USDA

Who Has Time To Cook?
How Family Resources Influence Food Preparation

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Abstract

Households participating in the Food Stamp Program are increasingly headed by a single parent or two working parents. As this trend continues, more low-income households may find it difficult to allocate the time needed to prepare meals that fit within a limited budget and meet dietary requirements. Using Tobit analysis of the 2003-04 American Time Use Survey (ATUS), this study finds that household time resources significantly affect how much time is allocated to preparing food. In fact, working full-time and being a single parent appear to have a larger impact on time allocated to food preparation than an individual's earnings or household income do. The results are relevant for the design of food assistance programs as well as for improving our understanding of how different family time resources affect consumption behavior.

Keywords: Food preparation, Tobit analysis, time use, Thrifty Food Plan

Acknowledgments

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Summary

USDA uses the Thrifty Food Plan (TFP) to show Food Stamp Program participants how low-cost, healthy meals can be purchased with monthly food stamp benefits. When the TFP was first created in 1975, most families had a nonworking adult in the home who was likely to prepare meals from scratch. Today, however, an increasing number of low-income families have either a single working parent or two working parents. These households may spend less time preparing meals than was typical in the past. Recent efforts have been made to incorporate more convenient and commercially prepared foods into the TFP market basket. This research supports those efforts by showing how differences in family time resources can affect food preparation decisions.

What Is the Issue?

There is little information on how time resources influence time spent in preparing food. Thus, to understand if and how time use decisions vary with both time and monetary resources, this study estimates how the amount of time an individual spends daily in preparing food correlates with individual and household characteristics. Does the time allocated to preparing food vary systematically with income, wage rates, marital status, employment status, employment status of other household adults, and the number of children in a household?

What Did the Project Find?

Our study shows that characteristics, such as income, employment status, gender, and family composition, clearly affect food preparation decisions. This relationship is weakest among men, stronger among women, and strongest of all among full-time workers and single parents.

The relationship between personal characteristics and how much time men spend preparing food, especially low-income men, was unclear. Our results for men also contradict the hypothesis that lower household earnings mean more time preparing food. For both full-time employed and nonworking men, those with lower household income spend less time preparing food than do men in households with higher incomes.

Regardless of income and marital status, women spend more time preparing food than men do. Among women, time spent preparing food in the home falls with higher household income and more time working outside the home. Our estimates suggest that nonworking women spend just over 70 minutes per day preparing food, whereas women who work part-time spend 53-56 minutes per day and full-time working women spend 38-46 minutes per day preparing food.

Single women spend less time preparing food than do married or partnered women whether they are working or not. Single working women spend about 15 minutes less per day preparing food than do married or partnered working women. Single nonworking women spend approximately 30 minutes less per day cooking than do nonworking women who are married or have partners.

Among low- and middle-income women, time spent preparing food does not decrease significantly with higher wage rates. Among higher income women, however, an increase in weekly earnings of $100 would translate into 9 fewer minutes spent in preparing food per day.

Having more children who live in the household also increases the time a woman spends preparing food, suggesting that, among women, household time resources significantly affect the amount of time allocated to preparing food. In fact, working full-time and being a single parent appear to affect the time allocated to preparing food more than an individual's earnings or household income do.

Estimates of the time needed to follow recipes from the TFP range from 80 minutes a day to 16 hours a week. We find that many low-income households—those with two adults or those headed by a single parent that works less than 35 hours a week—allocate enough time for food preparation. However, our estimates also say that low-income women who work full-time spend just over 40 minutes per day and thus may have difficulties meeting the past plan's implied time requirements.

How Was the Project Conducted?

We use 2003-04 data from the American Time Use Survey and multivariate analysis to explore how time allocated to preparing food differs between low-income and higher income households. A household is defined as low-income if total income equals 130 percent of the poverty line or less. We also run separate estimates based on gender and whether an individual works full-time (more than 35 hours in week), part-time (less than 35 hours a week, but in the labor force), or is not employed.

The dependent variable, time spent in food preparation, is the total minutes in a day spent in the following four activities:

- Preparing food and drinks, which includes cooking and in any way getting food and drink ready for consumption.

- Serving food and drinks, which includes activities like setting the table.

- Food and kitchen cleanup.

- Storing or putting away food and drinks.

We use a Tobit model because food preparation time in a single day is zero for many individuals. To account for the sample design, we use sampling weights to obtain representative parameter estimates and specify strata and clustering variables to increase their efficiency.

Introduction

To ensure access to nutritious food by low-income families,[1] the Food Stamp Program provides the Thrifty Food Plan (TFP) as a guide for how to purchase low-cost, healthy meals with food stamp benefits. Initially developed in 1975, the TFP is maintained by USDA's Center for Nutrition Policy and Promotion. CNPP determines the TFP with a model that uses data on the dietary intakes of low-income individuals and national average food prices to produce a theoretical food plan. The plan minimizes deviations from current dietary patterns while meeting nutrition requirements within a budget that does not exceed maximum food stamp benefits (Carlson et al., 2007). Because the data on the food people consume and the food they purchase are not directly linked, researchers must make assumptions about where food is purchased, in what form, and at what level of convenience or preparation. As a practice, they have assumed that all meals and snacks are prepared at home, often from scratch. To allow for more convenient and commercially prepared foods, the most recent TFP was created using a panel of experts to determine when these assumptions could be relaxed (Carlson et al., 2007).

However, there is little information on how much time people actually reserve for food preparation or how much time is needed to meet basic dietary requirements on a limited budget. Using a companion piece to the 1999 TFP that provides daily menus to conform with the TFP, *Recipes and Tips for Healthy, Thrifty Meals* (USDA, 2000), Rose (2004) estimates that it would require 16 hours a week to follow the suggested menus. Another study estimates that each of these recipes require an average of 40 minutes (Davis and You, 2006), where a typical weekly menu includes two dishes made from scratch each day. According to these estimates, the daily time required to meet dietary requirements within a family's maximum food stamp benefits could range from 80 minutes to 2½ hours per day.

A growing number of low-income families have either a single working parent or two working parents. Overall, wage earners have become more prevalent in the Food Stamp Program: In fiscal year 1990, 19 percent of food stamp recipient households had earnings, whereas in fiscal year 2005, 29 percent had earnings (Barrett, 2006). Also, single parents make up more than a third of all food stamp households. According to USDA's Food and Nutrition Service (FNS) (the agency that administers the Food Stamp Program), in fiscal year 2005, over 62 percent of food stamp households with children were headed by a single adult, representing 34 percent of all food stamp households (Barrett, 2006). As such, an increasing number of low-income families may find it difficult to allocate the time needed to prepare meals that would fit within the implied time budget of the TFP.

How much time one chooses to spend preparing food is likely to depend on both monetary and time resources. For example, the total time available to the household for food preparation will depend heavily on the number of adults in a household, how much time they all spend working in the labor force, and the number of children. Explicitly recognizing the importance of time as another household resource was first proposed by Vickery (1977). Two adults living in a household with only one person working full-time

outside of the home will have more total household time to prepare meals compared with a single person who works full-time. For simplicity, we refer to the total number of adult hours available for household activities as "household time." In reference to poverty measures, this relationship has consequences for low-income households with less household time because the food assistance they receive is calculated according to a uniform TFP formula (or poverty line in Vickery's case) that assumes a certain, average level of time availability. Because time spent in preparing food generally reduces the monetary cost of food and commercially prepared food costs relatively more, the food stamp benefit level implied by a uniform TFP may not fully address the needs of households that are low on both monetary resources and total household time.

We assess how sensitive time allocated to food preparation is to both monetary and time resources. We use data from the 2003-04 American Time Use Survey (ATUS) to estimate how the time an individual spends preparing food varies with labor force participation, wages, the presence of children and other adult household members, and earnings and labor force participation of other family members. Ideally, we would analyze total household time, but the time use data are only available for individuals. Thus, we must infer the effect of total household time by examining differences across individuals living in different household types.

So Many Choices, So Little Time: How Economic and Sociodemographic Factors Influence the Way We Spend Our Time

The framework developed in Becker's household production model (1965) is often used to analyze individual time-allocation choices.[2] This model assumes that individuals maximize utility from consumption goods and leisure time, subject to constraints on their time, budget, and ability to make consumption goods themselves. The model explicitly recognizes time as a valued input that is optimally allocated to produce income, consumption goods, and leisure. It predicts that individuals choose a mix of time and purchased inputs that maximizes well-being while minimizing the full cost (time and money) of doing so. The resulting supply of time spent in preparing food is determined by the price of inputs, wages, household income, and other individual and household characteristics.

In this framework, increasing wages and payoffs from time spent working will typically reduce the time spent in producing goods and services for personal use. Increasing other household assets, such as the earnings of other family members, may also reduce the time an individual spends in home production activities like cooking. Indeed, as family incomes rise, so does spending on convenience foods: A 10-percent increase in income brings about an estimated 4 percent rise in spending on food away from home but only a 1-percent rise in spending for food at home (Blisard, Variyam, and Cromartie, 2003). However, higher earnings of other family members may also increase the individual's time in food preparation if that individual specializes in food preparation in response to having lower relative earnings.

In terms of family characteristics, the number of people living in a household should increase the time required to prepare, cook, and clean up after meals for everyone. Volume discounts and other economies of scale should also make cooking at home more cost-effective for a larger family. We expect that households with more children will devote more time to food preparation, all else equal. Adult individuals who live with other adults may be better able to share responsibilities for certain household tasks than those who live alone or as single parents. One single adult will have less total time to devote to necessary household activities, such as food preparation, compared with two married or partnered individuals.

Individual differences in time-allocation decisions are also likely to depend on the households' overall ability to substitute time for money. All else equal, individuals living in homes with higher household incomes will be more able to afford foods prepared away from home and, therefore, more likely to substitute prepared foods for home-cooked foods. For example, we expect the inverse relationship between an individual's wage rate and time spent cooking to be less pronounced among individuals with lower household income. Similarly, because lower income households are less able to substitute time for money, we expect that some aspects of family composition, such as the number of children and working adults, will have a more pronounced effect on the amount of time they allocate to preparing food.

[2]Although modeling the joint supply of all household members' time would be more precise, the ATUS collects time use data only from a single individual within a household. Thus, modeling these decisions as a household would complicate the conceptual framework and, ultimately, not be directly applicable to the empirical analysis.

In addition to wages, household wealth, and the time availability of other household members, certain sociodemographic characteristics will likely affect how much time an individual allocates to preparing food. For one, we expect to find that women spend more time preparing food than men do even when taking into account other factors that determine food preparation time. As women move into the labor force in greater proportions, the traditional pattern of women doing all of the food preparation is changing. Nonetheless, the tradition persists and women tend to do more household work than men do. Women still spent over twice as much time as men did in child care activities in 2005 and nearly three times more time in food preparation (Bureau of Labor Statistics, 2006). Harnack et al. (1998) also found that men are less likely to be involved in planning or preparing family meals. In households with both female and male household heads, they found that less than 30 percent of male respondents reported any involvement in either planning or preparing family meals, whereas at least 90 percent of females reported involvement with these same tasks.

Although women still tend to do most of the meal planning and preparing in married and partnered homes, as women's hours in paid work increases, their time in food preparation decreases (Zick, 1996). In fact, the increased availability of convenience foods and food away from home has often been attributed to women's increased participation in the labor force. For that reason, we expect that changes in family resources, such as wages, household income, and family composition, will have more prominent effects on women's food-preparation decisions than on men's. Gender roles have also changed over time and differ across cultures. As such, the effects of age, culture, and other factors are likely to differ across gender as well.

In summary, we expect that the amount of time an individual spends preparing food each day to be a function of his or her earnings; the presence, earnings, and labor force participation of other family members; the number of children living in the household, and the individual's sociodemographic characteristics, such as education, ethnicity, and gender.

Modeling Time Use Decisions:
Our Data and Econometric Approach

Data

We use data from the 2003-04 American Time Use Survey (ATUS), which is administered by the Bureau of Labor Statistics and the Census Bureau. The ATUS is a stratified, three-stage, random and nationally representative sample of households completing their final month of interviews for the Current Population Survey (CPS) (Bureau of Labor Statistics, 2006). To account for the sample design, we used STATA 9.0 and sampling weights to obtain representative parameter estimates. We also specify strata and clustering variables to increase the efficiency of our estimates.

The ATUS interviews one person per household. On average, ATUS interviewed about 1,725 individuals per month in 2003 and 1,100 individuals per month in 2004. Respondents were asked about their activities on the day before their interview, covering a 24-hour period beginning at 4 a.m. Through conversational interviews, each respondent provides a description of the type and duration of each activity in which he or she participated during the previous 24 hours. Survey respondents were asked to identify their primary activity if they engaged in two or more activities simultaneously. Except for time spent caring for children, data on time spent in secondary activities were not included in the 2003-04 ATUS, which may have led to an underestimate of the total amount of time spent in any single activity. For example, someone who cleaned the refrigerator while cooking dinner and reported cleaning as his or her primary activity would have reported fewer minutes in food preparation than someone who spent the same amount of time cooking, but reported no other primary activity.

In addition to detailed activity descriptions, ATUS data also contain demographic information, such as age, gender, ethnicity, and household income as well as information about an individual's labor force participation and the labor force participation and earnings of other household members. All household members ages 15 and older are eligible for the ATUS. Some of these respondents, such as teenage children and elderly parents living with other family members, may not be as involved in preparing meals. If these individuals are also more likely to be single, which we believe they are, then including them in our sample could bias downward the effect of being single. We therefore limit our final sample to include only individuals who identify themselves as the male or female head of household in the CPS interview. Our final sample includes observations from 30,058 adult respondents who are identified as a household head in the CPS interview.

Econometric Approach

Our goal is to estimate if and how much time use decisions vary with differences in specific family and individual characteristics, such as whether or not an individual has a partner or spouse, while holding all other individual and family characteristics constant. For this application, we use multivariate analysis, which allows us to determine the net effect that a single variable has on how much time one spends in food preparation, while holding all other household and individual characteristics constant. Other techniques,

such as cross tabulations, would not allow us to look at differences in food preparation by marital status while simultaneously controlling for the employment status of other household members, the number of children in that household, and one's level of education.

Theoretically, the optimal allocation of each household member's time in all possible pursuits is determined simultaneously as a household decision. Due to data limitations, however, we cannot estimate all of these separate decisions and include their impacts on how much time an individual allocates to food preparation, as would be ideal. Consequently, including a measure of labor force participation directly in our model to estimate how much time one spends preparing food will lead to biased estimates.

However, the decision to work outside the home is so important to the decision to allocate time for food preparation that omitting this variable would also bias our results. Working outside the home requires that a large block of one's time be devoted to it—typically 8 or more hours per day. As such, it will greatly reduce the amount of time one can dedicate to other activities like food preparation. Unfortunately, estimating these decisions simultaneously using a two- or three-stage estimator becomes difficult because both food preparation and hours worked outside the home are censored, or take on a zero value, for a large portion of the sample. Among women, 36 percent of our final sample reported no time in food preparation and 41 percent were not in the labor force. Among men, 57 percent reported no time in food preparation and 26 percent were not in the labor force. To circumvent this problem, we run separate estimates of time spent preparing food by those who work full-time (more than 35 hours per week), those who work part-time (less than 35 per week, but employed), and those who are not employed.[3] Note, however, that a potential sample selection bias remains because we are splitting the sample along endogenous choice variables.

Because we expect the effect of some individual and household characteristics to differ by gender and income, we also run separate estimates for women and for low-income households. We define a household as low-income if that household's income relative to the poverty guideline for a household of the same size is 1.3 or below. This income relative to poverty ratio (IRP) is a common standard for comparing income across households of different sizes. It is used to determine whether an individual or household can qualify for certain food assistance and welfare programs. For example, an IRP of 1.3 or below is one of the first qualifications a household must meet to qualify for food stamp benefits. Researchers also use this same cutoff to calculate the typical diet of low-income consumers when creating the TFP (USDA, 1999). Because the ATUS reports income as a categorical, rather than continuous, variable, we use the midpoint value from each of the income categories and the top code value of $150,000 for the highest income category to create the IRP values.

Our dependent variable, the amount of time spent each day in food preparation (TF), is zero for many individuals. Thus, estimating the relationship between this dependent variable and the independent variables via ordinary least squares would result in inconsistent parameter estimates. We therefore use a Tobit model for our analysis. This model assumes a latent unobservable variable, TF^*, and an observable variable, TF, that is defined to equal

this latent variable whenever it takes on a value greater than zero and is defined equal to zero otherwise. The econometric model estimated for the Tobit can then be written as:

$$TF_{ig} = \begin{cases} 0 & if\ TF_{ig}^* \leq 0, \\ TF_{ig}^* & if\ TF_{ig}^* > 0. \end{cases}$$

And the latent variable, TF_{ig}^* is defined as:

$$TF_{ig}^* = \beta_1 w_{ig} + \beta_2 A_{ig} + \beta_3 wA_{ig} + \beta_4 TFA_{ig} + \beta_5 C_{ig} + \beta_6 D_{ig} + \varepsilon_{ig}$$

The subscript i refers to each individual, and the subscript g refers to his or her gender, income (IRP at or below 1.3 or IRP above 1.3), and employment (working full- or part-time or nonworking) grouping, which leaves a total of 12 subgroups. TF_{ig} is measured as the total minutes spent in preparing food, w_{ig} is an individual's wage rate, A_{ig} is the a vector representing the presence of other household adults, wA_{ig} is a vector of their earnings, TFA_{ig} is a vector of their household time, C_{ig} is the number of children living in a household, D_{ig} is a vector of individual sociodemographic characteristics, and ε_{ig} is a normally distributed error term.

Dependent Variable—Time Spent Preparing Food

Definitions and summary statistics for the variables used in the econometric analysis are found in table 1. The ATUS data contain six activity codes related to food preparation and acquisition. We combine the following four food preparation activities into one because they are all part of the main activity of preparing a meal:

1. Preparing food and drinks, which includes cooking and in any way getting food and drinks ready for consumption.

2. Serving food and drinks, which includes activities like setting the table.

3. Food and kitchen cleanup.

4. Storing or putting away food and drinks.

We refer to this general combination variable as "food preparation."

Explanatory Variables

For individuals in the work force, we use total weekly earnings and the number of hours worked at all jobs to calculate an individual's average hourly wage rate. However, we do not have such information for individuals who are not in the labor force. One way to correct for any possible bias caused from omitting a variable that represents an individual's opportunity cost of time would be to estimate the wage rate an individual would have earned if he or she were employed. Because these estimates are typically determined by the same variables that influence time-allocation decisions, however, using predicted values will also bias estimates. Thus, we opt to use reported wage rates for our entire sample, which means that our estimates among unemployed individuals, whose reported wage rate is zero, will suffer from an omitted-variable bias.[4]

[4]We ran all of our estimates using predicted wages and found that the predicted values of time spent in food preparation were extremely similar when using either reported or predicted wage rates. Also, there were few changes in terms of magnitude or significance of our parameter estimates. In using predicted wages, the biggest changes in significance were among variables meant to capture sociodemographic variables— education and urbanization—which is not surprising because these variables are most likely positively correlated with wage rates. Thus, our estimates that do not include wages for unemployed individuals may be downward biased for these variables. Conversely, any variables that are negatively correlated with either the probability of working or an opportunity cost of time wage may have an upward bias.

Table 1

Summary statistics for how much time family and individual characteristics affect time spent preparing food

Variable	Definition and units	Mean	Standard deviation
Dependent variable:			
Food time	Daily sum of minutes spent in food preparation	39.59	58.00
Separating variables:			
Full-time	1 if individual works more than 35 hours per week	.53	NA
Part-time	1 if individual works but less than 35 hours per week	.12	NA
Nonworking	1 if individual is neither part-time nor full-time employed	.35	NA
Low-income	1 if midpoint of household income category divided by poverty guideline for family size is 1.3 or below	.17	NA
Female	1 if individual is female	.57	NA
Monetary and time resources:			
Reported wage	Individual's reported hourly wage rate	16.53	15.79
Other earnings	Midpoint of weekly household income range less individual's weekly contribution	486.12	571.94
Partner	1 if individual has a spouse or unmarried partner	.66	
Partner's household time	Maximum number of hours one's partner has for household work. Number of hours in week, less 8 hours for sleep each day and usual hours worked per week	55.92	44.37
Extra adults—healthy	Number of adults in household who have not identified themselves as sick or disabled	.05	.25
Extra adults—unhealthy	Number of adults in household who are not in the labor force because of disability or illness	.01	.07
Extra adults' household time	Maximum number of hours other healthy household adults have for household work	4.27	23.27
Number of children	Total number of children younger than 18 living in household	.82	1.13
Young child	1 if one or more children are younger than 5	.17	
Sociodemographic shifters:			
High school only	1 if high school or GED only	.29	NA
Some college	1 if attended but did not complete a college degree	.18	NA
Bachelor's or associate degree	1 if received a bachelor's or associate degree	.29	NA
Graduate work or professional degree	1 if received a graduate or professional degree	.12	NA
Age	Age of respondent in years	48.81	15.71
Black (non-Hispanic)	1 if respondent is non-Hispanic Black	.11	NA
Hispanic	1 if respondent is Hispanic	.10	NA
Asian (non-Hispanic)	1 if respondent is Asian	.02	NA
Other race (non-Hispanic)	1 if other ethnicity	.01	NA
Foreign born	1 if respondent was born outside the United States	.11	NA
Regional shifters:			
Northeast	1 if respondent lives in the Northeast	.20	NA
West	1 if respondent lives in West	.35	NA
South	1 if respondent lives in the South	.20	NA
Metropolitan	1 if respondent lives in a metropolitan area	.79	NA
Other shifters:			
Weekend	1 if time diary was recorded for a weekend day	.51	NA
Holiday	1 if time diary was recorded for a holiday	.02	NA

NA = Not applicable.

Note: Sample includes 30,058 adult respondents who identify themselves as household head (self or spouse) in Current Population Survey interview.

Source: 2003-04 American Time Use Survey.

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Economic Research Service/USDA

In addition to an individual's own wage, other family members' earnings will also influence the entire household's monetary constraints. To approximate the earnings of other household members, we use the midpoint value of the categorical household income variable, convert it to a weekly value, and subtract an individual's weekly contribution.

To estimate how food preparation varies with family time resources, we include the number of adults present in the household and their availability of time for household chores like cooking. We create a categorical variable that takes on a zero or one value if the individual has a partner (married or unmarried) that was present in the household during the time use diary. We also create variables to indicate the number of other adults living in the household during the time use survey. We further classify these individuals as "healthy" or "unhealthy." Although these distinctions may be a bit crude, an individual is classified as unhealthy if he or she indicated the reason for not being in the labor force was due to ill health or disability. All other adults were classified as healthy. We anticipate that each unhealthy adult in a household will increase the time needed for food preparation more than other household adults.

We also anticipate that how much time an individual spends cooking depends on the time availability of other household adults. Thus, we create a variable to measure the maximum amount of time an individual's partner has for household production activities. This variable is simply the total number of hours in a week, less 8 hours a day for sleeping, and the total number of hours the partner or spouse works, on average. We create a similar variable for all healthy adults in a household.

The number of children in a household should increase the time spent preparing food. We also expect that households with young children spend more time preparing food than those with older children. The presence of young children may increase the opportunity cost of eating outside the home. Individuals with children in their care may find that eating food outside the home entails foregoing time that could have been spent reading to children or helping with their homework. For some, it may also reduce the enjoyment of eating outside the home. Thus, we include a dummy variable to indicate whether or not a nonschool-aged child (ages 5 or younger) lives in the household.

Many of the variables we include as individual characteristics, such as age, gender, and education, are self-explanatory. We also include age as a quadratic term because an individual's caloric requirements and health tend to decrease with age. We may therefore see them spending less time preparing meals. To proxy for cultural influences on diet and cooking, we include whether an individual is non-Hispanic White, non-Hispanic Black, Hispanic, Asian, or any other ethnicity and whether that individual was born outside the United States.

To control for possible price variations across regions, we include four regional dummy variables—Northeast, Midwest, West, and South. We include a variable to indicate whether an individual lives in a metropolitan area. We control for whether an individual's time diary was recorded on a weekend because past studies on time use have found very different patterns between weekdays and weekends. We also include a dummy variable to indicate if the diary day was a holiday.

Findings: Who's Cooking and How Much?
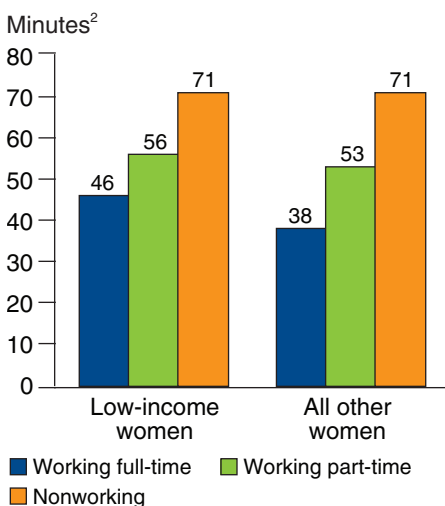
Estimation results for women and men are reported in tables 2-4, where the reported coefficients indicate the combined effect (in minutes) that each explanatory variable has on both the probability that one spends any time in food preparation and the amount of time he or she spends doing so in a single day. As expected, the results differed greatly for men and women and for whether they were employed or not. Using estimated coefficients and sample means within each subgroup, we estimated the predicted amount of time per day women and men spent preparing food, by income category and labor force participation (tables 2-5 and figs. 1 and 2).

We found very few explanatory variables to be significantly associated with how much time men spend preparing food, especially low-income men. Our results for men also contradict the hypothesis that there is an inverse relationship between household earnings and time spent in food preparation. For both full-time employed and nonworking men, those with lower household income spend less time preparing food than do men in households with higher incomes. Moreover, among men with higher incomes, the relationship between time spent in paid work and time spent preparing food was not clear. One possible reason for this lack of systematic variation among men is that most men still generally spend very little time preparing food compared with women. Our results suggest that men spend about a third less time preparing

Figure 1

Time that women spend per day preparing food, by income category and labor force participation

Women spend less time preparing food as time requirements of paid work increase, an effect that is less pronounced among low-income women[1]
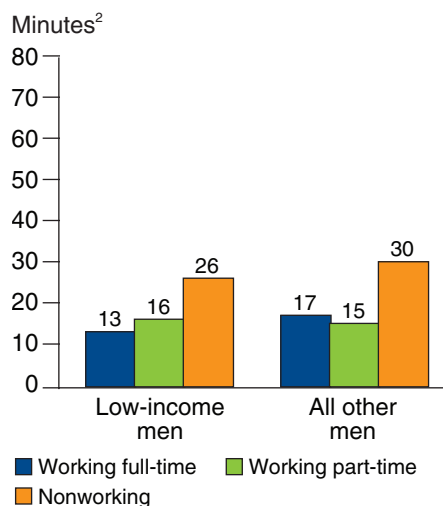
Minutes[2]

■ Working full-time ■ Working part-time
■ Nonworking

[1]Low income = Income-to-poverty ratio of 1.3 or below.
[2]Estimates are calculated using the mean value by income category and working status.
Source: Economic Research Service, USDA.

Figure 2

Time that men spend per day preparing food, by income category and labor force participation

Low-income men also spend less time preparing food as time requirements of paid work increases, but rising income increases the time spent preparing food[1]

Minutes[2]

■ Working full-time ■ Working part-time
■ Nonworking

[1]Low income = Income-to-poverty ratio of 1.3 or below.
[2]Estimates are calculated using the mean value by income category and working status.
Source: Economic Research Service, USDA.

food than women do—between 12 and 30 minutes per day. Because our models did not work well for men, we do not discuss the results further.

All of the results for women that we discuss here are estimated to be statistically significant in the regressions. The amount of time women allocate to preparing food appears to conform with standard economic theory: Time spent preparing food in the home decreases with household income. Also, working women spend less time preparing food than nonworking women. Our estimates suggest that nonworking women spend just over 70 minutes per day preparing food, whereas women who work part-time spend 53-56 minutes per day and full-time working women spend 38-46 minutes per day preparing food.[5]

In support of our initial hypothesis, we find evidence that low-income working women may be less able to substitute money for time than women with higher income. Our results show that, among low-income women, the time spent preparing food does not decrease significantly with their wage rate. However, higher wage rates are significantly and negatively related to less food preparation time among higher income women who work full-time. An increase in weekly earnings of $100 would translate into 9 fewer minutes spent in food preparation per day. Time allocated to food preparation does not vary significantly with the earnings of other household members.
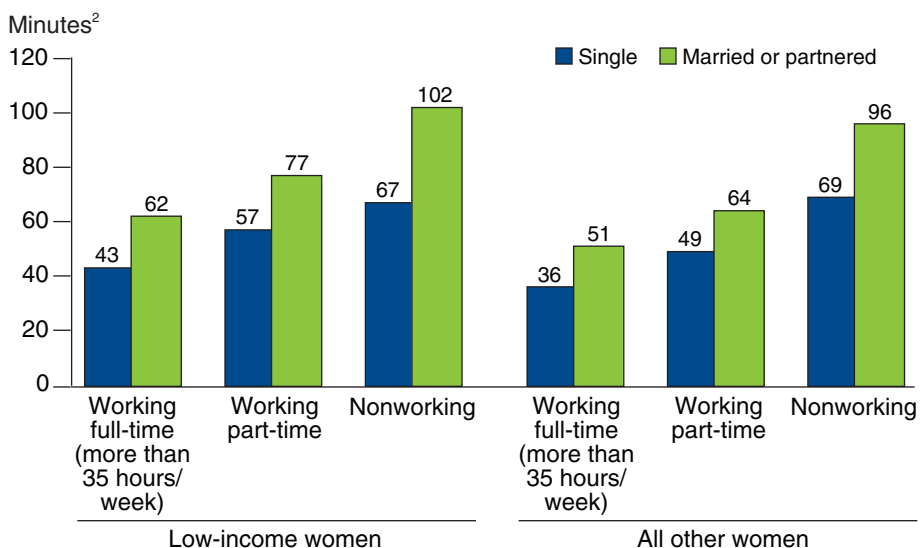
In all regressions, single women spend less time preparing food than their partnered counterparts do. The effect of having a partner is among the highest in magnitude of all parameter estimates. Figure 3 shows how the

[5]Although not presented here, we estimated the amount of time spent preparing food for men as well. The results indicate that men spend 13-20 minutes per day preparing food. These differences do not vary predictably by income. Also, the differences between working and nonworking men are much less pronounced than the differences between working and nonworking women.

Figure 3

Time that women spend per day preparing food, by marital status, labor force participation, and income category

Regardless of employment status, the extra time requirements associated with having a spouse or partner are more pronounced among low-income women, possibly because they are less able to substitute money for time[1]

Minutes[2]

[1]Low income = Income-to-poverty ratio of 1.3 or below.
[2]These estimates assume that each household has two children and that the spouse or partner works full-time. For all other parameters, estimates are calculated using the mean value by income category and working status.
Source: Economic Research Service, USDA.

estimated time allocated to food preparation by married and single women varies with labor force participation and income category. To control for household size and time availability of the spouse or partner, we calculate predicted minutes in food preparation for a household with two children and a fully employed partner.

As expected, the effect of having a partner varies by household income, likely because individuals with higher household incomes are better able to purchase time-saving inputs. Even after controlling for the number of children, low-income working women with partners spend about 19-20 more minutes per day preparing food than their single counterparts do. Higher income working women with partners, however, spend an additional 15-16 minutes per day. Similarly, among nonworking women, the low-income ones with partners spend about 35 more minutes per day cooking than single women, while nonworking, partnered women with higher incomes spend about 28 more minutes cooking per day than their single counterparts do.

Neither the presence of other healthy adults in the household nor their avail-ability of time for household chores correlates significantly with time spent preparing food. However, among women who work part-time, having an unhealthy adult in the household was positively correlated with more time preparing food, regardless of income. Among low-income women who work full-time, time spent preparing food decreases with the number of unhealthy adults in the household. We find that the number of children in a household is another important determinant of food preparation time for both working and nonworking women. However, this effect was not system-atically more pronounced among lower income women as we had expected.

Among low-income women, both part-time employed and nonworking, the amount of time spent preparing food was significantly lower for more educated individuals. However, education and time spent preparing food is not significantly correlated among low-income women who work full-time. The exact opposite is true for higher income women: The negative correla-tion between education and food preparation is only significant among women who work full-time. This odd result may indicate an omitted vari-able bias resulting from splitting the sample into employment categories. If the choice to work full-time is positively correlated with education, our esti-mates on education may be biased downward.

Across income categories, age had a significant, positive effect on the amount of time spent preparing food. Some of the variables used to proxy for culture also significantly affect food preparation. For high-income households, working Asian women spend approximately 11-20 more minutes per day preparing food compared with non-Hispanic White women. Among lower income women who work full-time, Hispanic and Asian women spend more time preparing food. Among higher income women, those born outside the United States spend more time preparing food, regardless of labor force participation. These results may reflect differences in cultural norms or availability of convenient foods that conform to one's traditional diet.

Table 2

Estimation results: Determinants of the time low-income women spend preparing food[1]

Variable	Working full-time N=1,505			Working part-time N=866			Not working N=2,986		
	Coefficient	Z-value	***	Coefficient	Z-value	***	Coefficient	Z-value	***
Reported wage	0.09	0.36		-0.16	-1.12		—	—	
Other earnings	-.01	-1.10		0	-.27		0	-0.41	
Partner	28.63	3.55	**	34.06	2.26	**	28.77	2.92	**
Partner's household time	-.19	-1.79	*	-.25	-1.36		.01	.14	
Extra adults—healthy	-43.56	-1.20		25.47	.39		.41	.01	
Extra adults—unhealthy	-23.70	-1.42	*	73.72	2.51	**	35.05	1.72	*
Extra adults' household time	.58	1.34		-.28	-.42		-.01	-.04	
Number of kids	5.09	3.06	**	11.18	4.21	**	10.37	6.76	**
Young child	4.99	.98		1.74	.29		5.76	1.01	
High school only	.65	.12		-22.36	-2.96	**	-1.13	-.29	
Some college	-2.49	-.46		-24.17	-3.26	**	-0.97	-.19	
Bachelor's or associate degree	-5.71	-1.07		-23.56	-2.48	**	-3.52	-.75	
Graduate work or professional degree	-2.23	-.35		-13.27	-1.14		-21.71	-3.63	**
Age	1.90	2.14	**	1.97	1.98	**	1.34	2.38	**
Age^2	-.02	-1.58		-.02	-1.45		-.01	-1.60	
Black (non-Hispanic)	.55	.13		.54	.09		.74	.17	
Hispanic	12.68	2.04	**	-4.17	-.46		6.73	1.20	
Asian (non-Hispanic)	25.24	1.94	**	25.81	1.11		-1.67	-.12	
Other race (non-Hispanic)	-10.26	-.84		-12.99	-.96		-4.51	-.46	
Foreign born	7.44	1.09		4.80	.53		20.00	3.10	**
Northeast	-4.19	-.98		-2.93	-.38		-3.22	-.75	
West	-8.74	-2.28	**	-10.02	-1.87	*	1.66	.44	
South	-4.51	-.98		-6.73	-1.10		-3.73	-.87	
Metropolitan	-6.04	-1.30		-1.36	-.26		-5.06	-1.45	
Weekend	3.54	1.06		-3.00	-.75		-7.59	-2.63	**
Holiday	4.45	.33		80.98	2.62	**	7.50	.69	
Left censored observations	466			208			667		
Uncensored observations	1,039			658			2,319		
Predicted minutes preparing food	46.38			56.11			70.59		
Pseudo R^2	.08			.11			.11		

**Parameter estimated to be significant at the 5 percent level.

*Parameter estimated to be significant at the 10 percent level.

†Predicted minutes are calculated from parameter estimates evaluated at the mean value for each employment, gender, and income group.

Note: The predicted excluded dummy variables are (1) less than high school education, (2) White non-Hispanic, (3) unmarried or unpartnered status, (4) Midwest, (5) nonmetropolitan, (6) weekday, and (7) nonholiday.

[1]Income-to-poverty ratio is equal to 1.3 or below.

Source: 2003-04 American Time Use Survey.

Table 3
Estimation results: Determinants of the time all other women spend preparing food[1]

Variable	Working full-time N=5,844			Working part-time N=1,938			Not working N=4,070		
	Coefficient	Z-value	***	Coefficient	Z-value	***	Coefficient	Z-value	***
Reported wage	-0.25	-3.26	**	-0.02	-0.36		—	—	
Other earnings	0	-.12		0	-.13		0.00	-0.37	
Partner	21.41	6.27	**	25.97	3.43	**	25.55	3.37	**
Partner's household time	-.13	-2.96	**	-.18	-2.17	**	-.02	-.28	
Extra adults—healthy	18.52	1.12		-28.49	-1.11		13.16	.46	
Extra adults—unhealthy	22.97	1.35		60.36	7.08	**	9.17	1.10	
Extra adults' household time	-.22	-1.29		.33	1.23		-.11	-.38	
Number of kids	5.45	6.47	**	7.19	4.55	**	11.32	7.18	**
Young child	6.14	2.65	**	3.39	.87		4.57	1.15	
High school only	-8.25	-1.93	*	6.10	.87		.40	.09	
Some college	-7.50	-1.77	*	5.70	.77		.30	.06	
Bachelor's or associate degree	-8.13	-1.93	*	3.78	.55		-2.11	-.47	
Graduate work or professional degree	-10.82	-2.61	**	-4.53	-.67		-3.23	-.53	
Age	1.73	3.80	**	1.19	1.72	*	2.06	3.75	**
Age^2	-.01	-2.52	**	-.01	-.75		-.01	-2.65	**
Black (non-Hispanic)	-.93	-.36		-5.84	-.89		-1.32	-.28	
Hispanic	1.22	.44		7.36	1.11		10.02	1.76	*
Asian (non-Hispanic)	11.27	2.01	**	20.60	2.02	**	8.61	1.08	
Other race (non-Hispanic)	2.30	.40		-5.75	-.54		-6.77	-1.05	
Foreign born	6.91	1.95	*	16.57	2.06	**	21.23	4.16	**
Northeast	7.70	3.45	**	3.33	.93		6.32	1.74	*
West	1.25	.74		-3.33	-.89		3.27	1.06	
South	2.21	1.14		-1.16	-.31		2.52	.73	
Metropolitan	.09	.05		-5.64	-1.51		-6.19	-2.03	**
Weekend	10.49	7.55	**	3.96	1.47		-12.74	-5.80	**
Holiday	21.23	1.84	*	6.63	.53		21.12	1.47	
Left censored observations	1,870			464			819		
Uncensored observations	3,974			1,474			3,251		
Predicted minutes preparing food	38.05			53.11			71.08		
Pseudo R^2	.08			.05			.07		

**Parameter estimated to be significant at the 5 percent level.
*Parameter estimated to be significant at the 10 percent level.
†Predicted minutes are calculated from parameter estimates evaluated at the mean value for each income group.
Note: The predicted excluded dummy variables are (1) less than high school education, (2) White non-Hispanic, (3) couple-headed household, and (4) Midwest.
[1]Income-to-poverty ratio is above 1.3.

Source: 2003-04 American Time Use Survey.

Table 4
Estimation results: Determinants of the time low-income men spend preparing food[1]

Variable	Working full-time N=1,594			Working part-time N=273			Not working N=1,270		
	Coefficient	Z-value	***	Coefficient	Z-value	***	Coefficient	Z-value	***
Reported wage	0.08	1.22		-0.25	-1.52		—	—	
Other earnings	0	-.91		.01	1.32		0.02	0.84	
Partner	10.49	2.66	**	23.49	1.92	*	6.77	.48	
Partner's household time	-.20	-3.90	**	-.26	-1.75	*	-.20	-1.43	
Extra adults—healthy	-6.34	-.52		-12.61	-.47		-13.51	-.49	
Extra adults—unhealthy	-15.29	-1.25		-173.56	-5.79	**	-15.11	-1.34	
Extra adults' household time	.08	.59		.11	.41		0	-.01	
Number of kids	.57	.73		.72	.33		6.57	2.21	**
Young child	6.71	2.09	**	2.28	.32		-2.02	-.27	
High school only	-.33	-.13		-3.81	-.77		10.45	2.23	**
Some college	.12	.04		-6.14	-1.21		-.66	-.14	
Bachelor's or associate degree	3.30	1.14		-8.85	-1.73	*	15.92	1.92	*
Graduate work or professional degree	1.58	.43		-7.84	-1.55		3.99	.53	
Age	-.21	-.51		.85	1.03		.81	1.35	
Age^2	0	.81		-.01	-.83		-.01	-.92	
Black (non-Hispanic)	.13	.04		.60	.11		-2.17	-.52	
Hispanic	-2.37	-.84		-1.54	-.22		-11.12	-1.93	*
Asian (non-Hispanic)	-1.74	-.43		12.49	.77		-23.26	-2.97	**
Other race (non-Hispanic)	1.98	.27		-4.76	-.52		-13.79	-1.89	*
Foreign born	-1.12	-.39		-6.10	-1.03		17.11	1.88	*
Northeast	-.30	-.13		5.57	.91		-5.84	-1.10	
West	-2.21	-1.10		1.83	.36		.68	.16	
South	-.10	-.04		-1.22	-.24		5.20	.99	
Metropolitan	-2.35	-.96		-3.82	-.78		3.94	1.08	
Weekend	5.19	3.10	**	-7.34	-2.16	**	.40	.13	
Holiday	1.93	.34		-8.38	-.90		-11.53	-1.29	
Left censored observations	1,028			162			669		
Uncensored observations	566			111			601		
Predicted minutes preparing food	12.73			16.48			25.63		
Pseudo R^2	.03			.03			.03		

**Parameter estimated to be significant at the 5 percent level.
*Parameter estimated to be significant at the 10 percent level.
Note: The predicted excluded dummy variables are (1) less than high school education, (2) White non-Hispanic, (3) couple-headed household, and (4) Midwest.
[1]Income-to-poverty ratio is equal to 1.3 or below.

Source: 2003-04 American Time Use Survey.

Table 5
Estimation results: Determinants of the time all other men spend preparing food[1]

Variable	Working full-time N=7,086			Working part-time N=535			Not working N=2,091		
	Coefficient	Z-value	***	Coefficient	Z-value	***	Coefficient	Z-value	***
Reported wage	-0.02	-0.62		-0.10	-2.56	**	—	—	
Other earnings	0	-1.78	*	0	-1.40		0	1.37	
Partner	9.89	5.01	**	22.08	2.79	**	26.10	3.21	**
Partner's household time	-.17	-7.11	**	-.23	-2.34	**	-.36	-4.19	**
Extra adults—healthy	-4.53	-.60		-.02	0		-13.54	-.45	
Extra adults—unhealthy	1.16	.24		14.06	1.43		-23.31	-1.13	
Extra adults' household time	.05	.56		.02	.05		.10	.31	
Number of kids	2.00	4.16	**	4.45	2.13	**	5.26	2.24	**
Young child	2.94	2.43	**	-4.69	-1.11		.99	.16	
High school only	1.07	.51		-5.14	-.97		-.17	-.04	
Some college	1.45	.65		-5.09	-1.04		3.84	.79	
Bachelor's or associate degree	2.28	1.05		-.03	-.01		1.16	.25	
Graduate work or professional degree	3.00	1.25		-5.37	-1.12		-2.26	-.45	
Age	.84	3.23	**	.94	1.55		.07	.11	
Age^2	-.01	-2.79	**	-.01	-1.12		0	.10	
Black (non-Hispanic)	-1.16	-.71		-5.39	-1.31		-4.79	-1.35	
Hispanic	-3.59	-2.27	**	-4.42	-.84		2.99	.34	
Asian (non-Hispanic)	-4.62	-1.90	*	-8.51	-1.43		-13.37	-2.04	**
Other race (non-Hispanic)	5.14	1.22		5.93	.36		11.78	.93	
Foreign born	2.01	1.08		.12	.02		7.46	.99	
Northeast	-1.01	-.90		-3.81	-1.08		2.74	.78	
West	-2.20	-2.14	**	.69	.20		2.84	.90	
South	1.74	1.48		3.02	.79		-1.69	-.47	
Metropolitan	1.20	1.18		7.35	2.55	**	2.69	.96	
Weekend	4.42	5.36	**	1.19	.41		-3.21	-1.26	
Holiday	9.12	2.01	**	-18.22	-6.65	**	26.90	1.84	*
Left censored observations	4,072			298			1,060		
Uncensored observations	3,014			237			1,031		
Predicted minutes preparing food	16.82			15.33			30.45		
Pseudo R^2	.03			.02			.03		

**Parameter estimated to be significant at the 5 percent level.

*Parameter estimated to be significant at the 10 percent level.

†Predicted minutes are calculated from parameter estimates evaluated at the mean value for each income group.

Note: The predicted excluded dummy variables are (1) less than high school education, (2) White non-Hispanic, (3) couple-headed household, and (4) Midwest.

[1]Income-to-poverty ratio is above 1.3.

Source: 2003-04 American Time Use Survey.

Conclusions

The goal of this study was to estimate if and how time allocated to cooking varies with both monetary and time resources. We find that how much time one chooses to spend preparing food does appear to correlate systematically with differences in variables meant to proxy family time resources. We find that working women spend less time cooking than those who do not work outside the home. Being married and having more children living in the household are separately estimated to increase the amount of time a woman spends in food preparation. Also, among low-income women, wages do not significantly affect their food preparation decisions.

These results suggest that, among women, household time resources significantly affect how much time is allocated to preparing food. In fact, we find these effects are greater than household monetary resources: Separately, both working full-time and being a single parent each have a greater impact on time allocated to food preparation than an individual's earnings or household income.

Recent estimates of the time needed to follow TFP recipes range from 80 minutes a day to 16 hours a week. We find that many low-income households—those with two adults or those headed by a single parent that works less than 35 hours a week—allocate enough time for food preparation. However, our estimates also say that low-income women who work full-time spend just over 40 minutes per day and thus may have difficulties meeting the plan's implied time requirements. The food assistance they receive is calculated according to a uniform TFP formula predicated on the assumption of an average level of time availability. Because time spent in food preparation generally reduces the monetary cost of food and commercially prepared food costs relatively more, the food stamp benefit level implied by a uniform TFP is less likely to meet the needs of households that are low on both time and money. Thus, a worthwhile endeavor would be to investigate whether a greater number of healthful, convenient foods could be included in the TFP market basket without requiring higher benefit levels.

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