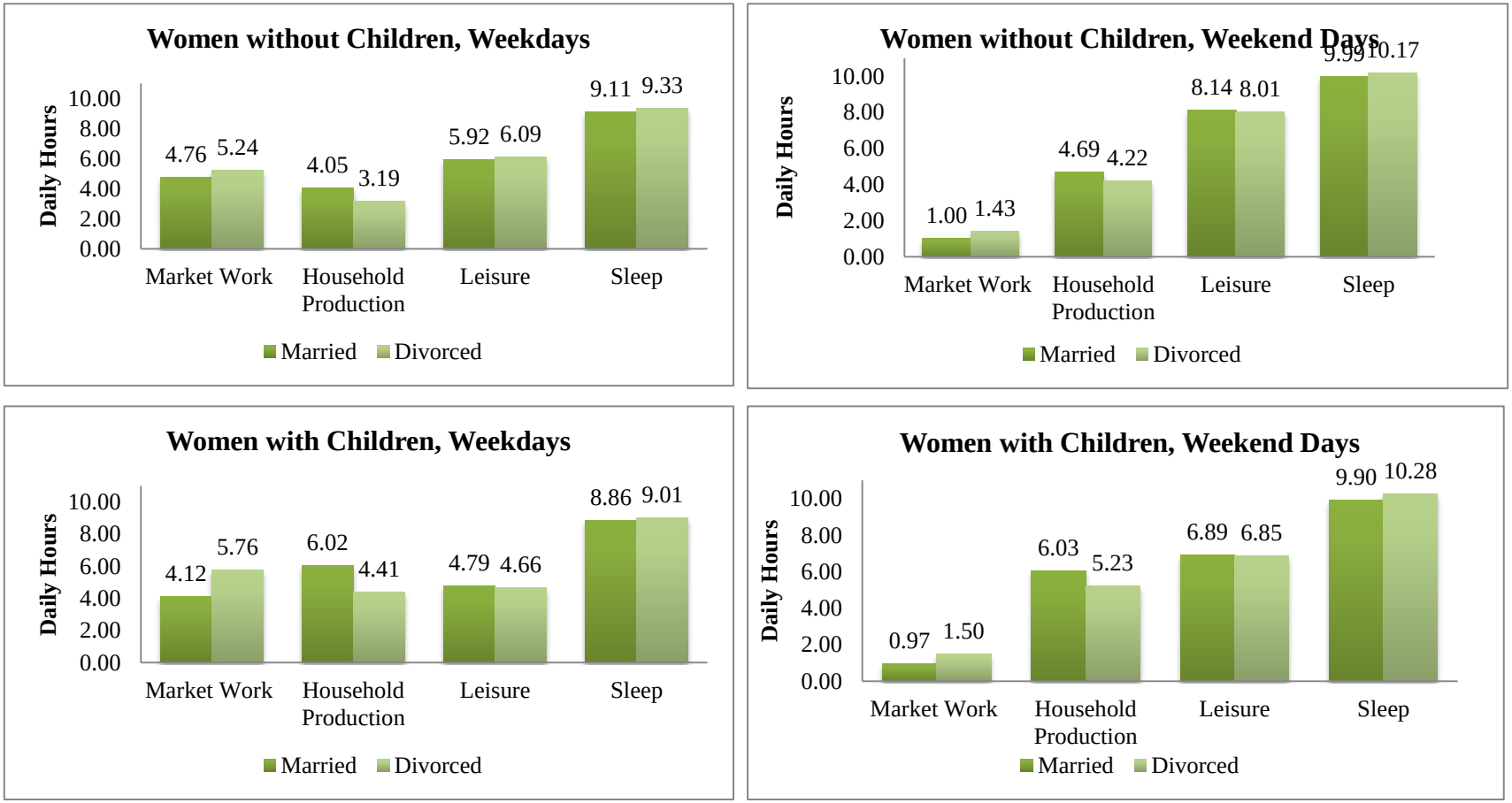
There is an abundance of previous research examining the economic impacts of divorce for women. This study contributes to this literature by analyzing the impact of divorce on time allocation and time spent with children, providing insight into the labor leisure trade-off for divorcees. Using time diary data from the ATUS, OLS regression and PSM estimation are used to compare four time allocation outcomes (market work, household production, leisure, and sleep) across married and divorced women. These estimation strategies control for differences in demographic characteristics, household composition, geography, diary day characteristics, and economic characteristics between divorced and married women. The data and methods are also used to measure differences in time spent in childcare by marital status.

The empirical results suggest that divorced women spend more time in market work and less time in household production than married women. Divorced women with children are also found to have slightly less leisure time than married women with children, and college educated divorced mothers are spending around 30 minutes less each day in leisure than there married counterparts. Time spent in childcare as a primary activity does not vary by marital status for women with children, yet married women are spending much more time in passive child care than divorced women.

These results highlight the importance of considering time outside of market work when evaluating the consequences of divorce for women. Women clearly devote more hours to work following a divorce, and this increases their economic well-being in terms of income, but corresponds to declines in leisure for some women. However, most women reduce hours in home production in order to spend more time at work and do not change the amount of time they are spending in leisure.

2-9 Figures

Figure 2-1. Daily Time Allocation for Women with and without Children



2-10 Tables

Table 2-1. ATUS respondent characteristics for married and divorced women

	Married	Divorced
Age	42.9	48.7
White, non-Hispanic	0.752	0.686
Black, non-Hispanic	0.065	0.172
Other, non-Hispanic	0.055	0.036
Hispanic	0.128	0.106
Less than High school	0.078	0.087
GED/HS Degree	0.255	0.271
Some College	0.285	0.363
College/Advanced Degree	0.382	0.279
Children in household	0.666	0.422
Number of children	1.299	0.702
Children under age 5	0.286	0.080
Number of additional adults	0.218	0.302
Employed	0.638	0.716
Work part time	0.204	0.122
Family Income	72,406	37,842
Number of Observations	26,338	6,939

Source: Authors' calculations from ATUS data from 2003-2010 obtained from ATUS-X (Abraham et al. 2008). Sample includes all married and divorced female respondents between the ages of 22 and 65. Family income is calculated as the midpoint between reported intervals.

Table 2-2. Time Use Measures

Time Allocation Measures

Market Work	working, work related activities travel to work
Household Production	cleaning, cooking, consumer purchases, caregiving, primary childcare, household maintenance, household services, educational activites
Leisure	socializing, relaxing, eating, entertainment, sports, volunteering
Sleep	sleep, personal care

Childcare measures

Primary Childcare	main activity is caring for childcare
Scondary Childcare	time spent caring for children under the age of 13 while engaged in other activities
Total time with children	reported own children were present during most activities

Table 2-3. Weighted Average Daily Hours Spent in Childcare for Women with Children

	Children under 13				Children under 18			
	Weekday		Weekend		Weekday		Weekend	
	Married	Divorced	Married	Divorced	Married	Divorced	Married	Divorced
Primary Childcare	2.62	2.00	1.89	1.36	2.26	1.54	1.61	1.11
Secondary Childcare	5.98	4.56	9.17	7.51				
Total Time with Children	6.49	4.81	8.49	6.76	5.88	4.06	7.96	5.78

Source: Authors' calculations from ATUS data from 2003-2010 obtained from ATUS-X (Abraham et al. 2008). Sample includes all married and divorced female respondents. Secondary child care includes all time spent in child care while performing other activies, and total time spent with children is calculated from respondents reports of who they were with throughout the day.

Table 2-4. Estimates of the relationship between divorce and daily time allocation relative to married respondents.

	Women without Children								Women with Children							
	Ordinary Least Squares				Propensity Score Matching				Ordinary Least Squares				Propensity Score Matching			
	Base Model		Full Model		Base Model		Full Model		Base Model		Full Model		Base Model		Full Model	
	1a		1b		2a		2b		3a		3b		4a		4b	
Market Work																
Weekday	42.00 ***	(8.34)	17.17 ***	(6.34)	53.11 ***	(14.86)	-1.79	(12.50)	70.26 ***	(9.92)	23.52 ***	(8.16)	52.16 ***	(15.30)	26.46	(16.93)
Weekend	26.04 ***	(5.77)	21.53 ***	(6.19)	27.12 ***	(7.88)	16.04 *	(8.92)	24.51 ***	(7.17)	9.24	(7.38)	23.22 **	(7.87)	2.31	(11.09)
Household Production																
Weekday	-55.34 ***	(5.59)	-42.28 ***	(5.86)	-53.02 ***	(8.76)	-32.65 ***	(9.18)	-58.72 ***	(7.19)	-25.95 ***	(6.86)	-46.28 ***	(8.85)	-20.83	(12.04)
Weekend	-28.79 ***	(6.19)	-25.68 ***	(6.81)	-39.33 ***	(7.46)	-10.55	(10.21)	-18.70 ***	(6.83)	-10.25	(7.54)	-9.08	(9.80)	1.69	(9.51)
Leisure																
Weekday	4.16	(6.34)	12.86 **	(6.23)	-5.36	(8.73)	19.79 **	(8.37)	-15.75 **	(6.97)	-5.25	(6.86)	-14.52	(8.95)	-9.87	(9.77)
Weekend	-6.10	(6.90)	-1.68	(7.63)	0.08	(7.51)	-9.43	(10.43)	-19.30 ***	(7.10)	-11.22	(7.88)	-14.48	(11.07)	-18.62	(10.89)
Sleep and Personal Care																
Weekday	10.66 **	(4.58)	14.05 ***	(5.04)	7.70	(4.97)	14.44 **	(6.37)	6.23	(5.31)	8.32	(5.64)	10.82	(6.93)	4.90	(7.13)
Weekend	9.49 *	(5.16)	6.72	(5.67)	12.62 *	(6.80)	4.77	(7.87)	15.82 ***	(5.57)	14.55 **	(6.00)	-0.21	(8.98)	16.80 *	(7.14)

Notes: All columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. The analysis in columns 1a, 2a, 3a, 4a are the base model which includes controls for age, race, educational attainment, number of children, children under age 5, region, season, year, and holiday. The anlaysis in columns 1b, 2b, 3b, 4b are the full model which also includes controls for number of aditional adults in household, employment status, part time employment, and adjusted per person family income. N=6,196 in Column 1a in Weekday rows, and N=6,894 in Column 1a in Weekend rows. N=5,993 in Column 1b in Weekday rows, and N=6,041 in Column 1b in Weekend rows. N=9,600 in Column 3a in Weekday rows, and N=9,387 in Column 3a in Weekend rows. N=8,653 in Column 3b in Weekday rows, and N=8,691 in Column 3b in Weekend rows. Robust standard errors are in the parenthesis. Columns 2 and 4 include only propensity score matched married and divorced respondents. N = 3,685 (divorced N=2,194) in Column 2a in Weekday rows, and N=3,695 (divorced N=2,177) in Column 2a in Weekend rows. N = 3,131 (divorced N=1,907) in Column 2b in Weekday rows, and N=3,152 (divorced N=1,928) in Column 2b in Weekend rows. N = 2,326 (divorced N=1,264) in Column 4a in Weekday rows, and N=2,377 (divorced N=1,300) in Column 4a in Weekend rows. N=1,954 (divorced N=1,135) in Column 4b in Weekday rows, and N=2,012 (divorced N=1,167) in Column 4b in Weekend rows. Boot strapped standard errors of PSM estimates are in the parenthesis.

*p<.10; **p<.05; ***p<.01

Table 2-5. Estimates of the relationship between divorce and daily time allocation relative to married respondents for employed women.

	Women without Children				Women with Children			
	Ordinary Least Squares		Propensity Score Matching		Ordinary Least Squares		Propensity Score Matching	
	1		2		3		4	
Market Work								
Weekday	15.95 *	(8.70)	9.15	(11.05)	21.86 **	(10.38)	32.20	(16.65)
Weekend	30.92 ***	(8.86)	34.07 ***	(9.66)	11.69	(9.76)	-7.04	(13.44)
Household Production								
Weekday	-21.88 ***	(5.76)	-7.74	(7.93)	-13.41 *	(7.18)	-17.89	(12.77)
Weekend	-21.13 ***	(8.01)	-21.72 *	(11.06)	-7.00	(8.46)	21.70	(12.79)
Leisure								
Weekday	3.51	(6.40)	-2.72	(7.65)	-6.73	(6.98)	-5.07	(9.90)
Weekend	-12.42	(8.50)	-12.67	(10.53)	-10.29	(8.70)	-21.69	(13.15)
Sleep and Personal Care								
Weekday	3.27	(4.84)	0.94	(5.36)	-1.86	(5.74)	-8.39	(6.70)
Weekend	3.49	(5.70)	0.27	(7.84)	6.23	(5.99)	4.89	(8.51)

Notes: All columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. The analysis in all columns are the full model which includes controls for age, race, educational attainment, number of children, children under age 5, region, season, year, holiday, aditional adults in household, part time employment, and adjusted per person family income. N=3,999 in Column 1 in Weekday rows, and N=3,915 in Column 1 in Weekend rows. N=5,661 in Column 3 in Weekday rows, and N=5,919 in Column 3 in Weekend rows. Robust standard errors are in the parenthesis. Columns 2 and 4 include only propensity score matched married and divorced respondents. N=2,143 (divorced N=2,119) in Column 2 in Weekday rows, and N=2,194 (divorced N=1,320) in Column 2 in Weekend rows. N=1,527 (divorced N=895) in Column 4 in Weekday rows, and N=1,557 (divorced N=904) in Column 4 in Weekend rows. Boot strapped standard errors of PSM estimates are in the parenthesis.

*p<.10; **p<.05; ***p<.01

Table 2-6. OLS Estimates of the relationship between divorce and daily time spent in household production activities relative to married respondents.

	Women without Children				Women with Children			
	Weekday		Weekend		Weekday		Weekend	
	1		2		3		4	
Cooking	-19.87	*** (1.87)	-17.60	*** (2.21)	-16.13	*** (1.95)	-14.49	*** (2.37)
Cleaning	-10.40	*** (2.14)	-0.11	(3.47)	-5.85	** (2.78)	3.17	(3.89)
Laundry	-4.12	*** (1.44)	-4.97	*** (1.70)	-6.07	*** (1.77)	-3.07	(2.41)
Shopping	-4.53	*** (1.63)	-2.26	(2.48)	-3.99	*** (1.51)	-7.80	*** (2.39)
Caregiving	-3.17	(2.54)	-3.64	(2.23)	-0.51	(3.62)	6.87	* (3.88)
Travel	-2.55	* (1.39)	-1.72	(1.76)	2.77	(2.02)	2.57	(2.22)
Other	3.56	(2.73)	4.93	(3.39)	4.66	* (2.51)	4.74	(3.55)

Notes: All columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. The analysis in all columns are the full model which includes controls for age, race, educational attainment, number of children, children under age 5, region, season, year, holiday, aditional adults in household, employment status, part time employment, and adjusted per person family income. N = 5,993 in Column 1, N=6,041 in Column 2, N = 8,653 in Column 3, and N=8,981 in Column 4. Robust standard errors are in the parenthesis.

*p<.10; **p<.05; ***p<.01

Table 2-7. OLS Estimates of the relationship between divorce and daily time allocation relative to married respondents by educaiton level.

	Women without Children				Women with Children			
	Base Model		Full Model		Base Model		Full Model	
	1a		1b		2a		2b	
Less than High School								
Market Work								
Weekday	39.08	(25.62)	11.62	(13.86)	37.95	(29.35)	3.47	(22.10)
Weekend	11.20	(14.38)	9.28	(13.60)	10.51	(17.98)	5.34	(14.52)
Household Production								
Weekday	-68.18 ***	(17.59)	-49.35 **	(19.28)	-88.45 **	(23.29)	-50.26 **	(23.11)
Weekend	-52.33 ***	(17.71)	-43.73 **	(20.32)	-28.43	(20.45)	-36.32	(22.32)
Leisure								
Weekday	20.61	(21.31)	25.94	(21.38)	3.28	(23.32)	-5.62	(23.00)
Weekend	28.93	(18.53)	27.84	(20.93)	-5.39	(20.99)	-4.86	(22.90)
Sleep								
Weekday	9.41	(17.45)	9.19	(19.56)	44.01 **	(19.96)	48.31 **	(19.78)
Weekend	15.77	(14.89)	10.36	(16.69)	20.58	(20.94)	31.61	(21.40)
High School Graduate, Some College								
Market Work								
Weekday	43.48 ***	(10.85)	17.73 **	(8.03)	68.98 **	(13.05)	14.09	(11.11)
Weekend	32.32 ***	(7.61)	29.31 ***	(8.41)	29.01 **	(9.83)	10.48	(10.61)
Household Production								
Weekday	-60.69 ***	(6.96)	-45.77 ***	(7.54)	-56.93 **	(9.27)	-19.51 **	(8.84)
Weekend	-32.75 ***	(8.19)	-26.68 ***	(9.26)	-14.56	(8.84)	-6.54	(9.86)
Leisure								
Weekday	6.13	(8.43)	14.17 *	(8.31)	-11.69	(9.15)	1.86	(9.26)
Weekend	-3.83	(9.08)	-2.60	(10.12)	-19.03 **	(9.25)	-4.33	(10.24)
Sleep								
Weekday	13.08 **	(5.92)	16.19 **	(6.68)	1.68	(6.82)	4.29	(7.71)
Weekend	4.64	(6.41)	0.90	(7.08)	7.94	(6.78)	2.66	(7.46)
College Degree								
Market Work								
Weekday	47.26 ***	(14.86)	20.46	(12.90)	100.11 **	(15.79)	54.02 **	(13.06)
Weekend	15.88	(9.86)	9.04	(10.16)	22.26 *	(11.37)	4.40	(11.65)
Household Production								
Weekday	-39.59 ***	(10.13)	-29.99 ***	(9.53)	-52.90 **	(11.23)	-24.23 **	(11.30)
Weekend	-4.51	(10.61)	-2.02	(11.21)	-19.24	(12.09)	-2.19	(13.16)
Leisure								
Weekday	-8.38	(10.14)	4.14	(10.76)	-35.45 **	(10.50)	-19.25 *	(10.36)
Weekend	-27.00 **	(11.76)	-19.47	(12.78)	-28.02 **	(12.25)	-23.52 *	(13.80)
Sleep								
Weekday	1.05	(7.37)	6.85	(7.73)	-7.85	(7.65)	-8.79	(7.11)
Weekend	16.26 *	(8.86)	11.79	(9.88)	28.08 **	(8.52)	26.06 **	(9.00)

Notes: All columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. The analysis in columns 1a, 2a are the base model which includes controls for age, race, educational attainment, number of children, children under age 5, region, season, year, and holiday. The anlaysis in columns 1b, 2b are the full model which also includes controls for number of aditional adults in household, employment status, part time employment, and adjusted per person family income. For the less than high school group: N=736 in Column 1a in Weekday rows, and N=798 in Column 1a in Weekend rows. N=617 in Column 1a in Weekday rows, and N=700 in Column 1b in Weekend rows. N=858 in Column 2a in Weekday rows, and N=964 in Column 2a in Weekend rows. N=767 in Column 2b in Weekday rows, and N=872 in Column 2b in Weekend rows. For the high school graduate group: N = 4,119 in Column 1a in Weekday rows, and N=4,033 in Column 1a in Weekend rows. N=3,555 in Column 1b in Weekday rows, and N=3,486 in Column 1b in Weekend rows. N=4,785 in Column 2a in Weekday rows, and N=4,988 in Column 2a in Weekend rows. N=4,290 in Column 2b in Weekday rows, and N=4,522 in Column 2b in Weekend rows. For the college graduate group: N=2,061 in Column 1a in Weekday rows, and N=2,063 in Column 1a in Weekend rows. N=1,821 in Column 1b in Weekday rows, and N=1,855 in Column 1b in Weekend rows. N=3,957 in Column 2a in Weekday rows, and N=3,915 in Column 2a in Weekend rows. N=3,596 in Column 2b in Weekday rows, and N=3,587 in Column 2b in Weekend rows. Robust standard errors are in the parenthesis.

*p<.10; **p<.05; ***p<.01

Table 2-8. Estimates of the relationship between divorce and childrencare for respondents for respondents with children.

	Women witht Children under Age 13								Women with Children under Age 18							
	Ordinary Least Squares				Propensity Score Matching				Ordinary Least Squares				Propensity Score Matching			
	Base Model		Full Model		Base Model		Full Model		Base Model		Full Model		Base Model		Full Model	
	1a		1b		2a		2b		3a		3b		4a		4b	
Primary Childcare																
Weekday	-7.63	(5.31)	7.03	(5.40)	-6.79	(6.68)	3.43	(7.28)	-9.77 *	3.9075	5.36	4.0391	-7.94	(4.86)	4.65	(5.90)
Weekend	2.02	(4.58)	9.86 *	(4.93)	-0.55	(6.93)	-3.43	(5.33)	3.32	3.5092	10.87 **	3.806	3.84	(5.49)	5.62	(5.68)
Secondary Childcare																
Weekday	-60.59 ***	(10.21)	-37.28 ***	(9.72)	-54.53 ***	(11.30)	-40.87 **	(16.74)								
Weekend	-103.24 ***	(11.77)	-94.02 ***	(12.73)	-98.42 ***	(14.54)	-96.39 ***	(18.84)								
Total Time Spent with Children																
Weekday	-43.56 ***	(9.77)	-13.09	(8.84)	-30.95 ***	(11.81)	-21.79	(16.19)	-41.25 ***	(7.70)	-9.56	(7.43)	-29.89 ***	(10.45)	-7.62	(10.36)
Weekend	-60.62 ***	(11.53)	-56.85 ***	(12.53)	-55.60 ***	(14.33)	-71.85 ***	(16.68)	-75.48 ***	(9.87)	-68.57 ***	(11.01)	-66.57 ***	(10.43)	-42.21 ***	(15.68)

Notes: All columns includes married and divorced female ATUS respondents with children between the ages of 22 and 65 for 2003-2010. The analysis in columns 1a, 2a, 3a, 4a are the base model which includes controls for age, race, educational attainment, number of children, children under age 5, region, season, year, and holiday. The anlaysis in columns 1b, 2b, 3b, 4b are the full model which also includes controls for number of aditional adults in household, employment status, part time employment, and adjusted per person family income. N=8,028 in Column 1a in Weekday rows, and N=7,790 in Column 1a in Weekend rows. N=7,066 in Column 1b in Weekday rows, and N=7,330 in Column 1b in Weekend rows. N=9,600 in Column 3a in Weekday rows, and N=9,387 in Column 3a in Weekend rows. N=8,653 in Column 3b in Weekday rows, and N=8,691 in Column 3b in Weekend rows. Robust standard errors are in the parenthesis. Columns 2 and 4 include only propensity score matched married and divorced respondents. N=1,645 (divorced N=880) in Column 2a in Weekday rows, and N=1,656 (divorced N=895) in Column 2a in Weekend rows. N=1,355 (divorced N=792) in Column 2b in Weekday rows, and N=1,413 (divorced N=810) in Column 2b in Weekend rows. N = 2,326 (divorced N=1,264) in Column 4a in Weekday rows, and N=2,377 (divorced N=1,300) in Column 4a in Weekend rows. N=1,954 (divorced N=1,135) in Column 4b in Weekday rows, and N=2,012 (divorced N=1,167) in Column 4b in Weekend rows. Boot strapped standard errors of PSM estimates are in the parenthesis

*p<.10; **p<.05; ***p<.01

Table 2-9. Propensity score matching estimates of the relationship between recent divorce and daily time allocation relative to married respondents and respondents divorced more than 18-21 months.

	Married				Divorced more than 18 months			
	Base Model		Full Model		Base Model		Full Model	
	1a		1b		2a		2b	
Market Work								
Weekday	59.77	(53.11)	37.89	(44.00)	-5.45	(47.78)	1.57	(48.10)
Weekend	50.56 **	(23.02)	-20.48	(32.36)	2.40	(36.15)	24.62	(32.74)
Household Production								
Weekday	-74.65 *	(41.67)	-60.94	(40.03)	21.70	(39.84)	-18.56	(31.90)
Weekend	18.09	(39.83)	57.85	(38.45)	44.49	(30.59)	46.46	(41.58)
Leisure								
Weekday	-3.80	(32.45)	-1.07	(33.41)	-28.47	(31.47)	-16.66	(36.67)
Weekend	-76.81 **	(36.16)	-55.32	(38.63)	-19.54	(37.26)	-68.95	(42.53)
Sleep								
Weekday	27.08	(28.73)	29.30	(28.53)	11.58	(25.22)	31.81	(29.99)
Weekend	-2.48	(24.71)	5.08	(26.99)	-29.91	(26.29)	-12.71	(33.78)

Notes: All columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. The analysis in columns 1a and 2a are the base model which includes controls for age, race, educational attainment, number of children, children under age 5, region, season, year, and holiday. The anlaysis in columns 1b and 2b are the full model which also includes controls for number of aditional adults in household, employment status, part time employment, and adjusted per person family income. All columns includes only propensity score matched married and divorced respondents. N = 166 (divorced N=83) in Column 1a in Weekday rows, and N=198 (divorced N=99) in Column 1a in Weekend rows. N = 141 (divorced N=71) in Column 1b in Weekday rows, and N=173 (divorced N=87) in Column 1b in Weekend rows. N=160 (divorced N=83) in Column 2a in Weekday rows, and N = 193 (divorced N=99) in Column 2a in Weekend rows. N = 136 (divorced N=70) in Column 2b in Weekday rows, and 171 (divorced N=87) in Column 2b in Weekend rows. Boot

*p<.10; **p<.05; ***p<.01

Table 2-10. First State Instrumental Variable Estimates of Divorce.

	(1)	(2)	(3)
Red States			
Weekday Sample	0.016 ** (0.008)		
Weekend Sample	0.004 (0.008)		
County Level Divorce Rates			
Weekday Sample		0.002 ** (0.001)	
Weekend Sample		0.001 (0.001)	
Smoking			
Weekday Sample			0.099 *** (0.018)
Weekend Sample			0.140 *** (0.019)

Notes: All Columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. Respondents in column 2 have county identified in the CPS basic monthly survey. Respondents in column 3 were in the CPS Tobacco Use Supplement respondents. N = 14,646 in the Weekday rows, and N=15,022 in Weekend rows in Column 1. N = 7,009 in the Weekday rows, and N=7,119 in Weekend rows in Column 2. N = 5,515 in the Weekday rows, and N=5,661 in Weekend rows in Column 3.

*p<.10; **p<.05; ***p<.01

Table 2-11. Instrumental variables results of the effect of divorce on daily time allocation.

	Red State		County Level Divorce Rate		Smoking	
	(1)		(2)		(3)	
Market Work						
Weekday	21.86 ***	(8.92)	15.17	(19.11)	32.71 **	(13.81)
Weekend	22.70 ***	(5.24)	22.55 ***	(9.11)	29.89 **	(11.87)
Household Production						
Weekday	214.18 ***	(8.30)	194.10 ***	(13.67)	202.06 ***	(14.86)
Weekend	96.38 ***	(37.89)	5.32	(53.66)	85.00	(67.65)
Leisure						
Weekday	-5.11	(7.73)	10.67	(13.84)	-15.01	(14.44)
Weekend	-8.41	(9.28)	-16.71	(12.86)	-13.09	(19.20)
Sleep						
Weekday	9.72 ***	(4.09)	9.27	(6.16)	10.24	(6.99)
Weekend	-1.51	(4.60)	7.51	(6.87)	-9.30	(8.75)

Notes: All Columns includes married and divorced female ATUS respondents between the ages of 22 and 65 for 2003-2010. Respondents in column 2 have county identified in the CPS basic monthly survey. Respondents in column 3 were in the CPS Tobacco Use Supplement respondents. N = 14,646 in the Weekday rows, and N=15,022 in Weekend rows in Column 1. N = 7,009 in the Weekday rows, and N=7,119 in Weekend rows in Column 2. N = 5,515 in the Weekday rows, and N=5,661 in Weekend rows in Column 3. The estimations include smoking status as an instrument, and include age, race, educational attainment, number of children, children under age 5, number of additional adults in household, employment status, region, season, holiday, and per person family income. Standard errors are in the parenthesis.

*p<.10; **p<.05; ***p<.01

Table 2-12. ATUS respondent characteristics for married and divorced women

	Married	Divorced > 18 mo	Divorced Recently
Age	43.0	48.9	44.0
White, non-Hispanic	0.760	0.697	0.709
Black, non-Hispanic	0.062	0.167	0.099
Other, non-Hispanic	0.053	0.033	0.038
Hispanic	0.126	0.103	0.154
Less than High school	0.078	0.085	0.115
GED/HS Degree	0.259	0.275	0.302
Some College	0.284	0.362	0.253
College/Advanced Degree	0.379	0.279	0.330
Children in household	0.663	0.414	0.593
Number of children	1.296	0.681	1.099
Children under age 5	0.284	0.074	0.176
Number of additional adults	0.213	0.299	0.242
Employed	0.636	0.725	0.747
Work part time	0.205	0.120	0.198
Family Income	72,018	37,291	43,053
Number of Observations	22,802	5,656	182

Source: Authors' calculations from ATUS data from 2003-2010 obtained from ATUS-X (Abraham et al. 2008). Sample includes all married and divorced female respondents between the ages of 22 and 65. Family income is calculated as the midpoint between reported intervals.

Table 2-13. Covariate Balance between Treatment and Control Respondents, Matched Sample, Women without Children, Weekday, Base Model

	Unmatched		Matched		
	Treatment	Control	Treatment	Control	Bias Reduction
Age	53.60	51.75	53.60	54.04	75.9
Black, non-Hispanic	0.217	0.097	0.217	0.213	97
Other, non-Hispanic	0.037	0.042	0.037	0.041	32.9
Hispanic	0.097	0.098	0.097	0.091	0
GED/HS Degree	0.278	0.332	0.278	0.284	89.1
Some College	0.347	0.284	0.347	0.350	95.7
College/Advanced Degree	0.284	0.305	0.284	0.287	82.8
Number of children	0.147	0.113	0.147	0.129	46.9
Children under age 5	0.032	0.029	0.032	0.030	22.1
Holiday	0.016	0.015	0.016	0.016	35.3
Year	2006.4	2006.0	2006.4	2006.3	90.2
South	0.398	0.381	0.398	0.408	44.2
Northeast	0.157	0.151	0.157	0.154	54.5
West	0.197	0.208	0.197	0.191	51.5
Summer	0.236	0.252	0.236	0.249	20.9
Winter	0.259	0.264	0.259	0.247	0
Spring	0.247	0.248	0.247	0.239	0

Notes: Matched sample information for the additional groups in the paper can be obtained from the author.

CHAPTER 3

SPOUSAL WORK SCHEDULES AND MATERNAL EMPLOYMENT

3-1 Introduction

Between 1970 and 2000 the percent of married women with children in the labor force increased from around 40% to 70%. This rapid rise is shown in Figure 3-1, which also shows the plateauing of maternal labor force participation rates since 2000. While the rise itself is of interest to scholars, maternal employment is an outcome of interest because, in addition to the impact it has on the economy as a whole, it is a factor in the economic well-being of a family and it may have an impact on children's development. The possible far-reaching impacts of maternal employment have warranted an abundance of research looking at the factors influencing mothers' decision to participate in the labor force. For married women with children, one possible determinant of labor force participation that has received little attention is her husband's work schedule. If a husband has a strict work schedule, or is required to work later in the day, this could influence decisions about the wife's employment including hours worked, occupation, and the decision to participate in the labor force at all.

This analysis is focused specifically on maternal employment rather than female employment because children significantly influence parents' daily time allocation. Young children must be cared for at all times by an adult, often the parents, and parents also want to spend time with children. Previous research has shown parents value time spent with children and early evening hours are when most parents spend time with

children. Husbands' daily work schedules, and specifically the time they stop working in the evening, is a determinant of their childcare availability. When a spouse is working, they are unable to care for children, perform household production or enjoy leisure time with their family. It is possible that a husband's work time commitments will influence his wife's decision to be in the labor force, especially in the early evening hours when younger children need care and school-aged children are available to spend time with parents.

This paper investigates the relationship between spousal work schedules and maternal employment. Using detailed employment data from the work schedules supplement of the Current Population Survey and time dairies from the American Time Use Survey, couple-level analyses of the time a husband stops working and the labor market outcomes of the wife are performed. Results from both single equation analyses and simultaneous equations models show that spousal work schedules do influence labor force participation and hours worked of married women with children. The later her spouse works, the less likely a women will be in the labor force, with a husband working after 6:00pm significantly reducing the probability of being in the labor force.

3-2 Previous Research

The study presented here is focused on the labor market decisions of married women with children. Children are generally associated with decreased female labor force participation; this negative correlation was documented in early research by Mincer (1962) and has been supported in more modern empirical work (Angrist and Evans, 1998, Leibowitz, et al, 1992). Studies have also found that married women with children earn

lower wages than married women without children (Gronau 1988, Fuchs 1989, Klerman and Leibowitz 1990, 1994), and in addition to generating differences in market wages among working mothers and non-mothers, fertility also impacts mothers' take-home wages because of child care. The cost of caring for children, especially young children, has repeatedly been found to be an important factor in the labor force participation decisions of mothers. Results from Blau and Robins (1988), Connelly (1992) and Kimmel (1998) support the hypothesis that the probability of mothers entering the labor force decreases when child care costs increase. Their research also attributed the lower rates of labor force participation among mothers of preschoolers, relative to mothers of school-aged children, to the high child care costs for preschool-aged children. Beyond care-giving costs, children likely increase reservation wages, which would also decrease labor force participation among mothers. The reservation wage reflects changes in a mother's preferences for spending time in childcare or her increased opportunity costs of working (Leibowitz, et al. 1992). Kimmel and Connelly (2007) confirm this by showing the determination of the amount of time spent in childcare is much different than time spent in home production and leisure.

In addition to the large rise the maternal labor force participation rate over the last fifty years, this study is focused on mothers because of the importance of caring for and spending time with children. There is evidence suggesting that during this time of increasing female labor force participation rates, the value of spending time with children has also increased for parents. For example, previous research shows that the amount of total time parents spend with children has increased in the last few decades (Bianchi 2000, Sayer et al. 2004). Using time dairy data, Sayer et al. (2004) found married mothers

spend significantly more time with children over each decade between the 1960s and 1990s, and married fathers more than doubled the average amount of time they spend their children each day over the 40 year period. Recently, Ramey and Ramey (2010) extended this research showing the increase in time with children continued until the early 2000s, when it plateaued. They hypothesize, and empirically support, that increased competition of college admissions caused educated parents to spend more time with their children. In general, this research supports the underlying assumption that mothers value spending time with children.

Children are repeatedly found to be an important factor determining the labor force participation of women, yet other factors also contribute to employment decisions for women with children. This paper investigates spousal work schedules as a possible factor effecting labor force participation decisions of married women with children. However, recent research suggests that spouse's characteristics have actually become less influential on women's employment decisions over the last few decades. Specifically, men's wages do not impact their wife's labor force participation like they did twenty years ago (Blau and Kahn 2007). Research on couples in France found that husband's employment had no effect on a woman's labor market decisions (Duguet and Simonett 2007), and Connelly and Kimmel (2009) showed that spouse's economic characteristics, including time spent at work and in other activities, do not influence non-market time allocation for parents.

The previous research suggests that couples are more independent in labor supply and time allocation decisions then they once were, thus it is possible that the work schedules of married men do not impact their wives' labor supply decisions. However,

there is a rich literature on couples synchronizing their work schedules and leisure time. Connelly and Kimmel (2009) actually found that leisure and home production were complementary activities for couples with children. These findings follow Hammermesh (2002) and Hallberg (2003) who both showed that the timing of work and leisure among couples are more synchronized than they would be randomly. This evidence that the working couples coordinate schedules, combined with Hammermesh's (2002) finding that wages are positively associated with more synchronicity, suggest that couples value togetherness. While the synchronization literature has focused on couples where both spouses are in the labor force, it is likely that couples value togetherness regardless of employment status. This hypothesis is supported by research looking at well-being and time allocation, which have shown that people are happier spending time with their spouse than when they are not, regardless of the activity (Sullivan 1996, Flood and Genadek 2010). Following this research, it is likely that spousal workday schedules are different than other economic characteristics of a spouse because they directly impact leisure time together and the time spouses are available for non-market activities. It also follows that if work schedules of spouses affect individual work schedules, they will also impact other labor market related decisions beyond when to work including the number of hours to work and the decision to work at all.

Additional literature on children and work schedule synchronization shows that couples with children synchronize their work schedules less and are more likely to work unusual hours than couples without children (Presser 1987, 1994, Hammermesh 2000, Klaveren and Brink 2007). Jenkins and Osberg (2005) found couples with children desynchronize their work schedules to reduce the costs of external child care. Recent

research looking at joint leisure time of parents affirms these findings, children continue to have a negative effect on the amount of leisure time couples spent together and schedule adjustment by parents is difficult due to work constraints (Barnet-Verzat et al 2011). It is clear from this research, and the increase in time spent in child care over time, that caring for children is a priority for parents and influences their work decisions and schedules. Research has also been performed looking at the relationship between work schedules and children in the opposite direction, or the impact of work schedules on time spent with children. Nock and Kingston (1988) found the timing of work affects fathers' time with the children more than mothers' time. They showed that men do not adjust their work time for children, and, in general, fathers spend less time with their children than mothers, even when both are full-time employees. Their research also highlighted the key childcare time of 3:00pm-6:00pm, the after school hours. Parents not working at that time spend significantly more time with their children then those who are working (Nock and Kingston, 1988). The after school time is intuitively important because young school aged children may need paid day care during this time if both parents are working. More recently, Rappoport and Bourdais (2008) used data form Canadian couples to show that the timing of work, especially working between 6:00pm – 10:00pm, has a significant and large negative impact on the total time parents spend with children.

The present study builds on this literature regarding work schedules and maternal labor supply by exploring the relationship between spousal work timing and labor market decisions of women with children. The previous research outlined suggests that children are an important part of the work decisions for women; mothers value spending time with

children and modify their work schedules to spend time with children. This paper focuses on mothers because of this trade-off between time with children and working. In addition to influencing work decisions, the previous research suggests children influence the work schedules of couples, and dual-earner couples coordinate work schedules. While previous research suggests a husband's characteristics are not influential in his wife's work related decisions, little previous research has looked at the influence of a husband's work schedule on his wife's employment decisions. This paper builds on the previous research by directly examining the impact of spousal work schedules on the employment decisions of married women with children.

3-3 A Simple Model of Joint Household Time Allocation

Following the temporal framework of time allocation put forward by Hallberg (2002), consider a couple where each spouse can spend time doing either market activities or non-market activities, and the non-market activities can be performed with or without the spouse. The non-market work time contains all activities not related to market work: household production, caring for children, and leisure. While it is likely individuals have different preferences regarding time spent in the various non-market activities, this analysis is primarily concerned with working time versus all other time, and this simplifies the model presented here. The previous literature suggests that couples prefer to spend leisure time together, and they may prefer to have one spouse in home production and the other engaged in market work. Couples with children maximize utility based on wife's total time spent in non-market activities (L^w), husband's total time spent in non-market activities (L^h), wife and husband's joint time spent in non-market

activities (L^J), household consumption goods (G), and child services (CS), which is comprised of childcare services and goods for children:

(3-1) $maximize\ U = U(L^w, L^h, L^J, G, CS)$

This utility function can be expanded to a temporal framework where instead of total time in spent in non-market (L^w, L^h, L^J), there is total daily time endowment denoted by T that is divisible by time periods (for example, 10 minutes), denoted by t. The spouses have individual and joint time allocation functions, $Z[l_t, \ldots, l_T]$, where l_t equals one if time is allocated to non-market work at time t:

(3-2) $maximize\ U = U(Z^h[l^h_t, \ldots, l^h_T], Z^w[l^w_t, \ldots, l^w_T], Z^J[l^J_t, \ldots, l^J_T], G, CS)$

This household utility function is maximized subject to a budget constraint

(3-3) $\sum_{s=w,h} \sum_{t=1}^{T} (1 - l^s_t) w^s_t = G,$

where w^s_t is the net wage rate at time t for spouse $s=w,h$ and the price market goods is set to 1. By maximizing equation (3-2) subject to equation (3-3), individual demands for non-market time throughout the day as well as the optimal amount of market goods (G) are determined. If the couple has a preference for spending non-market time together, or apart, at periods throughout the day, total household utility cannot be separable across the spouses. In order to maximize utility, the couple will need to take in account the work schedule (or the lack of a work schedule) of the spouse.

A wife will also take into account her husband's work schedule if she is not working. The decision to work for the wife can also be modeled within this temporal

framework. In a typical model of labor force participation, a women's market wage (w^w) reflects the value of time spent in the market and the reservation wage ($w_r{}^w$) reflects the value of non-market time. The women will enter the labor force when the market wage is greater than her reservation wage.

(3-4) $\textit{labor force participation} = f(w^w, w_r{}^w)$

Using the temporal aspect of the utility maximization model, a wife would work at time *t* if the $w^w{}_t > w_r{}^w{}_t$ where $w_r{}^w{}_t$ is the reservation wage at that time. This reservation wage reflects the value of non-market time, just as it does in equation (3-4); however, this is only at time *t*. Thus the value of spending time with children and family members can change throughout the day, reflecting important childcare times. It is generally not possible to work at all hours throughout the day, or work sporadic times throughout the day. For modeling purposes, assume if the market wage is greater than reservation wage at any point throughout the day, the wife will work:

(3-5) $\textit{labor force participation} = 1 \text{ if } w^w > w_r{}^w{}_t \text{ for all } t, \ldots T$

The implication of this theoretical framework is that the husband's time allocation to market work throughout the day will impact the married woman's decision to enter the labor force via her reservation wage.

For the first part of this analysis, it is assumed that the wife's labor market decision follows the husband's work decisions. This assumption is not unreasonable following research that supports a sequential Stackelberg game within couples (Belbo and Robedo 2008). The game predicts that husband makes work related decisions first,

the wife observes this, and then the wife makes her labor decisions. Following their theory, the expectation of the current study is that the time the husband's workday ends (whether he chooses a job that dictates when he finishes work or he chooses when to finish work) is determined before the wife makes her labor force participation decision. The later a husband finishes work in the evening, the higher the wife's reservation wage will be if childcare is necessary during those hours, which reduces the probability she will enter the labor force. It follows that if the wife is employed, the later work schedule may also reduce the number of hours she works.

The household model predicted that both spouses' allocation to work throughout the day will impact the other person's time allocation. It is possible that the husband's work schedule and the wife's decision to work are made jointly as the household maximizes utility. Thus, the assumption that the husband work schedule decisions is made first is relaxed, and the analysis is performed allowing for a simultaneous relationship between the work decision of the wife and the husband's work stopping time.

3-4 Data and Empirical Framework

The relationship between workday timing and spousal labor force participation is analyzed using data from the Current Population Survey (CPS) Work Schedules Supplement and the American Time Use Survey (ATUS). Two datasets are used because the data from the CPS work schedules supplement is more specific for analyzing the research question here, yet the ATUS data provides great detail on work throughout the day and activities related to work.

The CPS is a nationally representative household survey designed to measure monthly unemployment. The CPS work schedules supplement was given in 2004 to CPS respondents in the month of May. Following the CPS basic monthly survey, respondents in the labor force were asked a set of questions about start and stop times for their usual work day. They were also asked questions regarding flexible work schedules and work at home. The ATUS data were also collected by the Bureau of Labor Statistics, and are related to the CPS because the ATUS respondents were selected at random from the monthly CPS outgoing rotation groups. For the ATUS survey, the respondents report what activity they were doing, where they were doing the activity, and who they were with for a 24 hour period. The time diary is given to only one person in a household, but there is additional demographic and employment information for other family members in the household, including the spouse. The survey data used for this analysis is pooled over the years 2003-2010.

The samples are limited to heterosexual married couples with children where one of the spouses was interviewed, and the wife is between the ages of 20 and 60. The couples are also limited to those where the husband is in the labor force. The CPS work schedules supplement is only given to employed respondents, thus the sample is further limited to couples where the husband is working and reports working on weekdays. The sample from the ATUS includes couples where the husband is the respondent and reported working on the diary day and it is a weekday. Summary statistics for the couples in the final samples are presented in Table 3-1.

The main outcome of interest is the labor force participation of the wife. This variable is straightforward in the CPS sample, but the ATUS only asked respondents

whether their spouse was working or not working. Thus, in the ATUS sample it is not possible to tell which respondents are unemployed and which are not in the labor force. In order to obtain more detailed information about the wife's employment, the responses from the wife's final month in the CPS is obtained.[23] In addition to labor force participation, usual hours worked is also an outcome for employed women. Usual hours worked was asked at the time of the ATUS for respondents' spouses, so it was not necessary to construct it from the previous CPS sample. Table 3-1 shows that 72% of the women in the CPS sample are in the labor force, and 71% of the ATUS wives are in the labor force. Of the mothers who are in the labor force and employed, the average hours worked per week is 35 in both samples.

This study is focused on labor market decisions and spousal work time, specifically father's timing of work. The analysis uses the end of the work day as the work schedule measure because previous research suggests after school and evening hours are important time for child care (Nock and Kingston 1988, Rappoport and Bourdais 2008). The independent variables of interest are created using the question of usual work stop time in the CPS data. The ATUS time dairy data includes start and stop times for all individual activities, so the work stop time variable is created using the stopping time for the last work related activity outside of the home. Because the importance of evening hours for parents is a driving factor in this analysis, both samples are limited to couples where the husband works a day schedule.[24] In the CPS, the

[23] Couples where the wives of the respondents that were employed at the time of the CPS and were described as not working at the time of the ATUS (2-5 months later) were dropped from the analysis because it was not possible to distinguish between the unemployed and those not in the labor force. This was 5% of the original sample.

[24] About 15% of the CPS sample reported working non-standard hours. The exclusion of these respondents is not random, as they are more likely to be black and work in service occupations than those that work standard hours. However, the research questions being discussed in this paper are focused on work timing for people working standard

respondents were asked if they usually work a day schedule, and this is used in conjunction with the limitation that they must finish work between 3:00pm and 9:00pm. Day shift workers were identified in the ATUS using the time diary limits of finishing work between 3:00pm and 9:00pm. Table 3-1 shows the average stop time in both samples is about 5:00pm, and Figure 3-2 has the breakdown of work stop time by hour for both samples. The majority of husbands finish work between 5:00-5:59 in both samples.

The impact of the spousal work timing on labor force participation for couples with children is estimated using a basic regression analysis. Labor force participation, LFP, is a binary dependent variable for the wife of the CPS or ATUS respondent. Control variables (X_w) include the following characteristics of the wife: age, age-squared, race, and educational attainment. Household level control variables (X_h) are also included in the estimation and include, the number of children under the age of 18, region and urban residence. Non-labor income of the wife is not included in the original analyses because in the CPS wage information is collected for only 25% of the sample in the outgoing rotation groups of the CPS.[25] However, additional results are presented using the reduced sample that includes husband's wages as non-labor income for the reduced sample.[26] A year-specific dummy variable (I*y*) is also included in the analyses using the ATUS sample to control for possible factors, such as the recession, impacting time allocation in each year. Equation (2-6) is the specification estimated with a Probit model to measure

---

weekday schedules. There is a robust literature on people working nonstandard hours (see Connelly and Kimmel, 2011).

[25] The ATUS ask all respondents for wage information, yet many people do not provide their income information.

[26] The labor force participation estimation does not include wages because only respondents in the outgoing rotation groups have wage information, so only 25% of the sample has this information. In addition, of the 25% in the outgoing rotation groups, only women in the labor force have wage information. Labor economists often use Heckman selection models to deal with this, but with the 25% restriction this method is not used.

the relationship between a husband's work timing and probability the wife is in the labor force for couples with children.

(3-6) $LFP_w = \alpha_1 + \beta_1 Time_h + \beta_w X_w + \beta_j X_j + \beta_y I_y + e$

The independent variable of interest, $Time_h$, indicates the work stopping time of the spouse. This is variable is coded in three different ways: continuous, categorical and dichotomous. The continuous variable indicates the time a husband finishes work in 10 minute increments between 3:00pm and 9:00pm[27]. The categorical variable includes categories for each the hour in between 3:00pm and 9:00pm. Finally, an indicator for husbands working after 6:00pm is used as the dichotomous independent variable. For the continuous measure, the coefficient on $Time_h$ (β_1) estimates the increase in the probability of being in the labor force for the wife with each 10 minutes later the husband stops working. The coefficient on the categorical $Time_{sp}$ variables measures the impact of the husband finishing work in each hour before or after 5:00pm-5:59pm on the probability that the wife is in the labor force. The dichotomous variable indicating work after 6:00pm compares the probability of being in the labor force for women with husbands that finish work between 6:00pm and 9:00pm to those that finish between 3:00pm and 5:59pm.

The expectation is that for couples with children, the later a husband works reduces the probability his wife is in the labor force. Thus, the sign on β_1 will be negative

[27] Ten minute increments are used because there is heaping in the data on the five and ten minute intervals, and most commonly on the ten minutes increments.

for the continuous measure. For the categorical results, we would expect to see a similar pattern, for each additional hour the husband finishes work, the wife should be less likely to work. The dichotomous variable for working after 6:00pm is expected to have a negative impact on the probability of labor force participation of the wife.

3-5 Labor Force Participation Results

The Probit results from the labor force participation analyses are presented in Tables 3-2 through 3-5, and the coefficients shown are the calculated marginal effects from a change in the independent variable on labor force participation at the mean of the sample. Columns 1 and 2 of Table 3-2 show the analysis with the continuous work stop time variable for husbands, with the results from the CPS sample in column 1 and the results from the ATUS sample in column 2. The results for the continuous variable are quite similar between the two samples. The coefficient of -0.0008 (-0.0009 in the ATUS sample) suggests that if a women's husband comes home 10 minutes later, the probability she is in the labor force is reduced by 0.08%. This result is statistically significant, but the magnitude is not large. However, the categorical results in columns 3 and 4 shed some light onto why the linear result is small. In both samples, the effect of a spouse finishing work between 3:00pm-3:59pm and 4:00pm-4:59pm is not statistically different than finishing work between 5:00pm-5:59pm for women's labor force participation. However, in the hours following the reference category, there are large differences in the probability of the wife being in the labor force. If a spouse returns home between 6:00pm-6:59pm, the CPS sample shows that a wife is 29% less likely to be in the labor force. This result is statistically significant and slightly larger than the finding from the

ATUS, which shows a 16.9% lower probability of maternal labor force participation. The coefficients on the later hours, 7:00pm-7:59pm and 8:00pm-9:00pm, are similar and show a reduced probability of labor force participation for wives with husbands working during those hours when compared to wives whose husbands finish work between 5:00pm and 5:59pm. These results suggest for fathers working past 6:00pm, their wives are significantly less likely to be in the labor market than women with husbands who finish work before 6:00pm.

Previous research has shown that working between 3:00pm-6:00pm for parents significantly reduces the time spent with children (Nock and Kingston 1988). Intuitively this time is important because of the usual timing of school, and the results from the analysis presented here support this by showing women with children are less likely to be working if her husband does not finish working between 3:00pm-6:00pm. The dichotomous variable indicating working spouse working after 6:00pm is shown in columns 5 and 6 of Table 3-2. This result is similar to the categorical analysis; married women with children are 17.5%-28.4% less likely to be in the labor force than women's whose spouses finish work before 6:00pm.

The results presented in Table 3-2 show a strong relationship between husband's work stopping time and maternal employment. However, this analysis does not include controls for the husband's income, which is part of the wife's non-labor income. Non-labor income is an important factor in work decisions for both men and women and may impact the work timing results. As discussed previously, non-labor income is not included in the analysis because the CPS only has wage information for around 25% of the respondents, and while the ATUS does ask about wages, many of the respondents do

not provide this information. The previous analysis is repeated with the reduced sample sizes, including controls for husband's earnings and husband's earnings squared. The results from this analysis are presented in Table 3-3. Overall, the findings are similar to the results from the previous analysis; spousal work stopping time does impact employment decisions of married women with children. With the addition of the non-labor income control variables, having a husband working past 6:00pm is associated with a 16%-22% decreased probability of the wife being in the labor force. While the results for the dichotomous measure are slightly smaller in magnitude than the previous analysis without the income controls, the results for the continuous measure are nearly the same (and actually slightly larger in magnitude in the CPS sample). The categorical results are similar in sign and magnitude as the previous analysis, but CPS results are no longer statistically significant. The lack of statistical significance in for the categorical variables is likely caused by the small sample size because there are few respondents in each category past 6:00pm.

With the similar findings in the analyses with and without non-labor income, the model from the original analysis will be used in the following analyses. Also, using the full sample reduces possible selection effects in the ATUS sample because those that do not report income may not be random.

3-6 Robustness Results - Labor Force Participation

Work Start Time and Hours Worked

It is possible that the results for work stopping time are driven by actual hours spent working, and not the work stopping time itself. The work timing variables may be

indicating that women whose husbands that work more hours are less likely to be in the labor force. In order to test for this, controls for the husband's usual weekly hours worked and the husband's start time of working that day are added to the analysis. The addition of work start time will also control for the possibility of asynchronous morning schedules that could impact the wife's labor force participation decision. For example, the wife may work a slightly earlier daytime shift and the husband works a slightly later daytime shift so children have care before and after school or day care. Columns 1 and 2 in Table 3-4 show the results for the work time after 6:00pm dichotomous variable and the results for the additional work hour control variables for the CPS and ATUS samples, respectively.[28] The controls do not change the results from the original analysis, and neither the start time of work or the usual hours worked are statically significant with either sample. These results suggest that spouse's work starting time and usual hours worked does not impact married women with children's labor force participation decisions.

Commuting Time

This analysis is primarily focused on the actual end of the actual work hours, but commuting time is often considered a part of the workday and can extend total time spent working greatly for those with long commutes. If a husband has a long commute, finishing work before 6:00pm may not be important because the husband commutes and arrives home long after 6:00pm. The CPS does not ask about time spent commuting, but using the ATUS it is possible to identify time spent commuting, and the mean time spent

[28] Note that the sample size is smaller in this analysis because of missing usual hours worked for some respondents.

commuting in the sample is 26.9 minutes. The minutes spent commuting after work is included in the analysis with the work stop time after 6:00pm variable, and the results of this analysis are presented in Column 1 of Table 3-5. The work time after 6:00 variable continues to be statistically significant indicating that having a spouse working after 6:00pm is associated with a 16.6% decreased probability of a married women being in the labor force. The minutes comminuting after work variable is also statistically significant and suggests that for every minute more a husband commutes, his wife is .3% less likely to be in the labor force.

The dichotomous variable indicating the husband works after 6:00pm is interacted with the time spent commuting variable to further understand the relationship between work stopping time and time spent commuting. The results for the model with the interaction are presented in Column 2 of Table 3-5. All of the coefficients in the model are statistically significant, and show that women with husbands who work after 6:00pm and have no commuting time have a 31.4% lower probability of being in the labor force compared to women with husbands who finish work before 6:00pm.[29] For the women with husbands who finish work before 6:00pm, each additional minute of commuting decreases the probability she is in the labor force by 0.4%. For women with husbands commuting and working after 6:00pm, each additional minute commuting actually increases the likelihood of the wife being in the labor force by 0.5%. But the total effect is generally still negative, so for a wife of someone commuting 27 minutes (the mean of

[29] About 22% of the sample that does work from somewhere other than home does not report commuting time. Respondents who report travel related to something other than work are not included in time spent commuting. For example, if a respondent went from work to the grocery store and reported that as travel related to shopping, it is not considered commuting in this analysis.

the sample) and working after 6:00 is 17.9% less likely to be in the labor force than women whose husbands does not work after 6:00pm and does not commute.

Work Time Flexibility

Work stopping time may have less of an effect on their spouses' labor force participation if that stopping time is flexible. Flexible work start and stop times may allow husbands to coordinate more with other family member's schedules. It follows that work time flexibility of the husband will decrease the wife's reservation wage, thus increasing her probability of being in the labor force. However, previous research suggests that work time flexibility is more likely in high paying jobs, so the correlation with income may impact the result. In the CPS work schedules supplement, 39.25% of the respondents indicated that they did have a flexible schedule. A dichotomous variable indicating flexible work hours of the husband is added to the original regression estimating labor force participation for married women with children, and the original model with non-labor income controls. The results from this analysis are presented in columns 1 and 2 of Table 3-6. The impact of a spouse working past 6:00pm remains almost the same as the original analysis, the marginal effect of -0.261 in the original sample and -0.23 in the sample with husband's non-labor income. Thus, flexible work time does not change the impact of husband's work stopping time on the labor force participation of married women with children.

As suggested by previous research, the impact on flexible work time of a husband is actually associated with a decreased probability of being in the labor force for the

married women. With the addition of non-labor income control variables, the coefficients on the flexible work variable are no longer significant.

Working from Home

Another trait of a husband's job that could influence his wife's labor force participation is working from home. While working from home is not the same as work hours outside of the home, evening work hours at home can extend the workday. If a spouse finishes work before 6:00pm, but then works from home, he is less likely to be able to provide childcare, perform household production, or enjoy leisure with the family. Working from home is investigated using the ATUS data by identifying respondents working from home in the evening after working away from home during the day. Columns 3 – 4 of Table 3-6 show the results from the analysis with the work from home indicator variable, and this variable interacted with the working after 6:00pm variable. Overall, the marginal effect of a husband working after 6:00pm on the wife's labor force participation is not significantly changed by adding the working from home variables. The result for this working from home variable is statistically significant at the 10% level and shows that a husband working from home after returning home from the workplace decreases the probability of the wife being in the labor force by 11.3%. In the analysis with the interaction, working from home on the diary day reduces the probability of the wife being in the labor force for only those women whose husbands finish work before 6:00pm.

3-7 Hours Worked Results

The results presented thus far are focused on the employment decisions of married women with children. A natural extension of this is to consider the labor market choices of women who are already working; does spousal work timing influence the number of hours employed women work? The expectation is that for couples with children, the later a husband works, the fewer hours his wife will work. The results for the usual hours worked estimates for working women with children are shown in Table 3-7. The analyses using the CPS samples (columns 1, 3, and 5) show a significant relationship between spousal work timing and usual weekly hours worked for mothers in the labor force. The coefficient on the continuous measure is -0.0051, which suggests a .3 minute decrease in the hours worked of women with children for each 10 minutes later her husband ends work. This finding is similar to the labor force participation findings in that it is significant and very small in magnitude, it also suggests a relationship between hours worked and spousal work timing. The categorical analysis in column 3 shows that the pattern of analysis is strikingly different than the labor force participation findings, husbands finishing work in the hours before 5:00pm are driving the linear results. Employed women whose husbands finish work between 3:00pm-3:59pm themselves work, on average, 1.7 hours more per week than women whose husbands return home between 5:00pm-5:59pm. Similarly, for husbands coming home between 4:00pm-4:59pm, their wives work 1.9 hours less than then women whose husbands finish work in the hour later. There are no significant differences in the hours worked for women whose husbands return from work after 5:00pm and each of the hours following 6:00pm. The

dichotomous variable for working after 6:00pm summarizes these findings (in column 5); employed women with children with husbands working after 6:00pm work almost 1 hour less per week than women with husbands that finish work before 6:00pm.

The ATUS results show a different pattern in which spousal workday timing does not have an impact of the hours worked of employed married women with children. The differences found between the CPS and ATUS results likely stems from differences in the measurement of the work stop timing variable. In the CPS, the husband is asked the usual work stop time, which is what women would be incorporating into work decision. The ATUS numbers come from one random day of the year for an individual, and the analysis assumes that this day is representative of their workdays in general. This measure has more noise than the CPS measure. However, the results between the two samples show less influence of husband's work schedules on hours worked for working women than on the labor force participation of women for couples with children.[30]

3-8 Specification and Estimation of the Simultaneous Model

The findings from the basic analyses performed here suggest a relationship between spousal workday timing and maternal employment, but the direction of this relationship is not clear. The previous analysis assumed that the wife's work choices followed her husband's employment choices that dictated his schedule. It is possible that having a wife who is not in the labor force allows for the husband to work later in the day, and it is also likely that the household is making joint labor market decisions. The joint household decision making behavior outlined in the previous theory section suggests that

[30] This results is consistent with the labor supply literature, the labor force participation elasticities are generally larger than the work hours elasticities.

the timing of the hours worked of a husband will affect his wife's labor force participation, and that the timing of the hours worked of the husband are a function of the labor market behavior of the wife.

This relationship will be modeled empirically using a simultaneous equations model framework. The model is a two equation recursive model:

(3-7) $LFP_w = \alpha_1 + \beta_1 Time_h + \beta_w X_w + \beta_j X_j + \beta_y I_y + e_1$

(3-8) $Time_h = \alpha_2 + \beta_2 LFP_w + \beta_h X_h + \beta_j X_j + \beta_o OCC_h + \beta y Iy + e_2$

The notation is the same as was the case in equation (3-6), LFP_w is the labor force participation of the wife and $Time_h$ is the binary work stop time variable for the husband. The demographic control variables for the wife included in X_w are the same as they are in preliminary analysis. The control variables in X_h include demographic characteristics of the husband (age, age squared, race, and educational attainment), and both equations contain the joint household-level control variables (X_j) that were included in the original analysis. The equations are over identified, with identification achieved by the exclusion of spousal demographic characteristics in both equations, and the addition of seventeen dichotomous occupation variables for the occupation of the husband in equation (3-8). The equation estimating the wife's labor force participation is the same as it is in the original analysis, and the husband's demographic characteristics were not included in the estimation because they generally not found to be influential factors on women's employment decisions (Blau and Kahn 2007). Likewise, the wife's characteristics are not included in the husband's work timing equation, but his occupation is included. Occupation is related to the timing of a workday for the husband, and a husband's

occupation is not expected to influence a wife's labor force participation outside of the income related to that occupation.

This system of equations is estimated using a three-stage least squares model.[31] The results from simultaneous equations analysis are presented for the two endogenous variables of interest in Table 3-8. The results show that the wife's labor force participation is not affecting the husband's work stopping time, and after accounting for this, husband's work stop time does reduce the probability of his wife being in the labor force for couples with children. A husband working past 6:00pm decreases the probability of the wife being in the labor force by 25% in the CPS sample and 15% in the ATUS sample, after accounting for the simultaneity in spousal employment decisions. These findings for the effect of husband's work on the wife's labor force participation are only slightly smaller in magnitude than the original single equation results, and both the single and simultaneous equation results show that husband's work stopping time decreases the probability of the wife being in the labor force by over 15%.

The simultaneous equations estimation is also performed to estimate the relationship between usual hours worked for employed women with children and work stopping time of husbands. The results from this analysis are presented in Table 3-9. Unlike the results from the labor force participation analysis, the impact of spousal work stopping time on hours worked is actually greater when controlling for the simultaneity between the two outcomes. Also unlike the previous results, in this analysis of dual-earner couples, the usual hours worked of the wife affects the work stopping time of the husband in the CPS sample. The CPS sample results show that for each additional hour a

[31] The reg3 command in STATA is used for this estimation.

wife with children works during the week, her husband is 3.7% more likely to work past 6:00pm, and if her husband works past 6:00pm, the wife works 1.8 hours less per week than if he does not usually work past 6:00pm. While the result for the wife's usual hours worked is as expected, the reciprocal relationship is somewhat counterintuitive because if the couple is treating their non-market time as substitutes, the expectation is that more hours a wife works per week the more likely her husband would return home before 6:00 to partake in home production. However, the findings are in line with previous empirical results showing that working couples coordinate their schedules to spend more time together. So, if the wife works more hours per week and this time extends her workday, the husband will also work late. The impact of an employed wife's work hours on her husband's work stopping time is not significant in the analysis using the ATUS data, but the husband's work stopping time is found to have an effect on the wife's work hours. The results from both of the CPS and ATUS analysis, after controlling for simultaneity, show a much stronger effect of husbands work stopping time on work hours than the single equation analysis. The results from the ATUS analysis show that having a husband work after 6:00pm reduces the hours worked by the wife per week by 2.8 hours. The simultaneous hours worked analysis suggests that husband's work schedules do impact the hours worked of employed mothers.

The results from the simultaneous relationship between husband's daily work timing and his wife's labor force participation for couples with children suggests that while the wife is taking her husband's schedule into account, the employment status of the wife is not a factor in the husband's work timing. This finding may support theories that suggest that the wife's labor market decision follow her husbands, but this could also

be caused by the lack of control over work timing for employed people in general. However, the hours work analysis does show that husband's work stop timing is affected by the number of his hours his wife works. The results for hours worked provides evidence that the husband's decision about work hours does come before the wife's labor force participation decision, for couples with children.

3-9 Conclusion

This paper examined the effect of spousal work timing on labor force participation for couples with children. The results suggest that the probability of being in the labor force for a wife significantly decreases when a husband works past 6:00pm. This result holds when the simultaneity between spousal work schedules and labor market decisions is explicitly modeled and accounted for within the analysis. For the intensive margin, there is evidence that employed women with children work more hours if their husband finishes work before 5:00pm than if he finishes later in the evening. The finding for hours worked is less robust than the labor force participation results, and the simultaneous equations analysis results are actually larger when compared to the single equation results.

This research builds on the literature related to maternal employment decisions couples' workday synchronization. While recent studies suggest that husbands have less influence on their wife's work decisions than they once did, this analysis provides clear evidence that spousal timing of work is influencing employment decisions of women with children. Following the work day synchronization literature, it is not surprising that spousal work times influence employment decisions, since it has been found that dual-

earner couples coordinate their schedules to spend time together and parents desynchronize work schedules for childcare purposes. Finally, these results suggest that daily time allocation is an important factor in economic decisions, especially time with children.

3-10 Figures

Figure 3-1. Maternal Labor Force Participation Rates over Time

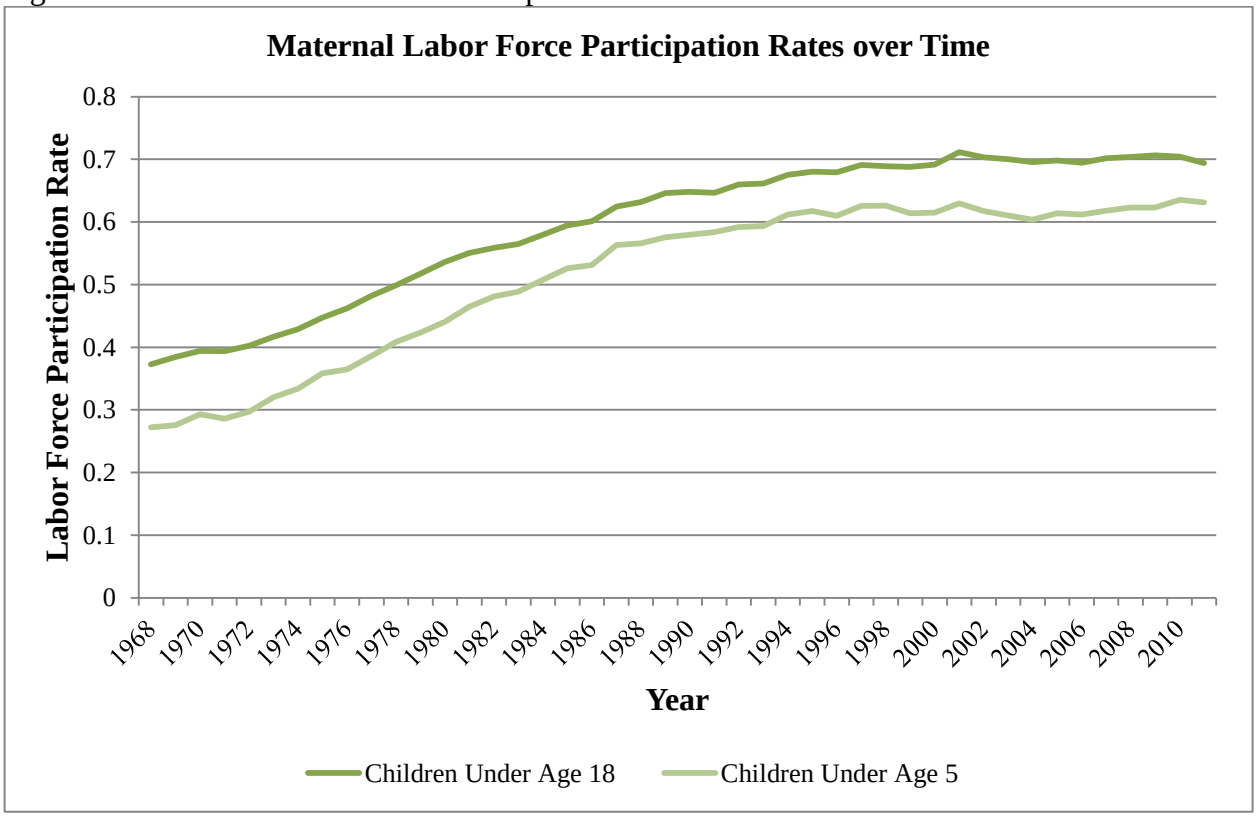
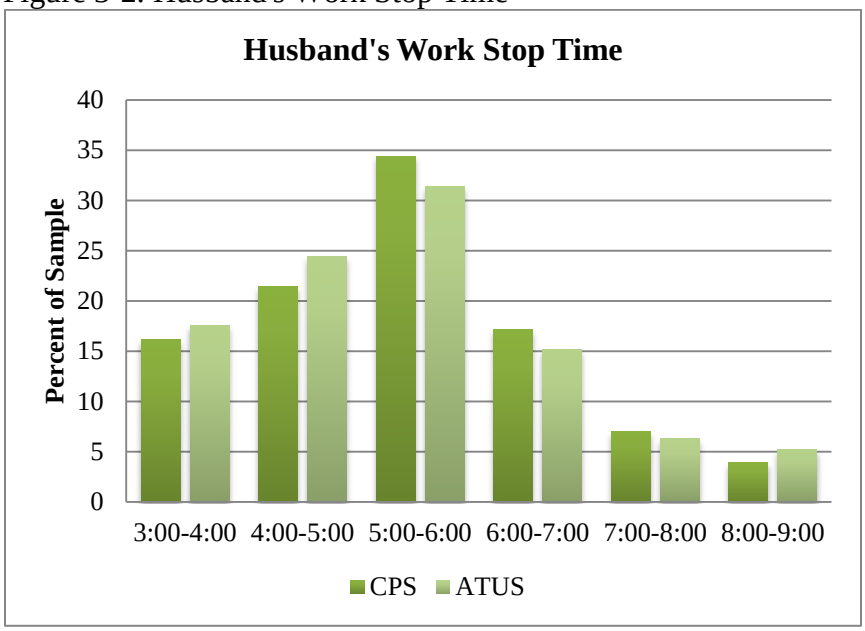


Figure 3-2. Husband's Work Stop Time



3-11 Tables

Table 3-1. CPS and ATUS respondent couple characteristics for couples with children

	CPS	ATUS
Wife		
Age	38.1	38.0
White, non-Hispanic	0.787	0.760
Black, non-Hispanic	0.036	0.039
Other, non-Hispanic	0.060	0.076
Hispanic	0.116	0.125
Less than High school	0.073	0.064
GED/HS Degree	0.244	0.201
Some College	0.298	0.264
College/Advanced Degree	0.384	0.468
Labor Force Participation	0.724	0.708
Hours Worked	35.27	35.03
Husband		
Age	40.4	40.1
White, non-Hispanic	0.787	0.889
Black, non-Hispanic	0.041	0.041
Other, non-Hispanic	0.058	0.070
Hispanic	0.114	0.124
Less than High school	0.086	0.072
GED/HS Degree	0.264	0.217
Some College	0.239	0.239
College/Advanced Degree	0.411	0.473
Usual Hours Work	45.4	47.0
Labor Force Participation	1.0	1.0
Work Stop Time	5:00:56 PM	5:09:55 PM
Household		
Number of children	1.950	1.938
Children under age 1	0.089	0.096
Children age 1-2	0.398	0.223
Children age 3-5	0.296	0.319
Children age 6-12	0.537	0.558
Children age 13-17	0.416	0.352
Urban Residence	0.770	0.839
Northeast	0.220	0.195
Midwest	0.262	0.260
South	0.266	0.330
West	0.252	0.216
Number of Observations	6,399	4,258

Source: Authors' calculations from the CPS Work Schedule Supplement 2004, and the ATUS data from 2003-2010. Sample includes all married couples with wives between the ages of 20 and 60 and the husband is in the labor force.

Table 3-2. Impact of Spousal Daily Work Stopping Time on Married Women's Labor Force Participation, Probit Results

	CPS	ATUS	CPS	ATUS	CPS	ATUS
	(1)	(2)	(3)	(4)	(5)	(6)
Continuous						
10 min interval	-0.0008 ***	-0.0009 ***				
	(0.0002)	(0.0003)				
Categorical						
3:00pm-3:59pm			0.025	-0.002		
			(0.067)	(0.074)		
4:00pm-4:59pm			-0.018	0.016		
			(0.058)	(0.064)		
5:00pm-5:59pm			–	–		
6:00pm-6:59pm			-0.290 ***	-0.169 **		
			(0.061)	(0.072)		
7:00pm-7:59pm			-0.294 ***	-0.157		
			(0.082)	(0.102)		
8:00pm-9:00pm			-0.241 **	-0.192 *		
			(0.113)	(0.109)		
Dichotomous						
After 6:00pm					-0.2841 ***	-0.1755 ***
					(0.046)	(0.053)
Observations	6399	4271	6399	4271	6399	4271
Pseudo R-squared	0.1049	0.1013	0.1071	0.1017	0.1070	0.1017

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The regressions include age, age-squared, race, educational attainment, number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. The reported coefficients are the estimated change in probability of labor force participation associated with a discrete change in the independent variable, calculated at the mean of the sample. Robust stantard errors are reported in the parthenthesis.

*p<.10; **p<.05; ***p<.01

Table 3-3. Impact of Spousal Daily Work Stopping Time on Married Women's Labor Force Participation controlling for Non-Labor Income, Probit Results

	CPS	ATUS	CPS	ATUS	CPS	ATUS
	(1)	(2)	(3)	(4)	(5)	(6)
Continuous						
10 min interval	-0.0010 **	-0.0009 ***				
	(0.0004)	(0.0003)				
Categorical						
3:00pm-3:59pm			0.150	-0.011		
			(0.137)	(0.079)		
4:00pm-4:59pm			0.154	0.000		
			(0.122)	(0.068)		
5:00pm-5:59pm			–	–		
6:00pm-6:59pm			-0.123	-0.137 *		
			(0.128)	(0.078)		
7:00pm-7:59pm			-0.285	-0.129		
			(0.197)	(0.115)		
8:00pm-9:00pm			-0.153	-0.279 **		
			(0.299)	(0.129)		
Dichotomous						
After 6:00pm					-0.2260 **	-0.1604 ***
					(0.104)	(0.059)
Non-Labor Income Controls	x	x	x	x	x	x
Observations	1421	3720	1421	3720	1421	3720
Pseudo R-squared	0.1664	0.1223	0.1670	0.1226	0.1650	0.1222

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The regressions include age, age-squared, race, educational attainment, number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, year, husband's wage, and husband's wage squared. The reported coefficients are the estimated change in probability of labor force participation associated with a discrete change in the independent variable, calculated at the mean of the sample. Robust stantard errors are reported in the parthenthesis.

*p<.10; **p<.05; ***p<.01

Table 3-4. Impact of Spousal Daily Work Stopping Time and Work Hours on Married Women's Labor Force Participation, Probit Results

	CPS	ATUS
	(1)	(2)
Work Stopping Time		
After 6:00pm	-0.261 ***	-0.170 ***
	(0.054)	(0.061)
Additional Work Hour Controls		
Work Start Time	0.0004	-0.0001
	(0.000)	(0.000)
Usual Hours Worked	-0.003	-0.0008
	(0.003)	(0.003)
Observations	6052	3718
Pseudo R-squared	0.1069	0.0965

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The regressions include age, age-squared, race, educational attainment, number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. The reported coefficients are the estimated change in probability of labor force participation associated with a discrete change in the independent variable, calculated at the mean of the sample. Robust stantard errors are reported in the

*p<.10; **p<.05; ***p<.01

Table 3-5. Impact of Spousal Daily Work Stopping Time and Commuting Time on Married Women's Labor Force Participation, Probit Results

	ATUS	ATUS
	(1)	(2)
Work After 6:00pm	-0.166 ***	-0.314 ***
	-0.053	-0.068
Minutes Commuting After Work	-0.003 ***	-0.004 ***
	-0.001	-0.001
After 6:00pm*Min Commuting		0.005 ***
		-0.001
Observations	4271	4271
R-squared	0.1046	0.1071

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The regressions include age, age-squared, race, educational attainment, number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. The reported coefficients are the estimated change in probability of labor force participation associated with a discrete change in the independent variable, calculated at the mean of the sample. Robust stantard errors are reported in the parthenthesis.

*p<.10; **p<.05; ***p<.01

Table 3-6. Impact of Spousal Daily Work Stopping Time, Work Time Flexibilty and Working from Home on Married Women's Labor Force Participation, Probit Results

	CPS	CPS	ATUS	ATUS
	(1)	(2)	(3)	(4)
Work After 6:00pm	-0.261 ***	-0.230 **	-0.172 ***	-0.189 ***
	(0.047)	(0.105)	(0.053)	(0.059)
Work time flexibilty	-0.123 ***	-0.093		
	(0.045)	(0.101)		
Work from home			-0.113 *	-0.146 *
			(0.063)	(0.075)
After 6:00pm*Home				0.099
				(0.134)
Non-Labor Income Controls		x		
Observations	6379	1416	4271	4271
R-squared	0.1079	0.1644	0.1024	0.1025

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The regressions include age, age-squared, race, educational attainment, number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. The regression in column 2 also includes husband's wage and husband's wage squared. The reported coefficients are the estimated change in probability of labor force participation associated with a discrete change in the independent variable, calculated at the mean of the sample. Robust stantard errors are reported in the

*p<.10; **p<.05; ***p<.01

Table 3-7. Impact of Spousal Daily Work Stopping Time on Employed Married Women's Usual Weekly Hours Worked, OLS Results

	CPS	ATUS	CPS	ATUS	CPS	ATUS
	(1)	(2)	(3)	(4)	(5)	(6)
Continuous						
10 min interval	-0.0051 ***	-0.0002				
	(0.0018)	(0.0034)				
Categorical						
3:00pm-3:59pm			1.729 ***	-0.334		
			(0.614)	(0.729)		
4:00pm-4:59pm			1.895 ***	-0.044		
			(0.487)	(0.677)		
5:00pm-5:59pm			–	–		
6:00pm-6:59pm			-0.027	0.083		
			(0.664)	(0.886)		
7:00pm-7:59pm			-0.289	-0.142		
			(1.114)	(1.347)		
8:00pm-9:00pm			0.356	-0.026		
			(1.326)	(1.338)		
Dichotomous						
After 6:00pm					-0.931 *	0.0957
					(0.524)	(0.652)
Observations	4232	2907	4232	2907	4232	2907
R-squared	0.0496	0.0508	0.0523	0.0509	0.0478	0.0508

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The regressions include age, age-squared, race, educational attainment, number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. The reported coefficients are the estimated change in probability of labor force participation associated with a discrete change in the independent variable, calculated at the mean of the sample. Robust stantard errors are reported in the parthenthesis.

*p<.10; **p<.05; ***p<.01

Table 3-8. Two-stage estimates of the system describing labor force participation and work stopping time for married couples with children

Dependent Variable	CPS		ATUS	
	Wife's Labor Force	Husband's Work Stopping Time	Wife's Labor Force	Husband's Work Stopping Time
	(1)	(2)	(3)	(4)
Effect of				
Wife's Labor Force Participation		0.078		0.041
		(0.080)		(0.087)
Husband Works After 6:00pm	-0.249 ***		-0.150 **	
	(0.047)		(0.076)	
Adjusted or Pseudo R-squared	0.1038	0.0800	0.1139	0.0471

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The equations estimating wife's labor force participation include the wife's age, age-squared, race, and educational attainment. The equations estimating husband's work shoptting time include the wife's age, age-squared, race, educational attainment, and occupation. Both equations includ: number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. Robust stantard errors are reported in the parthenthesis.

*p<.10; **p<.05; ***p<.01

Table 3-9. Two-stage estimates of the system describing usual weekly hours worked and work stopping time for married couples with children

Dependent Variable	CPS		ATUS	
	Wife's Hours Worked	Husband's Work Stopping Time	Wife's Hours Worked	Husband's Work Stopping Time
	(1)	(2)	(3)	(4)
Effect of				
Wife's Hours Worked		0.037 ***		0.008
		(0.017)		(0.025)
Husband Works After 6:00pm	-1.831 ***		-2.794 ***	
	(0.511)		(0.901)	
Adjusted or Pseudo R-squared	0.0494	0.0707	0.0491	0.0449

Note: The sample includes all married women between the ages of 20-60 with children whose husband is employed. The equations estimating wife's labor force participation include the wife's age, age-squared, race, and educational attainment. The equations estimating husband's work shoptting time include the wife's age, age-squared, race, educational attainment, and occupation. Both equations includ: number of children, children under age 1, children age 1 to 2, children age 3 to 5, children age 6 to 12, children age 13 to 17, urban residence, region, and year. Robust stantard errors are reported in the parthenthesis.

*p<.10; **p<.05; ***p<.01

CHAPTER 4

THE IMPACT OF DIVORCE LEGISLATION ON DAILY TIME ALLOCATION

4-1 Introduction

The period between 1950 and 2000 was a time of great change for women in the United States, marked by the increase in the female labor force participation rate, which rose from 33.9 percent to 59.5 percent.[32] Parallel to the dramatic increase in female labor force participation rates, other social, demographic, and technological changes occurred during this time related to female employment. These changes included: reduced fertility among married women, advancements in labor-saving technology in home production activities, declines in marriage rates, and increased divorce rates. During this time there were also significant changes in divorce law in the United States. Many states switched from a previous fault-based law, which required one of the spouses to be determined at fault for the marriages demise, to unilateral divorce law where either party could easily leave the marriage. There is an extensive amount of previous research on the change from fault-based divorce law to unilateral divorce (no-fault) law that occurred between the 1960s and the 1990s. In the context of the social climate at the time, much of this previous research attempts to explain changes in female labor force participation, and other outcomes associated with the adoption of unilateral divorce law.

[32] Derived from U.S. Census Bureau, Statistical Abstract of the United States: 2003, Mini-Historical Statistics, No. HS-11. Marital Status of the Population by Sex: 1900-2002

The previous research suggests that the law change had significant impacts on married women, especially on their employment (Genadek et al. 2007, Stevenson 2008). An important component of work for many women is home production, and very few studies have looked at the impact of unilateral divorce law on hours worked at home as well as in the market. Previous research also suggests unilateral divorce changes household dynamics and outcomes including children's well-being and domestic violence (Gruber 2004, Stevenson and Wolfers 2008). Household bargaining and dynamics can be assessed using the time allocation of men and women in the household, as time spent in market work, household production and leisure for spouses have been used to indicate power within relationships. This study investigates these topics in order to further understand the effect of unilateral divorce law on women, men and the household.

There are a few studies that look directly at unilateral divorce and time allocation (Gray 1998, Parkman 1998). Gray (1998) analyzes women's time use and finds that unilateral divorce law alone did not significantly change the time women spend in market work, while laws in conjunction with property laws had differential impacts on married women's time allocation. In some states, unilateral divorce law is found to be associated with more household production and in others it is actually associated with less household production. In general, Parkman (1998) found women are working significantly more and spending less time in leisure and home production in states with unilateral divorce. He also did not find any impact of unilateral divorce on the time allocation of men. One possible explanation for the differential findings, and the negligible effects for men, is that Parkman used a small dataset. This could be especially problematic for cross-state variation. In addition, Parkman (1998) only used one year of

data, and the data used by Gray (1998) was retrospective and the data used by Parkman was time dairy. The research for this paper adds to the previous literature on the effects of divorce laws by examining whether men and women alter their time allocation in response to divorce law using a larger time dairy dataset. This research also uses multiple methods utilizing both state and time variation in the adoption of state level divorce laws.

The findings for women from this analysis show that women are spending fewer hours working, fewer hours in household production and more hours in leisure in states with unilateral divorce law. This is contrary to Parkman's (1998) findings, yet the analysis of property laws support Gray's (1998) finding for community property laws, where women are found to be spending significantly fewer hours in home production in the states with unilateral divorce compared to women that live in states without unilateral divorce law. The results for the other property law states are not consistent with Gray's results. Overall, the estimates show that women in states with unilateral divorce law are spending more time in leisure and less time in household production than women in states without unilateral divorce law, regardless of the underlying property law or the number of years the unilateral divorce law has been in place. The results for men are consistent with Parkman's findings, even with the larger sample size, most of the analysis show that unilateral divorce is not associated with changes in men's time allocation.

4-2 Divorce Laws in the United States

A brief history of divorce law change in the United States is outlined in this section. The timing of state level divorce law changes is important because it allows for analyses that

capitalize on the variation across time and place. Following the legal history discussion, an overview of the findings on the effects of divorce law change on divorce itself is reviewed.

Evolution of Unilateral Divorce Laws

Before the 1970s, divorce laws in the United States, were primarily based on the English common law system and had little variation from one state to another. In the majority of states, a court was required to grant a divorce based on the guilty actions of a husband or wife and to allocate assets accordingly (Weitzman 1985). In 1969, however, California passed the first no-fault divorce law. Reasons cited for the legislative change are mixed; Weitzman (1985) suggests that the laws resulted from the desire for sexual equality, while Kay (1987) argues that the purpose of no-fault laws was to facilitate decreased hostility and lying in divorce court. Kay (2000) suggests that the creation of no-fault law was in response to changes already occurring within the courts, and the new legislation simply reflected how judges were actually handling and ruling divorce cases. Though the exact origin of no-fault legislation is difficult to isolate, it was primarily the result of actions by law scholars and judges, rather than political lobbies or other affected groups. As such, it is likely an exogenous law change for the purposes of measuring time allocation.

After California's law was enacted, similar legislation was passed in other states, with many states adopting the Uniform Marriage and Divorce Act[33] (UMDA) version of

[33] The National Conference of Commissioners on Uniform State Act used the California Family Law Act as a guideline for the creation of the Uniform Marriage and Divorce Act. The first version was published in 1970. It eliminated fault from marital dissolution, property allocation, and child placement decisions. It

no-fault divorce law or making variations to its proposed guidelines. These changes occurred throughout the 1970s, and by 1990 most states had some version of a no-fault or unilateral divorce provision in place. Differences in the laws across states persist; some states require mutual agreement between parties before a divorce is granted, and many states require long separation periods before allowing a no-fault divorce. For example, Kay (1987) classifies only 15 states as having "pure" no-fault divorce laws, while Freed and Walker (1990) categorize 14 states as having sole no-fault grounds for divorce. The no-fault and unilateral classification of states varies across papers because of the complexity and ambiguity in state divorce laws. This paper uses dates from the classification scheme for unilateral divorce that Gruber (2004) used because it has become the most commonly used in recent research on no-fault divorce laws. Table 4-1 shows the year each state adopted unilateral divorce, and the state's corresponding property law.

Divorce Laws and Divorce Rates

If unilateral divorce does make obtaining a divorce easier by reducing the transaction costs associated with divorce, the divorce rate should be higher in states with no-fault divorce law, ceteris paribus. However, the Coase Theorem (Coase, 1960) predicts that divorce law reform will not increase the number of divorces because it merely reallocates the marital property rights within a marriage. Researchers have pointed out that the assumptions necessary for the Coase theorem to apply may not be met when bargaining within a marriage (Parkman, 1992, Fella et al., 2005, Mechoulan,

---

also established a set of rules for a court to use in deciding whether a marriage had broken down (Kay 1987).

2005). The effects of no-fault divorce on divorce rates have been empirically tested in several previous studies.

The examination of divorce laws on divorce rates has been dominated by cross-sectional studies. Peters (1986) analyzed marriage and divorce using the 1979 Current Population Survey (CPS). Based on logit analysis of the probability of becoming divorced, Peters (1986) concluded that changes in divorce law did not significantly affect divorce incidence. Using similar methodology but eliminating regional dummy variables and making slight changes to the legal classification, Allen (1992) found a positive relationship between no-fault divorce law and the occurrence of divorce.

The disagreement between Allen (1992) and Peters (1986, 1992) led to further examination of divorce laws and to the use of time-series testing methods. Friedberg (1998) used panel data including state and year fixed effects. After estimating regressions using several alternative classifications of the no-fault states, Friedberg (1998) found that variations in the law classification generated differing impacts. Her final assessment, however, was that all forms of no-fault laws were associated with permanent increases in divorce rates. Using time-series data, Brinig and Buckley (1998) also found a positive relationship between divorce laws and divorce rates.

More recent research also suggests various outcomes of the divorce law change. Gruber (2004) used census data to show that the number of divorced people was significantly larger after divorce reform. Wolfers (2006) replicated Friedberg's (1998) study with a longer panel and also found increases in divorce rates immediately following changes in state laws, but found little evidence of the effect persisting over time. He argues that the probability of ever divorcing did not change dramatically following the

law changes. These findings and Rasul (2006) suggest that unilateral divorce is associated with shorter marriages and less remarriage.

To summarize, the literature examining divorce law generally finds a positive relationship between no-fault divorce law and divorce rates, at least in the short run. The longer-term impacts are less clear. In addition, there have been conflicting results generated by different classifications of the laws and, in the United States, their corresponding marital property rules.

4-3 Previous Research

This study is focused on the impact of divorce law change on time allocation of married individuals. The law itself may change actions within household (this is discussed in greater detail in the following theory section) and may also impact time allocation by changing the overall divorce risk shortly after the law change. There is an abundance of previous literature on divorce law changes, which is reviewed here. The first few sections cover research directly looking at the impact of divorce legislation on time allocation and outcomes related to time allocation, such as labor supply and fertility. The following sections review research that does not look at divorce law, but changes in divorce risk and how divorce risk impacts outcomes related to time allocation.

Divorce Laws and Time Allocation

The relationship between divorce law and individual time allocation has been empirically analyzed in very few studies. Gray (1998) uses the Panel Study of Income Dynamics (PSID) in 1970 and 1980 to find the effect of unilateral divorce law combined

with property laws on married women's time use. The most consistent and significant finding was women in states with community property and unilateral divorce laws spend fewer hours in home production than married women in states without unilateral divorce laws. The results for leisure hours are less clear, but in community property states, time spent in leisure increases with the adoption of unilateral divorce laws. Gray's results also show that for women in states with common law property rights, unilateral divorce is associated with more time spent in household production and less hours in market work. These findings are consistent with his hypothesis that unilateral divorce in community property states shifts the bargaining power to wives, and in common law states it shifts it to the husband. However, the findings in the states with equitable distribution property laws, where Gray suggests unilateral divorce is not expected to significantly alter the bargaining power, unilateral divorce is associated with working less hours in market work and slightly more in home production.

Parkman (1998) also analyzed time allocation and divorce laws using the Time Use Longitudinal Panel Study, 1975-1981. He performed basic regressions for work hours, housework, child care, and leisure separately for men and women with an indicator for living in a state with no-fault divorce laws on a cross sectional sample of married men and women in 1981. He concluded that no-fault divorce laws were associated with a greater number of hours worked among married women, and not married men. This finding supported his hypothesis that women work to protect themselves from the potential costs of divorce in states with no-fault divorce. Living in a no-fault state was also significantly associated with less time spent in leisure, but was not associated with difference in house work or child care for women.

Divorce Laws and Labor Supply

Researchers have used exogenous changes in divorce law to examine the relationships between divorce law and female labor force participation. Johnson and Skinner (1986) included residence in a state with no-fault divorce legislation in their predicted labor supply equations. They concluded that living in a state with a no-fault divorce law has a negative impact on women's labor supply. However, Johnson and Skinner's (1986) analysis used PSID data from 1972, when only a few states had changed their divorce laws to no-fault; this created a small comparison group and a limited amount of time for the laws' effects to occur. Alternatively, Peters (1986), using 1979 CPS data, found a higher probability of women participating in the labor force in no-fault states.

Parkman (1992) also used the 1979 CPS and a similar methodology to Peters (1986) to estimate the effect of no-fault divorce legislation on married women's labor supply. Consistent with Peters (1986), he also found about 2 percent higher rates of married women's labor force participation in no-fault states. However, he attributed this difference to lower compensation for women's marriage-specific investments in states with no-fault divorce law. In particular, he used differences in property division laws to illustrate that married women's labor force participation is greater in states with no-fault divorce because at the time of divorce, women's human capital losses from not engaging in market work are compensated at lower rates than in mutual consent states.

Gray (1998) utilized Census and CPS data, and he tested for the effect of no-fault divorce law in 1980 across states. His results indicated that the probability that a married

woman participates in the labor force is 1.6 percent higher in states with no-fault divorce law. He then used data from 1960 to 1980 to measure the change in married women's labor force participation in states with and without no-fault divorce laws. The results from this analysis found a small and insignificant impact of no-fault divorce law and Gray suggested that without considering the marital property laws of a state, "divorce legislation has no significant impact on married women's increasing labor-force participation rates during the 1970's" (Gray 1998, pg. 634). Gray (1998) categorized states into three types of property law: common property, community property and equitable distribution. With the enactment of no-fault divorce laws, common property favors the wife in divorce settlements, community property tends to lead to redistribution of assets to the husband, and equitable distribution gives the court discretion on property division and thus does not favor either party. The property laws were accounted for in Gray's (1998) analysis by interacting them with the no-fault variable. Consequently, the results from analyses using the Census, CPS and PSID all indicated that the adoption of a no-fault divorce law in a common property states is associated with decreases in married women's labor force participation. In addition, married women in states with community property laws had significant increases in labor force participation after no-fault legislation was enacted.

Chiappori, et al. (2002) also used PSID data from 1988 to test the effect of divorce and property legislation on married women's labor supply. They created a "divorce index" comprised of four attributes associated with the favorability of each state's divorce law towards women: no-fault divorce laws, property division laws, support order enforcement, and the settlement value of educational degrees. This index

was then used in a regression of the hours worked by married women. In their analysis, the "divorce index" was negatively correlated with hours worked. In other words, in states where the divorce laws are more favorable toward women, married women are likely to work fewer hours than in states where divorce law is less favorable towards married women.

Further research on divorce legislation and labor force participation by Genadek et al. (2007) suggests that married women with children are more likely to participate in the labor force in response to no-fault divorce laws than married women without children. The results also indicate that divorce risk has a greater effect on women with young children compared to women with older children. They also look at the effect of divorce legislation on time spent in market work, and find that law changes are associated with more annual hours worked for women with children. Stevenson (2008) also found a significant relationship between unilateral divorce legislation and increased women's labor force participation, regardless of the underlying property division laws.

Divorce Law and Marriage Specific Capital

Stevenson (2007) studied the effect of divorce law change on marriage specific capital directly by looking at several outcomes: having children, supporting spousal education, dual-earner status for couples, and home ownership within the first 2 years of marriage. Her results suggest unilateral divorce is associated with declines in marriage-specific capital investment, which are: decreases in having children, less spousal education support, and a greater likelihood of dual-earner status for newly married couples. While Stevenson (2007) does not find evidence of property law changes

affecting these outcomes, there is an increase in home ownership when property laws are no-fault.

Drewinka (2006) and Alesina and Guiliano (2006) both looked at the effect of divorce law change on aggregate fertility in the United States. The results were similar across studies; divorce legislation was associated with over all decreases in fertility, but marital fertility following divorce reform did not decrease significantly. Drewinka (2006) actually found a small increase in marital fertility, and a decrease in non-marital fertility, suggesting an increase in shot-gun marriages. Alesina and Guiliano (2006) also found an increase in shot-gun marriages.

Previous research suggests that unilateral divorce is associated with an overall decrease in fertility, but an increase in marital fertility. While this is not the result that Stevenson (2007) found regarding marriage specific capital investment, the fertility declines are likely driven by shot-gun marriages and the changing stock of marriages following divorce reform. The limited amount of literature directly looking at marital specific investment does suggest that divorce reform is associated with reductions in investment in marriage specific capital.

Divorce Risk and Time Allocation

One previous article directly analyzed relationship between divorce and time use decisions of married people. Weagley, et al. (2007) used the PSID to simultaneously study marital stability and time allocation decisions. The authors had three research questions, 1. What is the effect of market time allocations on the probability of divorce, 2. What is the effect of household time allocation on the probability of divorce, and 3.

What is the effect of divorce probabilities on market and household time allocation? They answered these questions using a simultaneous equations model with 5 equations. The equations included controls for demographic characteristics, household characteristics, spousal wages and time-use variables. In regard to the research questions, the results suggest that the more time husbands spend working, the lower the probability of divorce. Wives' annual housework hours decrease the probability of divorce, and increases in divorce probability reduce the amount of time married women spent in housework.

Divorce Risk and Labor Supply

There is a long history of research on the relationship between divorce risk and market work hours, especially for women. It is possible that as the probability of divorce increases, married people may decrease their investment in the marriage by reducing their hours in the market and hours in home production (Weagley et al. 2007). However, it is also possible that as the risk of divorce increases, hours worked increases as insurance for the economic distress following divorce (Montalo 1994). The probability of getting divorced may also be influenced by the amount of time spent working, in other words causation may work in the opposite direction. Empirical research has examined divorce and hours of work, and the potentially endogenous relationship between them.

Green and Quester (1982) utilized U.S. Census' Survey of Economic Opportunity data to generate a predicted divorce probability based on the demographic characteristics of married women. They found married women's labor supply increases with divorce risk, and did not find significant support for the opposite hypothesid, divorce risk

increasing with women's labor supply. Johnson and Skinner (1986) used the Panel Study of Income dynamics (PSID) to look at women's labor supply before divorce occurs and to estimate both directions of causation. Their results suggest that women about to divorce significantly increase their hours of work, on average. Also, they do not find support for the hypothesis that working hours for women increases marital instability. Gerner et al. (1990) also use the PSID to study working as insurance for divorce for married women and men. They found that women increase their hours worked within 1 or 2 years prior to divorcing, but there is not a change in labor supply for men.

More recently, Bedard and Deschenes (2005) used sex of first-born child as an instrumental variable for divorce risk because having a female child is associated with higher divorce risk. Using census data, they tested for labor market outcomes of divorce and found that ever-divorced mothers have higher levels of income than never-divorced mothers. They concluded that divorce increases the hours and weeks worked by mothers.

Time spent at work is large component of the day for people who choose to work; thus, it is important to understand how divorce and the decision to participate in the labor force are related. Like time spent at work, labor force participation may also be related to divorce in an endogenous way. Becker, et al. (1977, pg. 1181) state, "...the secular growth in wages, which contributed significantly to the growth in the labor force participation of women, especially married women, probably also contributed significantly to the growth in divorce rates. Again causation probably flows both ways: divorced women (and women who anticipate divorce) have higher wages because they spend more time in the labor force."

Michael (1985) performed an empirical examination to further understand the direction of causation, which included lagged divorce rates and lagged labor force participation rates as independent variables in time-series equations explaining subsequent divorce and labor force participation rates. He found that lagged divorce rates were positively correlated with subsequent labor force participation rates, but there was no significant relationship between lagged labor force participation rates and subsequent divorce rates. More recent studies on divorce suggest that divorce risk may not be as influential on female labor supply as the earlier studies suggested. Sen (2000) compared responses to divorce risk among 1944-1954 and 1957-1964 birth-cohorts using sub-samples from the National Longitudinal Surveys (NLS). The panel structure of this data allowed Sen to proxy current divorce risk using actual divorce in the future, which was then included in a labor force participation regression. Age at the time of marriage was also used in the labor force participation estimation as an instrument for divorce risk because research suggests that divorce risk decreases with age at the time of marriage. The results indicated that the impact of divorce risk on labor supply is significantly smaller for the younger cohort than the older group. Though divorce had a positive effect on both cohorts by each measure, divorce risk had a substantial impact on labor force participation for the older cohort while having a small (yet still significant) effect on the young cohort.

Divorce Risk and Marriage Specific Capital

Economic theories of marriage suggest couples with higher probabilities of divorce may choose to invest less in marriage-specific capital (Becker, et al. 1977). One

example of investment in marriage-specific capital that has been studied extensively is having children. Lillard and Waite (1993) studied the effect of anticipation of divorce on having children using a calculated "hazard of disruption" in their estimation of the likelihood of conception and the timing of conception. They found that the probability of marital disruption had strong negative effects on child-bearing. Couples in unstable marriages were less likely to have children than those in more stable relationships, and the unstable couples also have greater lengths of time between births.

While divorce risk may determine marriage-specific investment, the converse will also hold. Thus, as investment in marriage-specific capital increases, the costs of divorce or dissolving the relationship increase (Becker et al. 1977), suggesting the presence of children should decrease the probability of divorce. Empirical studies testing the prediction that divorce rates would be lower among couples with children have mixed results, but more recent work has suggested that young children decrease the probability of divorce, and as the probability of divorce increases, fertility decreases (Fan 2001).

Although Becker, et al. (1977) treated children of all ages as marriage-specific capital, because young children are more costly to care for, they represent a relatively larger investment in marriage-specific capital than older children. As a result, when children get older and their care costs decrease, the associated marriage-specific capital depreciates and the resulting costs of divorce fall. Cherlin's (1977) empirical analysis supported this hypothesis. He found that the presence of children under the age of six was correlated with a decreased probability of getting divorced, but children older than six did not have a significant effect on the divorce probabilities of their parents. Weiss and Willis (1977) also found that children stabilize marriages, especially when they are

between the ages three and six. Koo, et al. (1984) found that couples with children of preschool age had longer durations of separation before actual divorce occurred and the age of the youngest child had a significant effect on the probability of divorce post-separation. Morgan and Rindfuss (1985) found that a couple's first child decreases the probability of getting a divorce across cohorts and marriage durations. Finally, Waite and Lillard (1991) found that the first child within a marriage does increase the stability of the marriage, but the impact lasts only through the child's preschool years. Their results also suggested that older-aged children are associated with marital disruptions.

Conflicting research includes Hannan, et al. (1977) and Mott and Moore (1979) who found no evidence of a negative effect of children on divorce. Rankin and Maneker (1985) found that although the presence of *any* children is associated with longer marriages, having children under age two does not have a differential impact on marriage duration.

Summary of Previous Literature

Two papers (Parkman 1998 and Gray 1998) directly examine divorce legislation and time allocation and they present mixed findings. Thus, it is not clear how divorce laws effect time allocation, and the effect of divorce legislation may also depend on the property laws within a state. This paper attempts to reconcile these mixed findings by using multiple methods and larger data sets to analyze the impact of divorce law change on time allocation.

Research on the impact of unilateral divorce law on labor supply and marriage specific capital suggests divorce law change does effect the actions of married people.

The results for the direction of the impact of unilateral divorce on female labor supply were mixed, but the more recent research suggests that unilateral divorce increased female labor force participation and hours worked (Genadek et al. 2007, Stevenson 2008). Divorce law changes were also found to have significant impacts on marriage specific capital investment, which may influence married people's time allocation (Stevenson 2007). Specifically, increased education for women, reduced home ownership, and lower fertility could alter how couples spend their time.

As discussed in the previous section, scholars have debated the theoretical and empirical relationship between unilateral divorce and divorce rates. The most current research suggests that divorce rates increased in the short run and the duration of marriages decline. Thus if divorce law change increases divorce risk, the previous research outlined above suggest that this may influence time allocation of married people. Weagley et al. (2007) found women reducing their time spent in housework as their risk of divorce increased. The research presented in this section suggests that the probability of divorce has a positive relationship with labor supply of married women. Previous research also suggests couples with high probabilities of divorce are less likely to invest in marriage specific capital, including having children. With an increase in divorce risk via unilateral divorce, the expectations based on previous research is that work hours will increase, housework will decrease and overall time spent in child care will decrease.

4-4 Theoretical Framework

Several economic theories of the family have been developed by economists, including the common preference model introduced by Becker et al. (1977). This model predicts

that increases in the probability of divorce will decrease investments in marriage specific capital and increase investment in human capital or capital that is still valuable following divorce. If the adoption of unilateral divorce laws increases the probability of divorce, it is expected that couples in states that adopted the unilateral laws will spend less time investing in marriage specific capital building activities and more time in human capital building activities. However, it is also possible that the increased probability of divorce will cause couples to invest more in marriage specific capital as an action to increase the costs of divorce in the future.

Additional economic models of the family include bargaining models, where divorce law may also affect couples time allocation by changing the intra-household power between spouses. Unlike the common preference model where the allocation of resources among spouses does not affect the outcome, bargaining models result in different predictions depending on the relative power of the spouses. Economists have modeled bargaining within the households in different ways, and most models can be defined by having external threat points or internal threat points.

External threat point models (Manser and Brown, 1980 and McElroy and Horney, 1981) are defined by a threat point that is each spouse's best option outside of the marriage. The divorce law change affects the options outside of the marriage, and can alter each spouse's threat point. The change in threat point occurs because the more liberal divorce laws make it easier to exit the marriage, making leaving less costly, which in turn, causes outside options for a spouse that wants to leave a marriage more attractive. In the external threat model, unilateral divorce will shift the bargaining power in a marriage to the spouse who wants to leave the marriage from the spouse that is interested

in preserving the marriage. The person most interested in leaving the marriage does not actually have to get a divorce for this change to take effect; their bargaining power will be strengthened within the marriage by the change to their threat point. The predicted time allocation outcome of this change will be increased time spent in the areas that partner with the most power prefers, possibly more time in leisure and less time spent cleaning or doing laundry

Internal threat point or "separate spheres" bargaining models (Lundberg and Pollak, 1993) include threat points within a marriage as opposed to external threat points. The internal threat point is a threat that will change the marriage from a cooperative equilibrium to a non-cooperative equilibrium, unlike the threat of divorce in the external threat bargaining models. The internal threat point bargaining models predict little change in household allocation of time with unilateral divorce because changing the ability to get a divorce does not affect the internal threat points within the marriage.

While the exit threat bargaining model predicts unilateral divorce law will affect marriages, the prediction is not easily quantifiable. For example, it is difficult to know which spouse wants to leave, and which activities that spouse prefers. Previous empirical studies have analyzed the effect of unilateral divorce on bargaining power, Gray (1998) provides support for his claim that unilateral divorce in states with common-law property rights shifts the bargaining power to men and when community property law is in place, bargaining power is shifted to women. Stevenson and Wolfers (2006) argue that unilateral divorce shifts bargaining power to women, because they find a decrease in domestic violence and suicide for females.

This paper investigates time allocation differences between married people in states with and without unilateral divorce laws. Like previous research, the time allocation outcomes of market work, household production, child care, leisure and sleep are used to provide insight into the impact of unilateral divorce law on household dynamics.

4-5 Data

The analyses in this paper use data from the Time Use in Economic and Social Accounts (TUESA), 1975-1976, the National Human Activity Pattern Survey (NHAPS), 1992-1994, and the NHAPS follow-up survey, the National Time Diary Study, 1994-1995. The data were obtained from the American Heritage Time Use Study (AHTUS). The surveys were selected for this analysis because the respondents' state of residence is identified, unlike the U.S. time dairy studies from the 1960s and 1980s. Also, as mentioned in the section on divorce laws, most states that adopted unilateral divorce law changed the laws in the 1970s, and multiple states switched to unilateral divorce between 1976 and 1990.[34] Finally, the 1975-1976 data is a small sample and there were many states with no respondents, so the addition of the 1990 survey provided a more robust sample for this analysis.

The surveys are all slightly different from each other, yet they are all nationally representative and include daily time diaries. Time diaries ask respondents what they were doing throughout the day for a 24 hour period, and the diaries vary in the detail of the activities, but the AHTUS has harmonized the data across surveys. The TUESA

[34] See Table 1.

survey was collected by the Survey Research Center at the University of Michigan. It included 1,519 respondents in the first wave of the study, and time diaries were collected three more times over the following year. As well as the time diaries, respondents were asked about economic, social, and household characteristic questions in more detail than the NHAPS survey. In order to make the data compatible with the following time dairy studies, single day diaries were selected at random for each respondent.

The NHAPS survey was collected by the University of Maryland between September 1992 and October 1994. Single-day time diaries were collected from 7,514 adults, and respondents were asked a limited amount of geographic, demographic, and socioeconomic questions. The NHAPS follow-up time diaries were collected from 1200 new respondents between July 1994 and July 1995. Marital status was not asked of the original respondents, yet the NHAPS follow up did ask about marital status. Marital status is essential to determine which respondents the divorce legislation actually affects. Thus, marital status is imputed in the original NHAPS data using multiple imputation with demographic characteristics contained in both surveys and the marital status in the follow survey. For each respondent, marital status was imputed twenty times, and the respondents were considered married that were imputed as married at least 70% of the imputations.

The three samples are combined and limited to married respondents between the ages of 18 and 65. The data used does not include marital histories so it is not possible to identify respondents who were married before the laws were in place.[35] Table 4-2 shows

[35] The inability to identify recent marriage could impact the results of this analysis. The adoption of unilateral divorce laws will likely have a different impact on current marriages than couples that marry following the adoption of unilateral divorce laws. However, previous research has found labor supply effects for all married women in states

the sample characteristics for men and women of the combined TUESA, NHAPS, and NHAPS follow-up sample. The demographic and household characteristics in Table 4-2 are also included as individual control variables in the analysis.

Following the merging of samples, time allocation measures are created by summing the total minutes spent in the specified activity over the 24 hour period. Activities are segmented in the time allocation categories based on previous time diary studies (Aguiar and Hurst 2007). The categories are mutually exclusive thus the time spent across all five categories sums to the total minutes per day reported by the respondent.

Market Work contains all time spent in all activities relating to the respondent's job. This includes paid work, working at home, work breaks, meals at work, looking for work, and travel related to work.

Household Production includes all time spent in activities that could be classified as non-market work and activities pertaining to the home and family. The household production activities are: food preparation, cleaning, laundry, home repairs, shopping for household goods and services, caring for other adults, homework or educational activities, and travel related to home production.

Child Care activities are those where the primary activity is taking care of children. This includes time spent caring for older children, helping children with homework, caring for infants, talking to children, and playing with children.

---

with unilateral divorce law, regardless of if they were married before or after the divorce law change. Thus, unilateral divorce may impact the time allocation of all married people, not just those married over the period of divorce law change. Differences in time allocation between couples that married before and after the law change could be analyzed in future work using the 1976-1981 Time Use Longitudinal Panel data.

Leisure activities are those that could be considered free time in that the respondent is choosing to spend time in that activity. The obvious activities in leisure include watching television, relaxing, sports and exercise, reading books, listening to music, going to parties, going to the theatre or museums, social activities and hobbies. In addition to the basic leisure activities, time spend in volunteer activities, religious activities, eating and drinking, pet care, and personal care are also included in the leisure time.

Sleep time is all time spent sleeping or napping throughout the day. Figure 4-1 shows the average amount of time spent in the time allocation categories by unilateral divorce law and gender. Comparing across gender, men spent more hours on average in market work than women and women spent more hours in household production. Also, women spent more time in child care. There do not look to be large differences in time allocation across divorce law classification, and the greatest differences are between men in states with and without unilateral divorce. Men in the unilateral divorce states are spending slightly less time in market work and more time in household production.

4-6 Empirical Strategy

Three empirical strategies are used to analyze unilateral divorce law and time allocation of married people. The first is similar to the analysis performed by Parkman (1998), which is a regression estimating the impact of living in a state with unilateral divorce law on the time allocation outcomes by including a binary variable for unilateral divorce. Yet, including the state and year-level fixed effects gives us a difference-in-difference estimate of the effect of the change in divorce law on time allocation. The specification

in Equation 4-1 is used to estimate five outcomes with Ordinary Least Squares (OLS) regression: hours in market work, house work, child care, leisure, and sleep.[36]

(4-1) $Y_i = \alpha + \beta_1 law + \beta_i X_i + \beta_s I_s + \beta_y I_y + e_i$

The *law* variable is an indicator if the respondent lived in a state with unilateral divorce laws. The individual control variables X_i include: age, years of education, race, employment status, children under age 18, weekend and season.[37] The covariates included control for variation in time allocation by demographic and socio-economic status. For example, more education is associated with more time spent in leisure, market work and childcare (Aguiar and Hurst 2007, Ramey and Ramey 2010). The presence of children is also included because children impact time allocation, and diary day characteristics are included to control for differences across weekend and weekdays and seasons throughout the year. I_s and I_y represent state-specific and year-specific dummy variables, and are included to control for possible state and year level factors that could impact the time allocation outcomes.

Similar to Parkman (1998), the model will be estimated for men and women separately. The predicted size and sign of β_1 will vary with the outcome being predicted. As discussed in the theory section, when divorce risk increases with the change to

[36] OLS is used for the analysis of time allocation outcomes for two specific reasons. The first is that previous research has found that, with time-use data, OLS produces unbiased results when compared to Tobit and two-part models (Stewart 2009). The bias occurs because many activities that people report zero minutes in they may perform on different days of the week, so it is a mismatch in the reference period and the actual period of interest. The second is that, other than for child care and market work, the remaining broad time allocation activities have very few respondents spending no time in them. For child care and market work, Tobit models may be a better fit than OLS because people that do not work will have true zeros for market work time and most people without children do not spend time caring for children. However, OLS is used for consistency with the other outcomes, and Tobit models were performed as robustness analysis. The Tobit results are nearly identical to the OLS results for all outcomes and these results can be obtained from the author.

[37] Models were also performed for only employed respondents, and respondents that were not working. Results can be obtained from the author.

unilateral divorce, it is likely that married people will change their time allocation. However, theoretically it is not clear how each of the outcomes will be impacted. Previous research suggests that β_1 will be positive for work hours for women in states with unilateral divorce. The direction of changes in time spent in leisure, household production, childcare and sleep are less clear depending on how the change in divorce law influences household bargaining.

The *law* classification used by Parkman (1998) only allowed for states with a no-fault law for more than 2 years to be classified as no-fault. The analysis in this paper will not use the 2 year no-fault restriction. If the law is publicized, the perceived divorce risk increase may be immediate. However, the exact date of the divorce laws enactment is not always easily obtainable, so a unilateral divorce law is considered in effect the year following the year enacted.

The analyses will also be performed replacing the divorce law indicator with a set of indicators identifying state property classifications. Gray (1998) found the effects of divorce law vary based on the property law within the state, and following his empirical specification this analysis will create indicators combining property laws and no-fault divorce laws. The property law types include equitable distribution, common law and community property. In states with equitable distribution property laws, courts have discretion in the distribution of household assets following a divorce. Common law and community property states, on the other hand, dictate household distribution of assets based on the asset holder. Assuming assets are disproportionately held in the husband's name, unilateral divorce will lead to a distribution of assets towards the husband in states with common law property rights, and towards the wife in states with community

property laws. Equation 4-2 shows the specification accounting for property law within the state, and it includes three unilateral divorce law binary variables indicating the adoption of unilateral divorce based on the type of property law.

(4-2) $$Y_i = \alpha + \beta_1 law(equitable\ distribution) + \beta_2 law(common\ law) + \beta_3 law(community\ property) + \beta_i X_i + \beta_s I_s + \beta_y I_y + e_i$$

With assets being shifted towards the wife in common law states upon the adoption of unilateral divorce, the coefficient β_2 to be positive for the leisure outcome for women. Likewise for the leisure outcome for men in community property states the coefficient on unilateral divorce law should be negative. The expectation for the coefficients on the variables for divorce law and property laws is less clear for the other outcomes because of variation in preferences.

While it is likely the case that the law has an immediate effect, previous research suggests that the effect of divorce legislation on divorce rates may dissipate with time (Wolfers, 2006). If the change in divorce probability associated with the adoption of unilateral divorce is behind the impact of the law on time allocation, there may only be an effect immediately following the law adoption. The expectation is that the impact of unilateral divorce will decrease in the years following adoption because the initial increase in the risk of divorce may have the greatest impact on the time allocation of currently married couples. The third empirical strategy addresses this by adapting the model in Equation 1 to include the amount of time since the no-fault divorce law was enacted. Following Wolfers' (2006) empirical specification, Equation 4-3 shows the

model with the dummy variables for the years specified in the parenthesis following the no-fault which indicate how long the law has been in place.

(4-3) $Y_i = \alpha + \beta_1 law(0\text{-}2) + \beta_2 law(3\text{-}6) + \beta_3 law(7+) + \beta_i X_i + \beta_s I_s + \beta_y I_y + e_i$

Table 4-3 shows the percent of the sample living in state with unilateral divorce law, and the percent of the sample living in states with unilateral divorce and the specified property law. The table also shows the proportion of the sample living in states with a unilateral divorce law that has been in place for 2 years or less, between 3-6 years and more than 7 years. At the time of the surveys, the majority of states with unilateral divorce had it for more than 7 years, thus segmenting the states based in the length of time since the divorce law change is necessary to see the immediate effect of the law.

4-7 Results

Unilateral Divorce

Tables 4-4 through 4-6 show the results from the OLS models estimating the impact of unilateral divorce on the daily time allocation for women and men. Column 1 of Table 4-4 shows the estimated coefficients on the unilateral divorce variable from each of the time allocation outcomes for women.[38] Unlike evidence from the previous research, the impact of unilateral divorce on market work hours is actually negative and statistically significant at the 10% level. The results show that women in states with unilateral divorce work one hour less than women in states without unilateral divorce law. Women in states with unilateral divorce are also found to be spending 44 minutes

[38] The standard errors are reported in the parenthesis below the coefficients. They are robust and clustered on state and year, allowing for non-independent errors by the state and year groups.

less in household production and 67 more minutes in leisure than women in states without unilateral divorce laws. These results are significant at the 10% level. These results show that women in states with unilateral divorce are spending more than an hour each day in leisure than their married counterparts in states without the law.

These results also differ from Parkman's (1998) findings using time dairy data. He found significant increases in market work hours for women and that women were spending less time in leisure in states with unilateral divorce law. The results from the current analysis showed that women in states with unilateral divorce law work fewer hours and spend more time in leisure. While both analyses used time dairy data, the samples used are different. The data used in this study have more observations and spans more years, while Parkman (1998) only used data from 1981 for about 150 respondents. Parkman (1998) also limited his analysis to states that had unilateral divorce before 1978 and states that had no adopted unilateral divorce by 1981. Finally, the analysis in the paper includes state and year level fixed effects and these variables were not included in the Parkman (1998) analysis. The different samples likely led to the variation in results, and the larger sample used for this study fully encompassed the time period of the law change, making the results more robust.[39]

The results for men are presented in column 2 of Table 4-4 and show that, on average, unilateral divorce is not related to overall time allocation for men. These results

[39] All of the analyses were performed for the 1975-1976 sample alone. Results were very similar to the results for the full sample. The only major difference with the basic OLS analysis is that women in unilateral divorce states were not found to be spending more time in leisure, but they were found to be sleeping more than women in states without the law. Men were also found to be doing more market work and less leisure in this sample. These results can be obtained from the author.

are similar to Parkman's (1998) results, which also showed no significant impact of unilateral divorce on men's time allocation.

Unilateral Divorce and Property Laws

Table 4-5 shows the results from the analysis with unilateral divorce law in each of the three kinds of property law states. The time allocation outcomes for women are in columns 1-5, and each regression includes the variables for adoption of unilateral divorce law by the property laws in the state, with the comparison group being respondents who live in states without unilateral divorce laws. In states with equitable distribution property rights and unilateral divorce laws, women are working 250 minutes more per day, on average, than women in states without unilateral divorce laws. This large difference in market work hours corresponds to significantly less time spent in household production, childcare, and sleep. However, women in states with unilateral divorce and equitable distribution property laws are spending almost 90 minutes more in leisure per day than women without unilateral divorce laws.

The results for unilateral divorce adoption within common law states are not as large in magnitude as the previous results, but show that women living in states with common law property rights and unilateral divorce are also spending more than an hour more in leisure than women without unilateral divorce law. The women in common law states are spending less time in both market work and household production. The results are statistically significant at the 10% level, but the coefficients for unilateral divorce on the remaining time allocation outcomes are not statistically significant.

Finally, the adoption of unilateral divorce law in states with community property laws is associated with about 30 minutes more market work and more than 4 hours less household production than women in states without unilateral divorce. The results also show that women in the community property states with unilateral divorce law are spending less time in child care and more time sleeping.

The results show very different impacts of unilateral divorce across the property right regimes, and they are different from Gray's (1998) time allocation results. Gray (1998) found the opposite of the findings from this study in states with equitable distribution property laws; women in unilateral states were working less and spending more time in home production. He also did not find difference in leisure time across the state with and without unilateral divorce in the equitable distribution states. For the common law states, the results for household production is contrary to Gray's (1998) findings in which women in states with unilateral divorce law and common law are spending more time in household production. However, he also found that unilateral divorce was associated with women working fewer hours just as these results show. With the community property law states, the findings are very similar to Gray (1998), as he also found women in states with unilateral divorce and community property rights spending fewer hours in household production.

The result from the analyses support Gray's (1998) hypothesis that the adoption of unilateral divorce law in states with community property law shifts the bargaining power to women. However, this study does not support the assertion that the husband has greater bargaining power in states with unilateral divorce and common law property

rights. A possible reason for the difference in findings, which is primarily driven by the results for home production, is the type of data used. Gray (1998) used the PSID data, which includes a question to respondents about how many hours of housework they typically do. The time dairy data used for this study uses the amount of time the respondent reports on that day. While recall questions, like the one in the PSID, are generally similar to that of time diary data, the time diary data is often found to be more accurate measure of time spent in activities (Conrath et al. 1983, Frazis and Stewart 2004).

The results for men are different from women. Most of the estimated coefficients on time allocation are not statistically significant for men. Thus, unilateral divorce and the underlying property law do not seem to be related to time allocation of married men. Most of the magnitudes of the coefficients are smaller on average than the ones found for women, with a few exceptions. In states with equitable distribution and unilateral divorce law, men are found to spend about 120 minutes more in leisure and less time in sleep compared to men in states without unilateral divorce law. Unilateral divorce, combined with community property laws, is also associated with significantly more time in household production for men and less time in sleep for men.

Years Since Unilateral Divorce Adoption

The results for the analysis with differential effects for how long the unilateral divorce law has been in place are presented in Table 4-6. For women, the impact of unilateral divorce on time spent in market work is the largest, and statistically significant, in the first 3 years following the law change. The coefficients decrease in magnitude and

are no longer significant following the first few years. The results are similar for time spent in childcare; immediately following the law adoption women spend significantly more time in childcare than women in states without unilateral divorce law. This decreases in magnitude and is no longer significant for women in states with unilateral divorce for longer periods of time.

The results with the indicator for unilateral divorce law suggest unilateral divorce law did not significantly impact men's time allocation. The results from the analysis with the variables for years since unilateral divorce adoption confirm this, with only a few significant coefficients across the five time allocation categories and the three unilateral divorce law classifications. One of the significant results is for leisure; in the first three years following the adoption of unilateral divorce, men spend 57 less minutes in leisure than men in states without a unilateral divorce law. The longer the unilateral divorce law is in place, this result falls in size and is no longer statistically significant.

The results from this section suggest that changing to unilateral divorce law did not impacts time allocation through a short-term increase in the divorce rate. However, the increase in hours worked for women immediately following divorce is consistent with previous research suggesting that an increase in divorce risk causes women to protect themselves by working. The other time allocation outcomes are not significantly different across time, suggesting that it is changes in bargaining within the household in states with unilateral divorce that are altering time allocation behavior, at least for women.

4-8 Conclusion

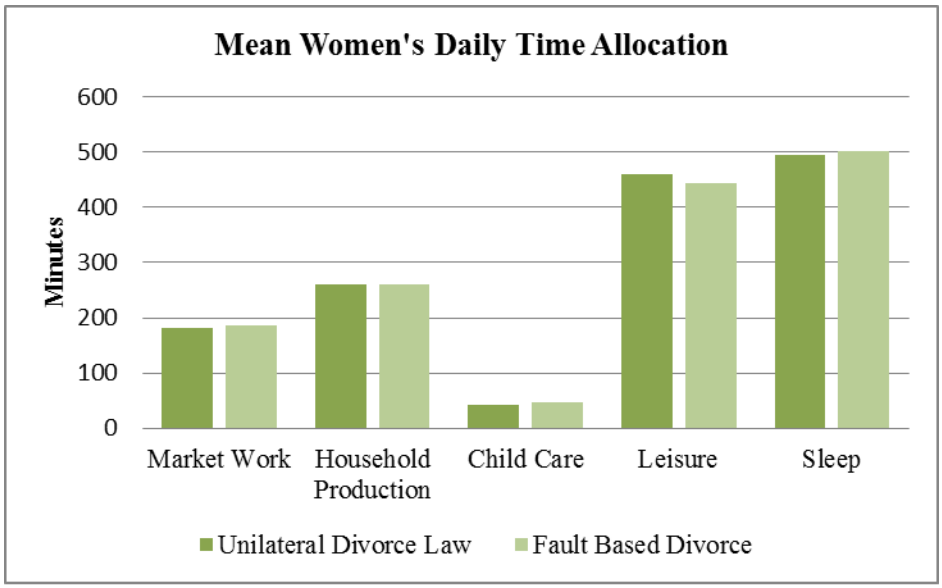
This study used a time diary dataset from 1974-1995 to analyze the impact of unilateral divorce legislation on the time allocation outcomes of married men and women. The results show women in states with unilateral divorce law are spending more time in leisure and less time in household production than women in states without unilateral divorce law, regardless of the property law in place or the number of years the unilateral divorce law has been in place. The findings are contrary to previous research by Parkman (1998) who found that women were working many more hours at the expense of leisure time and home production. The results for property laws support findings by Gray (1998) that suggest the adoption of unilateral divorce in states with community property rights shifted the bargaining power to women. In fact, the analysis showed that men in states with unilateral divorce and community property law are doing many more hours of home production while working less, spending less time in leisure, and spending less time sleeping than their married counterparts in states without unilateral divorce law. These results are some of the only significant results found for men; in general, married men's time allocation is not significantly impacted by unilateral divorce.

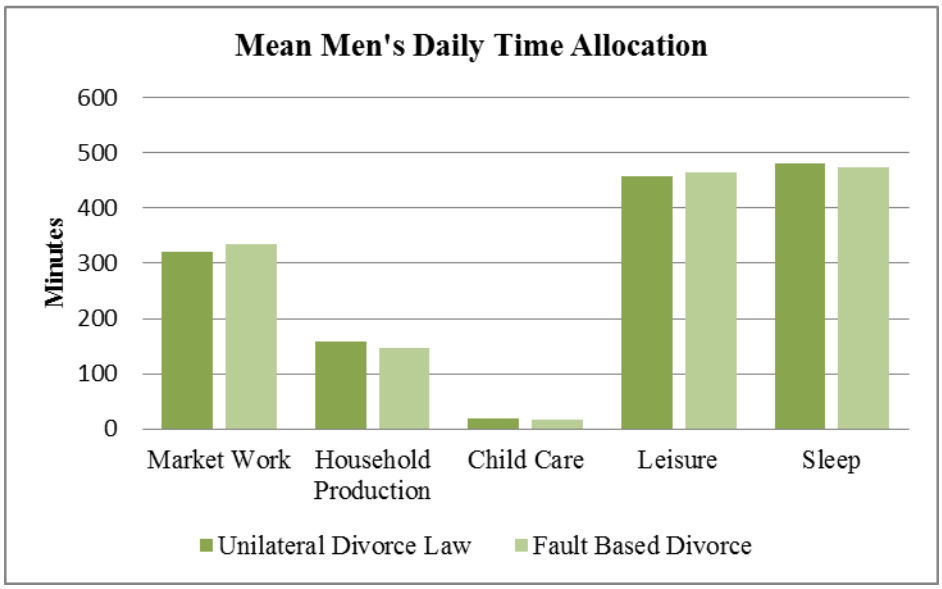
A possible problem with the results presented here is that systematic variation across states with and without no-fault laws could be driving results. In other words, respondents in states with the laws may have greater levels of time spent in market work, for example, for some reason other than unilateral divorce. While this problem is mitigated by the addition of state and year level fixed effects, the cross sectional analysis may not be measuring the actual impact of adopting unilateral divorce. Various methods

could be used to address this problem, one being an individual-level fixed effect model using the time use panel data from 1975 and 1981. This data provides the ability to analyze the same married people's time allocation before and after law changes. The other benefit of using the 1976-1981 panel data is that time diary data was collected for the spouses of married people. Future work could also include analyses of retrospective time allocation data from the PSID.

4-9 Figures

Figure 4.1 Women and Men's Daily Time Allocation by Law Type





4-10 Tables

Table 4-1. Unilateral Divorce Adoption and Property Law by State

State	Year Adopted Unilateral Divorce*	Property Law Classification**	State	Year Adopted Unilateral Divorce*	Property Law Classification**
Alabama	1971	common law	Montana	1973	equitable distribution
Alaska	1935	equitable distribution	Nebraska	1972	equitable distribution
Arizona	1973	community property	Nevada	1967	community property
Arkansas		equitable distribution	New Hampshire	1971	equitable distribution
California	1970	community property	New Jersey		equitable distribution
Colorado	1972	equitable distribution	New Mexico	1933	community property
Connecticut	1973	equitable distribution	New York		common law
Delaware	1968	equitable distribution	North Carolina		common law
DC		equitable distribution	North Dakota	1971	equitable distribution
Florida	1971	common law	Ohio		common law
Georgia	1973	common law	Oklahoma	1953	equitable distribution
Hawaii	1972	equitable distribution	Oregon	1971	equitable distribution
Idaho	1971	community property	Pennsylvania		common law
Illinois		equitable distribution	Rhode Island	1975	common law
Indiana	1973	equitable distribution	South Carolina		common law
Iowa	1970	equitable distribution	South Dakota	1985	equitable distribution
Kansas	1969	equitable distribution	Tennessee		common law
Kentucky	1972	equitable distribution	Texas	1970	community property
Louisiana		community property	Utah	1987	equitable distribution
Maine	1973	equitable distribution	Vermont		equitable distribution
Maryland		common law	Virginia		common law
Massachusetts	1975	equitable distribution	Washington	1973	community property
Michigan	1972	equitable distribution	West Virginia		common law
Minnesota	1974	equitable distribution	Wisconsin	1978	equitable distribution
Mississippi		common law	Wyoming	1977	equitable distribution
Missouri		equitable distribution			

*from Gruber (2004)

**from Gray (1998)

Table 4-2. Time diary respondent characteristics for married couples

	Women	Men
Age	43.1	44.4
White	0.911	0.888
Black	0.047	0.048
Other	0.041	0.063
Less than High school	0.085	0.084
GED/HS Degree	0.386	0.324
Some College	0.263	0.236
College/Advanced Degree	0.264	0.353
Employed	0.624	0.859
Number of children under 18	1.12	1.02
Weekend	0.358	0.357
1975	0.088	0.117
1976	0.142	0.137
1990s	0.770	0.747
Number of Observations	1,877	1,587

Source: Author's calculations from AHTUS data from 1974/75, 1992/95. Sample includes all married respondents between the ages of 18 and 65.

Table 4-3. Proportion of Sample with Unilateral Divorce Laws

	Women	Men
Unilateral Divorce Law	0.546	0.558
Unilateral Divorce - Equitable Distribution	0.099	0.104
Unilateral Divorce - Common Law	0.249	0.239
Unilateral Divorce - Community Property	0.198	0.215
Unilateral Divorce - 1-3 years	0.031	0.053
Unilateral Divorce - 4-6 years	0.076	0.068
Unilateral Divorce - 7+ years	0.439	0.437

Source: Author's calculations from the CPS Work Schedule Supplement 2004, and the ATUS data from 2003-2010. Sample includes all married respondents with wives between the ages of 20 and 60 and the husband is in the labor force.

Table 4-4. Regression estimates of unilateral divorce law and daily time allocation, OLS Results

	Women		Men	
	(1)		(2)	
Market Work	-57.71 *	*{0.428}*	18.17	*{0.471}*
	(34.69)		(50.46)	
Household Production	-43.79 *	*{0.187}*	24.00	*{0.180}*
	(23.15)		(33.85)	
Child Care	11.37	*{0.297}*	-8.03	*{0.107}*
	(8.86)		(11.36)	
Leisure	67.17 *	*{0.228}*	-49.25	*{0.329}*
	(36.00)		(31.64)	
Sleep	23.96	*{0.128}*	14.36	*{0.216}*
	(32.41)		(17.56)	
Observations	1877		1587	

Notes: The sample includes all married respondents between the ages of 18-65. The regressions include age, race, educational attainment, employment status, children under age 18, weekend, season, state-level and year-level fixed effects. The standard errors are reported in the parenthesis, and allow for non-independent regression errors within groups defined by state and year. R-sqaured is in italics to the right of the estimate.

*p<.10; **p<.05; ***p<.01

Table 4-5. Regression estimates of the relationship between unilateral divorce with property law and daily time allocation, OLS Results

	Women					Men				
	Market Work	Household Production	Child Care	Leisure	Sleep	Market Work	Household Production	Child Care	Leisure	Sleep
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unilateral Divorce	251.01 ***	-139.18 ***	-88.83 ***	87.87 ***	-58.78 ***	-33.75	-45.19	10.68	122.36 *	-55.94 *
Equitable Distribtion	(32.88)	(27.09)	(14.45)	(31.02)	(19.98)	(83.19)	(45.39)	(12.45)	(62.47)	(31.75)
Unilateral Divorce	-57.71 *	-43.79 *	11.37	67.17 *	23.96	18.17	24.00	-8.03	-49.25	14.36
Common Law	(34.69)	(23.15)	(8.86)	(36.00)	(32.41)	(50.46)	(33.85)	(11.36)	(31.64)	(17.56)
Unilateral Divorce	27.95 ***	-266.62 ***	-68.26 ***	-23.30	127.08 **	-98.11	328.34 ***	3.87	-38.61	-199.48 ***
Community Property	(10.34)	(28.97)	(15.50)	(31.67)	(50.20)	(67.66)	(44.25)	(14.20)	(55.16)	(28.77)
Observations	1880	1880	1880	1880	1880	1589	1589	1589	1589	1589
R-squared	0.4279	0.1872	0.2972	0.2278	0.1278	0.4712	0.1804	0.1070	0.3293	0.2155

Notes: The sample includes all married respondents between the ages of 18-65. The regressions include age, race, educational attainment, employment status, children under age 18, weekend, season, state-level and year-level fixed effects. The standard errors are reported in the parenthesis, and allow for non-independent regression errors within groups defined by state and year.

*p<.10; **p<.05; ***p<.01

Table 4-6. Regression estimates of the relationship between unilateral divorce law by time in place and daily time allocation, OLS Results

	Women					Men				
	Market Work	Household Production	Child Care	Leisure	Sleep	Market Work	Household Production	Child Care	Leisure	Sleep
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Unilateral Divorce	-65.56 *	-31.54	16.21 *	67.24	14.13	25.55	32.42	-7.98	-57.03 *	8.81
1-3 years	(36.17)	(26.44)	(8.96)	(42.54)	(37.68)	(50.84)	(34.94)	(10.82)	(33.32)	(16.92)
Unilateral Divorce	-43.03	-26.11	8.95	29.86	32.18	73.26	-8.91	-23.12 *	-50.22	9.97
4-6 years	(41.11)	(28.57)	(11.83)	(41.36)	(35.69)	(60.79)	(40.36)	(12.63)	(40.35)	(18.40)
Unilateral Divorce	-51.13	-70.49 **	4.61	82.14 **	36.33	-19.06	19.37	-2.17	-32.57	27.72
7+ years	(40.34)	(28.23)	(10.98)	(41.14)	(35.77)	(56.73)	(39.64)	(13.20)	(36.08)	(19.41)
Observations	1880	1880	1880	1880	1880	1589	1589	1589	1589	1589
R-squared	0.4281	0.1901	0.2978	0.2309	0.1291	0.4752	0.1829	0.1143	0.3298	0.2169

Notes: The sample includes all married respondents between the ages of 18-65. The regressions include age, race, educational attainment, employment status, children under age 18, weekend, season, state-level and year-level fixed effects. The standard errors are reported in the parenthesis, and allow for non-independent regression errors within groups defined by state and year.

*p<.10; **p<.05; ***p<.01

CHAPTER 5

CONCLUSION

All three chapters of this dissertation have relevant findings that provide insights on the economics of the family, and build on the previous literature in the field. The first essay shows that while most divorced women are working more hours, they are not sacrificing time in leisure; rather they are spending less time in housework then their married counterparts. However, the results also show that divorced women with children have less leisure time than married women with children, as do divorced women with college degrees. The second essay shows large effects of husband's workday timing on the wife's labor force participation. This indicates that women do take the husband's work schedule into account when making work related decision, and this finding could inform policy aimed at making dual-earner careers easier for parents. Finally the third essay shows that the adoption of unilateral divorce law did not significantly reduce the amount of leisure time women have, as was previously thought.

While the essays provide useful and significant findings, these areas of research could be developed further. Following the methods of the first essay, preliminary results suggest that divorce does not alter the time allocation behavior of men. This finding, or lack of a finding, is an area for further research. Also, researchers often include separated people with divorced people in their analyses, yet the time diary data show significant differences between the two groups' time allocation behaviors. In future research, the second essay could be expanded to look at the husbands who work non-standard work hours, and how the timing of those shifts impacts the wife's labor force participation, and

vice versa. Also, the research could be expanded to include the two additional CPS work schedules supplements going back to 1997, with the possibility of looking at change in over time. Finally, analyses using the previously mentioned time diary panel data and PSID data could further inform the results from the last essay.

Beyond looking at the labor – leisure decision of individuals and households, these three essays get at another essential element of economics, which is utility maximization and well-being. Economists generally use income or consumption as an indicator of well-being. However, individuals also maximize their time, and these three essays highlight the importance of including time allocation as an outcome related to economic well-being.

BIBLIOGRAPHY

Abraham, Katharine G., Sarah M. Flood, Matthew Sobek, and Betsy Thorn (2008), American Time Use Survey Data Extract System: Version 1.0 [Machine-readable database], Maryland Population Research Center, University of Maryland, College Park, Maryland, and Minnesota Population Center, University of Minnesota, Minneapolis, Minnesota.

Abraham, Katharine G, Sara Helms, and Stanley Presser (2009) "How Social Processes Distort Measurement: The Impact of Survey Nonresponse on Estimates of Volunteer Work in the United States," *American Journal of Sociology* 114: 1129-1165.

Aguiar, Mark and Erik Hurst (2004) "Consumption vs. expenditure," *NBER Working Paper*, No. 10307.

Aguiar, Mark and Erik Hurst (2007) "Measuring Trends in Leisure: The Allocation of Time Over Five Decades," *The Quarterly Journal of Economics*, 122(3): 969.

Allen, Douglas W. (1992) "Marriage and Divorce: Comment," *The American Economic Review*, 82(3) (June): 679-685.

American Heritage Time Use Study, release 5 (March 2012), Created at the Centre for Time Use Research, United Kingdom, by Kimberly Fisher, Evrim Altintas, Muriel Egerton and Jonathan Gershuny, with Nuno Torres and Andreas Pollmann, and contributions from Anne H. Gauthier and John Robinson.

Ananat, Elizabeth O., Guy Michaels (2008) "The Effect of Marital Breakup on the Income Distribution of Women with Children," *The Journal of Human Resources*, 43(3): 611-629.

Angrist, John D. and William N. Evans (1998) "Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size," *The American Economic Review*, 88(3) (June): 450-477.

Barnet-Verzat, C., Ariane Pailhe, Anne Solaz (2011) "Spending Time Together: The Impact of Children on Couples' Leisure Synchronization," *Review of Economics of the Household*, 9(4): 465-486.

Becker, Gary S., Elisabeth M. Landes, and Robert T. Michael (1977) "An Economic Analysis of Marital Instability," *Journal of Political Economy*, 85(6) (December): 1141-1187.

Becker, Gary S. (1965) "A theory of the allocation of time," *Economic Journal*, 75: 493–517.

Becker, Gary S. (1981) *A Treatise on the Family*, Cambridge, MA: Harvard University Press.

Bedard, Kelly and Oliver Deschenes (2003) "Sex Preferences, Marital Dissolution and the Economic Status of Women," *Journal of Human Resources*, 40(2): 411-434.

Belbo, Miriam and Julio R. Robledo (2008) "The Wage Gap and the Leisure Gap for Double-Earner Couples," *Journal of Population Economics*, 21: 281-304.

Bianchi, Suzanne M. (2000) "Maternal Employment and Time with Children: Dramatic Change or Surprising Continuity?," Demography, 37(4): 401–414.

Bianchi, Suzanne M., John P. Robinson, and Melissa A. Milkie (2006) *Changing Rhythms of American Family Life*, ASA Rose Series, New York: Russell Sage.

Blau, David M. and Philip K. Robins (1988) "Child-Care Costs and Family Labor Supply," *The Review of Economics and Statistics*, 70(3) (August): 374-381.

Blau, Francine D. and Lawrence M. Kahn (2007) "Changes in the Labor Supply Behavior of Married Women: 1980-2000," *Journal of Labor Economics*, 25(3): 393-438.

Brinig, Margaret F. and F.H. Buckley (1998) "No-Fault Laws and At-Fault People," *International Review of Law and Economics*, 18(3) (September): 325-340.

Browning, Martin (1992) "Children and Household Economic Behavior," *Journal of Economic Literature*, 30(3) (September): 1434-1475.

Cherlin, Andrew (1977) "The Effect of Children on Marital Dissolution," *Demography*, 14(3) (August): 265-272.

Chiappori, Pierre-Andre, Bernard Fortin, and Guy Lacroix (2002) "Marriage Market, Divorce Legislation and Household Labor Supply," *Journal of Political Economy*, 110(1) (February): 37-72.

Confessore, Nicholas (2010) "N.Y. Moves Closer to No-Fault Divorce," *New York Times*, (June 15): A1.

Connelly, Rachel (1992) "The Effect of Child Care Costs on Married Women's Labor Force Participation," *The Review of Economics and Statistics*, 74(1) (February): 83-90.

Connelly, Rachel and Jean Kimmel (2009) "Marital status and Full-Time/Part-Time Work Status in Child Care Choices," *Applied Economics*, 35: 761-777.

Connelly, Rachel and Jean Kimmel (2003) "Spousal Influences on Parents' Non-Market Time Choices," *Review of Economics of the Household*, 7: 361-394.

Connelly, Rachel and Jean Kimmel (2011) "The Role of Non-standard Work Status in Parental Caregiving for Young Children," *Eastern Economic Journal*, 37: 248-269.

Conrath, David W. and Christopher A. Higgins (1983) "A comparison of the reliability of questionnaire versus diary data," *Social Networks*, 5(3) (September): 315-322.

Del Boca, Daniela, Christopher Flinn, and Matthew Wiswall (2010) "Household Choices and Child Development," *IZA Working Paper* 5155.

Doherty, Eric W. and William J. Doherty (1998) "Smoke Gets In Your Eyes: Cigarette Smoking and Divorce in a National Sample of American Adults," *Families, Systems, and Health* 16: 393–400.

Dow, Greg K. and F. Thomas Juster (1985) "Goods, Time and Well-Being: The Joint Dependence Problem," in Time, Goods, and Well-Being, ed. F. Thomas Juster and Frank P. Stafford (The University of Michigan), 397-414.

Drewianka, Scott (2006) "Divorce law and family formation," *Journal of Population Economics*, 21: 485–503.

Duguet, Emmanuel and Veronique Simonnet (2007) "Labor Market Participation in France: an Asymptotic Least Squares Analysis of Couples Decisions," *Review of Economics of the Household*, 5: 159-179.

Duncan, Greg J., and Saul D. Hoffman (1985) "A Reconsideration of the Economic Consequences of Marital Dissolution," *Demography*, 22(4): 485-497.

El Lahga, Abdel Rahmen, and Nicolas Moreau (2007) "The Effects of Marriage on Couples Allocation of Time between Market and Non-Market Hours," *IZA Working Paper*, 2619.

Ellman, Ira Mark (1996) "The Place of Fault in a Modern Divorce Law," *Arizona State Law Journal*, 28 (Fall): 773-837.

Ellman, Ira Mark and Sharon L. Lohr (1998) "Dissolving the Relationship Between Divorce Laws and Divorce Rates," *International Review of Law and Economics*, 18(3) (September): 341-359.

Fan, Chengze Simon (2001) "A Model of Endogenous Divorce and Endogenous Fertility," *Journal of Population Economics*, 14(1) (May): 101-117.

Flood, Sarah M. and Katie R. Genadek (2010) "Time for Each Other: Work and Family Constraints Among Couples," Paper presented at the Population Association of America Annual Meeting, Dallas, TX.

Folbre, Nancy, Jayoung Yoon, Kade Finnoff, and Allison Sidle Fuligni (2005) "By What Measure? Family Time Devoted to Children in the United States," *Demography*, 42(2): 373-390.

Frazis, Harley and Jay Stewart (2004) "What Can Time-Use Data Tell Us about Hours of Work," *Monthly Labor Review*, 127(3) (December): 3-9.

Freed, Doris Jonas and Henry H. Foster Jr. (1979) "Divorce in the Fifty States: An Overview as of 1978," *Family Law Quarterly*, 13(1) (Spring): 105-128.

Freed, Doris Jonas and Timothy B. Walker (1990) "Family Law in the Fifty States: An Overview," *Family Law Quarterly*, 23(4) (Winter): 495-607.

Friedberg, Leora (1998) "Did Unilateral Divorce Raise Divorce Rates? Evidence from Panel Data," *The American Economic Review*, 88(3) (June): 608-627.

Fuchs, Victor R. (1989) "Women's Quest for Economic Equality," *The Journal of Economic Perspectives*, 3(1) (Winter): 25-41.

Genadek, Katie R., Wendy A. Stock, and Christina Stoddard (2007) "No-Fault Divorce Laws and the Labor Supple of Women with and without Children," *The Journal of Human Resources*, 42(1) (January): 247-274.

Gonzalez, Libertad and Tarja K. Viitanen (2009) "The effect of divorce laws on divorce rates in Europe," *European Economic Review*, 52: 127-138.

Gray, Jeffery S. (1998) "Divorce Law Changes, Household Bargaining and Married Women's Labor Supply," *The American Economic Review*, 88(3) (June) 628-642.

Greene, William H. and Aline O. Quester (1982) "Divorce Risk and Wives' Labor Supply Behavior," *Social Science Quarterly*, 63(1) (March): 16-27.

Gronau, Reuben (1988) "Sex-Related Wage Differentials and Women's Interrupted Labor Careers—the Chicken or the Egg," *Journal of Labor Economics*, 6(3) (July): 277-301.

Gruber, Jonathan (2004) "Is Making Divorce Easier Bad for Children? The Long Run Implications of Unilateral Divorce," *Journal of Labor Economics* 22(4): 799-833.

Halberg Daniel (2003) "Synchronous leisure, Jointness and Household Labor Supply," *Labour Economics*, 10(2): 185-203.

Hammermesh, Daniel S. (2002) "Timing, Togetherness, and Time Windfalls," *Journal of Population Economics*, 15(4): 601-623.

Hamermesh, Daniel S. (2000) "Togetherness: spouses synchronous leisure, and the impact of children, *NBER, working paper 7455*.

Hannan, Michael T, Nancy Brandon Tuma, and Lyle P. Groeneveld (1977) "Income and Marital Events: Evidence from an Income-Maintenance Experiment," *American Journal of Sociology*, 82(6) (May): 1186-1211.

Haurin, Donald R. (1989) "Women's Labor Force Market Reactions to Family Disruptions," *The Review of Economics and Statistics*, 71(1) (February): 54-61.

Heckman, James (1974) "Shadow Prices, Market Wages and Labor Supply," *Econometrica*, 42(4) (July): 679-694.

Hill, C. Russell and Frank P. Stafford (1974) "Allocation of Time to Preschool Children and Educational Opportunity," *The Journal of Human Resources*, 9(3): 323–41.

Holden, Karen C. and Pamela J. Smock (1991) "The Economic Costs of Marital Dissolution: Why Do Women Bear a Disproportionate Cost?," *Annual Review of Sociology* 17(1): 51-78.

Jacobson, Joyce P., James Wishart Pearce III, and Joshua L. Rosenbloom (1999) "The Effects of Childbearing on Married Women's Labor Supply and Earnings: Using Twin Births as a Natural Experiment," *The Journal of Human Resources*, 43(3) (Summer): 449-474.

Jenkins, Stephan P. and Lars Osberg (2003) "Nobody to Play With? The Implications of Leisure Coordination," *Institute for Social and Economic Research, University of Essex, Working paper 2003-19*.

Johnson, William R. and Jonathan Skinner (1986) "Labor Supply and Martial Separation," *The American Economic Review*, 76(3) (June): 455-469.

Kalenkoski, Charlene M., David C. Ribar, and Leslie S. Stratton, (2007) "The effect of family structure on parents' childcare time in the United States and the United Kingdom," *Review of Economics of the Household*, 5:353–384.

Kay, Herma Hill (1987) "Equality and Difference: A Perspective on No-Fault Divorce and its Aftermath," *University of Cincinnati Law Review*, 56: 1-90.

Kay, Herma Hill (2000) “From the Second Sex to the Joint Venture: An Overview of Women’s Rights and Family Law in the United States during the Twentieth Century,” *California Law Review*, 88: 2017-2093.

Kendig, Sarah M, and Suzanne M Bianchi (2008) “Single, Cohabitating, and Married Mothers’ Time With Children,” *Journal of Marriage and Family*, 70(5): 1228-1240.

Kennedy, Sheela, and Steven Ruggles (2011) "Trends in Union Instability in the United States." Paper presented at the Annual Meeting of the American Sociological Association, Las Vegas, NV.

Kimmel, Jean (1998) “Child Care Costs as a Barrier to Employment for Single and Married Mothers,” *The Review of Economics and Statistics*, 80(2) (May): 287-299.

Kimmel, Jean and Rachel Connelly (2007) “Mothers’ Time Choices: Caregiving, Leisure, Home Productions and Paid Work,” *Journal of Human Resources*, 42(3):643-681.

King, Miriam, Steven Ruggles, J. Trent Alexander, Sarah Flood, Katie Genadek, Matthew B. Schroeder, Brandon Trampe, and Rebecca Vick (2010) *Integrated Public Use Microdata Series, Current Population Survey: Version 3.0*. [Machine-readable database], Minneapolis: University of Minnesota.

Klaveren, Chris and Henriette Massdden Brink (2007) “Intra-Household Work Time Synchronication Togetherness or Material Benefits?,” *Social Indicators Research*, 84(1): 39-52.

Klerman, Jacob Alex and Arleen Leibowitz (1990) “Child Care and Women’s Return to Work After Childbirth,” *American Economic Review*, 80(2) (May): 284-288.

Klerman, Jacob Alex and Arleen Leibowitz (1994) “The Work Employment Distinction Among New Mothers,” *The Journal of Human Resources*, 29(2) (Spring): 277-302.

Kneip, Thorsten and Gerrir Bauer (2009) “Did Unilateral Divorce Laws Raise Divorce Rates in Western Europe?,” *Journal of Marriage and Family*, 71 (August): 592 – 607

Koo, Helen P., C.M. Suchindran, and Janet D. Griffith (1984) “The Effects of Children on Divorce and Remarriage: A Multivariate Analysis of Life Table Probabilities,” *Population Studies*, 38(3) (November): 451-471.

Korenman, Sanders and David Neumark (1992) “Marriage, Motherhood and Wages,” *Journal of Human Resources*, 27(2) (Spring): 233-255.

Leibowitz, Arleen, Jacob Alex Klerman, and Linda J. Waite (1992) “Employment of

New Mothers and Child Care Choice: Differences by Children's Age," *The Journal of Human Resources*, 27(1) (Winter): 112-133.

Lesthaeghe, Ron and Lisa Neidert (2006) "The Second Demographic Transition in the U.S.: Spatial Patterns and Correlates," Report 06-592, Population Studies Center, Univ. of Michigan.

Lillard, Lee A. and Linda J. Waite (1993) "A Joint Model of Marital Childbearing and Marital Disruption," *Demography*, 30(4) (November): 653-681.

Lundberg, Shelly, and Robert A. Pollak. (1994) "Separate spheres bargaining and the marriage market," *Journal of Political Economy*, 101(6): 988–1010.

Manser, Marilyn and Murray Brown (1981) ''Marriage and Household Decision Making: a Bargaining Analysis,'' *International Economic Review*, 21(1): 31–44.

McElroy, Marjorie B. and Mary J. Horney (1981) ''Nash Bargained Household Decisions,'' *International Economic Review*, 22(2): 333–349.

Mechoulan, Stephan (2005) "Economic Theory's Stance On No-Fault Divorce," *Review of Economics of the Household*, 3: 337–359.

Michael, Robert T. (1985) "Consequences of the Rise in Female Labor Force Participation Rates: Questions and Probes," *Journal of Labor Economics*, 3(1) (January): S117-S146.

Mincer, Jacob (1962) "Labor Force Participation of Married Women: A Study of Labor Supply," in *Aspects of Labor Economics*, ed. H. Gregg Lewis, Princeton: National Bureau of Economic Research and Princeton University Press: 63-105.

Morgan, S. Philip and Ronold R. Rindfuss (1985) "Marital Disruption: Structural and Temporal Dimensions," *American Journal of Sociology*, 90(5) (March): 1055-1077.

Mott, Frank L. and Sylvia F. Moore (1979) "The Causes of Marital Disruption among Young American Women," *Journal of Marriage and the Family*, 41(2) (May): 355-365.

Nock, Steven and Paul Kingston (1988) "Time with Children: The Impact of Couples' Work-Time Commitments," *Social Forces*, 67(1): 59-85.

Pabilonia, Sabrina Wulff and Younghwan Song (2011) "Single Mothers' Time Preference, Smoking, and Enriching Childcare: Evidence from Time Diaries," *Eastern Econoimic Journal*, forthcoming.

Parkman, Allen M. (1992) “Unilateral Divorce and the Labor-Force Participation Rate of Married Women, Revisited,” *The American Economic Review*, 82(3) (June): 671-678.

Parkman, Allen M. (1998) “Why Are Married Women Working so Hard?,” *International Review of Law and Economics*, 18(1) (March): 41-49.

Peters, H. Elizabeth (1986) “Marriage and Divorce: Informational Constraints and Private Contracting,” *The American Economic Review*, 76(3) (June): 437-454.

Peters, H. Elizabeth (1992) “Marriage and Divorce: Reply,” *The American Economic Review*, 82(3) (June): 686-693.

Peters, H Elizabeth (1993) “The Importance of Financial Considerations in Divorce Decisions,” *Economic Inquiry* 31(1): 71-86.

Presser, Harriet B. (1989) "Can We Make Time for Children? The Economy, Work Schedules, and Child Care," *Demography*, 26: 523-43.

Presser, Harriet B. (1994) “Employment Schedules among Dual-Earner Spouses and the Division of Household Labor by Gender,” *American Sociological Review*, 59: 348-364.

Presser, Harriet B. (1987) “Work Shifts of Full-Time Dual-Earner Couples: Patterns and Contrasts by Sex of Spouse,” *Demography*, 24(1): 99-112.

Ramey, Garey, and Valerie A. Ramey (2010) “The Rug Rat Race,” *Brookings Papers on Economic Activity*, Spring, 129–176.

Rankin, P. Robert and Jerry S. Maneker (1985) “The Duration of Marriage in a Divorcing Population: The Impact of Children,” *Journal of Marriage and the Family*, 47(1) (February): 43-52.

Rapoport, Benoit and Celine Le Bourdais (2008) “Parental Time and Working Schedules,” *Journal of Population Economics*, 21: 903-932.

Rasul, Imran (2006) “Marriage Markets and Divorce Laws,” *The Journal of Law, Economics, & Organization*, 22(1): 30-69.

Ruggles, Steven J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. (2010) Integrated Public Use Microdata Series: Version 5.0 [Machine-readable database]. Minneapolis: University of Minnesota.

Sandberg, John F., and Sandra L. Hofferth, (2001) "Changes in Children's Time With Parents: United States, 1981-1997," *Demography*, 38(3): 423-36.

Sayer, Liana C, Suzanne M. Bianchi, and John P. Robinson (2004) "Are parents investing less in their children? Trends in mothers' and fathers' time with children," *American Journal of Sociology,* 110(1): 1–43.

Sen, Bisakha (2000) "How Important Is Anticipation of Divorce in Married Women's Labor Supply Decisions? An Intercohort Comparison Using NLS Data," *Economics Letters,* 67(2) (May): 209-216.

Shapiro, David and Frank L. Mott (1994) "Long-Term Employment and Earnings of Women in Relation to Employment Behavior Surrounding the First Birth," *The Journal of Human Resources,* 29(2) (Spring): 248-274.

Smock, Pamela J., Wendy D. Manning, and Sanjiv Gupta (1999) "The Effect of Marriage and Divorce on Women's Economic Well-Being," *American Sociological Review,* 64(6) (December): 794-812.

Spain, Daphne, and Suzanne M. Bianchi (1996) *Balancing act: motherhood, marriage, and employment among American women,* Russell Sage Foundation.

Stevenson, Betsey (2008) "Divorce Law and Women's Labor Supply," *Journal of Empirical Legal Studies,* 5(4) (December): 853–873.

Stevenson, Betsey (2007) "The Impact of Divorce Laws on Marriage-Specific Capital," *Journal of Labor Economics,* 25(1): 75-94.

Stevenson, Betsey, and Justin Wolfers (2006) "Bargaining in the Shadow of the Law: Divorce Laws and Family Distress", *Quarterly Journal of Economics* 121(1): 267–88.

Steward, Jay (2009) "Tobit or Not Tobit?," *IZA Working Paper,* 4588.

Sullivan, Oriel (1996) "Time Co-ordination, the Domestic Division of Labour and Affective Relations: Time Use and the Enjoyment of Activities within Couples," *Sociology* 30(1): 79-100.

Vernon, Victoria. (2010) "Marriage: for love, for money...and for time?" *Review of Economics of the Household,* 8(4): 433–457.

Waite, Linda J. (1995) "Does Marriage Matter?," *Demography* 32(4): 483.

Waite, Linda J. and Lee A. Lillard (1991) "Children and Marital Disruption," *The American Journal of Sociology,* 96(4) (June): 930-953.

Weagley, Robert O., Min-Lee Chan, Jiahui Yan (2007) "Married Couples' Time Allocation Decisions and Marital Stability," Journal of Family and Economic Issues 28: 507–525.

Weitzman, Lenore J. (1985) *The Divorce Revolution*, New York, NY: The Free Press.

Weiss, Robert S. (1984) "The Impact of Marital Dissolution on Income and Consumption in Single-Parent Households," *Journal of Marriage and Family* 46(1): 115-127.

Weiss, Yoram and Robert J. Willis (1997) "Match Quality, New Information and Marital Dissolution," *Journal of Labor Economics*, 15(1, part 2) (January): S293-S329.

Weiss, Yoram and Robert J. Willis (1993) "Transfers among Divorced Couples: Evidence and Interpretation," *Journal of Labor Economics*, 11(4) (October): 629-679.

Willis, Robert J. (1987) "What Have We Learned from the Economics of the Family?," *The American Economic Review*, 77(2) (May): 68-81.

Wolfers, Justin (2006) "Did Unilateral Divorce Laws Raise Divorce Rates? A Reconciliation and New Results," *American Economic Review*, 96(5): 1805-1820.