Unemployment or Out of the Labor Force:
A Perspective from Time Allocation and Life Satisfaction

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Abstract

Availability for work and engagement in active job search have been the conventional criteria to distinguish the unemployed from those not in the labor force. In this paper we use American time use survey data 2012-2013 to compare the demographic characteristics, time allocation and life satisfaction between the unemployed and three subgroups of those out of the labor force. The three subgroups include the retired, the disabled, and those who are out of the labor force but not retired or disabled (NLFNRND). We find that despite differences in time spent on job search, NLFNRND males share similar demographic characteristics, time allocation and life satisfaction as unemployed males. By examining the labor market status of the sample population in their CPS interviews, we also find that males who were NLFNRND or unemployed at the time of CPS interviews have similar transition rates to employment by the time of their ATUS interviews about two to five months later. By contrast, NLFNRND females spend as little time on job search as their male counterparts, yet their demographics characteristics and time allocations show high opportunity cost of substituting search and market activities for child care and nonmarket work. Compared to NLFNRND males, NLFNRND females have higher life satisfaction in their current status, and lower transition rates to employment. Both NLFNRND males and females have drastically different demographics, time allocation and life satisfaction from the retired and disabled, the other two subgroups of those not in the labor force. We argue that engagement in active job search reflects only a tiny fraction of time allocation patterns, and thus may not capture the full opportunity cost of time for employment considerations. We advocate a more sophisticated criterion considering time allocation and life satisfaction in distinguishing between being unemployed and not being in the labor force.

JEL Codes: J22, J64, E24

Key words: time use, life satisfaction, unemployment, out of the labor force

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1 Introduction

The distinction between "unemployed" and "not in the labor force" has been an important issue. The conventional criteria to distinguish those two statuses are availability for work and engagement in active job search. Since the criteria are qualitative in nature, there has been considerable controversy whether it is meaningful to distinguish these two labor market states.

The controversy on the distinction of the two has gained renewed attention as the economy witnesses both a decline in the unemployment rate and a decline in the labor force participation rate after the great recession, which have raised questions about the information content of existing measures of labor under-utilization.

The issue is also central to understanding the aggregate labor supply elasticity in academic literature. Recent studies, including Veracierto (2011), Krusell et al. (2012), have advocated three-state transitions among unemployment, employment and nonparticipation (not in the labor force), instead of the traditional focus on the flow from unemployment to employment. Our paper takes the three-state transition further by taking a close look at the heterogeneous subgroups within those out of the labor force. We ask the following questions: Are the unemployed and those out of the labor force behaviorally distinct? Are there any subgroups within those out of the labor force, that behaviorally resemble the unemployed more than the rest? How would such resemblance affect our assessment of the labor market status?

In this paper we evaluate the distinction between the unemployed and those not in the labor force by directly examining the time allocation and life satisfaction of the unemployed and those out of the labor force. We take a close look at the population out of the labor force to examine their distinctions from the unemployed. We divide the population out of the labor force into three subgroups: those not in the labor force, yet not retired or disabled (henceforth NLFNRND), the retired and the disabled. The American Time Use Survey (ATUS) 2012-2013 has a module on lifetime satisfaction that asks questions on both time allocation and subjective well-being of respondents. We focus on the population between 18 and 65, and exclude full-time students to abstract from human capital investment decisions. In addition to ATUS surveys, we also use CPS interviews 2 to 5 months ahead of the ATUS surveys to track transitions of our ATUS sample across labor market states.

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We find that there is significant heterogeneity in terms of demographic characteristics and time allocations within the population out of the labor force, both among the three subgroups and across gender. In terms of time allocation, those out of the labor force, but neither retired nor disabled, have drastically different time allocation patterns from the retired and the disabled. We find that despite differences in time spent on job search, NLFNRND males share similar demographic characteristics, time allocation and life satisfaction as unemployed males. By examining the labor market statuses of the sample population in their CPS interviews, we also find that males who were NLFN-RND or unemployed at the time of CPS interviews have similar transition rates to employment by the time of their ATUS interviews about two to five months later. By contrast, NLFNRND females spend as little time on job search just as their male counterparts, yet their demographic characteristics and time allocations show high opportunity cost of substituting search and market activities for child care and nonmarket work. Compared to NLFNRND males, NLFNRND females have higher life satisfaction in their current status, and lower transition rates to employment.

We take a broad perspective from time allocation and life satisfaction for the following reasons: First, time spent on job search is an inadequate measure of labor market states. We construct a theoretical model of time allocation for nonworkers to spell out optimal conditions for job search. Our model shows that search time can differ across individuals and over time due to heterogeneous search efficiencies and varying aggregate economic conditions. Thus larger amount of search time may not translate to higher transition rates to employment. Moreover, search time in a particular period may not be informative if there are high elasticities of substitution between time spent on search and other activities. We conclude that from a time allocation perspective, job search time constitutes only a small portion of an individual's time allocation, and thus may not capture the full opportunity cost of time for employment considerations.

The second reason we take a broad perspective is that time allocation is arguably one of the most important decisions made by nonworkers. Decisions on time allocation reflect the individual's preferences, constraints, and demographic characteristics including age, gender, education, marital status, family background and etc. We hypothesize that if the unemployed and those not in the labor force have similar time allocation patterns, they would share similar opportunity cost of time when choosing employment over their status quo. However, if their time allocations are different, that would not only reflect differences in their underlying individual characteristics, but also in

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their trade-offs between staying in their current state and getting a job. Such trade-offs are the key determinants of transition rates. Thus we consider differences in time allocation a key indicator of the distinction between being unemployed and not being in the labor force.

The comparison of life satisfaction also allows us to examine the differences between the unemployed and those not in the labor force. The link with the CPS interview also allow us to examine life satisfaction of those who have changed or kept their labor status in the past months. The satisfaction with their current status quo not only indicates the desire to potentially change the status, but also helps to address the question whether the unemployment rate is an adequate measure for the health of the labor market. If those not in the labor force are not satisfied with the state they are in, and we also witness an outflow from the labor force, we would certainly reconsider whether a decline in the unemployment rate is as positive a signal for the labor market as otherwise suggested.

Our findings show that search time alone cannot capture opportunity costs of time for employment considerations. A more sophisticated criterion, which takes into consideration an individual's full spectrum of time uses and life satisfaction, is needed to distinguish between unemployment and not being in the labor force. The difference can be consequential. We show that treating NLFNRND males as unemployed results in an upward revision of the unemployment rate by about 2 to 3 percentage points, a magnitude substantial enough to make a difference in economic policies. Although CPS respondents are asked whether they want a job or they are available for work, their time allocation serves as an objective measure of their availability. The BLS has compiled alternative measures of labor under-utilization such as U-4, U-5 and U-6 by including discouraged workers and those marginally attached to the labor market. However, to our knowledge, there has not been a systematic approach to evaluate labor market attachment using information on time allocation and life satisfaction.

The focus of previous literature on the controversy has been on testing whether transition rates from unemployment or not in the labor force to employment are statistically distinguishable. Clark and Summers (1982) lean toward no distinction between the two states for young people, while Flinn and Heckman (1983) use the NLSY data on young men to argue that behaviorally distinct equations govern transitions of young men from out of the labor force to employment and from unemployment to employment. Using Canadian labor survey data, Jones and Riddell (2006) find that marginal attachment - defined as desiring work, although not working - is a distinct

labor market state, lying between those who do not desire work and the unemployed. We take a close look into heterogeneous groups out of the labor force, and find some subgroups bearing strong behavioral similarity to the unemployed than others. Feng and Hu (2013) take a different approach. They explicitly model the measurement error of labor market states, and find that official figures may understate unemployment rates by 2.1 percentage points on average. Their estimates of the quantitative magnitude of underestimation are similar to ours.

Our work is also related to an expanding literature on unemployment and labor force participation. Barnichon and Figura (2015) document declining desire to work among labor force nonparticipants, and use that to explain downward trends in unemployment and participation. We share their emphasis on the presence of heterogeneity among nonparticipants, but instead of relying on the respondents' self-stated desires to work, we rely on their time allocation patterns to categorize subgroups within those out of the labor force. Krueger and Mueller (2012) analyze time uses of the unemployed in fourteen countries, while our focus is to use time allocation data to distinguish unemployment from out of the labor force. Veracierto (2011), Hall and Schulhofer-Wohl (2015) explicitly model the transition from out of the labor force to employment. Our findings suggest that dividing nonparticipants into subcategories based on their time allocation and life satisfaction may help to understand the issue of matching efficiency better.

Our work also relates to a recent literature on happiness and life satisfaction. Using information from the General Social Surveys of the United States, Blanchflower and Oswald (2004) show that an individual's life satisfaction depends upon demographic characteristics. They conclude that unemployment per se reduces life satisfaction, regardless of loss of income. Krueger (2016) also use the 2012-2013 well-being module to document the life satisfaction of prime-age men out of work. We sympathize with this literature on the importance of life satisfaction for economic analysis. Our work shows that data on life satisfaction, combined with time allocation patterns, can help us to understand different subgroups of labor nonparticipants.

The paper is organized as follows. The next section describes the American Time Use Survey in general, our measure of time uses and the module on life satisfaction. Section 3 describes a theoretical model that highlights the inadequacy of search time as a distinguishing criterion of labor market states, and motivate a broad perspective from time allocation and life satisfaction. In Sections 4 to 7, we compare demographic characteristics, time allocation, life satisfaction and

transition rates to alternative states across sample population of different labor market statuses. Section 8 demonstrates that our findings can lead to a different assessment of the labor market by providing an alternative measure of the unemployment rate.

2   Surveys and Measures

Since 2003 Bureau of Labor Statistics has sponsored annual American Time Use Surveys. In ATUS, individuals are randomly selected from a subset of households that have completed their eighth and final month of interviews for the Current Population Survey (CPS). The time interval between CPS and ATUS surveys can be two to five months. ATUS respondents are interviewed only one time about how they spent their time on the previous day.

Both CPS and ATUS surveys ask about the respondents' labor market status. According to the official Current Population Survey (CPS), employed persons are those 16 years and older in the civilian non-institutional population who, during the reference week, (a) worked at least 1 hour as paid employees; worked in their own business or worked 15 hours or more as unpaid workers in a family enterprise; and (b) all those who were not working but temporarily absent from their jobs or businesses because of vacation, illness, job-related or personal reasons.

The CPS categorizes the unemployed as persons aged 16 years and older who had no employment during the survey week, were available for work, and (a) had actively looked for work within the past four weeks, or (b) were waiting to be called back to a job from which they had been laid off, or (c) were waiting to report to a new wage or salary job scheduled to start within the following 30 days.

Persons aged 16 years and older in the civilian non-institutional population who are neither employed nor unemployed are considered not in the labor force (NLF). The ATUS has the same definition of labor market statuses as the CPS.[1] The linkage between the CPS and ATUS allows us to track changes in labor market statuses of the ATUS sample.

A well-being (WB) module, sponsored by the National Institute on Aging (NIA), was added to the ATUS and fielded for three full years—in 2010, 2012, and 2013. The 2012 and 2013 WB

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[1]The only difference is that ATUS data are collected continuously, the employment reference period being the 7 days prior to the interview. By contrast, CPS data are usually collected during the week including the 19th of the month and generally refer to employment during the week containing the 12th of the month.

Modules included additional questions that collected data about life satisfaction, in addition to questions about the respondents' general health. These questions provide information about the quality of life in the United States and they can be used to develop measures of well-being. We thus focus our research on pooled data from 2012-2013 Annual American Time Use Surveys (ATUS).

In order to focus on the prime working-age population, we drop three categories of population from our analysis sample. They are: (1) respondents younger than 18 and older than 65 years old; (2) full-time students; (3) respondents who are younger than 50 but report retirement (there are 11 such respondents). We also exclude respondents whose time use record is incomplete (i.e. all time use components in the diary do not add up to 1440 minutes per week); and whose answers are missing on key items, such as labor market status, age, gender, education, marriage status, presence of children in the household, and family income. In the end, we form our analysis sample with 18,106 observations for our time use analysis, and 16,571 observations when life satisfaction issues are involved. The latter sample is smaller as we exclude those with missing entries on life satisfaction.

2.1 Measures of Time Uses

We divide time uses into the following main categories of activities: market work, nonmarket work, leisure (core leisure and broad leisure), child care, assorted cares, education, and other uses. The first and second columns of Table 1 show components within each category, and the third column describes specific activities for each component.

Specifically, market work includes core market work, consisting of work for pay and work-related activities. Activities related to unemployment such as job search and interviewing, are also counted as work-related activities. Nonmarket work has two main components: home production and obtaining goods and services. The former includes housework and other household activities; while the latter includes shopping, obtaining household and government services except for medical services. Our definition of core leisure is the same as the narrowest measure of leisure in Aguiar and Hurst (2007) (henceforth A&H)—leisure measure 1. The measure includes all time spent on entertainment, social activities, relaxation and active recreation, such as television watching, going to movies, listening to music, going to social events, playing sports, leisure reading, caring for gardens and pet, and developing hobbies. Our (broad) leisure is consistent with leisure measure

2 in A&H, which adds time spent on eating and drinking, sleeping, and personal care to the core leisure.

There has been controversy on whether child care belongs to nonmarket work or leisure. Given the importance of child care as a nonmarket activity, we treat child care as a separate activity category. Other than child care, we also define assorted cares, which are a combination of own medical care—self care related to health and medical services, and cares for other household and non-household adults. Education is another separate category, which includes all time spent on taking classes or courses, and doing homework or research for coursework. Finally, civic activities such as religious and volunteer activities, and other security procedures related to traveling as well as those unable to code are put in "Other" category.

2.2 Module of Well-Being

We focus on one measure of subjective well-being (SWB) in the ATUS-WB module, the Cantril Ladder, a self-anchoring scale which asks respondents to evaluate their life in general. The question was included in the 2012 and 2013 waves of the ATUS survey. The exact question wording was:

> Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder do you feel you personally stand at the present time?

The SWB is difficult to measure and compare across individuals, therefore the usual caveats when using SWB measures apply.

The ATUS-WB module also asks questions on the respondents' health in general. One of the health-related question is, "Did you take any pain medication yesterday, such as Aspirin, Ibuprofen or prescription pain medication?" The other question is: "In the last five years, were you ever told by a doctor or other health professional that you have hypertension, also called high blood pressure, or borderline hypertension?". In addition to the two more specific health questions, we also make use of responses to one general health question, "Would you say your health in general is

excellent, very good, good, fair, or poor?". Those health-related information helps us to understand respondents' time allocation and self-reported life satisfaction.

3 Theoretical Considerations

In this section we sketch a model of job search and time allocation for population not at work. In the model, an individual, either unemployed or not in the labor force, decides how much time to spend on leisure, job search, nonmarket work and child care. Each individual is characterized by a set of individual-specific state variables, $\mathbf{s}_{it}$, which includes the individual's family income and assorted demographic characteristics, such as age, education, marital status, presence of children in the family, and etc. We treat the individual's family income as a state variable based on the following considerations. Since the individual is not at work, the family income would consist of government transfers and spousal support. Both can be considered pre-determined with regard to the individual's time allocation decision while not at work. There also exist a set of aggregate state variables, $\mathbf{S}_t$, which summarize aggregate economic conditions relevant for an individual's labor market prospects. In addition to leisure, the individual takes utility from consumption of market and nonmarket goods, where the former depends solely on the family income, while the latter depends upon time allocated to nonmarket work and child care. Time spent on job search is a key determinant of the individual's chance of getting a job next period. For simplicity we consider a deterministic environment and assume that when employed the individual works at a wage that can be predicted from his demographic characteristics. The assumption is without loss of generality as we seek to enumerate theoretical considerations.

The value function of individual i not at work takes on following form,

$$
\begin{aligned}
V\left(\mathbf{s}_{it}, \mathbf{S}_t\right) = & \max_{\left\{l_{it}^{sr}, l_{it}^{nm}\right\}} \left\{ U\left[c_{it}^m\left(\mathbf{s}_{it}\right), c_{it}^{nm}\left(l_{it}^{nm}\right)\right] + h_i \psi\left(l_{it}\right) \right. \\
& \left. + \beta \pi_i\left(l_{it}^{sr}, \mathbf{S}_t\right) V^e\left(\overline{w}_i; \mathbf{s}_{i\mathbf{t+1}}, \mathbf{S}_{t+1}\right) + \beta\left[1 - \pi_i\left(l_{it}^{sr}, \mathbf{S}_t\right)\right] V\left(\mathbf{s}_{i\mathbf{t+1}}, \mathbf{S}_{t+1}\right) \right\},
\end{aligned}
\tag{1}
$$

where l_{it}^{sr} represents time spent on job search and l_{it}^{nm} represents time spent on nonmarket work and child care. Together with time spent on leisure, l_{it}, the three time uses add up to 1 as the individual is not at work: $l_{it}^{sr} + l_{it}^{nm} + l_{it} = 1$.

Here c_{it}^m and c_{it}^{nm} represent respectively consumption of market and nonmarket goods. The parameter h_i indexes the degree of preferences for leisure, and it may depend upon health conditions that mandates an individual's high preferences for leisure. β represents subjective time preferences. $\pi_i\left(l_{it}^{sr}, \mathbf{S}_t\right)$ represents individual-specific effectiveness of job search in securing a job, which depends both upon time spent on search and aggregate economic conditions. $V^e\left(\overline{w}_{it}; \mathbf{s_{it+1}}, \mathbf{S}_{t+1}\right)$ represents the individual's value function once at work, where $\overline{w}_{it}$ represents the individual's predicted wage based upon his characteristics. We can further specify the individual's utility function as

$$U\left(c_{it}^m, c_{it}^{nm}\right) = \left[(1 - \phi_i)\left(c_{it}^m\right)^\theta + \phi_i\left(c_{it}^{nm}\right)^\theta\right]^{\frac{1}{\theta}},\tag{2}$$

where θ indexes the degree of substitution between market and nonmarket goods, and ϕ_i indicates the importance of nonmarket goods in the consumption portfolio. A larger ϕ_i indicates stronger preferences for nonmarket goods such as caring for children and carrying out household chores, which may be typical among married households with children. Both h_i and ϕ_i can be considered as part of the individual-specific state variables, $\mathbf{s_{it}}$. They may change over time, but we keep it as a constant for now without loss of generality.

The model yields the following optimal condition for time spent on job search:

$$h_i\psi'\left(l_{it}\right) = \beta\pi_i'\left(l_{it}^{sr}, \mathbf{S}_t\right)\left[V^e\left(\overline{w}_i; \mathbf{s_{it+1}}, \mathbf{S}_{t+1}\right) - V\left(\mathbf{s_{it}}, \mathbf{S}_t\right)\right].\tag{3}$$

The left hand side of the optimal condition represents the marginal cost of job search as measured by the marginal utility of leisure scaled by the individual-specific parameter h_i. A high h_i indicates strong preferences for leisure, which may be related to poor health conditions that necessitate extra rest. The opportunity cost of foregone leisure can be small if the individual has plenty of leisure time at hand. The right hand side of the optimal search condition represents the marginal gain from job search, which is determined by the marginal return to job search measured by $\pi_i'\left(l_{it}^{sr}, \mathbf{S}_t\right)$ and the expected gain from the change of labor status from not at work to being employed, with the latter affected by the expected wage once at work. Higher efficiency of job search and higher predicted wage once at work drive up the marginal gain and thus encourage more time spent on job search.

The optimal amount of nonmarket work and child care time is determined by the following condition:

$$\phi_i \left[\frac{c_{it}^{nm}}{U\left(c_{it}^m, c_{it}^{nm}\right)} \right]^{\theta-1} \frac{\partial c_{it}^{nm}}{\partial l_{it}^{nm}} = h_i \psi'\left(l_{it}\right), \tag{4}$$

where the left-hand side represents the marginal gain from extra time used on nonmarket work, and the right-hand side represents the marginal disutility of leisure.

Based on the CPS definition, whether an individual is counted as out of the labor force depends upon whether he is available for work and actively searches for a job. The goal of distinguishing the status of unemployment and being out of labor force is to monitor more closely the transition into employment by focusing on those who look for jobs. Our theoretical model shows that there are several problems with distinguishing the two statuses based solely on search activity. First, the marginal efficiency of job search, $\pi_i'\left(l_{it}^{sr}, \mathbf{S}_t\right)$, depends upon aggregate economic conditions. When aggregate economic conditions are good, differences in job search time may not have much impact on the probability of getting a job. Second, the efficiency of job search, $\pi_i\left(\cdot\right)$, may differ across individuals. Heterogeneity in job search efficiency may lead to different amounts of search time, but similar search outcome. Third, for certain periods and certain individuals the elasticity of substitution between time spent on job search and other time uses may be high. If other time uses can be readily converted into job search time from period to period for certain demographic groups, the labor market status can be very fluid. As a result, the search time for a particular period may not be an informative measure to distinguish labor market states.

Our theoretical model indicates that a careful examination of demographic characteristics and time allocation patterns would be helpful for classifying different labor market statuses. Demographic characteristics play an important role in time allocation decisions, which reflect opportunity costs of moving from one status to another. Our model shows that time spent on search depends upon three sets of factors: demographic characteristics, in particular, those which characterize h_i and ϕ_i; the expected gain from changes of labor market statuses; and the marginal efficiency of search that determines how productive time spent on job search is.

American time use survey data provide ample information on demographic characteristics and time allocation, and the 2012-2013 module also provides information on life satisfaction, which may be an indicator of an individual's well-being when in different labor market statuses. In the

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following sections we compare demographic characteristics, time allocation and life satisfaction to understand from a behavioral perspective the distinction between people of different labor market statuses. The research would shed light on whether engaging in active job search is an adequate criterion to classify labor market statuses.

4   Demographic Statistics by Labor Market Status

Table 2 shows demographic characteristics for our full sample as well as for each labor market status. The demographic characteristics include gender, age, education, marital status, having children or not, and family income. The gender composition of the NLFNRND group is distinctively different from all other groups. Panel A of Table 2 shows that males make up 22 percent of the NLFNRND group, as compared to slightly above 50 percent for the employed, slightly below 50 percent for the unemployed and the disabled, and around 41 percent for the retired. In the following subsections we compare demographic characteristics across different labor market statuses for each gender, so that differences in gender composition do not mask the similarity of demographic features across different labor statuses for a particular gender.

4.1   Comparison of Age and Education Attainment

In this subsection we compare the age composition and education attainment across different labor market statuses for each gender. Panel (a) of Figure 1 shows the age profile for employed, unemployed, NLFNRND and disabled males. We omit retired males in the figure as they are over 50 by our definition. The figure shows that while unemployed males are the youngest group of all males, the unemployed and NLFNRND males share similar age profiles. The age distributions of both groups peak around the age of 23, and flatten out after age 30. By contrast, the age distribution of employed males follows the shape of a near plateau between age 31 and 49. Disabled males are much older, with the highest concentration between 50 and 65. Panel B of Table 2 documents that around 52 percent of unemployed males, 43 percent of NLFNRND males, and 26 percent of employed males are between 18 and 30. The disabled males are older in general than those in the labor force and the NLFNRND group. About 66 percent of the disabled are in the age group between 50 and 65, as compared to around 22 percent for both unemployed and NLFNRND males,

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Figure 1: Age Distribution

(a) Male
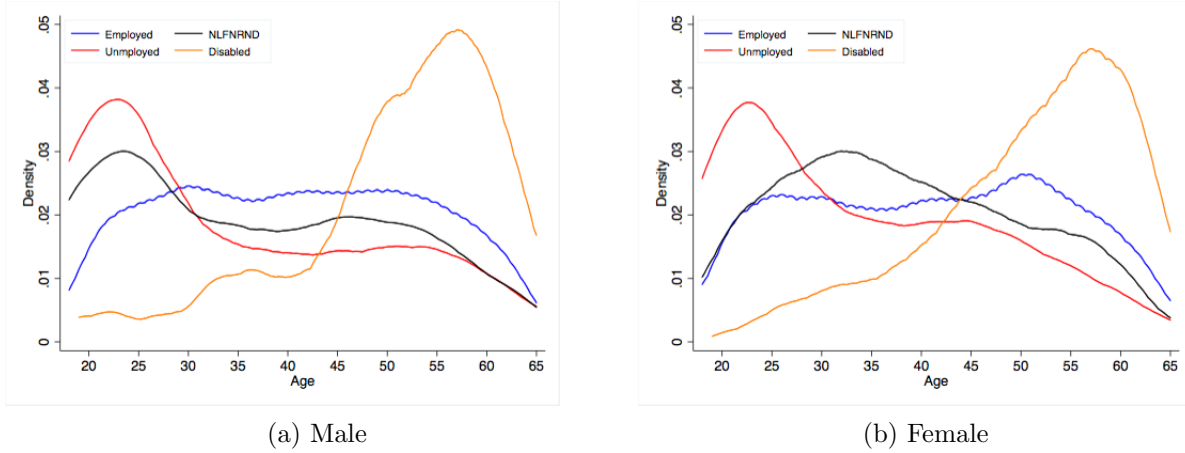
(b) Female

and 30 percent for employed males.

Panel (b) of Figure 1 shows the age composition for females of different labor market statuses. The age distributions of unemployed males and females both peak around the age of 23. Panels B and C of Table 2 also show remarkably similar age composition between unemployed males and females in the three age group, 18-30, 31-49 and 50-65. The NLFNRND females, however, are markedly older than unemployed females, but younger than employed females. Similar to disabled males, disabled females are older than other labor status groups. Panel C of Table 2 confirms the graphic patterns of the age composition.

In terms of educational attainment, a similar fraction (around 57 percent) of unemployed and NLFNRND males have high school or less education, as compared to 39 percent of the employed, 47 percent of the retired, and 73 percent of the disabled males. When we focus on the higher end of education, 35 percent of employed males have college and above degrees, followed by 25 percent of the retired, and 17 percent of the NLFNRND males. The ratio is 3 to 4 percent higher for NLFNRND males as compared to their unemployed counterparts. Only 9 percent of disabled males have college degrees and above.

The female educational attainment shares similar general patterns. Again a similar fraction (around 50 percent) of unemployed and NLFNRND females have high school or less education. The corresponding number is 30 percent for the employed, 45 percent for the retired, and 65 percent for the disabled females. About 39 percent of the employed, 30 percent of the retired, and 25 percent of the NLFNRND females have college and above degrees. There are 8 percent more

NLFNRND females who have college education and above as compared to unemployed females. Only 10 percent of disabled females belong to the highest education bracket.

Those key demographic characteristics show that for both genders the age composition and education attainment of the disabled and retired are drastically different from those who are not in the labor force, yet not disabled or retired. NLFNRND males in particular share more similarity with unemployed males than with the retired or disabled. Such demographic differences question the wisdom of putting the latter two in the same category as the NLFNRND group.

4.2   Comparison of Marital Status and Household Structure

In terms of marital status, around 35 percent of the NLFNRND males are married, as compared to 26 percent of the unemployed males, both ratios at the lower end as compared to the employed (60 percent), the retired (68 percent) and the disabled males (40 percent). Around 38 percent of the unemployed males have children, as compared to 33 percent of the NLFNRND males, a ratio lower than the employed males (43 percent), but higher than the relatively older retired (7 percent) and disabled males (21 percent). In terms of employment status of spouses (including both married and unmarried partners in the same household), 21 percent of the unemployed males have employed spouses, as compared to 24 percent of the NLFNRND males and 21 percent of the disabled males. The corresponding number for the employed males is 44 percent, consistent with dominance of double-income households. The numbers show that similar percentages of the unemployed and NLFNRND males benefit from employment income from their spouses.

In terms of family income, Panel (a) of Figure 2 shows that the distribution of family income of unemployed and NLFNRND males track each other closely, and both distributions differ significantly from those of employed, retired and disabled males. About 63 percent of the NLFNRND group have family income below $50,000, around the median of U.S. household income, as compared to around 60 percent of the unemployed, 83 percent of the disabled, 54 percent of the retired, and 37 percent of the employed males. NLFNRND males' family income have slightly higher concentration on the lower end than the unemployed males, but the two groups are much better off compared to the disabled males.

It is a different story when we compare the marital status and presence of children between unemployed females and NLFNRND females. 74 percent of NLFNRND females are married, as

Figure 2: Family Income Distribution

(a) Male   (b) Female
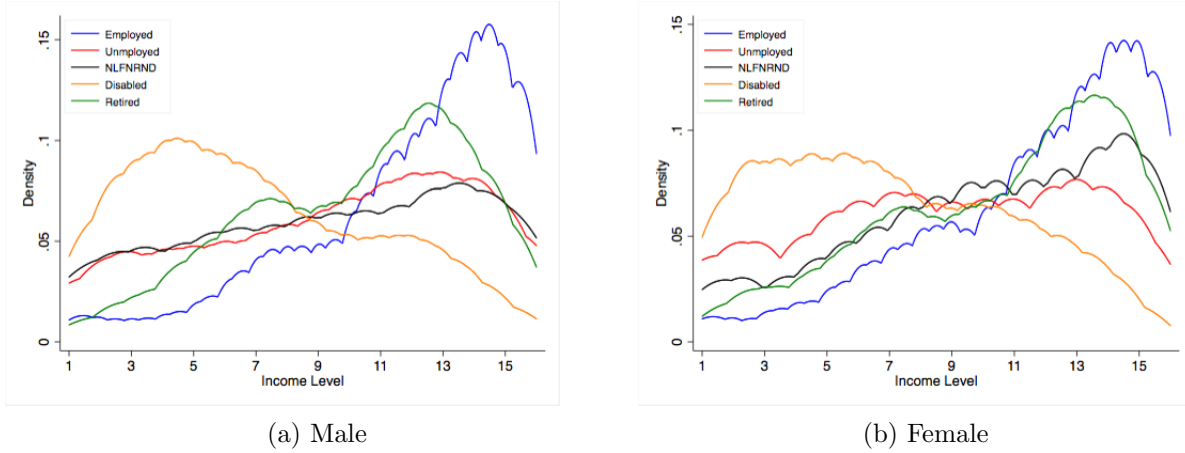
compared to 31 percent of unemployed females. The marriage rate of the NLFNRND females is even higher than those of the employed and the retired, who are more likely to be married due to older age. While 51 percent of the unemployed females have children, the corresponding number for the NLFNRND females is 73 percent. The difference is even more striking when we compare the employment status of their spouses. About 69 percent of spouses of the NLFNRND females are married, as compared to 30 percent of spouses of the unemployed females. The differences in spousal support become even larger considering the differences in marriage rates of the two groups. Such differences are also reflected in their respective family income. While a larger fraction of unemployed females have family income below the median household income as compared to unemployed males, the NLFNRND females are better off than their NLFNRND male counterparts in terms of family income, due to the contribution of spousal income. Fewer disabled females have working spouses as compared to both the unemployed and NLFNRND females, and around 84 percent of disabled females have family income below the median household. Panel (b) of Figure 2 shows that there are more NLFNRND females in the high family income range than unemployed females, a pattern different from the two corresponding male groups. The family income distribution of disabled females is similar to that of disabled males, both drastically different from those of NLFNRND and retired groups.

It is worth noting that in our sample NLFNRND males make up 23 percent of males out of the labor force, while NLFNRND females make up 53 percent of females out of the labor force. By contrast, around 44 percent of males out of the labor force are disabled and 33 percent are retired,

as compared to 25 percent and 22 percent of females in the corresponding categories. The number of NLFNRND females is 2.25 times that of the unemployed females, and the corresponding number for males is 0.58.

The statistics paint a drastically different picture for males and females out of work. While a relatively smaller fraction of males out of the labor force are NLFNRND, they share similar demographic features as unemployed males, which may potentially blur the boundary between being unemployed and being out of the labor force for males. Although a large fraction of females out of the labor force are NLFNRND, they have strongly different marital statuses and family structures as compared to unemployed females. Those demographic differences underlie differences in time allocation by gender and across labor market statuses.[2]

4.3 Comparison of Predicted Wages

Our theoretical model shows that each individual's predicted wage upon employment may affect their decision on time allocation. In this subsection we regress observed wages on observed demographic characteristics of the employed, and use the estimated coefficients from the regression equation to predict wages for those not at work, whether they seek a job or not. Essentially we ask the question what wages an individual with certain demographic characteristics can earn provided that he or she becomes employed. We then compute the means of predicted wages within each labor market status, and compare across them.

Specifically, we run the following regression:

$$\log\left(w_i\right) = \beta_0 + \mathbf{X}_i\beta_1 + \varepsilon_i, \tag{5}$$

where $\mathbf{X}_i$ represents demographic variables such as age, gender, education, race, and whether one is located in metropolitan areas. In another regression we also include self-reported health conditions as independent variables. Since only the module with well-being surveys have data on health conditions, we use WB weights for the well-being module and time-use weights for the larger time use survey sample population.

We use a sample of 11,339 workers from the CPS outgoing rotation group files for 2012 and

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[2]In the appendix we show the comparison of the age composition and family income distribution for the ATUS sample from 2010 to 2015. Our main findings on the comparison of demographics hold for the larger sample.

2013 in the first regression. The total number of observations becomes 10,407 when we restrict the sample to the module with well-being statistics. Table 3 reports the regression results. We can see that the log hourly wage increases with age, with a negative second-order term on age. It also shows a positive gender premium for males. As expected, log hourly wages are higher for people with higher education attainment, or residing in metropolitan areas; but lower for Black and Hispanic population. When we take into account health conditions, self-reported fair health reduces predicted wages.

Table 4 reports differences in predicted hourly wages by both gender and labor market status. The columns indicate both genders and whether health conditions are included in equation (5). Entries in the first four rows represent differences in predicted hourly wages of those in a particular labor status relative to their unemployed counterparts. The fifth row reports means of predicted wages of unemployed males and females.

Table 4 shows that on average unemployed males and females are expected to earn slightly above $15 or $13 per hour respectively. The differences in predicted wages between NLFNRND males and unemployed males are the smallest of all comparisons, with the difference being $0.83 per hour at a 10 percent significance level in the regression using the entire time use sample for 2012-2013. The difference is only slightly larger at $1.22 per hour at a 5 percent significance level in the alternative regression. Predicted wages of the employed and retired males both register a positive gap of more than $4 per hour when compared to those of unemployed males, reflecting an older age profile and higher educational attainment. Surprisingly predicted wages of disabled males are higher than those of unemployed males. Two factors may be at play. First, disabled males are older, thus enjoying an age premium. Second, when we regress equation (5) on workers, we do not have data to identify those who are disabled but at work. That group would provide a better insight on predicted wages of the disabled out of the labor force.

In contrast to corresponding males, predicted wages of NLFNRND females are around or above $2 higher per hour as compared to unemployed females, and around $2 lower as compared to employed females. All differences are significant at 1 percent level. The comparison shows that NLFNRND females have stronger earning power compared to unemployed females, possibly due to their age and educational attainment.

The comparison of demographic features and predicted wages show that NLFNRND and un-

employed males have much in common, as compared to the rest of males out of the labor force. There are large differences in both demographic features and predicted wages between NLFNRND and unemployed females.

5   Time Allocation by Labor Market Status

In this section we compare time allocation between the unemployed and three subgroups of those not in the labor force. Since time allocation reflects the individual's decisions given their circumstances, and also influence the individual's welfare, we conjecture that a comparison of time allocation between those groups may yield valuable information on the transition costs between labor statuses. For example, if a certain demographic group has similar time allocation patterns while unemployed or out of the labor force, it is reasonable to assume that the opportunity cost of transition from one status to the other is small in terms of time uses. However, if a demographic group spends considerably more time on child care and nonmarket work while out of the labor force, as compared to the group while unemployed, the opportunity cost of transition to the status of unemployment is high, as the individual may have to pay for market prices of child care to free up time for work.

Tables 5 to 7 show differences in time allocation by labor market status. Table 5 focuses on time spent on job search by gender and by labor market status, Table 6 presents time allocation patterns on child care, and Table 7 shows broad comparisons of time allocation by labor status.

5.1   Time on Job Search

According to CPS definitions, the difference between being unemployed or being out of the labor force rests on whether the individual actively searches for a job. The data show that unemployed males and females on average spend respectively 5.14 and 3.38 hours per week on searching for a job, in contrast to 0.85 hours per week spent by NLFNRND males, and indistinguishable from zero amount of time spent by NLFNRND females on average. Employed males and females spend around 0.09 hours per week on job search. The amount of time on job search by the disabled and retired are statistically indistinguishable from zero.

Average job search time, however, masks heterogeneity of job search time within each group. Since time use surveys track twenty-four-hour time use by respondents, we categorize those who

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spend time on job search on survey days as job search participants. The data show that about 22 percent of the unemployed males spend time on job search on their survey days, and on average those participants spend around 24 hours per week on job search. By contrast, around 4 percent of the NLFNRND males conduct as intensive job search as the unemployed males. Around 0.6 percent of employed males spend time on job search with lower intensity than those out of work. Among unemployed females, 17 percent spend time on job search on their survey days, and those who do search spend on average 20 hours per week looking for jobs. By contrast, only 0.8 percent of NLFNRND females engage in job search on survey days. Even for those NLFNRND females who search, they spend 7 hours less per week on search than their male counterparts.

In terms of job search time, the NLFNRND group has more in common with the other two subgroups of the population out of the labor force. Within the NLFNRND group, males spend more time on job search than females.

5.2 Time on Child Care

Whether there are children in the household differs greatly across labor statuses. The difference naturally is reflected in differences in time spent on child care. Table 6 shows that females on average spend more time on child care than males, with the most drastic difference at more than 10 hours per week spent on child care by NLFNRND females compared to NLFNRND males.

The differences in child care among males of different labor statuses are relatively small. NLFNRND males spend on average about 4.6 hours per week on child care, half an hour more than unemployed males. Employed males spend around 3 hours per week on child care, half an hour more than disabled males. The retired spend the least amount of time on child care. The second column of Table 6 also documents the fraction of males spending time on child care on their survey days. The participation rate is around 20 percent for the employed, unemployed and NLFNRND males, but lower for disabled and retired males, which is understandable given that smaller fraction of those last two groups having children in the household. Among those who spend time on child care on the survey days, NLFNRND males spend around 24 hours per week on child care, around 6 hours more than unemployed male participants, and approximately 10 hours more than employed male participants.

While NLFNRND males who actively spend time on child care face high opportunity cost of

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foregoing child care, a large fraction (about 80 percent) of unemployed and NLFNRND males do not engage in child care on survey days. As a result, on average NLFNRND and unemployed males incur a similarly small opportunity cost of time when reducing their child care time to the amount of time spent by employed males.

By contrast, there are huge differences in time spent on child care by women of different labor statuses. NLFNRND females spend on average 15 hours per week on child care, more than 7 hours more than unemployed females, and more than 10 hours more than employed or disabled females. Retired females spend the least amount of time on child care. The differences in average time spent on child care mostly reflect differences in participation rates. Around 63 percent of NLFNRND females spend time on child care on survey days, as compared to around 40 percent of unemployed females, and 33 percent of employed females. The participation rates of retired and disabled females are lower. Among females who spend time on child care on survey days, NLFNRND females spend 24 hours per week on child care, similar to NLFNRND male participants. NLFNRND female participants face high opportunity cost of foregoing child care as compared to females in the labor force who spend time on child care on survey days.

Conditional on a particular labor status, females who spend time on child care on average allocate similar amount of time on child care as compared to their male counterparts. The differences of average child care time by gender come from differences in participation rates, the fraction who actively engage in child care on a given day. NLFNRND females have a much higher opportunity cost of foregoing child care compared to both employed and unemployed females.

5.3   Time Use in General

Table 7 shows differences in time allocations of the employed and three subgroups of those not in the labor force, as compared to those of the unemployed. In addition to time spent on job search and child care, Table 7 also presents differences in time use on nonmarket work, core leisure, leisure, assorted care and education. Panels A and B are respectively for males and females.

Consistent with Table 5, Panel A shows that the amount of time spent on job search by unemployed males are statistically significantly different from that of males in other groups. Except for time spent on job search, NLFNRND and unemployed males share similar time allocations to nonmarket work, core leisure, leisure, child care, assorted care and education. Their differences in

time use on those activities are insignificantly different from zero.

The employed, retired and disabled males have quite different time allocation patterns from those of unemployed males. Among the most striking differences, employed males spend 28 hours less per week on leisure, while disabled males spend 13 hours more per week on leisure. It is worth noting that disabled males also spend about 3 hours less per week on nonmarket work, while the retired spend around 5 hours more per week on nonmarket work, and also 5 hours more per week on leisure as compared to unemployed males. Those numbers show that disability is shown not only in increased amount of leisure, but also in reduced amount of nonmarket work for males. The employed, retired and disabled males also spend statistically significantly different amount of time on education than unemployed males.

Although NLFNRND males have similar time allocation patterns as unemployed males other than time spent on job search, time allocations of unemployed and NLFNRND females are quite different. NLFNRND females spend 11 hours more on child care and nonmarket work per week as compared to unemployed females, and 21 hours more per week comparing to employed females. NLFNRND females have 4 hour less per week of leisure time, and employed females around 16 hours less per week when compared to unemployed females. NLFNRND females are similar to employed females in the sense that while employed females engage in market work, NLFNRND females spend their time on nonmarket work and child care instead.

The disabled and retired females have drastically different time allocation patterns compared to unemployed and NLFNRND females. The disabled females spend 17 hours more per week on leisure, and around 7 hours less on nonmarket work; while the retired females allocate 11 more hours per week on leisure, and insignificantly different amount of time on nonmarket work as compared to unemployed females.

It is worth noting that since unemployed females spend on average 24 hours on nonmarket work, disabled females end up spending more time on nonmarket work than disabled males. In fact, even employed females spend more time on nonmarket work and child care than unemployed males. As a result, women on average spend less time on leisure compared to men.

To sum up, time allocation patterns show that NLFNRND males have similar time allocation patterns as unemployed males except for differences in time spent on job search. NLFNRND males have more similarity compared to unemployed males, rather than to the retired and disabled males.

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NLFNRND females spend considerably less time on leisure as compared to retired and disabled females. Although NLFNRND females are not employed for market work, they are occupied by their nonmarket work and child care responsibilities.

6   Comparison of Life Satisfaction

In this section we compare self-ranked life satisfaction by labor market status and by gender. Panels A of Table 8 shows the distribution of life satisfaction for males. A comparison of both the mean and the median shows that retired males rank their life satisfaction the highest, followed in order by employed, NLFNRND, unemployed and disabled males. Although NLFNRND males only have slightly higher life satisfaction as compared to unemployed males, their higher median indicate that there are more NLFNRND males than their unemployed counterparts at the high end of life satisfaction. The same can be said about retired versus employed males.

Panel B of Table 8 shows the distribution of life satisfaction for females. Retired females have the highest life satisfaction by both the mean and the median. Interestingly, while employed males have slightly higher average, but the same median life satisfaction as compared to NLFNRND males, NLFNRND females have higher life satisfaction on average, and also a higher median than employed females. Unemployed females have markedly lower life satisfaction compared to NLFNRND females, followed by disabled females with the lowest life satisfaction of all groups.

A comparison of life satisfaction by gender shows that on average women have higher life satisfaction than men. However, within each labor market status, the medians of life satisfaction are the same for males and females, except that NLFNRND females have higher median than their male counterparts.

Since health can be an important factor related to life satisfaction, we utilize the three health-related questions in the well-being module. Panels A and B of Table 9 show the statistics of self-reported health scores by labor market status and by gender. As expected, disabled males and females give the lowest ratings on their own health, both in terms of the mean and the median. Moreover, fractions of respondents who report hypertension and pain medication among the disabled and the retired—both males and females—are two or three times the corresponding fractions among the rest of sample. Essentially NLFNRND males and females have health conditions similar

to those in the labor force, but drastically different from the other two subgroups out of the labor force.

In order to control the impact of various demographic features and health conditions on life satisfaction, we next estimate the following empirical model using ordered logit regression.

$$WB_i = Z_i'\gamma + \mu_i, \tag{6}$$

where WB_i represents the life satisfaction rating (0-10) for individual i; Z_i is a vector of demographic variables, including labor market status, age, age^2, family income, education attainment, marriage status, having children or not, race, and health conditions. γ represents the vector of coefficients on these demographic variables, and μ_i represents the error term.

Tables 10 reports results for both males (columns 1 to 4) and females (columns 5 to 8).[3] We use four sets of independent variables include dummies for labor market statuses and assorted demographic characteristics of the sample. The demographic variables include age, marital status, presence of children, education, family income, race, self-reported health and other health-related variables. The level of life satisfaction in general declines with age. Being married, having children, higher family income and better health improve life satisfaction, while medical conditions such as hypertension and medication reduce it. Interestingly, being Black or Hispanic is related to higher life satisfaction. The relation between life satisfaction and education becomes negative once family income is controlled.

Now we examine the importance of labor market status to life satisfaction for males. The coefficients for labor market statuses are relative to the status of unemployment. The regression results show that employed and retired males have higher level of life satisfaction, even after controlling all demographic characteristics. NLFNRND males, interestingly, have statistically indistinguishable level of life satisfaction from that of unemployed males in all four sets of regressions. Disabled males have lower life satisfaction than unemployed males when not controlling demographic variables. However, when self-reported health conditions and other demographic variables are controlled, disabled males have statistically similar, or even higher life satisfaction than unemployed males. Those

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[3]We run regressions for two satisfaction scales, one using the full scale-11 life satisfaction index, and the other using the four grouped satisfaction levels. The results are similar. We report the full-scale index regression results in the paper. The regression results using four grouped levels will be provided by authors upon request.

results indicate that disabled males are worse off not due to the status per se, but possibly due to lower family income and poor health conditions that come with being disabled.

Life satisfaction of females relate differently to their labor market statuses as compared to that of males. Even after controlling all demographic variables, retired females have higher life satisfaction than NLFNRND females, followed in order by employed, unemployed, and then disabled women. Only in one set of regressions, when self-reported health is controlled, disabled females have statistically indistinguishable level of life satisfaction from unemployed women. In all other three regressions, disabled females have lower life satisfaction, which creates a big contrast with NLFNRND and retired females.

The comparison of life satisfaction shows a very uneven picture, even within the population out of the labor force. Since whether to search, to work, or to retire are all choice variables for survey respondents, the presence of highly satisfied NLFNRND females indicate that some of them may opt not to engage in market work. By contrast, since NLFNRND males and unemployed males share similar level of life satisfaction and similar demographic characteristics, a change of the labor market status from one to the other may not involve a statistically significant decline in one's level of life satisfaction.

7 Transition Rates and Life Satisfaction after Transition

In this section we examine transition rates between different labor market statuses for the 2012-2013 ATUS sample, between their CPS and ATUS interviews. The time interval is two to five months, with eighty six percent of ATUS surveys conducted within three months of the last CPS interview. We are also able to observe the respondents' life satisfaction conditional on whether they have changed to a different labor market status.

7.1 Transition Rates

Table 11 reports transition rates for both genders for the ATUS sample in 2012-2013. The rows of each panel represent the labor market status the respondent was in at the time of the CPS interview, while the columns represent the respondent's status at the time of ATUS surveys.

We start with transition rates of males. The status of being employed is highly persistent as

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96 percent of those employed at the time of CPS interview remain employed at the time of ATUS surveys. The most interesting finding, however, is that the transition rate from unemployment to employment is not statistically different from the transition rate from being NLFNRND to employment, with the former at around 41 percent, and the latter at 37 percent. The transition rate from being disabled to being employed is at 5 percent, while the rate from retirement to employment is about 10 percent. The similarity between the transition rates from unemployment to employment and from being NLFNRND to employment is surprising. According to the CPS, being out of labor force means not engaging in active job search by definition. Indeed, if ATUS surveys can provide any guidance on time spent on job search by NLFNRND males at the time of their CPS interviews, we can say that NLFNRND males spend much less time on job search as compared to unemployed males, yet the transition rates to employment remain remarkably close for those two groups. Certainly, since we do not observe what happened between the CPS and ATUS interviews, it is possible that someone who were identified as NLFNRND at the time of his CPS interview transited into being unemployed and eventually has got a job at the time of the ATUS survey. The short time span it takes to make such transitions speaks for the fluidity of being in the NLFNRND status.

The data also show that NLFNRND males at the time of the CPS interview have almost equal probabilities of becoming unemployed or maintaining the same status at the time of the ATUS survey, both transition rates just slightly lower than the group's transition rate to employment. In fact, being NLFNRND is the most fluid status for males, with a large outflow to the labor market, and a large inflow from the unemployment pool. By contrast, more than 80 percent of the disabled and retired males keep status quo between the two surveys. Given that the difference in transition rates is one of the most important distinctions one can use to distinguish between labor market states, NLFNRND males bear much stronger similarity to unemployed males than the retired and disabled males, the other two subgroups of those out of the labor force.

Transition rates of females across different labor market statuses tell a different story. While around 40 percent of unemployed females at the time of their CPS interviews transit into employment at the time of ATUS surveys, only 20 percent of NLFNRND females do the same. Unemployed females share very similar transition rates to employment and probability of staying unemployed as unemployed males, but have a slightly higher rate of transiting to NLFNRND as compared to

their male counterparts. Being NLFNRND is a less fluid status for females than for males. About 62 percent of females who were NLFNRND at the time of CPS interviews remain in the same status at the time of ATUS interviews, with 16 percent flowing into unemployment, and 20 percent to employment, the latter two numbers being about half of the corresponding transition rates for males. Similar to males, the states of being employed, retired, or disabled are highly persistent for females as well.

In order to examine whether the transition patterns above are specific to our 2012-2013 sample or more general across different years, we conduct similar examinations using ATUS data from 2010 to 2015. We pool the five-year ATUS sample to examine transition rates of their labor market states between their last CPS interviews and ATUS surveys. The general patterns we have found in the 2012-2013 sample hold in the longer sample. Specifically, males who were unemployed or NLFNRND at the time of CPS interviews have similar transition rates to employment by the time of their ATUS interviews. Being NLFNRND is a very fluid state for males, with reasonably high probabilities of transiting to employment, unemployment and maintaining the status quo. While around 36 percent of unemployed females at the time of their CPS interviews transit into employment at the time of ATUS surveys, only 20 percent of NLFNRND females do the same. Being NLFNRND is a less fluid status for females than for males, but still more fluid as compared to the statuses of being employed, retired or disabled. The results for the 2010-2015 sample are reported in the appendix.

The results on transition rates show that time spent on job search does not determine transition rates to employment. Instead, similarities in demographic characteristics, time allocation other than job search, and life satisfaction between unemployed and NLFNRND males underlie their indistinguishable transition rates to employment.

7.2 Life Satisfaction after Transition

Table 12 reports average life satisfaction after transition. Panel A shows that except for males who were retired, men not at work at the time of CPS interviews, either unemployed or out of the labor force, report higher life satisfaction after transiting to employment, as compared to those who remain at their nonwork status at the time of ATUS interviews.

Panel B tells a different story. Unemployed, disabled and retired females at the time of CPS

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interviews all report higher life satisfaction after transiting to employment, as compared to those who still remain at their nonwork status. By contrast, NLFNRND females who remain at the same status report higher life satisfaction than those NLFNRND females who transit to employment at the time of ATUS interviews.

As shown in our theoretical model, differences in life satisfaction after transition underlie decisions on different amount of time on job search by males and females of different labor market statuses. Those who experience positive gains in life satisfaction have incentives needed to transit to employment.

8   Implications for Measuring the Unemployment Rate

The distinction between being unemployed and being out of the labor force are important for accurate assessment of the labor market. Our research findings show that from a time allocation and life satisfaction perspective, NLFNRND males bear strong similarity to unemployed males. The strong similarity makes their distinction by the amount of search time artificial and uninformative.

In order to gauge the possible impact of re-categorizing a subset of population out of the labor force, we conduct an exercise treating NLFNRND males, the subgroups of NLF with the strongest similarity to the unemployed, as part of the unemployed population. We construct both conventional and alternative measures of annual unemployment rates using the CPS monthly data.[4] Our conventional measure adopts the same definition of unemployment and out of the labor force as the CPS, while our alternative measure includes NLFNRND males among the unemployed, and thus in the labor force.

Figure 3 demonstrates our conventional and alternative measures of unemployment rates (Panels (a) and (b)) and labor force participation rates (Panels (c) and (d)) from 2003 to 2015. In all panels, dot-dashed lines represent official BLS measures of unemployment rates or labor force participation rates. Dashed lines represent our calculated unemployment rates using the CPS monthly data,[5]

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[4]There are two reasons we use the CPS instead of ATUS surveys to construct the conventional and alternative unemployment rates. First, official unemployment rates are based on the CPS monthly data. It is important to show the difference between our alternative measure and the official unemployment rate. Second, ATUS surveys individuals from a subset of households from the CPS. ATUS survey is conducted continuously throughout the year, while the CPS is conducted monthly at a particular week. As a result, it is more appropriate to use the CPS data to construct both conventional and alternative unemployment rates.

[5]We have data for all months except for April, thus the annual averages are constructed using 11 months of data, which may explain the minor difference from official numbers. To be consistent with the definition of official labor

and solid lines represent adjusted measures with NLFNRND males treated as unemployed. In all the panels our conventional measures follow official rates very closely. Panels (a) and (c) are for the sample population aged 16 and up, while Panels (b) and (d) are for those between 25 and 54, the prime-working age population. Panel (a) shows that for the group aged 16 and up, the official

Figure 3: Unemployment Rate and Labor Force Participation Rate

(a) Unemployment Rate (16 and up)

(b) Unemployment Rate (25 to 54)

(c) Labor Force Participation Rate (16 and up)

(d) Labor Force Participation Rate (25 to 54)

measure may underestimate unemployment rates by a margin between 2.6 and 3.2 percentage points, which is a substantial difference. For the group between 25 and 54, the gap is between 1.8 and 2.3 percentage points. The smaller gap for the prime working-age population reflects that a large fraction of NLFNRND males are between 16 and 25 year old, as shown in Section 4.

The degree of underestimation by the official measure based on our exercise is quantitatively close to that reported by Feng and Hu (2013). Using a completely different approach, Feng and Hu (2013) find that during the period from January 1996 to August 2011, their corrected unemploy-

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force participation rates, we include full-time students in calculating the numbers for Figure 3 .

ment rates are higher than the corresponding official figures by 2.1 percentage points on average. However, they attribute the discrepancy to unemployed individuals misreporting as either not in the labor force or employed. Thus according to their corrections, official unemployment rates are underestimated, but official labor force participation rates are about right. By contrast, our work focuses on the comparison between NLFNRND and unemployed males, and our revisions of unemployment rates and labor force participation rates are motivated by the striking similarity in demographic characteristics, time allocation, life satisfaction and transition rates between the two groups. Compared to Feng and Hu (2013), we focus on possible misclassification of unemployment as not in the labor force. Our analysis shows that there are significant differences between the employed and unemployed in terms of time allocation, life satisfaction, and transition rates to employment, thus misclassification of unemployment as employment is not our focus. It is possible, however, that a subgroup of the employed, may bear sufficient similarity to the unemployed, which makes a further study into the issue necessary. We leave that to our future research.

Since our work indicates that NLFNRND males may be more appropriately classified as in the labor market, an upward adjustment of unemployment rates corresponds to an upward adjustment of labor force participation rates as well. Panel (c) shows an upward adjustment of labor force participation rates between 1.8 and 2.3 percentage points, while Panel (d) shows the adjustment to be between 1.8 and 2.6 percentage points. Interestingly, in addition to raising the labor force participation rates, our revisions also change the trajectory of labor force participation rates after the great recession. Although we see a decline in labor force participation rates from 2008 for both age groups in Panels (c) and (d), the labor force participation rate for the age group between 25 and 54 seems to stabilize between 2013 and 2015. The pattern indicates that the decline in labor force participation among the prime working-age group may be neutralized if we count NLFNRND males as in the labor force.

Our exercise indicates that reclassifying NLFNRND males and possibly some NLFNRND females who bear similarity to their unemployed counterparts may lead to substantial differences in our measures of unemployment and labor force participation rates. Our work underscores the inadequacy of using search activity to categorize labor market statuses, and calls for a more sophisticated criterion to distinguish among subgroups of those not in the labor force, taking into account information from demographic characteristics, time allocation and life satisfaction.

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Table 1: Descriptions of Time Use Categories and Measures

Time Use Categories	Components	Descriptions
Market Work	Core Market Work	Work for pay, main job and other jobs
	Work-Related Activities	Commuting to/from work, other income-generating activities, meals/break at work, job search and interviewing
Nonmarket Work	Home Production	Housework, food preparation, car maintenance, and other household activities (but no garden and pet cares)
	Obtaining Goods & Services	Consumer purchases, household and government services, professional and personal care services except medical
Core Leisure	TV	Watching television
	Non-TV entertainment	Going to movies/theatre, listen to music/radio, computer use for leisure (not games)
	Socializing	Attending or hosting social events, socializing and communicating, playing games, telephone calls
	Sports & Exercises	Playing sports, attending sporting events, and exercises
	Reading	Reading for personal interest, personal mail and emails
	Garden & Pet Cares	Caring for lawns, garden, houseplants, and pets
	Hobbies	Arts and crafts, collecting, and other hobbies
(Broad) Leisure	Core Leisure	
	Eating	Eating and Drinking
	Sleeping	Sleeping, naps
	Personal Care	Grooming, bathing, going to bathroom, sex (excluding own medical care)
Child Care	Basic Child Care	Physical care for household and nonhousehold children
	Educational Child Care	Reading, talking and teaching to household and nonhousehold children
	Recreational Child Care	Playing, arts and crafts with household and nonhousehold children
Assorted Cares	Own Medical Care	Health-related self care and medical care services
	Other Care	Care for other household and nonhousehold adults
Education		Taking classes for degree, personal interest courses, homework/research for coursework, etc
Other	Civic	Religious and spiritual, and volunteer activities
	Other/unclassified	Security procedures related to travelling, other unable to code

Notes: The first column shows the main categories of activities. The second columns of shows components within each category. The third column describes specific activities for each component. Our definition of core leisure is the same as the narrowest measure of leisure in Aguiar and Hurst (2007)—leisure measure 1. Our (broad) leisure is consistent with leisure measure 2 in Aguiar and Hurst (2007), which adds time spent on eating and drinking, sleeping, and personal care to the core leisure. There has been controversy on whether child care belongs to nonmarket work or leisure. Given the importance of child care as a nonmarket activity, we treat child care as a separate activity category.

Table 2: Demographic Statistics by Labor Market Status (%)

Panel A: Full Sample						
	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Age Range						
Age: 18-30	26.4	49.3	32.9	5.9	0.0	26.0
Age: 31-49	43.5	31.8	45.5	30.5	0.0	40.1
Age: 50-65	30.1	18.9	21.6	63.6	100.0	33.9
Male	52.8	48.8	22.0	46.0	41.1	48.9
Education						
Less than High School	7.6	20.3	21.5	26.2	9.5	10.7
High School	27.3	33.1	30.1	42.3	36.0	29.2
Some College	28.2	31.3	25.0	21.9	26.8	27.7
College and Above	36.9	15.3	23.4	9.6	27.8	32.3
Married	56.5	28.1	65.3	39.6	67.3	55.0
Spouse Employment Status*						
Unemployed Spouse	15.4	10.5	10.9	21.3	43.1	16.4
Employed Spouse	47.1	26.0	58.6	22.6	28.0	44.4
No Spouse	37.6	63.5	30.5	56.1	28.9	39.3
Have Child(ren)	43.1	44.7	63.8	23.1	6.8	42.1
Family Income						
Fam:$30000 or below	19.3	43.0	35.8	66.0	31.7	25.5
Fam:$30000-49999	19.2	21.1	22.9	17.8	20.7	19.6
Fam:$50000-99999	36.2	23.6	22.8	13.7	35.0	32.9
Fam:$100000 or above	25.3	12.3	18.5	2.5	12.6	22.0
Black	11.0	23.1	12.3	19.9	11.7	12.4
Hispanic	15.4	21.4	26.0	12.3	6.0	16.0
Observations	13,389	1,043	1,591	1,144	939	18,106
Panel B: Male						
	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Age Range						
Age: 18-30	26.1	51.9	42.6	6.0	0.0	26.3
Age: 31-49	44.4	26.5	34.7	28.5	0.0	40.2
Age: 50-65	29.5	21.6	22.7	65.5	100.0	33.5
Education						
Less than High School	9.0	21.1	24.9	27.0	10.1	11.4
High School	30.0	35.6	31.8	46.0	36.6	31.6
Some College	25.9	29.9	26.5	18.2	28.1	25.8
College and Above	35.0	13.4	16.9	8.8	25.3	31.1
Married	59.6	25.6	35.3	40.2	67.9	55.8
Spouse Employment Status						
Unemployed Spouse	20.9	11.9	14.8	24.3	42.4	21.1
Employed Spouse	44.4	21.3	23.5	20.8	29.0	40.2
No Spouse	34.8	66.8	61.7	54.9	28.6	38.7
Have Child(ren)	42.6	37.9	32.7	21.2	6.9	39.3

Table 2 Continued: Demographic Statistics by Labor Market Status

Family Income						
Fam:$30000 or below	18.3	38.9	43.1	67.7	33.2	23.8
Fam:$30000-49999	18.8	21.4	20.1	15.3	21.0	18.9
Fam:$50000-99999	37.8	24.5	19.2	13.6	36.4	34.8
Fam:$100000 or above	25.2	15.2	17.5	3.3	9.4	22.4
Black	9.6	21.5	17.4	20.6	10.4	11.3
Hispanic	16.6	23.3	18.7	11.9	7.6	16.5
Observations	6,642	451	260	500	380	8,233

Panel C: Female						
	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Age Range						
Age: 18-30	26.8	46.8	30.2	5.8	0.0	25.8
Age: 31-49	42.5	36.8	48.5	32.2	0.0	39.9
Age: 50-65	30.7	16.4	21.3	62.0	100.0	34.2
Education						
Less than High School	5.9	19.6	20.6	25.5	9.1	10.1
High School	24.3	30.8	29.6	39.1	35.6	26.9
Some College	30.8	32.5	24.6	25.1	25.8	29.5
College and Above	39.0	17.0	25.2	10.3	29.5	33.5
Married	53.1	30.5	73.7	39.2	66.9	54.3
Spouse Employment Status						
Unemployed Spouse	9.2	9.2	9.8	18.7	43.6	11.8
Employed Spouse	50.0	30.4	68.6	24.1	27.2	48.4
No Spouse	40.7	60.4	21.6	57.2	29.1	39.8
Have Child(ren)	43.7	51.2	72.6	24.6	6.8	44.8
Family Income						
Fam:$30000 or below	20.4	46.9	33.7	64.4	30.6	27.1
Fam:$30000-49999	19.6	20.8	23.6	20.0	20.5	20.3
Fam:$50000-99999	34.5	22.8	23.8	13.7	34.1	31.1
Fam:$100000 or above	25.5	9.5	18.8	1.9	14.9	21.6
Black	12.4	24.7	10.9	19.3	12.6	13.4
Hispanic	14.0	19.6	28.1	12.7	4.9	15.6
Observations	6,747	592	1,331	644	559	9,873

*Here spouse refers to either married or unmarried partner.

Notes: This table shows demographic characteristics for the full sample and also by labor market status. The demographics characteristics include age, gender, education, marital status, with children or not, family income, and race. Since the gender composition of NLFNRND group is distinctively different from all other groups, in addition to Panel A that present the statistics for the full sample, we show those demographic characteristics for male and female in Panels B and C, respectively.

Table 3: Regression Results of Log Hourly Wage

	WB Weight		Time Use Weight	
Age	0.076***	(0.003)	0.074***	(0.003)
Age^2	-0.001***	(0.000)	-0.001***	(0.000)
Male	0.183***	(0.011)	0.187***	(0.011)
High School	0.188***	(0.024)	0.233***	(0.022)
Some College	0.305***	(0.024)	0.353***	(0.023)
College and Above	0.679***	(0.024)	0.740***	(0.023)
Black	-0.138***	(0.018)	-0.149***	(0.017)
Hispanic	-0.139***	(0.017)	-0.141***	(0.017)
Metropolitan	0.093***	(0.017)	0.088***	(0.016)
State dummies	Yes		Yes	
Fair Health	-0.152***	(0.054)		
Good Health	-0.062	(0.052)		
V.Good Health	-0.005	(0.052)		
Excellent Health	0.018	(0.052)		
Constant	0.566***	(0.090)	0.545***	(0.073)
Observations	10407		11339	

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Notes: The sample used in the regressions consists of 11,339 workers from the CPS outgoing rotation group files for 2012 and 2013. Regressions are weighted using well-being weights (WB Weight) and time-use survey weights (Time Use Weight), respectively. The results are based on the following regression equation: $\log(w_i) = \beta_0 + \mathbf{X}_i\beta_1 + \varepsilon_i$, where $\mathbf{X}_i$ represents demographic variables, as well as health conditions when using well-being module.

Table 4: Differences in Predicted Hourly Wage (relative to the Unemployed)

	Male		Female	
	WB Weight	Time Use Weight	WB Weight	Time Use Weight
Employed	5.01***	4.80***	4.37***	4.05***
	(0.33)	(0.32)	(0.26)	(0.24)
NLFNRND	1.22**	0.83*	2.33***	2.01***
	(0.53)	(0.51)	(0.30)	(0.28)
Disabled	1.64***	1.85***	1.44***	1.54***
	(0.48)	(0.46)	(0.36)	(0.34)
Retired	4.32***	4.20***	3.76***	3.64***
	(0.52)	(0.50)	(0.36)	(0.34)
Mean(Unemployed)	15.44***	15.68***	13.10***	13.35***
	(0.32)	(0.31)	(0.25)	(0.23)
Observations	7445	8173	9002	9795

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Notes: Using coefficients estimated in Table 3, this table reports differences in predicted hourly wages for males and females, respectively. Entries in the first four rows represent differences in predicted hourly wages of those in a particular labor status relative to their unemployed counterparts. The fifth row reports means of predicted wages of unemployed males and females.

Table 5: Average Job Search Time (hours per week) and Job Search Participation

	Male			Female		
	Average Job Search Time	Participation Rates (%)	Average Job Search Time (Participants)	Average Job Search Time	Participation Rates(%)	Average Job Search Time (Participants)
Employed	0.09**	0.59***	15.52***	0.09**	0.43***	20.49***
	(0.05)	(0.16)	(3.05)	(0.04)	(0.14)	(2.79)
Unemployed	5.14***	21.69***	23.69***	3.38***	16.92***	19.99***
	(0.17)	(0.57)	(1.78)	(0.11)	(0.46)	(1.45)
NLFNRND	0.85***	3.89***	21.77***	0.12	0.79**	14.82***
	(0.21)	(0.74)	(5.41)	(0.08)	(0.32)	(4.70)
Disabled	0.21	0.72	29.65***	0.18	0.90*	19.63***
	(0.18)	(0.64)	(10.80)	(0.12)	(0.48)	(6.55)
Retired	0.00	0.00	0.00	0.00	0.00	0.00
	(0.21)	(0.72)	(.)	(0.12)	(0.50)	(.)
N	8233	8233	145	9873	9873	141

Standard errors are in parentheses, and * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Notes: Average time and participation rates are computed with adjusted time-use survey weights. Both weekdays and weekends are included in the sample and used in the estimation.

Table 6: Average Child Care Time (hours per week) and Child Care Participation

	Male			Female		
	Average Child Care Time	Participation Rates (%)	Average Child Care Time (Participants)	Average Child Care Time	Participation Rates(%)	Average Child Care Time (Participants)
Employed	2.98***	22.95***	12.98***	4.86***	33.29***	14.59***
	(0.10)	(0.51)	(0.30)	(0.14)	(0.56)	(0.28)
Unemployed	4.10***	22.62***	18.11***	7.65***	40.30***	18.98***
	(0.36)	(1.78)	(1.05)	(0.46)	(1.83)	(0.82)
NLFNRND	4.64***	19.72***	23.53***	15.13***	63.00***	24.02***
	(0.47)	(2.30)	(1.45)	(0.32)	(1.29)	(0.46)
Disabled	2.48***	14.66***	16.89***	4.17***	22.08***	18.89***
	(0.40)	(1.97)	(1.44)	(0.48)	(1.92)	(1.16)
Retired	1.18***	8.43***	14.01***	2.80***	13.62***	20.54***
	(0.45)	(2.24)	(2.16)	(0.49)	(1.98)	(1.52)
N	8233	8233	2242	9873	9873	4161

Standard errors are in parentheses, and * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Notes: Average time and participation rates are computed with adjusted time-use survey weights. Both weekdays and weekends are included in the sample and used in the estimation.

Table 7: Differences in Time Use (Hours per Week)

	Job Search	Nonmarket Work	Core Leisure	Leisure	Child Care	Assorted Cares	Education
Panel A: Male							
Employed	-5.05***	-3.57***	-24.67***	-28.06***	-1.12***	-1.14***	-3.12***
	(0.17)	(0.66)	(1.12)	(1.26)	(0.38)	(0.32)	(0.35)
NLFNRND	-4.29***	-0.91	-0.11	2.02	0.54	0.49	-0.15
	(0.27)	(1.03)	(1.75)	(1.98)	(0.59)	(0.51)	(0.55)
Disabled	-4.92***	-2.68***	8.25***	12.67***	-1.62***	1.98***	-3.42***
	(0.25)	(0.94)	(1.60)	(1.82)	(0.54)	(0.46)	(0.50)
Retired	-5.14***	5.26***	5.32***	5.06***	-2.92***	2.00***	-4.13***
	(0.27)	(1.01)	(1.73)	(1.96)	(0.58)	(0.50)	(0.54)
Mean(Unemployed)	5.14***	13.59***	58.64***	133.31***	4.10***	2.51***	4.19***
	(0.17)	(0.63)	(1.07)	(1.22)	(0.36)	(0.31)	(0.34)
N	8233	8233	8233	8233	8233	8233	8233
Panel B: Female							
Employed	-3.29***	-7.76***	-11.39***	-15.90***	-2.79***	-1.65***	-3.26***
	(0.12)	(0.72)	(0.90)	(1.06)	(0.48)	(0.32)	(0.34)
NLFNRND	-3.27***	3.20***	-3.78***	-4.11***	7.48***	-0.80**	-3.32***
	(0.14)	(0.84)	(1.06)	(1.23)	(0.56)	(0.37)	(0.39)
Disabled	-3.20***	-6.69***	14.34***	16.55***	-3.48***	2.40***	-4.50***
	(0.17)	(1.00)	(1.25)	(1.46)	(0.67)	(0.44)	(0.47)
Retired	-3.38***	1.52	12.52***	10.81***	-4.85***	0.65	-4.61***
	(0.17)	(1.01)	(1.27)	(1.48)	(0.68)	(0.45)	(0.47)
Mean(Unemployed)	3.38***	24.35***	40.86***	119.24***	7.65***	3.26***	4.72***
	(0.11)	(0.69)	(0.86)	(1.01)	(0.46)	(0.31)	(0.32)
N	9873	9873	9873	9873	9873	9873	9873

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: Average time uses are computed with adjusted time-use survey weights. Both weekdays and weekends are included in the sample and used in the estimation. This table shows the differences in each time use category between a specific labor market group (from the first row to the fourth row) and the unemployed group. The fifth row shows the average time uses of the unemployed group.

Table 8: Life Satisfaction by Labor Market Status

Panel A: Male						
Satisfaction	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Mean	7.1	6.1	6.4	5.6	7.2	6.9
Median	7.0	6.0	7.0	5.0	8.0	7.0
S.D.	1.9	2.2	2.1	2.8	2.1	2.0
Grouped	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Satisfaction	%	%	%	%	%	%
Not at all	0.9	1.5	0.4	7.8	1.7	1.3
Not very	7.6	21.3	16.8	21.8	7.6	9.6
Fairly	46.6	49.7	48.8	44.0	33.6	46.2
Very	44.9	27.5	34.0	26.4	57.1	42.9
Sample size	6,051	421	226	454	350	7,502

Panel B: Female						
Satisfaction	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Mean	7.2	6.4	7.5	5.7	7.7	7.1
Median	7.0	6.0	8.0	5.0	8.0	7.0
S.D.	1.8	2.3	2.1	2.5	2.0	2.0
Grouped	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Satisfaction	%	%	%	%	%	%
Not at all	0.6	2.9	1.6	5.3	0.1	1.1
Not very	5.8	13.6	4.6	24.6	5.4	7.2
Fairly	45.7	48.6	36.1	45.2	31.1	43.8
Very	47.9	34.8	57.7	25.0	63.5	47.9
Sample size	6,211	553	1,209	575	521	9,069

Notes: Sample is the pooled ATUS 2012-2013 Well-Being Module, and weighted using the well-being module final weights. Panels A and B first shows the mean, median and standard deviation of satisfaction scores for each labor market status for males and females, respectively. Those ladder scores are then grouped into four levels of satisfaction: Not at all (0-1), Not very (2-4), Fairly (5-7), and Very (8-10). The proportions of respondents who belong to different levels of satisfaction in each labor market status are presented accordingly.

Table 9: Self Reported Health Status

Panel A: Male

Health	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Mean	2.6	2.4	2.6	1.2	2.2	2.5
Median	3.0	2.0	3.0	1.0	2.0	3.0
S.D.	0.9	1.0	1.1	1.1	1.2	1.0
Poor(%)	1.2	2.7	3.8	29.2	8.2	3.2
Fair(%)	9.5	12.8	15.6	37.7	21.2	11.9
Good(%)	32.7	39.0	25.1	20.3	27.9	32.0
Very Good(%)	37.6	28.5	29.4	9.5	29.4	34.9
Excellent(%)	18.9	17.1	26.0	3.3	13.3	18.0
Hypertension(%)	24.2	20.7	21.1	57.1	61.2	27.1
Medication(%)	21.1	21.2	23.0	63.1	46.6	24.5
Sample size	6,051	421	226	454	350	7,502

Panel B: Female

Health	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Mean	2.6	2.3	2.4	0.9	2.3	2.5
Median	3.0	2.0	2.0	1.0	2.0	3.0
S.D.	1.0	1.1	1.0	0.9	1.0	1.1
Poor(%)	1.5	3.2	3.0	39.0	3.9	4.1
Fair(%)	10.7	18.9	15.0	38.4	19.0	13.9
Good(%)	30.8	36.3	34.4	17.0	29.3	30.7
Very Good(%)	37.3	25.2	30.4	3.7	35.3	33.5
Excellent(%)	19.8	16.4	17.3	1.8	12.5	17.8
Hypertension(%)	20.2	19.6	17.5	57.2	53.7	23.9
Medication(%)	26.5	24.6	25.5	72.0	44.7	30.0
Sample size	6,211	553	1,209	575	521	9,069

Notes: Sample is the pooled ATUS 2012-2013 Well-Being Module, and weighted using the well-being module final weights. This table first shows the mean, median and standard deviation of self reported health scores by labor market status for male and female, respectively. It then shows the proportions of respondents given different self reported health scores in each labor market status. Finally, the table also shows the fractions of respondents with hypertension (also called high blood pressure, or borderline hypertension) and who took pain medication the day before interview, such as Aspirin, Ibuprofen or prescription pain medication by labor market status.

Table 10: Ordered Logit Regression Results on Life Satisfaction

	Male				Female			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employed	0.878***	0.825***	0.773***	0.815***	0.710***	0.563***	0.514***	0.570***
	(0.135)	(0.139)	(0.140)	(0.140)	(0.132)	(0.136)	(0.138)	(0.137)
NLFNRND	0.267	0.314	0.239	0.317	1.056***	0.760***	0.760***	0.754***
	(0.226)	(0.223)	(0.217)	(0.229)	(0.150)	(0.149)	(0.151)	(0.150)
Disabled	-0.355*	-0.204	0.400*	-0.055	-0.721***	-0.778***	-0.031	-0.551***
	(0.200)	(0.208)	(0.208)	(0.212)	(0.178)	(0.187)	(0.191)	(0.191)
Retired	1.097***	0.862***	0.968***	0.915***	1.316***	1.075***	1.148***	1.154***
	(0.188)	(0.198)	(0.189)	(0.197)	(0.173)	(0.184)	(0.183)	(0.183)
Age		-0.083***	-0.056***	-0.080***		-0.012	0.007	-0.010
		(0.017)	(0.017)	(0.017)		(0.016)	(0.016)	(0.016)
Age^2		0.001***	0.001***	0.001***		0.000	-0.000	0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Married		0.545***	0.500***	0.543***		0.581***	0.555***	0.588***
		(0.071)	(0.070)	(0.071)		(0.059)	(0.060)	(0.059)
Have Child(ren)		0.136**	0.162**	0.124*		-0.011	-0.025	-0.006
		(0.067)	(0.067)	(0.067)		(0.061)	(0.062)	(0.061)
High School		-0.260*	-0.429***	-0.269**		-0.181	-0.252**	-0.181
		(0.133)	(0.134)	(0.132)		(0.127)	(0.129)	(0.127)
Some College		-0.250*	-0.480***	-0.254*		-0.439***	-0.588***	-0.442***
		(0.132)	(0.133)	(0.130)		(0.124)	(0.125)	(0.124)
College and Above		-0.137	-0.459***	-0.158		-0.298**	-0.590***	-0.324***
		(0.135)	(0.135)	(0.134)		(0.125)	(0.127)	(0.125)
Fam:$30000-49999		0.162	0.072	0.154		0.130	0.068	0.127
		(0.099)	(0.098)	(0.098)		(0.081)	(0.083)	(0.081)
Fam:$50000-99999		0.179**	0.079	0.177**		0.240***	0.118	0.218***
		(0.088)	(0.089)	(0.088)		(0.081)	(0.081)	(0.081)
Fam:$100000 or above		0.540***	0.405***	0.532***		0.460***	0.261***	0.418***
		(0.102)	(0.103)	(0.103)		(0.090)	(0.092)	(0.090)
Black		0.435***	0.424***	0.431***		0.123*	0.228***	0.139*
		(0.107)	(0.106)	(0.107)		(0.074)	(0.075)	(0.076)
Hispanic		0.330***	0.326***	0.306***		0.242***	0.356***	0.216**
		(0.091)	(0.093)	(0.092)		(0.086)	(0.087)	(0.086)
Health			0.611***				0.578***	
			(0.033)				(0.032)	
Hypertension				-0.266***				-0.185***
				(0.065)				(0.069)
Medication				-0.313***				-0.495***
				(0.071)				(0.057)
Observations	7502	7502	7502	7502	9069	9069	9069	9069
χ^2	110.12	357.16	768.04	411.48	202.68	424.17	774.41	541.38
Prob> χ^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Notes: Sample is the pooled ATUS 2012-2013 Well-Being Module, and weighted using the well-being module final weights. The ordered logit regressions are based on the following equation: $WB_i = Z_i'\gamma + \mu_i$ where WB_i represents the life satisfaction rating (0-10) for individual i; Z_i is a vector of demographic variables.

Table 11: Transition Rates (TR)

	Panel A: Male				
	Transitions to:				
Transitions from:	Employed (E)	Unemployed (U)	NLFNRND (N)	Disabled (D)	Retired (R)
Employed	0.9579	0.0245	0.0125	0.0020	0.0031
	(0.0025)	(0.0019)	(0.0014)	(0.0005)	(0.0007)
Unemployed	0.4092	0.4282	0.1375	0.0043	0.0209
	(0.0240)	(0.0241)	(0.0168)	(0.0032)	(0.0070)
NLFNRND	0.3667	0.2938	0.2964	0.0265	0.0166
	(0.0257)	(0.0243)	(0.0243)	(0.0086)	(0.0068)
Disabled	0.0513	0.0325	0.0325	0.8559	0.0279
	(0.0096)	(0.0077)	(0.0077)	(0.0152)	(0.0071)
Retired	0.1010	0.0239	0.0314	0.0114	0.8323
	(0.0153)	(0.0077)	(0.0088)	(0.0054)	(0.0189)
Test: TR(U $\to$ E) - TR(N $\to$ E)=0. $\chi^2(1) = 0.74$, $Prob > \chi^2 = 0.3910$.					

	Panel B: Female				
	Transitions to:				
Transitions from:	Employed (E)	Unemployed (U)	NLFNRND (N)	Disabled (D)	Retired (R)
Employed	0.9427	0.0260	0.0255	0.0019	0.0039
	(0.0029)	(0.0020)	(0.0019)	(0.0005)	(0.0008)
Unemployed	0.4013	0.4279	0.1614	0.0018	0.0076
	(0.0222)	(0.0224)	(0.0167)	(0.0019)	(0.0039)
NLFNRND	0.1950	0.1588	0.6223	0.0124	0.0115
	(0.0102)	(0.0094)	(0.0124)	(0.0028)	(0.0027)
Disabled	0.0398	0.0135	0.0741	0.8546	0.0180
	(0.0075)	(0.0044)	(0.0101)	(0.0136)	(0.0051)
Retired	0.0707	0.0088	0.0474	0.0224	0.8506
	(0.0106)	(0.0039)	(0.0088)	(0.0061)	(0.0147)
Test: TR(U $\to$ E) - TR(N $\to$ E)=0. $\chi^2(1) = 37.84$, $Prob > \chi^2 = 0.0000$.					

Standard errors are in parentheses.
Notes: The rows of each panel represent the labor market status the respondent was in at the time of the CPS interview, while the columns represent the respondent's status at the time of ATUS interviews in 2012 and 2013. The CPS interviews were conducted two to five months earlier than the ATUS interviews. Panels A and B reports the transition rates among different labor market statutes for male and female, respectively.

Table 12: Life Satisfaction by Transition of Labor Market Status

		Panel A: Male				
From \ To	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Employed	7.09	6.17	7.03	6.25	6.74	7.06
	(0.03)	(0.30)	(0.32)	(0.91)	(0.76)	(0.03)
Unemployed	6.20	5.66	6.33	0.00	6.53	5.97
	(0.23)	(0.20)	(0.34)	(0.00)	(0.76)	(0.14)
NLFNRND	6.93	6.57	6.22	4.68	7.75	6.56
	(0.26)	(0.27)	(0.30)	(1.44)	(0.50)	(0.17)
Disabled	6.92	6.39	5.71	5.64	6.17	5.75
	(0.57)	(0.50)	(0.55)	(0.17)	(0.91)	(0.16)
Retired	6.97	5.20	7.20	8.19	7.25	7.18
	(0.58)	(0.64)	(0.52)	(1.80)	(0.15)	(0.14)
Total	7.06	6.09	6.44	5.63	7.18	6.90
	(0.03)	(0.14)	(0.19)	(0.18)	(0.14)	(0.03)
N	6,642	451	260	500	380	8,233
		Panel B: Female				
From \ To	Employed	Unemployed	NLFNRND	Disabled	Retired	Total
Employed	7.19	6.43	7.53	8.00	8.24	7.19
	(0.03)	(0.30)	(0.22)	(0.57)	(0.37)	(0.03)
Unemployed	6.85	6.03	6.71	6.00	8.28	6.47
	(0.18)	(0.20)	(0.44)	(0.00)	(1.20)	(0.14)
NLFNRND	7.10	6.65	7.55	4.93	8.29	7.29
	(0.17)	(0.24)	(0.08)	(0.62)	(0.58)	(0.07)
Disabled	7.24	4.89	6.45	5.63	5.60	5.75
	(0.54)	(0.53)	(0.48)	(0.14)	(1.22)	(0.13)
Retired	7.97	7.83	7.96	4.24	7.68	7.65
	(0.32)	(0.67)	(0.41)	(0.69)	(0.11)	(0.11)
Total	7.18	6.38	7.46	5.63	7.70	7.11
	(0.03)	(0.14)	(0.08)	(0.13)	(0.11)	(0.03)
N	6,747	592	1,331	644	559	9,873

Standard errors are in parentheses.
Notes: The rows of each panel represent the labor market status the respondent was in at the time of the CPS interview, while the columns represent the respondent's status at the time of ATUS interviews in 2012 and 2013. The CPS interviews were conducted two to five months earlier than the ATUS interviews. Panel A (B) of the table shows the mean of ladder satisfaction for male (female) with each possible labor force status transition, i.e., from the earlier status reported in CPS to the later status reported in ATUS.

Appendix

Table A1: Transition Rate (TR), Male, 2010-2015

| Panel A: Male					
	Transitions to:				
Transitions from:	Employed (E)	Unemployed (U)	NLFNRND (N)	Disabled (D)	Retired (R)
Employed	0.9542	0.0271	0.0143	0.0018	0.0025
	(0.0015)	(0.0012)	(0.0008)	(0.0003)	(0.0004)
Unemployed	0.4100	0.4476	0.1203	0.0063	0.0158
	(0.0135)	(0.0137)	(0.0089)	(0.0022)	(0.0034)
NLFNRND	0.3830	0.3164	0.2558	0.0319	0.0129
	(0.0152)	(0.0145)	(0.0136)	(0.0055)	(0.0035)
Disabled	0.0712	0.0288	0.0443	0.8235	0.0322
	(0.0067)	(0.0043)	(0.0053)	(0.0099)	(0.0046)
Retired	0.0921	0.0322	0.0307	0.0086	0.8363
	(0.0084)	(0.0051)	(0.0050)	(0.0027)	(0.0108)
Test: TR(U $\rightarrow$ E) - TR(N $\rightarrow$ E)=0.	$\chi^2(1) = 0.86$, $Prob > \chi^2 = 0.3544$.				
Panel B: Female					
	Transitions to:				
Transitions from:	Employed (E)	Unemployed (U)	NLFNRND (N)	Disabled (D)	Retired (R)
Employed	0.9412	0.0257	0.0278	0.0016	0.0037
	(0.0017)	(0.0011)	(0.0012)	(0.0003)	(0.0004)
Unemployed	0.3538	0.4530	0.1840	0.0020	0.0072
	(0.0126)	(0.0131)	(0.0102)	(0.0012)	(0.0022)
NLFNRND	0.1970	0.1481	0.6302	0.0148	0.0099
	(0.0058)	(0.0052)	(0.0070)	(0.0018)	(0.0014)
Disabled	0.0339	0.0150	0.0576	0.8802	0.0133
	(0.0041)	(0.0027)	(0.0052)	(0.0073)	(0.0026)
Retired	0.0749	0.0152	0.0490	0.0193	0.8417
	(0.0064)	(0.0030)	(0.0052)	(0.0033)	(0.0089)
Test: TR(U $\rightarrow$ E) - TR(N $\rightarrow$ E)=0.	$\chi^2(1) = 70.60$, $Prob > \chi^2 = 0.0000$.				

Standard errors are in parentheses.
Notes: The rows of each panel represent the labor market status the respondent was in at the time of the CPS interview, while the columns represent the respondent's status at the time of interviews in 2010-2015 ATUS. The CPS interviews were conducted two to five months earlier than the ATUS interviews. Panels A and B reports the transition rates among different labor market statutes for male and female, respectively.

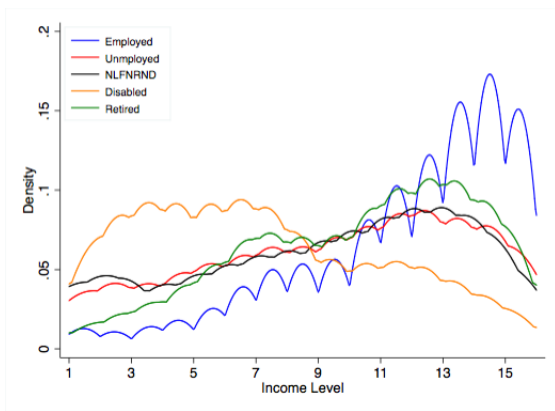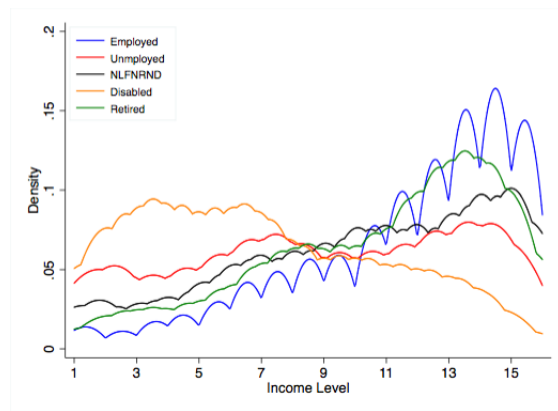Figure A1: Age Distribution, 2010-2015
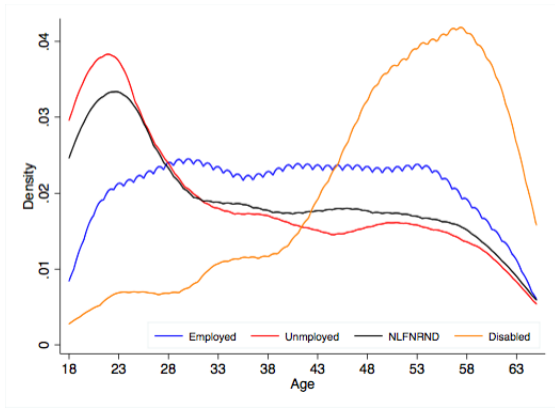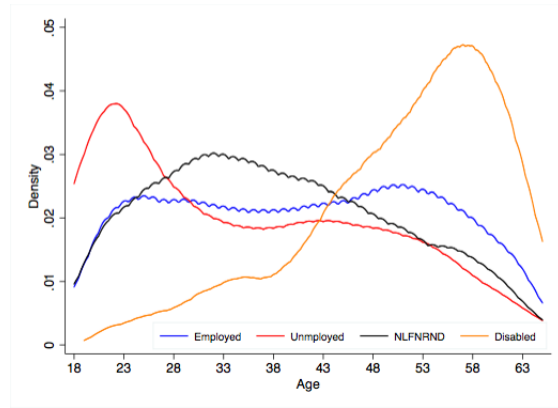
(a) Male

(b) Female

Figure A2: Family Income Distribution, 2010-2015

(a) Male

(b) Female