

Highlights from the ATUS Early Results Conference

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INTRODUCTION

This report summarizes the results of the American Time Use Survey (ATUS) Early Results Conference held on December 8-9, 2005 at the Bethesda North Marriott Hotel and Conference Center in Bethesda, Maryland.

The ATUS Early Results Conference brought together over 120 researchers from across the United States and around the world to review preliminary research using the new ATUS dataset released by the Bureau of Labor Statistics. Fourteen papers and 27 posters were presented across six sessions over the two-day period. Presenting researchers came from a variety of disciplines including sociology, economics, both from academia and from government agencies, and even medicine.

Each section of this report corresponds to one of the six sessions at the ATUS early Results Conference. Under each session heading are: (1) a few short paragraphs summarizing each presentation's main points and findings (2) brief overviews of the questions and comments raised by the discussants for each paper and (3) a synopsis of the general discussion that followed the presentations. The report concludes with a list of the titles and authors of the poster presentations from the conference.

SESSION 1: PARENTAL TIME

Maternal Time and Activities with Children in the ATUS — Suzanne Bianchi, Vanessa Wight, Sara Raley (University of Maryland)

Presentation

This paper examines the 2003 ATUS and historical time diary studies in the U.S. to extend the portrait of maternal employment and its relationship to other facets of family life. The first part of the analysis focuses on maternal and paternal time in primary activities – childcare, housework, paid work – since 1965. Mothers’ paid work increased from 9.3 hours per week to 22.0 hours per week between 1965 and 2003. This 14-hour increase in paid work was counterbalanced by a decrease in housework. However, mothers’ childcare time stayed steady and may have even increased: Routine childcare remained stable over time, but interactive care increased slightly. What happened to the fathers? Their housework hours increased between 1965 and 1985 and childcare increased between 1985 and 2003. Hence, mothers replaced paid work with housework and protected time with children, and fathers engaged in more housework and childcare over time (though increases leveled off in the 1980s).

The second objective of this paper was to describe differences in selected time use activities of mothers by employment status. Sometimes the trend analysis showing that mothers have protected time with children over the period of rising maternal employment is mistaken for point-in-time differences—so, people say employed mothers do just as much childcare as nonemployed mothers. That is not true. In both 1975 and 2000, employed mothers spent less time in childcare than nonemployed mothers (about 6 less hours per week). What “finances” the employment of mothers? Total workloads are higher for employed mothers in 2003—averaging a total workweek of 66 hours per week compared with a 52 hour work week for the nonemployed mother. Nonmarket costs to employment include sleep and free time.

The third dimension of the paper was to examine the new measure of “secondary” childcare asked outside the diary in the 2003 ATUS, compare it with past measurement, and explore how new ATUS estimates add to the conceptualization of childcare time. The comparison of the secondary time between historical diaries and the ATUS indicated the estimates are not consistent. Secondary time was more likely to be reported by both mothers and fathers in the ATUS compared with the 2000 National Survey of Parents (NSP). Average secondary time reported was much higher in the 2003 ATUS than the 2000 NSP. A look at the “in your care” measure in the ATUS showed that it was much higher than reports of secondary childcare and primary plus secondary time with children. For nonemployed mothers, “in your care” approached the 24-hour mark. Employed mothers reported 17 hours caring for children and nonemployed mothers reported 22 hours. Therefore, it is questionable whether the “in your care” measure is tapping child investments or constraints on parents’ time.

Discussant — Kimberly Fisher (University of Essex)

Fisher wondered to what extent there really are finite tradeoffs in time devoted to different purposes. The zero-sum nature of time is questionable for housework—what about the use of time saving devices? Also, how does the amount of housework performed by older children vary by maternal employment? Looking at sleep, are employed mothers being deprived of the minimum level of sleep they need? Some medical evidence may help interpret this claim.

The paper's analysis of childcare time is limited to mothers and fathers, but Fisher noted that this could be expanded to look at friends and other members of the household. Another question about the analysis concerned the age of children and differences in childcare based on need. Age is not the only area of "need." Children who are gifted may need more nurturing as may children with a disability. It might be nice to match some information from the CPS March interviews to see what other factors the authors can examine.

Finally, the authors show that the "in your care" measure in the ATUS is not consistent with previous time diaries. What do Americans do while performing secondary childcare? Eat meals, prepare food, watch TV, travel, do domestic work, socialize, and do personal care. This raises the question: Is the new measure of care in the ATUS missing other elements of care? Because it is only measured for children under age 12, it might miss out on care of children aged 13-17. In the 1975 time diary data, secondary time amounts to three hours per day when parents have older children. Further, is "in your care" related to certain dimensions of care? Reading time drops off markedly in the ATUS compared with earlier diaries because it is often done as a secondary activity (e.g., while waiting at the doctor's office, while traveling).

Overall, the paper makes an important contribution to understanding the changing elements of childcare.

Fathers' Time Investments in Children: Do Sons Get More? — Kristin Mammen
(Columbia University)

Presentation

Investments in children have lasting consequences for their well-being and life chances. In addition, gender continues to be an important marker of well-being for both children and adults. This raises the question: Does gender affect investment in children by their parents? Parental time is thought to be one of the most important investments in children and fathers' differential time investments in girls and boys could be one channel leading to differential adult outcomes by gender.

This paper addresses the following three research questions: (1) Does the gender composition of his children affect father's time allocation? (2) Does the gender of individual child have an additional affect? (3) Is the girl advantaged or disadvantaged by the presence of brothers?

Previous research has indicated the areas where boy preference manifests itself in families' decisions (e.g. families with boys are less likely to divorce than families with girls). These studies have examined the effect of gender on father involvement (with measures ranging from closeness to time diaries) as well as the “Brother-advantage,” how in some cases having brothers advantages girls in terms of fathers’ involvement and educational attainment. Other research has also underscored the importance of fathers’ time with children for child development. Lamb et al. (1985) has identified three concepts/measures of father involvement: interaction (measured in this paper by primary care achievement time, leisure time with children, TV time); availability (e.g. secondary care time); and responsibility (time with kids without wife).

Results indicate that both the gender composition of the sibship and the gender of the individual are associated with father involvement. Having at least one boy increases a father’s time with children on average and being a boy increases achievement time, leisure time, TV time, and time with father without mother present (however, results in the paper show it is only the boys in one child families who receive more achievement time; boys in larger families get more TV watching time). Further, having brothers has implications for girls: relative to girls in all-girl families, girls with brothers get more TV watching time and more time with father without mother, though whether this extra time is “quality” time is less clear. Finally, the fixed effects models show that being a boy and the oldest increases a child’s time with father relative to girls in the same family. Overall, boys get more of fathers’ time in certain types of activities. To the extent that these investments of father’s time affect child’s outcomes, it appears that girls are at a disadvantage.

Discussant — Cathleen Zick (University of Utah)

First, Zick noted that this paper made clever use of the data by using both father and child perspectives and that the findings were consistent with the history of gender of child findings as well as the larger domain of father involvement research.

Second, Zick suggested some specific areas where the paper could be enhanced. The individual-child model could be expanded to a multi-child model for a more formal examination of the father’s time and income constraints. For example, is father’s time a normal good in the economic sense? Additionally, the discussant suggested the author reconsider the operationalization of Lamb et al.’s (1985) model, because fathers’ time without the wife may not be a true measure of responsibility, but rather the substitutability of mothers’ and fathers’ time. Examining measures like picking up and dropping off children, school conferences, and attaining medical care in the ATUS may more accurately reflect Lamb’s construct. Further, the authors could go beyond general measures of achievement time in their analysis of father-child interaction time and look at activities like time spent eating meals.

Third, Zick noted broader questions raised by the analysis. Differences between one-child and multi-child estimates are intriguing but difficult to interpret because the one-child families are really a mix of true one-child families, those who only have one child but

plan on having more, and those whose older children have aged out of the household. The paper also prompts the reader to think about what happens to children as they age. As children get older they exercise their own preferences in interacting with parents and how to spend leisure time, and hence parental preferences are not the only force guiding parent-child interaction. Finally, even the author's rich analysis was limited because the ATUS only has one diary from one household member, and there is no information on the capital equipment in the household. Data on adults in the household—spousal data—are needed to enhance our understanding of child development and well-being.

The Effects of Schooling on Parental Time in Education Production — Jeff DeSimone (University of South Florida)

Presentation

The importance of family background as a predictor of student achievement is well-established. There is weak but growing evidence that parental education causes child outcomes. Is more time in educational production among more educated parents one reason why children of highly educated parents have high achievement? Economic theory is ambiguous. On the one hand, there are reasons to expect a positive relationship between parental education and time spent in education production: (1) Additional schooling reduces systematic underestimation of marginal benefit of educational time and/or directly increases this marginal benefit (causal), and (2) higher attainment reflects stronger education preferences (spurious effect). On the other hand, there are reasons to expect a negative relationship: (1) Schooling increases maternal employment and wages, which tightens mothers' time constraints and raises their opportunity costs for spending time in educational activities and (2) Highly educated parents and their children may be more efficient in performing educational activities than less educated parents and children.

Because most parents spend no educational time with children on any given day, the analysis looked at whether parents spent any time in these activities and then among those who did, at how much time they spent. Regression models were estimated for time spent reading, helping with homework, and any activity with one's children on years of parental schooling, holding constant proxies for opportunity costs, time and income constraints and preferences regarding education. Estimated schooling coefficients were positive: An additional year of schooling increased time with children by 12 percent for reading, 4 percent for homework and 2 percent overall. Because the author was unable to reject the hypothesis that schooling coefficients were equivalent for degree and non-degree years, he concluded the results at least partially reflected a human capital effect. This would imply policies that promote educational attainment among youth might also raise attainment among the future children of those youth.

Discussant — Karl Alexander (Johns Hopkins University)

Alexander's comments explored the use of the ATUS to address the questions in which DeSimone is interested. First, Alexander suggested that the author consider Epstein's Framework of the "Six Types of Parent Involvement" to get an idea of how to expand some of the parental involvement measures. DeSimone's analysis does not address time

spent attending teacher conferences and other dimensions of parental involvement that may be linked to education production. Second, Alexander felt that the cross-sectional ATUS data are inadequate to isolate the effects of human capital on parents' involvement with children. Third, Alexander suggested that the author may want to consider Coleman's work on social and cultural capital, as there may be other types of capital of interest beyond human if the goal is to understand the resources available to the child. Finally, Alexander suggested the author consider "child capital," or the child's agency in examining the relationship between parental education and parent's time spent with children. To the extent that children govern interaction with parents, reverse causality may be at work, though again it may not be possible to study this using the ATUS.

General Discussion — Lynne Casper, Chair (University of Southern California)

Lynne Casper opened the general discussion noting the lack of information to distinguish between own children and step children in the ATUS, arguing that this information would be valuable. The discussion then focused on two major points:

- The desire to assess feelings about time use as well as other dimensions of time use researchers would like attached to the ATUS survey
- Methodological/measurement issues related to analyzing time use data

Bill Michelson of the University of Toronto commented that the ATUS does not measure how people feel about their time experiences. For example, how do parents feel about the time they are helping with homework? Suzanne Bianchi responded that there are disciplinary differences in how we respond to and interpret results about people's feelings toward time use. She and her co-authors covered subjective questions about time use in their book and social psychologists tend to love them, whereas economists tend to question them and wonder what they add. Further, Kimberly Fisher added that subjective questions about time use might create more problems than they solve. For example, parents may feel in the immediate term that they do not enjoy helping children with homework, but are pleased when their children do well in school in the longer term.

Frank Stafford of the University of Michigan commented that economists do care about people's feelings regarding time spent in different activities, but that these questions are hard to implement. Andy Harvey of Saint Mary's University disagreed, noting that questions about feelings can just be asked at the end of the diary: What was your most enjoyable activity? What was your most stressful activity? John Robinson of the University of Maryland pointed out that in the 1985 diaries, which were a national probability survey, people were asked how much they enjoyed every activity, so this information is available.

Jeff Evans of NICHD asked whether it would be possible to do nested or follow-up studies of this sample or if there is anything besides money preventing that? Diane Herz of the BLS responded that cost and response rate as well as OMB approval would influence the decision to include such measures. Cathleen Zick suggested that special modules, like those in the CPS where particular issues are targeted for each module, might be a way to get around adding to the main survey—her interest would be in spousal diaries.

Stacey Oliner of the University of Wisconsin Milwaukee added that her interest would be in assessing occasional versus persistent participation in activities, asking respondents retrospective questions about this. Cathleen Zick did some work with Keith Bryant (at Cornell University) as well as John Robinson comparing diary reports to reports in surveys, and found there is considerable underreporting of certain activities in survey data. Surveys and diaries are not capturing the same underlying construct.

Turning to the methodological issues about time diary studies, Shlomi Parizat of Tel Aviv University expressed concerns about using OLS regression to analyze the ATUS because there are a lot of zeros for some measures and that needs to be taken into consideration. Further, he questioned the appropriateness of using sample weights for individual data. DeSimone pointed out that when analysts choose something like a Tobit regression model, they are imposing a very specific structure on the data, and if the researcher is wrong about the distributional structure of the data, then all the results from the Tobit model are erroneous. An alternative is a Poisson model, but the researcher has to take into consideration that the results will be off a little.

Addressing the topic of spousal data collection, Katharine Abraham of the University of Maryland pointed out that the ATUS only collects a diary for one day. On any particular day, most parents do not read to their kids, but this might look different if the period of study was a whole week. The ATUS are really good about telling us, on average, how the allocation of time differs across people with different characteristics. However, she raised the question: If the respondent's spouse was interviewed on the same day as the respondent, would that really add much to the understanding of what households do, given that this is only information on a particular day? Is that meaningful to the outcomes and experiences of families?

John Eltinge of the BLS underscored Abraham's point that the CPS-ATUS may not be the best framework to address couple-level issues. He also responded to Parizat's comment about weighting, pointing out there is a deep weighting literature that people interested in this issue can explore. Most of these conference papers are exploratory in nature, and therefore probability weights may offer some protection against model misspecification. Finally, regarding the studies on parental involvement, he suggested it might be worth studying the lower tails or quartiles.

SESSION 2: NONMARKET WORK AND CAREGIVING

What Do Male Nonworkers Do? — Harley Frazis and Jay Stewart (Bureau of Labor Statistics)

Presentation

Over the past 35 years, the percentage of men aged 25–54 not working at all during the year has risen from 2.2 percent in 1967 to 8.2 percent. Most of the work on nonworking men has focused on explaining this increase and how nonworkers support themselves.

Relatively less research has focused on what male nonworkers do in the absence of paid work and the extent to which these workers substitute nonmarket work for market work. Using data from the 2003 and 2004 ATUS, the authors explore how nonworking men spend their time and how much of their time is devoted to household work.

First, the authors compare nonworking men, which they disaggregate by disability status, to working men—first comparing to the average day (workdays and nonwork days) of men who work full time, then to an average nonwork day of men who work full time. Second, the authors compare nonworking men to nonworking women.

The authors find that, overall, nonworking men spend more time doing household work than working men on an average day—but only about an hour more. Indeed, nonworking men appear to spend most of the time freed up by not working full time on leisure and personal care activities. The average day of nonworking men is similar to that of working men sampled on a nonwork day. While disabled nonworking women and men do similar amounts of housework, overall, nonworking women do nearly twice as much housework as nonworking men—with nondisabled, nonworking women doing upwards of 60 percent more household labor than nondisabled, nonworking men. Differences in household living arrangements (i.e., the presence and age of children) and reasons for not working explain a large portion of the differences between nonworking men and women's time in housework—between one-half to two-thirds.

Discussant — David Ribar (The George Washington University)

David Ribar's discussion of the paper raised three main points.

First, while the authors raise an interesting set of research questions, the reader is left wanting more. That is, the focus of the paper quickly departs from what is promised in the title and narrows to address how the time use of men and women differ by work status and what determines housework time of nonworking men and women. What is less clear and what Ribar would like to know more about are the characteristics of the nonworking populations (e.g., demographic as well as whether the diary was a weekday or weekend) and whether these characteristics are associated with differences in leisure and personal care—i.e., *why* do we observe these differences; what explains them?

Second, the authors are opaque about their statistical analysis. That is, the Oaxaca results indicate a difference across groups in both circumstances and behavior. However, the regression results that lead to the Oaxaca decomposition are not included in the paper. The paper would be improved by including these results. In addition, it is not clear how the authors deal with the issue of selection. It is recommended that the authors redo the analysis using market wages and show results that come from a selection model; examples can be found in the work of Willis and Rosen.

Finally, the paper raises the issue of how expanding the ATUS could benefit further research in this area. The authors provide analyses that make the case for both differences and similarities in time use among working and nonworking respondents. Yet, the authors need to provide results that are more confirmatory. Expanding the

ATUS may help meet this need. For example, including topical modules where certain groups are oversampled during some of the months is one way to expand the reach of the ATUS without changing the structure of the survey.

The Gender Gap in Caregiving to Adults: Finding from the American Time Use Survey — Nancy Mathiowetz and Stacey Oliker (University of Wisconsin-Milwaukee)

Presentation

Decreases in mortality and increases in divorce and independent living arrangements have resulted in more people alone and in need of care in their old age. Furthermore, smaller families coupled with increases in women's labor force participation means that the pool of daughters who have traditionally been the providers of elder care may be shrinking. Yet, the growing proportion of adults concentrated in the older ages result in an increased need for care and this need may put pressure on both women and men to serve as providers for elders and other adults in need care. Thus, the authors ask if caregiving for adults is "women's work." Despite demographic and structural changes and reports that men are becoming more involved in care work, the authors hypothesize that the gender gap in adult care persists and that these differences are due both to the positions that men and women occupy in the social structure as well as to gender roles, culture, and dispositions.

The authors use the 2003 ATUS to examine three main questions. First, the authors ask whether women are more likely than men to engage in adult care. Adult care is defined as providing physical, medical and other caring activities, waiting associated with care activities, and looking after an adult as a primary activity. The authors present differences in adult care by whether the care is for a household or nonhousehold adult and examine whether gender is a stronger predictor of care to household adults, since prior research has found that parents who live with adult children are more likely to be the wife's parents. Second, the authors restrict their analysis to only women and men who do provide care and examine whether women do more of it. They hypothesize that differences in the amount of time engaged in adult care among male and female careworkers will be explained more by structural variables such as employment status and number of hours worked than by gender. Third, the authors ask whether there are gender differences in how adult caregiving affects other daily activities.

The authors find that when it comes to providing adult care, women are significantly more likely than men to serve as providers to both household and nonhousehold adults—with women about twice as likely to engage in care relative to their male counterparts. However, when it came to married women and men under age 65, they did not find a difference in the probability of providing care for a nonhousehold adult. In terms of the amount of time women and men engage in adult care, the authors did not find differences by gender net of key structural factors such as age, marital status, and employment—women and men who are caregivers spend similar amounts of time in caring for both household and nonhousehold adults. Finally, the provision of adult care constrains both women's and men's time in other activities, but they experience the costs of adult care

differently. On average, men who provide adult care finance that time with reductions in work time. Women trade time in work, sleep, childcare, and leisure to provide adult care.

Discussant — Nancy Folbre (University of Massachusetts)

The discussion focused on a number of key points.

First, Folbre noted that the findings presented in the paper were not a complete surprise. One way to expand what we know would be to look more closely at the men who are providing care.

Second, the nomenclature of “structure” and “gender” is problematic. Employment is endogenous. That is, to talk about employment as “structural” ignores the issue of employment as gendered. One solution may be to restrict all analyses to respondents over age 65. Employment in this population may not be as endogenous because so many of these individuals are not working.

Third, it is unclear what the needs are of the adults who require care. Information on who needs what would allow us to look at the relationship of providing care in terms of the supply of care and the demand for care. For example, we know that among those who provide care, the amount of time engaged in adult care does not differ by gender. Here is an example of how the demand for care may overwhelm normative behavior about who should provide care. The authors may want to say more about children and how they influence the supply of care. For example, when are children substitutes and when are they complements to providing adult care?

Fourth, the ATUS does not specify who benefits from adult care. The authors may want to exploit the “with whom” data more aggressively to identify who was present when the respondent was providing adult care.

Finally, equating “care” with care activities is problematic. Providing care to both children and adults is much bigger than the time a respondent is engaged in a care activity. For example, providing care may require a person to be “on call” but not necessarily involved directly in a care activity. The ATUS “in your care” measure is a good start at capturing the time it takes to provide care. However, this measure only captures the care of young children. It would be good if the ATUS included an “in your care” measure for adults. One good example of thinking more expansively about measuring care is the work of Michael Bittman and Kimberly Fisher who are working on a “care signature” that would allow researchers to identify people as care providers. We need to continue to think about how we can use the diaries to discern this temporal care signature.

General Discussion — Seth Sanders, Chair (University of Maryland)

The general discussion raised the following key issues:

- Bias associated with time diary methodology
- Productivity associated with time use

- Complexity of measuring caregiving, particularly adult care

First, David Berrigan of the National Cancer Institute raised the issue of bias. He noted that diaries are thought to have less bias than other data sources, but it is less clear how the substitution or selection of activities can create bias. There was general agreement that time-diary data are thought to reduce the amount of social desirability bias by collecting data across a 24-hour day rather than soliciting responses on time engaged in selected activities. However, time-diary data could have an activity bias. More critical attention to the potential biases and limitations of time-diary collections is warranted.

John Robinson challenged the assumption that more time engaged in an activity is positively related to productivity. As David Ribar noted, someone may spend many hours on household repairs, but not actually fix anything. How might we measure time use and subsequent productivity?

Finally, the issue and subtlety involved in measuring care (both adult and child care) was raised. Kimberly Fisher of the University of Essex briefly described how she and Michael Bittman are attempting to get at this subtlety by isolating a “care signature” that helps to locate people who would not ordinarily be identified as caregivers. The signature, for example, might look at cooking and cleaning that arises as part of care. In response to Fisher, there was a general consensus that we can learn from each other’s work how to think creatively about measuring care, such as developing a care signature.

Finally, creating a more expansive measure of adult care that goes beyond primary care activities may be more difficult than including an “in your care” measure similar to what is used to measure childcare. Diane Herz of the Bureau of Labor Statistics (BLS) noted that in the early stages of the ATUS, the BLS did cognitive testing on child and adult care. People did not know how to respond to questions about whether they had an older person in their care. This highlighted the complexities involved in measuring adult care. The BLS is still considering an elder care measure for the ATUS. BLS staff also are in the process of testing disability questions in the CPS, although it is recognized that recipients of adult care need not be disabled.

SESSION 3: GENDER DIFFERENCES IN PAID AND UNPAID WORK

The Chore Wars: Household Bargaining and Leisure Time — Leora Friedberg (University of Virginia) and Anthony Webb (Center for Retirement Research at Boston College)

Presentation

The purpose of the paper was to explore whether household bargaining can explain the time use of spouses. Is household bargaining the reason why wives spend more time doing chores and does it explain popular concerns related to time use, such as those explored in *The Overworked American* and *The Second Shift*?

The paper examined the impact of relative wages on time use, focusing on two-worker families and comparing results for various subsamples. The authors estimated the extent to which, controlling for household income, the higher-wage spouse consumed more leisure. Data came from the 2003 ATUS, and the sample included married, dual-earner couples with non-zero hourly wages. Activities were classified into four broad categories: leisure (L), household services (S), work hours (H), and emergencies (E). Separate regressions predicting time use were run for men and women controlling for spouse wages, household income, children, education, race, age, and season.

Overall, results indicated that men work more during the week/weekend, men get more leisure on the weekend, and men do fewer chores during the week/weekend. The impact of relative wages significantly affected women's time use in two-worker families: Wives with higher relative wages had more leisure time and spent less time doing chores. There was less effect on men's time use except that husbands with higher wages spent more time in personal activities, working out, and fixing things in the house, and less time with family. Results estimated separately by age and number of children indicated the strongest overall effects of bargaining were observed among wives without children.

The authors concluded that future research should focus on bargaining and labor supply decisions as well as the impact of exogenous variation in bargaining power on time use.

Discussant — Marjorie McElroy (Duke University)

The discussant commented that this was a good paper on an important subject. She suggested the authors consider analyzing some alternative measures of bargaining power, such as share of earnings capacity, relative education, and majority/minority race. In addition, she discussed various systems of time use equations, such as adding up the implicit "left out" time uses and considering complements and substitutes for time expenditures. She concluded her remarks with her wishes for the ATUS: data on spouses; detailed information on hobbies (e.g. fixing computers may be a hobby rather than a household chore for some); and the ability to merge the ATUS data easily with CPS data.

Time Use and Gender and Marital Differences in Pay and Occupations — Sanders Korenman and June O'Neill (Baruch College, CUNY)

Presentation

The gender gap in pay has narrowed over the past few decades, but persists. Explanations for gender differences in pay have focused on work experience and occupational differences as well as differences in responsibilities for housework and childcare. The literature is limited, however, in that inferences about the effect of child care responsibilities on labor market outcomes of parents are typically indirect, rather than based on objective measures of time spent caring for children. This paper provided evidence on this issue by using the 2003 ATUS to examine patterns of time use of men and women, their differences and correlates, and the relation of these time use patterns to wage rates and the gender wage gap. The analysis focused on childcare, housework, and market work hours on the diary day among respondents ages 20-50.

The authors found that women spent twice as much time as men in household tasks and caring for others and that gender differences are smaller among childless men and women, though childless women still do a little more housework than childless men. More specifically, the authors found that housework and childcare had different implications for women's wages. Women's additional hours spent in housework on workdays were associated with lower pay, a finding consistent with other studies. However, the effect of child care on wages differed depending on how childcare was measured. Total hours spent with children on a workday had an adverse effect on pay for women, but hours spent in primary childcare on a workday were associated with higher pay (though not statistically significant).

The authors explained the differential effects of housework and child care on wages for women by suggesting that the way one spends time identifies personal characteristics that may be correlated with work productivity. For example, time spent in child care may indicate a strong taste for child development, which may be correlated with unmeasured human capital that is also valued in labor markets. In contrast, those who do more housework, especially cooking and cleaning, may be less skilled, on average, and simply not have the income to purchase substitutes. Further, time with children or housework may not fully measure the distraction of children. The extent to which one worries about a child may have a stronger effect on pay than hours spent with the child, but this is not captured in these time use measures. The authors concluded their presentation noting a final complication with studying the relationship between time use and wages: Wages are not determined by what one does on a particular day, but rather what one has done their whole life, and it is not possible to get at this through time use data.

Discussant — Judith Hellerstein (University of Maryland)

Hellerstein opened her remarks by acknowledging the motivations to examine investments in children and intra-household allocations between partners. The ATUS has tantalizing opportunities to provide descriptive data on home production vs. market production as well as childcare vs. leisure vs. housework, across gender, marital status, presence of children, and educational attainment.

However, the ATUS also has limitations. For example, there is only one diary day per respondent, which may increase measurement error in regression analysis. There is also only one respondent per family, which makes it impossible to study intra-household allocation. In addition, the data are cross-sectional, so it is difficult to draw causal inferences. This makes it hard to draw firm conclusions, even descriptive ones, across lots of important dimensions of interest. Even though the ATUS is much bigger than historical time diaries, researchers may need to be creative with statistical methods to borrow power from the core CPS and other data sets in order to nail down relationships between time use and other factors.

General Discussion — Karen Hamrick, Chair (Economic Research Service, USDA)

Andrew Harvey of St. Mary's University wondered to what extent pooling data across years might help solve some of the sample size problems. O'Neill added that it would be

nice to have information on whether people hired household help. (Note: the general discussion was cut short due to time constraints).

SESSION 4: METHODOLOGICAL CONSIDERATIONS

Are Busy People Missing from the Data? Nonresponse in the American Time Use Survey — Katharine Abraham, Aaron Maitland, and Suzanne Bianchi (University of Maryland)

Presentation

The response rate in the ATUS has been less than 60 percent. Nonresponse can be a source of bias and have implications for the types of estimates calculated from the survey, but only if nonrespondents differ from respondents on characteristics of interest. This paper assessed the characteristics of nonresponders in the ATUS and whether nonresponse affected survey measures produced. In order to examine the differences between responders and nonresponders, the authors used data from the Current Population Survey (CPS). In the ATUS, samples are drawn from the outgoing rotation group of the CPS and therefore include data on personal characteristics, such as marital status, hours of work, age, and sex, as well as household characteristics, such as presence of children and spouses' working hours, and residential characteristics, such as urban/nonurban and region for both responders and nonresponders.

The authors offered two hypotheses about nonresponse: 1) busy people will be less likely to respond and 2) people who are less socially integrated will be less likely to respond. Using overall response rates, contact and noncontact rates, and cooperation and refusal rates, the authors examined how these rates were associated with indicators of busyness, such as hours of work for both the householder and spouse and the presence of children, and indicators of social integration, such as marital status, unemployment status, presence of children, home owner status, living in an urban environment, and presence of household adults other than householder and spouse.

The authors did not find strong evidence that busy people were less likely to answer the ATUS. Their results indicated that people who work long hours are less likely to respond to the ATUS than those working about 40 hours per week, but the people with the lowest response rates were those who were not in the labor force. However, the authors did find support for the social integration hypothesis. People who possessed characteristics associated with weak social ties were much less likely to be contactable and if contacted, somewhat less likely to cooperate and complete the survey. Next the authors examined whether the large and systematic nonresponse in the ATUS was related to the survey estimates produced. Reweighting the data to take into account the differing response propensities, the authors found that the adjustments had little effect on measures of time use. The authors closed by noting that the majority of the nonresponse in the ATUS is attributable to the inability to contact people. The ATUS design decision not to track individuals who have moved contributes to the high rate of noncontact. Future work in

this area should exploit information on “easy” and “hard” respondents, using the call history files, and on recent movers, using the CPS.

Discussant — Mike Brick (Westat)

Brick opened his remarks by noting that the authors had a sensible approach to analyzing nonresponse: Response rates alone are not meaningful, bias is a function of the correlation between important variables and response propensity, mechanisms of nonresponse are essential to understanding nonresponse bias, and each estimate has its own nonresponse bias. In short, this was a good paper that found bias from nonresponse is not that important—he encourages everyone to read the paper.

In regards to case disposition classification, the authors do a good job of revising the nonresponse scheme to make it consistent with the American Association of Public Opinion Research (AAPOR) guidelines by including those who move away as nonresponders. It is important also to consider nonresponse from the CPS—this also counts. The large differences in contact rates observed in the data are all related to mobility. The key issue to consider is whether there are important time use variables related to mobility. If there are, then nonresponse bias could actually be a problem. Brick also emphasized the need to consider accessibility and amenability, which the authors capture in contact and cooperation rates.

In terms of additional analysis, Brick noted that the response rate distribution analysis and the logit analysis are primarily an examination of “main effects.” He recommended using a categorical search algorithm to look for interactions in order to uncover different patterns of response. He also noted that some potential respondents were lost because they did not answer the CPS, and this is a problem to keep in mind. Finally, in terms of weighting adjustments, he recommended the authors include factors that are correlated with nonresponse. It may be true that the absence of these indicators do not make a big difference for overall estimates, but they may be more likely to influence domain comparisons.

Measurement of Travel Behavior in a Trip-Based Survey Versus a Time Use Survey — Jonaki Bose and Joy Sharp (Bureau of Transportation Statistics)

Presentation

Travel data are useful to many different groups for many different reasons. Before the ATUS, the National Household Travel Survey (NHTS), a trip-based survey, was the only national data source on daily travel. There is a debate in the field about the best way to measure travel activity: by focusing only on trips taken or by collecting all activities, including travel activities. The expectation based on previous research was that activity-based measures of travel are the preferred measure because they trigger recall of shorter, more incidental trips, and because they are expected to suffer less from rounding effects found in trip duration measures. Yet there are few comparisons of the two types of data that consider other methodological differences that might impact estimates. The addition of the ATUS, an activity-based survey, now provides researchers with an opportunity to

compare travel estimates from the two different kinds of surveys. This paper compared estimates of travel derived from two different sources of travel data keeping in mind methodological differences in order to better understand how travel measures compare depending on how the data are collected.

Using data from the 2001 NHTS and the 2003 ATUS, the authors created comparable trips definitions by excluding certain trips and combining others (trip chaining). Beyond considering just differences in the nature of data collection (activity versus trip), the authors attempted to control for other methodological differences when comparing estimates. For example, though both surveys collect data for a twenty-four hour period, the NHTS collects the data within a six-day window after the reference period, compared to the ATUS which collects the data the very next day. The NHTS includes data on all household members (including children) compared to the ATUS, which surveys one person aged 15 and older per household. Finally, the NHTS has more travel-related details (e.g., distance traveled) while the ATUS has more context related details (e.g., what activity preceded and followed the travel activity). For each trip, the authors compared the mean minutes spent traveling and the total number of trips taken per person per day, the percent of persons not taking any trips on a given day, and trends in travel by selected characteristics. They also attempted to match the ATUS and NHTS on mode of transportation and reason for traveling in order to assess how the distribution varied by survey type.

The results indicate that contrary to what some expected, the ATUS does not show a greater number of daily trips per person or longer travel times. Possible reasons resulting in similar numbers of trips may be that the NHTS has probes specifically for walk and bike trips and respondents are requested to fill a diary prior to the interview. In addition, outdoor running and walking trips for exercise and dog-walking trips are excluded as travel activities in the ATUS, whereas they are included in the NHTS. The longer travel durations in the NHTS may also be due to the fact that the NHTS lacks other activities that could bind estimated trip times. The NHTS and the ATUS matched up well with similar estimates on the number of trips taken and the distribution of trips across the time of day and day of the week. With the exception of walking, the estimates of the top five modes of transportation were similar across the two surveys. By and large, the purpose of travel was similar between the two surveys, with the exception of traveling for the purpose of caring for others. This could be a context effort resulting from the focus and primary objectives of the ATUS. The NHTS estimates were slightly higher for vehicle occupancies, but both surveys showed that women are accompanied by more people when they travel. There were distinct differences across the two surveys in trip estimates among younger respondents (e.g., younger respondents had fewer daily trips on average in the NHTS than in the ATUS). This may be due to a proxy effect. That is, proxy respondents tended to report fewer trips and the younger age groups in the NHTS had a higher percent of proxy respondents. Yet despite the differences in methodology, estimates from the two surveys appeared closer than expected, though the authors cautioned that this research is preliminary.

The authors closed by making the case for having two different national surveys on travel. The NHTS data are rich with travel-specific information not available on the ATUS. It collects information on all household members, even those under age 15, whereas the ATUS is restricted to one member per household who must be at least 15 years of age. Finally, the NHTS data include details about household vehicles, general travel behaviors, miles traveled, and attitudinal information related to transportation issues. Two national surveys on travel provide a valuable source of benchmark data for key travel estimates and they also allow researchers to analyze methodological features for future survey design. Most importantly, the ATUS data provide a valuable opportunity to examine travel in the context of other activities.

Discussant — Andrew Harvey (St. Mary's University)

Harvey opened his comments by noting that another way to compare the two surveys is to look at the difference or “gap” between the NHTS and ATUS estimates, a theme he explored in some depth. Harvey also made a series of recommendations for future work in this area. First, the authors should compare travel estimates from one person randomly drawn in the NHTS with those from the ATUS. Second, additional work should be done to harmonize the concepts associated with travel across the two surveys while also maintaining opportunity for historical continuity. Finally, the author noted that research like this should be presented to the Transportation Research Board.

General Discussion — Suzanne Bianchi, Chair (University of Maryland)

The general discussion focused largely on nonresponse in the ATUS.

Jennifer Olmstead of Drew University opened the discussion with a question about what constitutes social integration. In addition, she wondered whether some of the variables used to indicate being socially isolated could not also serve as indicators of economic marginality. And finally, she asked whether the ATUS oversampled for such households. Olmstead also commented that Abraham et al. had modeled nonresponse as a function of either busyness *or* being socially isolated, with no interaction terms included. This could be too restrictive a specification. Katharine Abraham acknowledged that the definition of social integration is tricky and that the presence of important interactions between busyness and being isolated should not be overlooked. She is also looking at the issue of volunteering and although the CPS does not include a regular question in their main survey, there is a regular supplement on volunteer behavior. Abraham notes that one preliminary finding is that people who volunteer are more likely to respond to the ATUS.

Diane Herz commented that BLS staff had reviewed AAPOR guidelines and thought about including movers as nonrespondents. They need also to consider the politics of the response rate and are working very hard to increase these rates. (The general policy is that there must be a 70 percent response rate in order to get survey funding approved by OMB.) Suzanne Bianchi noted that there would be several in the community who would be willing to make the case that the ATUS is doing a good job.

Kimberly Fisher of the University of Essex noted that she faced a similar issue in the American Heritage Time Use Survey (AHTUS) to Bose and Sharp’s issue of missing

trips in the ATUS. Like Bose and Sharp, Fisher looked at what a respondent was doing right before and right after they reported engaging in pet/garden care in order to disentangle pet care from gardening in the AHTUS.

David Berrigan of the National Cancer Institute commented that there was great deal of focus on physical activities in the ATUS. Yet, we could probably do more in terms of linking this information to the environment. For example, we should think more about how we link the ATUS to neighborhoods, Census tracts, and the environmental context.

SESSION 5: HOUSEHOLD PRODUCTION

Time to Eat: Household Production under Increasing Economic Inequality — Dan Hamermesh (University of Texas at Austin)

Presentation

This paper sought to understand how people's time use explains patterns of food consumption over the years 1985-2003, a period of rising income and earnings inequality. To examine the relationship between measures of people's price of time and time spent buying food, preparing meals, eating them and cleaning up, the author examined data from several studies: the 1985 UMCP Time Use Study; the 1985 Consumer Expenditure Survey; the 2003 ATUS; the 2003 Consumer Expenditure Survey; and the December 2002 CPS Food Security Supplement.

Results from the 1985 and 2003 surveys indicated married women spend more time related to eating than married men and that the total amount of time in eating-related activities in married couples has declined since 1985. Over the same period, the fraction of dollars spent on food went down from 19 percent to 16 percent. Using percentiles to allow for comparability over time, the author found that as a husband's time price goes up, the couple spends less time on eating. The same was true for wives and was consistent for both 1985 and 2003. As couple's incomes go up, they spend more time eating and more dollars on food items.

Regression estimates from the ATUS combined with Food Security Supplement (FSS) data also indicated a positive correlation between time and dollars spent on food. It is relatively hard to substitute goods for time in the production of food, and the rate of increase over time in the ratio of goods spending to time spending on food has been less pronounced for higher income households. In terms of what has happened to well-being in the United States, rich people are spending relatively more time in food production than in the past. This implies there has been an increase in the relative burden associated with food production among the wealthy. However, if eating is not conceptualized as production, but rather as consumption (people are not just cooking to make food, they "enjoy" the experience of grilling), then the opposite is true.

Discussant — Frank Stafford (University of Michigan)

Stafford commented that the paper made creative use of the data, but the analysis faced limitations. First, he questioned whether there were limits to the imputation tools used in the analysis. Second, he noted there was ambiguity in several measures in the paper. For example, it was not clear what was consumption and what was leisure. That is, there are all kinds of components to eating—social interaction, preparation, clean up—and these cannot necessarily be parsed out in these data. In addition, good outcome measures are not available in the datasets. For instance, there is a connection between food consumption and health. Over the 15-year period of study, obesity and weight problems increased, which has had acute influences on mortality.

Accounting for Nonmarket Household Production — J. Steven Landefeld (Bureau of Economic Analysis), Barbara M. Fraumeni (University of Southern Maine), Cindy M. Vojtech (Bureau of Economic Analysis)

Presentation

There is a big debate over what the appropriate scope of national economic accounts should be. Some argue that for consistency and relevance, the accounts should not be changed to incorporate nonmarket production. Others wonder whether welfare (e.g., concern about the care of children) or production (e.g., concern about the production aspect of caring for children) should be the focus. Finally, others argue that even if there is agreement that the national accounts should be expanded to include household production, it may not be feasible to do so (e.g., household production may be too difficult to measure objectively).

It is estimated that the overall level of measured economic activity in 2004 would have been over \$3 trillion, or 25 percent, higher if household production were added to GDP. Accounting for household production lowers the long-term growth rate from 7.1 to 6.8 percent—market production grew faster as women entered the labor force, but household production grew at a slower rate. Household production also acts as a buffer to market cyclicity.

Treating the household as a producer would require tracking investments in consumer durables, and affect the measurement of capital services, household saving, and intermediate products.

In sum, the ATUS presents many opportunities to measure time use and its effect on a number of important economic areas, such as the analysis of consumer demand for items ranging from consumer durables to health care. Future work should focus on input-output satellite accounts, independent estimates of output quantities and prices, and development of quality-adjustments for specialist wages.

Discussant — Jonathan Gershuny (University of Essex) (presented by Kimberly Fisher)

Speaking on behalf of Gershuny, Fisher first noted that the paper offered significant lessons for understanding human behavior and public policy. She then raised some

theoretical problems with using alternative measures of inputs—most notably, that there is wide variation depending on how the input measure is calculated. Therefore, one might need to reconsider the focus on value of inputs and put more emphasis on measuring the value of outputs.

Data were then presented on domestic productivity using the heritage data sets (1960-2003). If one looks at time spent in activities and wages, one gets similar results as the authors show: domestic production remains relatively constant.

General Discussion — Sandra Hofferth, Chair (University of Maryland)

The general discussion centered on the issue of studying food consumption and production in the ATUS.

The discussion opened with a general question about how the decline in time spent in food preparation by low-income women can be explained—is it simply that they are all getting microwaves? Dan Hamermesh hypothesized that they might be eating out more. Andrew Harvey of St. Mary's University suggested that households might not be as productive as they used to be. Kimberly Fisher added that the huge advertising budgets for fast food companies might play a role in people's changing attitudes toward what they can and cannot do. Further, Bill Michelson of the University of Toronto wondered whether societal conditions might affect the extent to which people cannot or do not eat three meals a day. Joanne Guthrie, of the USDA, noted that there are some issues brought up by this that might interest the USDA (e.g. social/welfare policy, school breakfast, summer food programs, after school snacks). It seems as if the ATUS has a measure of time devoted to food preparation, but not really a measure of the adequacy of that time.

Finally, Steve Payson of the Bureau of Economic Analysis commented that in all of these analyses of time use, there is an implicit assumption that every category of time is mutually exclusive. If there has been any kind of evolution toward multitasking, one might be wrong in the assumption that people are just sitting down and eating and doing nothing else. Indeed, Landefeld noted this is what one sees in the economic data. Suzanne Bianchi of the University of Maryland commented that one could use the 1975 time diary data as well as the 1998/2000 studies to examine trends in multitasking over time. She and co-authors examined this among parents and found pretty dramatic increases in multitasking.

SESSION 6: SCHEDULING TIME FOR ONESELF

The Food and Eating Module of the American Time Use Survey — Karen Hamrick, Margaret Andrews, and Joanne Guthrie (Economic Research Service, USDA)

The Economic Research Service of the USDA has developed a module of questions that will be added to the ATUS. The module was designed to assess whether certain patterns of eating and time use are associated with obesity and how meal preparation affects well-being. Specifically, the module includes questions about eating patterns, such as eating

as a secondary activity. It also includes indicators such as general health, height, and weight, which when combined with information from the diary on the amount of time being active and sedentary will allow analysts to assess the relationship between time use, and obesity. There are detailed questions in the module on food stamp and school meal participation, and also income, which will allow analysts to examine the relationship between time use and food assistance programs. Lastly, the module asks if the respondent is the person in the household who usually does the grocery shopping and meal preparation.

The module will run from October 2005–December 2006 and is funded by the ERS and NIH-NCI-Applied Research Program. The data will be available from BLS September 2007 along with the 2006 ATUS data.

Here Comes the Rain Again: Weather and the Intertemporal Substitution of Leisure — Marie Connolly (Princeton University)

Presentation

Recent research on weather and stock returns indicates that returns are abnormally higher on sunny days—sunshine lifts moods, which influences behavior. Weather influences our leisure activities. Good weather increases our desire to enjoy it, which may draw us to outside activities. However, does bad weather lead us to work more? The answer presumably depends both on desires and on the flexibility of work schedules. Using time-use data along with daily weather reports from over 8,000 individual weather stations across the United States, this paper examined the impact of weather shocks on the marginal adjustment of labor supply.

The author used both the 2003 and the 2004 ATUS data. ATUS respondents were linked to the data on weather using the geographic variables in the CPS. Estimates of time in work, leisure, and home production were created by summing the total number of minutes in these categories. A rainy day was defined as a day with at least 0.10 inches of rain in 24 hours.

The results indicate that workers do respond to weather shocks. Among men, a rainy day today is associated with a 13 minute average increase in work time, and therefore less leisure time. This estimate triples in the Sunbelt where men do an average of 45 minutes more work on a rainy day. Furthermore, rain yesterday reduces men's time at work today by 25 minutes, suggestive of intertemporal substitution. Among women, rain yesterday and today is associated with a 33 minute shift from work to leisure.

Discussant — Charles Brown (University of Michigan)

Brown first noted that the theory is stripped down and would benefit from additional thought about what is happening in period one (T1). That is, there may be some benefit in thinking about what today's weather will tell me about tomorrow's. In addition, he suggested thinking more fully about the role of weekends in this research.

Although he had been concerned that the results might reflect longer commuting times on rainy days, Brown noted his fears were calmed by talking with the author about the sensitivity checks. However, he was somewhat troubled by the way rain was collected and the daily aspect of measurement. That is, the impact of rain over a 24-hour day may differ, depending on the timing of the rain.. The discussant recommended considering the within-day variation. For example, rain early in the day may lead me to stay at work later (it's too wet to do anything outside); rain at 6PM (if it's anticipated) might lead me to leave early (and mow the lawn before it rains).

Unlike the author, Brown did not see a consistent pattern of rain today, work harder—rain yesterday, work less in the results. He noted that the overall effects were not estimated with “blinding” precision. For example, added variables, which are expected to have no effect, change things somewhat. This may be suggestive of important interactions— notably how the region interacts with the persistence of weather; how weekend and weekday interact with a rainy day, and how salaried people, relative to those paid by the hour, interact with the weather, as salaried employers may have more flexibility in their schedules.

Time Use for Sleeping in Relation to Waking Activities — David Dinges (University of Pennsylvania School of Medicine)

Presentation

Every complex life form sleeps—it is a biological imperative. Sleep has been shown to be associated with mortality, stroke, diabetes, and obesity. Indeed, the previous research indicates that body mass index (BMI) increases if sleep is too long or too short. Sleep also affects our cognitive ability. Sleep is a zero-sum game. Thus, if one is not sleeping, one is doing other things. The assumption is that paid work, housework, and childcare would be key substitutes for sleep. Using a sample of women and men aged 25–64 from the 2003 ATUS, this paper assessed the lifestyle factors associated with reduced (or prolonged) sleep.

The results indicate that time engaged in sleep declines with age. Women are slightly advantaged over men with somewhat higher estimates of sleep time. Sleep time declines as work time, weekly pay, and both total travel and commuting time increase. Declines in sleep time also were associated with increases in leisure time. There were very little differences in sleep associated with the care of household members.

Discussant — Roger Rosa (Centers for Disease Control)

Rosa noted that that paper was well written and makes the point clearly that sleep gives when there are other demands on time. Yet, when it gives, we can suffer acute effects such as loss of productivity, and increase in errors, and medical impairment. He noted that work tends to drive sleep and according to the paper, travel may also be associated with how we manage our sleep time. However, it is important to consider that choice may be operating in the negotiation of sleep time and this may be part of the travel finding. That is, how much sleep one gets may be driving one's waking activities. The discussant recommended that future research consider the role of occupation and industry in more

detail. Additionally, he would like to see research in this area that focuses on vulnerable or underserved populations, differences by age, and differences across ethnic/race populations.

Shift Work and Participation in Social, Recreational, or Executive Activities —
Anne Polivka (Bureau of Labor Statistics)

Presentation

Shift work has a long history in the United States. It originally grew in response to the increasing demand of manufacturing. Today shift work meets the demand for a 24/7 economy—i.e., an economy that never sleeps. Previous analysis has focused on the physical effects of shift work and how this arrangement of work affects family dynamics. Expanding what we know about shiftwork, this paper used data from the ATUS and examined how individuals with different work arrangements spend their time on days that they work. In addition, using the ATUS in conjunction with data from the May 2004 CPS supplement, this paper also considered how individuals with different work arrangements spend time on days that they did not work. Specifically, the paper looked at the effect of a non-day work schedule on time spent sleeping, eating, exercising, and with family members.

Shift work was defined using the framework developed by Presser where a majority of a respondent's work hours must fall within a day, evening, or night shift in order to be categorized as working that shift. Using this framework to identify day and non-day shift workers in the ATUS, the author first compared the characteristics of shift workers in the ATUS to shift workers identified in the CPS Work Schedule supplement. The two groups of non-day workers were similar. They were disproportionately younger, black, and male, with low income and low educational attainment. In short, there appeared to be consistency in the workers' characteristics across the ATUS and CPS. With respect to time use, the findings suggested that the costs to being a non-day worker are mixed. While non-day workers spend more time sleeping and watching television, they spend less time eating than day workers. All workers, regardless of when they worked, spend relatively little time engaged in exercise, social, sporting, or artistic events. Non-day workers spend more time alone than day workers. However, when it comes to time with family, night workers may be the most advantaged. They spend significantly more time with their children and spouse than day workers, while evening workers spent less time.

Discussant — Harriet Presser (University of Maryland)

Presser noted that the paper is an important contribution and highlights the degree to which shiftwork, both its causes and consequences, is a complex issue that has to date received little attention from the research community. She argued that which hours people worked matters as well as how many, and that by ignoring nonstandard work arrangements in our research we are ignoring a significant labor force phenomenon that affects individual and family well-being.

How significant is shift work? Using the same definition of shift work that Ann Polivka uses, Presser's own analysis of the May 1997 CPS supplement indicates that one in five

employed Americans work *mostly* during the evening, nights, or on a rotating or highly variable schedule. One in three employed Americans work at least one day on the weekend and two in five employed Americans work a late shift and/or on a weekend. Approximately 27.8 percent of all dual-earner married couples have at least one spouse who works most of their hours at nonstandard times. This proportion increases among dual-earning couples with young children at home. Single mothers with children under age 14 are more likely than their married counterparts to work nonstandard hours (20.8 percent versus 16.4 percent) or on weekends (33.2 percent versus 23.9 percent). In short, nonstandard work hours are a pervasive work arrangement and these estimates are consistent with other national data sources that ask about *which* hours people work (e.g., National Survey of Families and Households, the Medical Expenditure Panel Survey [MEPS], and the National Longitudinal Survey of Youth).

Presser noted that Polivka's estimates on shift work from the ATUS are highly concordant with the May 2004 CPS. About 17 percent of those with a work day diary work other than a day schedule as compared to Presser's reported 20 percent. However Presser's sample included self-employed workers while the analysis of the ATUS was restricted to wage and salary earners.

Presser highlighted how changes in the CPS classification methodology create historical inconsistency. That is, prior to 2001, the reference period on questions about when work begins and ends was "last week." In 2001 and 2004, the reference period changed to usually (i.e., "how many hours do you usually work") and the responses to the option of "time varies" jumped substantially to over 20 percent. This has implications for classifying workers using hours worked in the CPS as noted in Polivka's paper. The discussant strongly recommends that the CPS go back to "last week" as a reference period. She notes that seasonal concerns with a "last week" referent seem unwarranted (e.g., 1996 MEPS data taken over a year yield results consistent with the May 1997 CPS).

Presser commented on how Polivka's paper points to the need for both CPS and ATUS shiftwork data. For example, the ATUS is restricted to one day while the CPS reference for work related questions refers to a "usual" experience or what the respondent experiences "last week," which may yield estimates that approximate more typical behavior. However, time diaries provide detailed time-specific activities for one day and do not suffer recall error associated with thinking about long periods of time. A larger CPS sample, however, is needed for detail about different types of shifts (i.e., evening versus night), for information on the shift of the spouse, detailed age of children information, and detailed occupation codes.

Finally, Presser closed with a few methodological concerns about the ATUS findings. First, the sample sizes for each of the non-day shifts are small and grouping them together has the potential to mask important differences between them. For example, some of Polivka's mixed results are to be expected as the relationships are often conditional on the type of shift worked. It also would be good to look at people with young children separately and to do the analysis separately by gender. Presser noted that people who work a rotating shift were not classified as such in the paper, and apparently

cannot be using ATUS data for one day. Rotating shift workers comprise one-third of all non-day shift workers, so not to consider them separately may again mask important differences. Furthermore, because the diary runs from 4:00 am to the next day, sleep time in the ATUS is the sum of sleep from two different days. Polivka's finding on sleep counters the large body of research showing chronic sleep problems for night workers and rotators. Thus, she may want to think about the issue of measuring sleep a bit further. Lastly, including a section on spouses is important, especially given past research showing that fathers do a large amount of childcare when their spouse works a different shift.

General Discussion — Diane Herz, Chair (Bureau of Labor Statistics)

Questions during the general discussion were organized around the three substantive papers.

With respect to the analysis of how weather affects time use, Marjorie McElroy of Duke University asked whether the author had considered the length of the day (in terms of daylight available). Dan Hamermesh of the University of Texas at Austin noted that he had considered the length of the day in his research and did not find a difference in time use. One option would be to interact season with leisure.

Bill Michelson of the University of Toronto commented that he had looked at lifestyle factors associated with sleep and found similar results to David Dinges's findings. Using step-wise regression, Michelson noted that when he inserted a variable for work-related computing, the effect of hours of work on sleep time became insignificant. His results indicated that work-related computing was the most important factor predicting variation in sleep.

Frank Stafford of the University of Michigan lauded Dinges's research noting that weight in the U.S. is accumulating at a staggering rate. This research has major implications for medical concerns about obesity—particularly at the older ages. Dan Hamermesh suggested looking at the CPS work hours of ATUS respondents with a nonwork, weekend diary to assess how much sleep is reduced during the week, but recovered on the weekend. Kimberly Fisher of the University of Essex recommended looking at how people travel and whether sleep time varies by mode of transportation when travel takes place.

Dinges closed by noting that there are many amateur theories about sleep and the factors that constitute good sleep. Yet, it has been a challenge to document objectively and medically what causes good sleep, while at the same time the implications of not enough sleep are important and have been well documented.

Marie Connolly suggested that one way to overcome the limitations of measuring sleep from two different nights is to use the nontruncated stop time available on the diary file. That is, the last activity on the file, which is typically sleep, is available truncated at 4:00 am and also not truncated so that one can estimate the length of a full-night's sleep.

Andrew Harvey of St. Mary's University asked for clarification on whether students were included in Polivka's sample. Polivka responded that they were, but that she controlled for whether or not they were in school and she also did a separate analysis excluding them. Both analyses yielded similar results.

Frank Stafford raised the issue of whether isolating work hours in the ATUS captures atypical work behavior. Can we assume that these hours worked are planned or could they be a quick fix to remedy a cash flow problem? According to Polivka, the CPS includes a question on "reason for working a shift" and only a small percentage responds that they work a shift for "additional pay."

POSTER SESSIONS

"24 Hour Economy: Transatlantic Myth, Or A Reality After All?"

Koen Breedveld (Netherlands Social and Cultural Planning Office)

"Is Mothers' Time With Their Children Home Production Time or Leisure?"

Rachel Connelly (Bowdoin College), Jean Kimmel (Western Michigan University)

"Are Those Who Take Work Home Really Working Longer Hours? Implications for BLS Productivity Measures"

Lucy P. Eldridge, Sabrina Wulff Pabilonia (Bureau of Labor Statistics)

"Comparative Time Use Data Resources: The Multinational Time Use Study and the USA Heritage Datasets"

Kimberly Fisher (University of Essex)

"The Value of Unpaid Child Care in the U.S. in 2003"

Nancy Folbre, Jayoung Yoon (University of Massachusetts)

"Time Squeezed Out: Time Use Effects of Long Hours of Work and Study"

Lonnie Golden (Penn State University)

"The Difference A State Makes: Women's Allocation of Paid and Unpaid Work in the 50 States"

Jennifer Hook (University of Washington)

"Who's Cooking? Analysis of Food Preparation Time in the 2003 ATUS"

Jennifer Jabs (Cornell University)

"Parental Child Care in Single Parent, Cohabiting, and Married Couple Families: Time Diary Evidence from the United States and the United Kingdom"

Charlene M. Kalenkoski (Ohio University), David C. Ribar (The George Washington University), Leslie S. Stratton (Virginia Commonwealth University)

"Married Parents' Time Use at Home, at Play and with Children: Variations by Labor Force Status"

Ariel Kalil, Kathleen M. Ziol-Guest (University of Chicago)

"An Analysis of Travel Behavior Using American Time Use Data"

Mary Kokoski (Bureau of Labor Statistics)

"Who Has Time for Dinner? The Full Price of Preparing Nutritious Meals at a Minimal Cost"

Lisa Mancino, Constance Newman (USDA - Economic Research Service)

"Dimensions of Home-based Work in the United States"

William Michelson (University of Toronto)

"Demand in Leisure Markets - An Economic Analysis of Time Allocation"

Shlomi Parizat (Tel-Aviv University)

"Where Did All the Time Go? Volunteer Labor's Contribution to Nonprofit Output in the NIPA Government Sector: Evidence from the 2003 American Time Use Survey"

Yvon Pho, Steve Payson (Bureau of Economic Analysis)

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