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ARTICLE

# How do older workers use nontraditional jobs?

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**Abstract**

Working consistently through one's early 60s is key to retirement security. However, workers without access to retirement plans and health insurance will likely struggle to achieve such security. This paper uses the Health and Retirement Study to identify nontraditional jobs – which lack these benefits – and applies sequence analysis to explore how workers aged 50–62 use them. The results suggest that most nontraditional jobs are used by workers consistently, and that fewer workers use these jobs briefly or as a bridge to retirement. Workers consistently in nontraditional jobs end up with less retirement income and are more likely to be depressed.

**Key words:** Alternative work; employer benefits; nontraditional jobs; older workers; retirement security; sequence analysis

**JEL Classification:** J26; J32

## 1. Introduction

While working consistently through one's 50s and early 60s is key to achieving retirement security, working – by itself – may not be enough. Workers in jobs that lack retirement and health benefits are at risk of a retirement income shortfall. Few households save for retirement outside of employer-sponsored plans, and poor health drains resources for those without health insurance. Yet, despite the increased focus on 'nontraditional' jobs – jobs that usually lack these benefits – it is unclear how older workers use these jobs and how they might affect well-being approaching retirement.[1] If some older workers end up in nontraditional work for much of their later careers, then they likely will end up worse off financially, and perhaps emotionally too as they struggle with the possibility of a less secure retirement. If, instead, older workers use nontraditional jobs only temporarily before returning to traditional work or as a bridge to retirement, then it is unlikely that their situation will end up substantially worse than had they worked in traditional jobs their entire late career.

To gain a better understanding of the uses and impact of nontraditional jobs in workers' late careers, this project follows workers from ages 50 through 62 in the *Health and Retirement Study* (HRS), and determines at each age whether they are in a traditional job, a nontraditional job, not working, or retired.[2] The next step is to use sequence analysis to group older workers who have similar employment patterns, calculate the share following each pattern, and compare the personal characteristics of each group. Finally, the project will use the employment groupings from the sequence analysis as explanatory variables in two sets of regression analyses. The first set of regressions will focus on the effects of each sequence on the availability of retirement resources. The second set of regressions will look at a more holistic measure of well-being – the incidence of depression. The results will shed light

[1]See Katz and Krueger (2016, 2019).

[2]In practice, not working is defined as earning less than $5,000 per year, unemployed, or out of the labor force (which includes disabled individuals).

on the ways in which older workers use nontraditional work, how the use of that work varies by socioeconomic status, and ultimately its impact on the workers' using it.

The remainder of the paper is organized as follows. Section 2 provides background on how older workers use nontraditional jobs late in their careers. Section 3 describes the data and provides details on how nontraditional jobs are identified in the HRS, and also offers a comparison with other estimates of the prevalence of these jobs. Section 4 describes the methodology behind sequence analysis as well as the regression formulations used, while Section 5 presents the results.

Section 6 concludes that just 26% of the sample works in a traditional job with benefits throughout their 50s and early 60s – this 'ideal' pattern of employment is just not that common. Of the remainder, four patterns emerge: (1) those who retire well before age 62 (21%); (2) those who are only weakly attached to the labor force (16%); (3) those who work consistently, but in nontraditional jobs (11%); and (4) those who work consistently and mainly in traditional jobs, but with brief periods of nontraditional work or not working (26%). Regarding their financial well-being, individuals who are consistently in nontraditional jobs have lower projected retirement income. However, much of the difference seems driven by lower income and a lack of retirement coverage *prior* to late-career, perhaps associated with early-career nontraditional work. These consistently nontraditional workers are also more likely to experience depression than otherwise similar individuals who are in traditional jobs consistently. Unlike the result for retirement income, the depression result holds even conditional on their lifetime income and incidence of depression at age 50. Expanding benefits to late-career workers in these jobs – for example, through access to retirement savings vehicles such as state-level auto-Individual Retirement Accounts – may therefore be a valuable policy goal.

## 2. Background

Despite the possibility that nontraditional jobs could occur at any time in a worker's late career, almost all research on how nontraditional work fits into late-career employment patterns has been focused on jobs that serve as a stepping-stone to ease the transition into retirement.[3] Johnson and Kawachi (2007) find that older workers who switch jobs near retirement are likely to end up in a nontraditional job that does not offer benefits, but also report greater satisfaction with those jobs, in part due to less stress and lighter physical demands. Some evidence also exists that workers use these lower-compensating jobs to gain flexibility in their schedules as they approach retirement (James *et al.*, 2007). Indeed, Cahill *et al.* (2011) find that more than 60% of older workers who left full-time career jobs moved to this sort of 'bridge job'. In other words, this literature would suggest that using nontraditional jobs as a transition to retirement may be somewhat common and that, as part of this transition, these jobs offer a way to work without the rigidity and stress of a more traditional job. However, it's unclear that the same positive impacts would exist for the workers examined in this paper, some of whom would be using the jobs well before retirement and unintentionally.

And the limited literature suggests that some workers do find themselves in this position. Specifically, research shows that workers who were in nontraditional jobs for an extended period have difficulty transitioning back to traditional work (Fournier *et al.*, 2011). For example, about one-fifth of temporary workers become trapped in a 'precarious job carousel' where they cycle between bad jobs and no jobs (Barbieri and Scherer, 2009; Fuller and Stecy-Hildebrandt, 2015). However, it is unclear exactly how common this outcome is for older workers specifically.

While researchers have not focused on how older workers use nontraditional jobs in their late-career working patterns beyond as a transition to retirement, other work has used sequence analysis to investigate labor force participation at older ages more generally. For example, Calvo *et al.* (2017) use sequence analysis to examine how workers' labor force status evolves in their 60s. Their analysis considers full- and part-time employment and non-employment to show that few workers follow the transition from full-time work to complete retirement at age 65. Instead, the retirement process is much more diverse and includes early and late retirement, as well as people who remain partly retired all the way up to age

[3]Quinn and Burkhauser (1990) and Ruhm (1990) provide early reviews of partial retirement and bridge jobs.

70. However, their study does not consider the traditional or nontraditional nature of any jobs and does not focus on the 50s, a time of life when people should be working to prepare for a secure retirement.[4]

## 3. Data

Given the lack of research on the use of nontraditional jobs throughout late careers, this paper uses the 1992–2016 waves of the HRS, a biennial longitudinal survey of older Americans to characterize workers' labor force patterns from ages 50 through 62 and to see how nontraditional work fits in. The sample consists of members of the Original HRS, War Baby, and Early Baby Boomer birth cohorts, for whom data on work history are currently available through age 62. Although the analysis seeks to follow workers from ages 50–62, to increase the sample size the paper also includes those entering the HRS at 52 and imputes these individuals' age 50 work status.[5] The sample is further restricted to respondents who live to at least 62, do not otherwise exit the HRS prior to 62, do not have missing demographic variables (described below), and work at least one time between ages 50 and 62. Within this sample, some people are missing information for individual waves – if this omission happens for three or more waves the individual is dropped from the analysis; if it is for two or fewer waves then their work status is imputed for the missing periods. The final sample consists of 4,174 respondents (see Table 1 for detail on the exclusions).

Once the sample is identified, the next step is to identify each individual's work status at each wave from ages 50 through 62. For the sequence analysis, each individual is assigned one of four statuses in each wave: (1) not working (but not retired); (2) retired; (3) working in a traditional job; and (4) working in a nontraditional job. Not working is defined as earning less than $5,000 a year but not claiming to be fully retired.[6] 'Retired' is defined as not working and classified as retired by the RAND labor force status variable. Among those who are working, the key distinction is between traditional and nontraditional work. The issue is how to define nontraditional work.

### 3.1 Defining nontraditional work

Defining nontraditional work is complicated – an agreed upon definition does not exist, and different definitions yield vastly different estimates. Much of the existing literature has defined this type of work based on the nature of the relationship workers have with employers. Using this approach, researchers have come up with a wide range of estimates. The narrowest definitions of nontraditional work are limited to workers in the 'gig economy' (e.g., Uber and Task Rabbit) or in short-term employment relationships.[7] These groups include just 1% and 2% of workers, respectively.[8]

At the other extreme, the U.S. Government Accountability Office's (2015) broadest concept, which includes the self-employed and those in part-time jobs, covers 31% of the workforce.[9] In between these extremes is the definition of 'alternative' work used by the Bureau of Labor Statistics (BLS) – which has received considerable attention through research by Katz and Krueger (2016, 2019). The BLS definition includes independent contractors and workers who are either with a temp agency, employed by a contract firm, or on-call. Under this definition, the prevalence of nontraditional work hovers around 10%. Another definition in between the two extremes is that of '1,099 workers', as used in a 2019 study by Collins *et al.* These workers are self-employed individuals who work for firms that

[4]Gustman and Steinmeier (2000) also examine patterns of full-time work, partial retirement, and complete retirement but do not use sequence analysis; their analysis is limited to the first four waves of the HRS, so the number of potential patterns is more manageable.

[5]All imputations are carried out using STATA's mi (multiple imputation) framework, as described in Halpin (2013).

[6]This definition also includes those who claim not to be working because they are disabled, unemployed, or otherwise out of the labor force.

[7]Short-term jobs are defined as expected to last less than one year.

[8]See Farrell and Greig (2016); U.S. Bureau of Labor Statistics (2018); and Collins et al. (2019).

[9]U.S. Government Accountability Office (2015).

**Table 1.** Sample restrictions

| Restriction | Sample |
|---|---|
| Total HRS sample | 37,495 |
| Born from 1939 to 1954 and observed at 52 | 11,732 |
| Live to age 62 | 10,940 |
| Not dropped by the HRS | 10,097 |
| Report working with income | 8,513 |
| Have less than three missing observations | 5,030 |
| Work at least once between ages 50 and 62 | 4,174 |

*Source:* Authors' calculations from Health and Retirement Study (1992–2016).

file 1,099 forms reporting the workers' pay (i.e., freelancers and 'gig' work) but do not fall under normal employment classification rules. Using this definition, nontraditional work would account for 11.8% of the workforce.[10]

Regardless of how nontraditional jobs are defined, the common concern is that these jobs may lack even basic benefits, such as health insurance and retirement plans, and/or have volatile earnings and employment. For this reason, instead of looking at the employee–employer relationship – as the definitions above do – our analysis adopts a more direct measure of nontraditional jobs based on the presence of these job characteristics. Specifically, the analysis will define nontraditional work in two ways: (1) broadly as any job lacking both health insurance and retirement benefits; and (2) more narrowly as a job without these benefits that also has some measure of job instability.[11]

In the HRS, these characteristics can be identified for an individual's current 'main' job at the time of their HRS interview. Because these characteristics cannot be easily identified for jobs held in-between HRS interviews, the sequence analysis is limited to 'snapshots' of an individual's employment status at the seven interviews occurring between ages 50 and 62.[12] Importantly, the job characteristics approach may disagree with the employee–employer-based definitions above in some instances. For example, a worker with stable hours at a contract firm that covers its workers with health insurance and a retirement plan would be labeled as in an 'alternative' job under the BLS definition, but as in a traditional job under our definitions.

Indeed, given the variance in the definitions, it is useful to see how a definition based on job characteristics like benefits compares to the employer–employee-based definitions from the existing literature. To ensure an accurate comparison, the analysis requires a dataset with questions on both the worker–employer relationships used in the other definitions presented above, and job characteristics such as the availability of benefits that are used in this paper. For this purpose, the BLS's *Current Population Survey* (CPS) is the best source.

For the comparison of the various definitions that exist in the literature to the one used in this paper, we first compute the share of workers aged 50–62 in 2017 who are in employer relationships under the standard BLS definition. Next, the share of workers in jobs without health insurance and retirement benefits is calculated – i.e., our broad 'no benefits' definition of nontraditional work (unfortunately, the CPS does not have the right variables to get at the measures of instability used in the narrow definition). Under the employee–employer-relationship-based BLS measure, 11% of workers

[10]Collins et al. (2019).

[11]One potential problem with identifying health insurance being offered by an employer is that the line of questioning in the HRS only asks if individuals are covered by their employers' plan, not whether they are offered it. So married individuals with coverage through their spouse would look like they are not offered health insurance. Looking at the CPS, it turns out roughly 70 percent of married individuals with health insurance through their spouse were also offered it at their job – we assume that if a person's spouse has employer health insurance that they were offered coverage through their employer. This approach provides a conservative estimate of nontraditional work.

[12]It is also worth noting that the questions necessary to derive the nontraditional definition used in this paper are not asked about jobs an individual holds other than their main job. However, since it seems unlikely an individual would have these benefits through a job that they do not consider to be their main source of employment, any effect on the sequence analysis of focusing on the main job is likely to be limited.

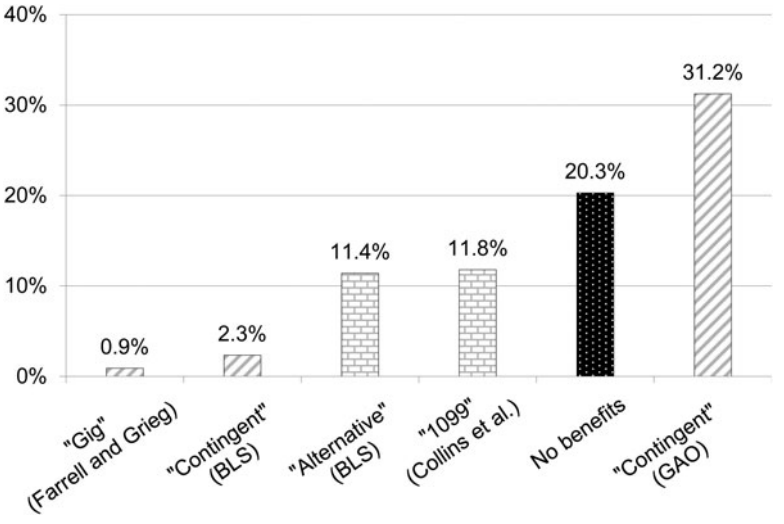


**Figure 1.** Percentage of workers ages 50–62 in nontraditional jobs by definition.
*Notes*: 'Gig' definition as in Farrell and Greig (2016) and covers all workers. '1099' workers defined as in Collins *et al*. (2019) and applies to all workers. 'Contingent' (BLS), 'Alternative' (BLS), 'No benefits,' and 'Contingent' (GAO) were calculated by the authors and apply to workers aged 50–62.
*Sources*: Farrell and Greig (2016); Collins *et al*. (2019); and Current Population Survey May Supplement (2017).

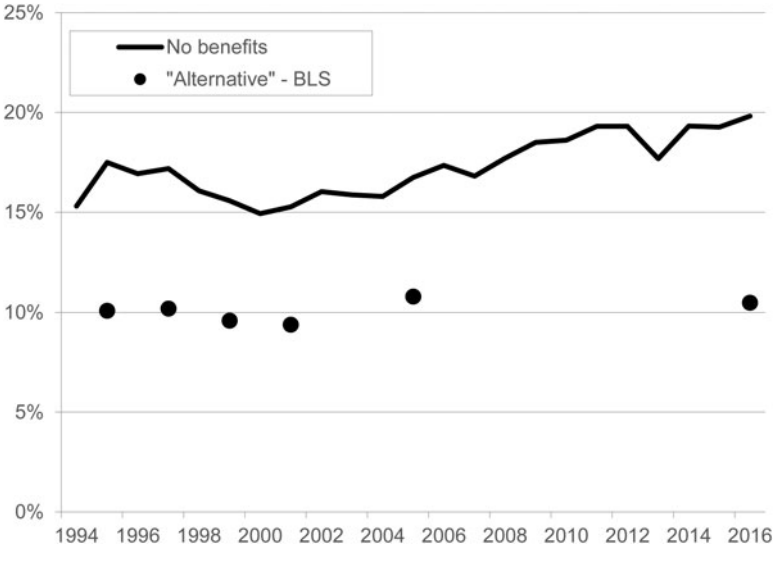


**Figure 2.** Percentage of workers in nontraditional jobs under different definitions, 1994–2016.
*Note*: 'Alternative' estimate comes from Katz and Krueger (2019) and includes *all* workers.
*Sources*: Current Population Survey March Supplement (1995–2017); and Katz and Krueger (2019).

in 2017 were in nontraditional jobs, compared to 20% under the no-benefits measure (Figure 1 also includes other definitions from the literature for additional context). The estimates in Figure 1 are for a single point in time. Figure 2 compares the two measures over 1994–2016, and it still finds a large and persistent gap.

**Table 2.** Select characteristics of workers in nontraditional jobs, 2017

| | 'Alternative' BLS | No benefits minus BLS |
|---|---|---|
| Average tenure (years) | 11 | 6 |
| Household income | | |
| 10th percentile | $22,500 | $17,500 |
| 25th percentile | 45,000 | 32,500 |
| Median | 67,500 | 55,000 |
| Demographics | | |
| At least some college (%) | 65 | 52 |
| Non-white | 20 | 34 |

*Note*: The 'no benefits minus BLS' column consists of those workers without benefits who are not already captured under the BLS definition.
*Source*: Authors' calculations from Current Population Survey May Supplement (2017).

Given the considerable gap between the two definitions of nontraditional work, the question is: which does a better job of picking up the vulnerable workers that researchers are concerned with – one based on the employer–employee relationship or one based on the presence of benefits? It turns out, compared to the workers defined as alternative under the BLS definition, the additional workers picked up by the no-benefits definition (i.e., workers with a more typical employer–employee relationship but who lack benefits) tend to have shorter job tenure and lower socio-economic status (see Table 2).[13] The basic issue is that the majority of alternative workers under the BLS definition are independent contractors, and those individuals tend to have been employed in that type of work for a while with relatively high incomes, even though they may lack benefits.[14] By picking up many employees working without benefits instead of mainly individuals who lack benefits only because they employ themselves, the definition used in this paper and based on the presence of benefits picks up more vulnerable workers than the BLS measure, making it a better choice for this paper.

Given that the benefit-based definition used in this paper seems to appropriately capture the vulnerable workers researchers are concerned with, it is worth exploring how the definition looks in the longitudinal data needed to do sequence analysis – the HRS. Reassuringly, the HRS data show that the percentage of workers aged 50–62 in jobs with no benefits is generally similar to that using the CPS data despite a noticeable difference early in the period (see the solid versus dashed lines in Figure 3).[15] As noted above, the concern over nontraditional jobs stems not just from a lack of benefits, but also a lack of stability in earnings or employment. Some of the jobs that lack benefits will be stable, and these workers may be less vulnerable. Therefore, the paper also uses a more narrow definition that takes into account job stability. This definition will count a job as nontraditional if it lacks benefits and: (1) has hours that are variable at some point during the job; or (2) if the worker is self-employed with no benefits and with no employees.[16] Under this definition, the percentage of jobs that are nontraditional falls from 16.9% to 7.6%, somewhat lower than the standard BLS definition of nontraditional workers.

[13]The Current Population Survey May Supplement does not ask earnings questions for all workers.

[14]Authors' calculation from the CPS. For example, the median tenure for an independent contractor ages 50–62 is 15 years, much higher than for the typical worker, and they have an average household income of $85,000, similar to traditional workers under the BLS definition.

[15]The definition shown in Figure 3 defines nontraditional as lacking benefits. Another approach would be to use the longitudinal nature of the data to see if the job ever offered those benefits. Such an approach reduces the share of those in nontraditional jobs by 3–4 percentage points. This approach is not used as the default since it seems relevant that the person said the job was lacking those benefits in a given year.

[16]The study includes the self-employed with no benefits and with no employees as nontraditional work to capture those who run a small business or are independent contractors.

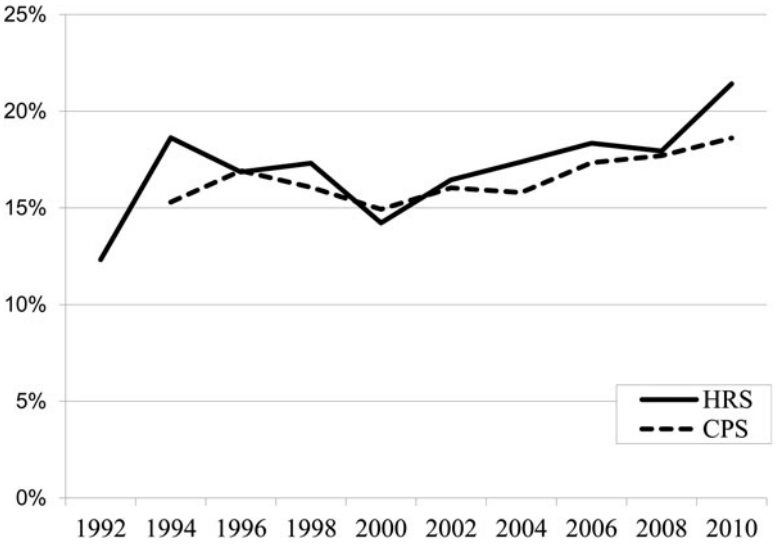


**Figure 3.** Percentage of workers aged 50–62 in jobs with no benefits by dataset, 1992–2010.
*Sources*: Authors' calculations from Health and Retirement Study (1992–2010); and Current Population Survey March Supplement (1995–2011).

## 4. Methodology

With each worker assigned a status as not working, retired, working in a traditional job, or working in a nontraditional job, the next step is to identify various patterns of work for ages 50–62 using sequence analysis. Then, the project turns to analyze the relationship between these employment sequences and retirement resources using a regression analysis.

### *4.1 Sequence analysis*

Sequence analysis is a relatively novel technique in the social sciences; its strength is that the outcome of interest is an individual's entire employment history rather than employment status or job transition at a given age (Abbott, 1990; Aisenbrey and Fasang, 2010; MacIndoe and Abbott, 2011). The goal of sequence analysis is to group together workers with similar employment statuses at similar times and in a similar order. Consider the hypothetical example below, which shows how three workers move between traditional work (T), nontraditional work (N), not-working (U), and retired (R).

In this example, the sequence analysis will likely group workers A and B together, because they both started as traditional workers, used nontraditional work temporarily before returning to traditional work, and then retired at the same age. The only difference is small: how long they experienced nontraditional work. That experience differs distinctly from the pattern for worker C, who moved from traditional to nontraditional work at the same age as A and B, and retired at the same age, but never returned to traditional work.

**Example 1.** Employment Sequences for Hypothetical Workers

| | Age | | | | | | |
|---|---|---|---|---|---|---|---|
| | 50 | 52 | 54 | 56 | 58 | 60 | 62 |
| Worker A | T | T | N | N | T | T | R |
| Worker B | T | T | N | T | T | T | R |
| Worker C | T | T | N | N | N | U | R |

In more technical terms, sequence analysis compares all of the sequences for sample members and constructs a matrix of how different each sequence is from the others. The difference between sequences is based on the minimum number of modifications needed to transform one sequence into another. A modification can take one of two forms. The first form is a substitution in which the state of one sequence is changed to match the state from another (e.g., changing work status at age 56 from nontraditional to traditional so that workers A and B have the same sequence). The second form is an insertion or deletion. An insertion occurs where a state is plugged into a sequence and every other state pushed back one wave to an older age. A deletion occurs when a state is removed and every subsequent state pulled forward to a younger age. Insertions and deletions typically happen simultaneously: a state is inserted and another state is deleted to preserve the number of observations.

To determine the difference between two sequences, the analysis follows the literature and uses optimal matching analysis (OMA) (MacIndoe and Abbott, 2011; Calvo *et al.*, 2017). OMA requires that each substitution and insertion or deletion be assigned a 'cost' to calculate the difference between sequences. The simplest way to calculate these differences would be to add up the number of substitutions and insertions/deletions – in other words to assign a uniform cost of one – but this approach has several disadvantages (Aisenbrey and Fasang, 2010; Cornwell, 2015). Most notably, it does not recognize that some substitutions reflect much bigger changes than others – e.g., substituting a traditional job for a person who is not working at all may be a bigger leap than substituting a status of retired. Simply assigning substitution costs based on theories of which transitions are more likely runs the risk of being highly arbitrary, so this project uses an intuitive metric (Cornwell, 2015; Calvo *et al.*, 2017). Observed transition probabilities – transitions that are observed frequently in the data – e.g., from not working to retired – are assigned a lower substitution cost than those that are uncommon (Halpin, 2014; Cornwell, 2015). Once substitution costs are assigned, this paper follows the approach commonly taken in the literature and sets the cost of insertions/deletions to one-tenth of the highest substitution cost (see Appendix Tables A1 and A2 for the substitution costs used under the broad and narrow definitions of nontraditional work) (Cornwell, 2015).[17]

The end result of OMA is a so-called pairwise distance matrix, which contains the sum of the costs of all substitutions and insertion/deletions required to transform each sequence into another. To group similar sequences together, a Hierarchical Cluster Analysis is used to detect groupings among the individual sequences with respect to their pairwise distances (Cornwell, 2015; Calvo *et al.*, 2017). The last step is to determine the number of groups for the analysis to detect. To choose the number of groups, the process was run assuming 2 through 12 groupings, with the final choice reflecting the number that maximized the Caliniskin and Harabasz index such that the resulting sequences made theoretical sense (Cornwell, 2015).[18]

### 4.2 Regression methodology

With the sequences in hand, the next question is how individuals' employment patterns relate to their available retirement resources and their emotional well-being at age 62. The issue is that people experiencing different patterns of non-employment, retirement, traditional work, and nontraditional work in their 50s and early 60s will also have different initial characteristics that may cause them to fall into those sequences, and those initial characteristics are likely to affect both their preparedness and their emotional well-being.

[17]Assigning the insertion and deletion cost to one-tenth of the highest substitution cost tends to create sensible sequence groupings (MacIndoe and Abbott 2011; Hollister 2009).

[18]The Caliniskin Harabasz index is a measure of the extent to which sequences within clusters are similar to one another and sequences across clusters are dissimilar (Cornwell, 2015). Specifically, the index is the ratio of the between group sum of squared differences to the within group sum of squared differences. Sequence analysis is vulnerable to claims that the results are the consequence of an ad hoc trial and error. To test the validity of the results, this paper used different cost assignments and dropped imputed respondents and achieved similar results. For critiques of sequence analysis and responses to those critiques, see Aisenbrey and Fasang (2010).

For example, workers frequently doing nontraditional work may have less education and therefore contribute less to retirement accounts even when they have the resources. Failure to control for education would therefore exaggerate the negative role of a sequence showing frequent nontraditional work – i.e., these workers would indeed have less, but some of the effect would be due to their education level. Or, workers who spend their late careers in nontraditional jobs may have spent their early careers in these jobs too, leading to less pension coverage earlier in life or lower lifetime incomes and therefore lower retirement income. In this case, it would not necessarily be the late-career experience of these jobs driving poor outcomes, but earlier experiences as well. On the emotional health side, if workers who are able to maintain traditional employment throughout their 50s and early 60s were less likely to be depressed entering their late careers, then failure to control for age 50 emotional health would exaggerate the benefits of the traditional work sequence. Therefore, controlling for both demographic characteristics and an individual's initial state (i.e., prior to age 50) regarding financial or emotional health is crucial to understanding how the late-career use of nontraditional jobs impacts well-being approaching retirement.

The paper therefore estimates two sets of regressions in which the individual's assignment of a sequence group serves as the independent variable of interest. The first set of regressions use retirement income at age 62 as the dependent variable. These regressions are estimated as quantile regressions at the median to lessen the impact of outlier levels of retirement income and control for demographics and initial health, the availability of retirement plans, and lifetime income prior to late career. The complete equation to be estimated is:

$$R_{i,62} = \beta_0 + \sum_{j=2}^{K} \gamma_j S_{i,j} + X'_{i,50}\beta + \delta H_{i,50} + \theta RP_{i,50} + \rho LI_{i,50} + \tau_i + \varepsilon_i$$

where $R_{i,62}$ is the log of the individual's retirement income at age 62: defined benefit pension income, Social Security benefits, and annuitized defined contribution plan and other financial wealth.[19] The variable $S_{i,j}$ is an indicator for whether person $i$ was assigned to sequence group $j$. Therefore, $\gamma_j$ is the predicted percentage point change in median retirement resources associated with being in sequence group $j$ relative to the base sequence group, which is assigned as the one with the highest amount of traditional work. The vector $X'_{i,50}$ contains demographic characteristics that could ultimately affect an individual's preparedness, like education, gender, race/ethnicity, and their age-50 marital status. $H_{i,50}$ is an index of the individual's initial health at age 50 that is based on objective measures, with higher values indicating worse health, whereas $\tau_i$ enters year of sample entry fixed effects.[20] Finally, $RP_{i,50}$ and $LI_{i,50}$ are coverage by retirement plans and lifetime income, respectively, at age 50.

The second set of regressions is similar to the first, except that the dependent variable here is the incidence of depression and the controls include depression prior to late career instead of lifetime income. These regressions are estimated as a probit, with average marginal effects reported in Section 5. The full specification to be estimated is:

$$D^*_{i,62} = \beta_0 + \sum_{j=2}^{K} \gamma_j S_{i,j} + X'_{i,50}\beta + \delta H_{i,50} + \theta RP_{i,50} + \rho D_{i,50} + \tau_i + \varepsilon_i$$

[19]Social Security wealth is obtained based on RAND imputations that use Social Security administrative data. Defined-contribution and financial wealth are assumed to be annuitized at a rate consistent with private market data from ImmediateAnnuities.com.

[20]In practice, eight health conditions and five limitations to activities of daily living are used: The health conditions are: 1) high blood pressure with medication; 2) diabetes with insulin; 3) cancer of any kind, seeing doctor; 4) activity limiting lung disease; 5) heart condition, taking medication; 6) emotional/psychological problems; 7) stroke with problems afterward; and 8) arthritis with medication. The limitations to activities of daily living involve needing help with: 1) bathing; 2) getting dressed; 3) eating; 4) using a map; and 5) walking.

where $D^*_{i,62}$ is the latent propensity of the individual to be depressed at age 62, $D_{i,50}$ is an indicator for depression at age 50, and the other variables are the same as defined above.

The hypothesis is that, even conditional on the initial characteristics described, sequences containing primarily traditional work with little interruption will be associated with higher retirement income and a lower incidence of depression at age 62. The next-best sequence will occur where nontraditional work is used sparingly as a stopgap, followed by long spells of nontraditional work. The sequences with the worst outcomes – i.e., lowest retirement income or highest incidence of depression – will be those associated with long spells of nontraditional work – in other words, weak attachment to the labor force – or very early retirement. This hypothesis means that relative to the base sequence of consistent traditional work, the coefficients $\gamma_j$ will be increasingly negative for the retirement income median regressions, and increasingly positive for the depression probit regressions as they move from mostly traditional work to mostly nontraditional work and finally to unattached.

## 5. Results

This section first presents the results of the sequence analysis, before turning to the regression results.

### 5.1 Sequence analysis

The results show late-career employment patterns of HRS workers and how nontraditional jobs fit into those patterns. The sequence groupings were calculated for each definition of nontraditional work, the broad no-benefits definition and the narrower definition that includes both no-benefits and instability.

With the broad no-benefits definition of nontraditional work, five work patterns emerge (see Figure 4, which can be viewed best by zooming in if viewing electronically). The first two involve individuals who do not work consistently throughout their 50s and 60s. These individuals are either in an 'Early Retirement' sequence with retirement in their 50s (21% of sample members) or are in a 'Weak Attachment' sequence, with frequent spells of not working despite not retiring (16%). The next three sequences consist of people who work most of the time, and include sequences of

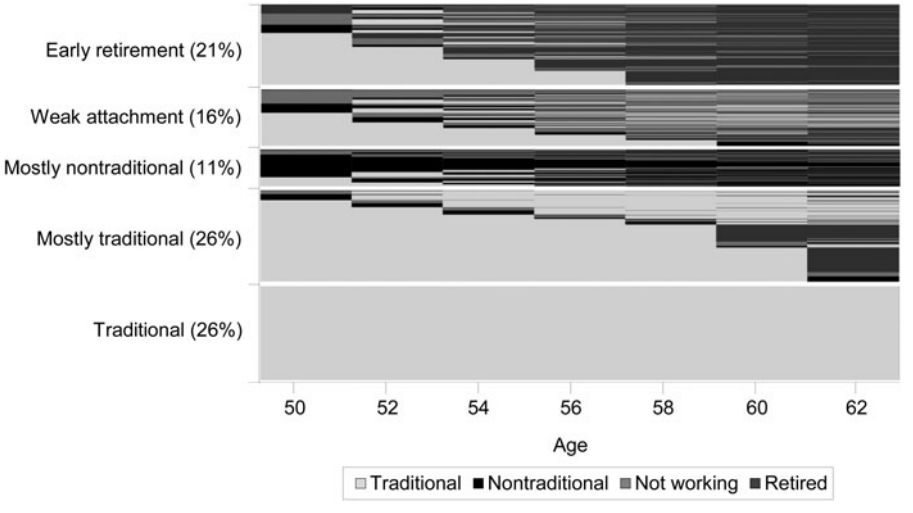


**Figure 4.** Work histories from ages 50 to 62, no benefits definition of nontraditional work.
*Source*: Authors' calculations using Health and Retirement Study (1992–2016).

**Table 3.** Share of jobs that are nontraditional and in each sequence group

| | Nontraditional jobs | | | |
|---|---|---|---|---|
| Sequence group | No benefits | Distribution of no benefits jobs | No benefits and unstable | Distribution of no benefits and unstable jobs |
| Very early retirement | – | – | 0.5% | 6.4% |
| Early retirement | 1.9% | 11.0% | 0.7 | 9.2 |
| Weak attachment | 4.3 | 25.7 | 1.4 | 17.9 |
| Mostly nontraditional | 9.1 | 53.7 | 3.6 | 47.3 |
| Mostly traditional | 1.6 | 9.6 | 1.4 | 19.1 |
| Traditional | 0.0 | 0 | 0 | 0.0 |
| Total | 16.9 | 100 | 7.6 | 100 |

*Source:* Authors' calculations from Health and Retirement Study (1992–2016).

work that are: 'Mostly Nontraditional' (11%); 'Mostly Traditional' (26%); and 'All Traditional' (26%). The 'ideal' employment pattern of working throughout one's 50s and early 60s in a job with benefits is rare – less than a third of workers do it. Although somewhat surprising, the result does not seem to be an artifact of the HRS data used here; individuals in the *Panel Study of Income Dynamics* (PSID) from 1998 to 2010 showed almost the same low share of workers fitting the ideal pattern.[21]

With respect to how nontraditional jobs are used within those sequences, it turns out that the vast majority of nontraditional work is done by those who do it often – it is used less often as a bridge to retirement or a stopgap to unemployment. To illustrate, Table 3 shows the distribution of nontraditional jobs across these sequence groups – under the broad definition, 16.9% of all jobs are nontraditional. The table shows that 53.7% of all nontraditional jobs (9.1/16.9) are within the Mostly Nontraditional sequence. The comparable numbers are 11.0% and 25.7% for both the Early Retirement and Weak Attachment sequences, representing a total of 36.7% of all nontraditional jobs. The remaining 9.6% of nontraditional jobs fit into the Mainly Traditional sequence. Overall, older workers tend to fall into two very different groups: they use these jobs either often or only briefly.

Turning to the more narrow definition of nontraditional work (see Figure 5, which can be viewed best by zooming in if viewing electronically) – jobs with no benefits *and* less stability – the fundamental nature of the sequence groupings is unchanged, although a sixth group differentiates very early retirements from those who simply retire prior to age 62. The main difference between the two definitions is intuitive – sequences involving nontraditional work are less common. Table 3 shows that the majority of nontraditional jobs – 47.3% – are again done by the small percentage of workers in the Mostly Nontraditional sequence, who use nontraditional jobs consistently throughout their 50s and 60s. The comparable numbers are 6.4%, 9.2%, and 17.9% for both the Very Early Retirement, Early Retirement, and Weak Attachment sequences, representing a total of 33.5% of all nontraditional jobs. Within the group doing mostly traditional jobs, few spells of nontraditional work exist under the narrow definition, although they do represent 19.1% of all narrowly defined nontraditional jobs. This number is slightly higher than under the broad definition, which was 9.6%.

Tables 4 and 5, respectively, highlight the demographics of older workers, by sequence group at their first HRS observation and based on the broad and narrow definitions of nontraditional work. Since most nontraditional jobs are held by people who do them frequently, the focus is on this

[21]In that dataset, both retirement plans and health insurance were identified for a sample of 403 individuals ages 50–52 in 1998 (the same start wave as the War Baby Cohort in the HRS), who worked at least once, and who were observed continuously through 2010. In this sample, only 24.6 percent worked in a traditional job the entire time – remarkably similar to the number in the HRS. It seems that it really is not that common to be in a consistent, traditional job between ages 50 and 62.

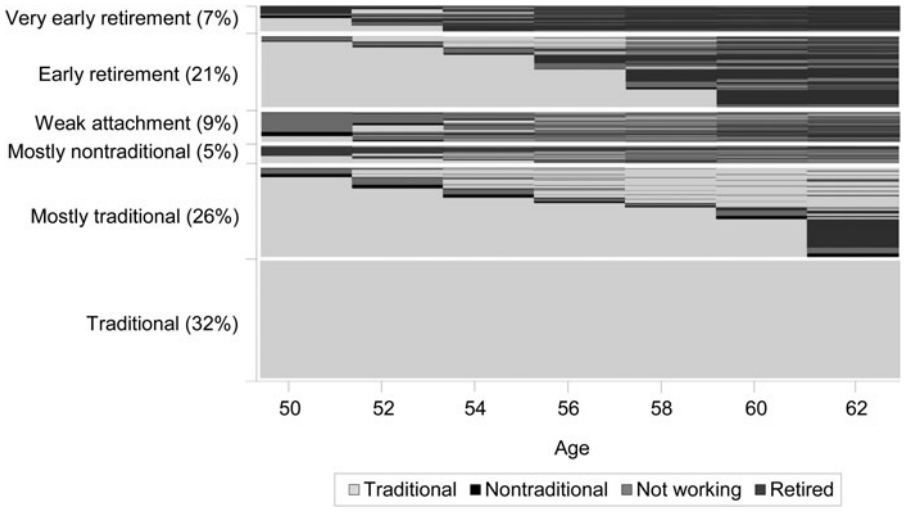


**Figure 5.** Work histories from ages 50 to 62, no benefits with instability definition of nontraditional work.
*Source*: Authors' calculations using Health and Retirement Study (1992–2016).

**Table 4.** Older workers' demographics for benefits only definition of nontraditional work

| | Sequence group | | | | |
|---|---|---|---|---|---|
| Demographics at ages 50–52 | Early retirement | Weak attachment | Mostly nontraditional | Mostly traditional | All traditional |
| *Share of total sample (%)* | *21* | *16* | *11* | *26* | *26* |
| Female | 62 | 65 | 55 | 55 | 52 |
| Race | | | | | |
| White | 78 | 76 | 77 | 81 | 84 |
| Black | 17 | 15 | 15 | 13 | 11 |
| Other | 4 | 9 | 9 | 5 | 5 |
| Education | | | | | |
| Less than high school | 16 | 19 | 15 | 9 | 6 |
| High school | 38 | 34 | 38 | 34 | 29 |
| Some college | 24 | 23 | 26 | 29 | 26 |
| College | 22 | 24 | 21 | 28 | 39 |
| Coupled | 82 | 81 | 76 | 81 | 82 |
| Has pension wealth | | | | | |
| DB pension | 32 | 20 | 13 | 32 | 29 |
| DC pension | 26 | 20 | 12 | 27 | 33 |
| Number of health conditions | 1.0 | 0.8 | 0.7 | 0.7 | 0.6 |
| Household size | 2 | 3 | 2 | 3 | 3 |
| Number of children | 3 | 3 | 3 | 3 | 2 |
| Median wages | $35,796 | $24,423 | $17,898 | $43,135 | $58,396 |
| Median wealth | | | | | |
| Financial | $15,488 | $11,051 | $9,127 | $17,898 | $21,477 |
| Housing | $93,052 | $80,540 | $70,530 | $81,088 | $93,052 |

*Notes*: Wages and wealth are in 2018 dollars. AIME is an individual's Average Indexed Monthly Earnings based on a linkage to Social Security Administrative data summarized by RAND in its version of the HRS.
*Source:* Authors' calculations from Health and Retirement Study (1992–2016).

sequence group. This group appears more vulnerable than workers who are mostly in more traditional work arrangements, although the differences are not as extreme as one might expect given their continued work in jobs without benefits. For example, those who are in the Mostly Nontraditional

**Table 5.** Older workers' demographics for nontraditional work with no benefits and unstable hours definition of nontraditional work

| | Sequence group | | | | | |
|---|---|---|---|---|---|---|
| Demographics at ages 50–52 | Very early retirement | Early retirement | Weak attachment | Mostly nontraditional | Mostly traditional | Traditional |
| *Share of total sample (%)* | *7* | *21* | *9* | *5* | *26* | *32* |
| Female | 61 | 59 | 76 | 51 | 55 | 52 |
| Race | | | | | | |
| White | 77 | 78 | 75 | 83 | 80 | 83 |
| Black | 17 | 17 | 16 | 10 | 13 | 12 |
| Other | 5 | 6 | 9 | 6 | 6 | 5 |
| Education | | | | | | |
| Less than high school | 21 | 11 | 27 | 9 | 10 | 7 |
| High school | 37 | 36 | 38 | 29 | 34 | 31 |
| Some college | 22 | 25 | 21 | 30 | 29 | 26 |
| College | 19 | 28 | 14 | 32 | 27 | 35 |
| Married | 57 | 57 | 51 | 44 | 52 | 48 |
| Has pension wealth | | | | | | |
| DB pension | 29 | 36 | 8 | 15 | 28 | 27 |
| DC pension | 20 | 31 | 8 | 12 | 25 | 30 |
| Number of health conditions | 1.2 | 0.9 | 1.0 | 0.6 | 0.7 | 0.6 |
| Household size | 3 | 3 | 3 | 2 | 3 | 3 |
| Number of children | 3 | 3 | 3 | 2.5 | 3 | 2 |
| Median wages | $37,576 | $52,019 | $16,636 | $30,327 | $47,245 | $54,462 |
| Median wealth | | | | | | |
| Financial | 94,580 | 67,700 | 57,429 | 100,186 | 82,313 | 73,381 |
| Housing | 114,578 | 119,172 | 108,269 | 149,815 | 108,051 | 123,842 |

*Note*: Wages and wealth are in 2018 dollars.
*Source:* Authors' calculations from Health and Retirement Study (1992–2016).

**Table 6.** LCA analysis of mostly nontraditional sequence group

| | High school dropouts | Married with an earning spouse | Solo earners |
|---|---|---|---|
| Share of 'mostly nontraditional' sequence (%) | 15.4 | 35.5 | 49.1 |
| Female | 53.7 | 60.4 | 52.1 |
| Non-white | 44.8 | 16.9 | 22.1 |
| Education | | | |
| High school dropouts | 100.0 | 0.6 | 0.0 |
| High school graduates | 0.0 | 39.6 | 47.9 |
| Some college | 0.0 | 33.8 | 28.2 |
| College graduate | 0.0 | 26.0 | 23.9 |
| Marriage status | | | |
| Married | 80.4 | 100.0 | 40.4 |
| Married with an earning spouse | 32.8 | 94.2 | 0.0 |
| Employer-sponsored plans from past job | | | |
| Defined benefit | 0.0 | 31.2 | 8.4 |
| Defined contribution | 7.5 | 24.7 | 7.5 |
| Other limiting factors | | | |
| Own health limits work | 18.5 | 5.8 | 13.2 |
| Caregiving for someone with ADL/IADL | 9.6 | 12.9 | 17.9 |

*Source*: Authors' calculations from Health and Retirement Study (1992–2016).

sequence are 77% white, compared to 81% for those in the Mostly Traditional sequence. Similarly, 47% of those in the Mostly Nontraditional sequence have at least some college education, compared to 57% in the Mostly Traditional sequence. The share who are female, the marriage rates, and the

**Box 1.** Description of latent class analysis

Latent class analysis (LCA) is a tool that allows researchers to identify relationships among observed categorical variables as a function of some unobserved grouping. The analysis starts with the observation that within the population, the observed variables are not independent. For example, within the group of workers in the Mostly Nontraditional group, being a high school dropout may tend to occur together with being nonwhite. The goal of LCA is to group the observations so that within each group, or 'latent class', the observed categorical variables are locally independent. That is, being a high school dropout and nonwhite are both explained by some unobserved third variable, for example the level of economic advantage.

Conditional on an assumed number of classes, LCA outputs two sets of estimates: (1) the share of the population within each class; and (2) the conditional probabilities of having a given value for each observed variable within each class. These parameters are estimated by maximum likelihood estimation. The second output – the conditional probabilities – has a special interpretation within LCA since they represent an association between the class and the observed characteristic. That is, if one class is comprised disproportionately of high school dropouts who are nonwhite, then that class can be viewed as more economically disadvantaged than the other.

number of health conditions are fairly similar between the two groups. Table 5 shows a similar conclusion when the narrower definition of nontraditional work is used.

It would be nice to understand why some people spend most of their late work lives in nontraditional jobs. Latent class analysis (LCA), which identifies unobservable subgroups within a population (see Box 1), shows that workers who spend most of their time in nontraditional work fall into

**Table 7.** Effect of select variables on median retirement income, no benefits definition

| | Specification | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Sequence (traditional = base case) | | | | |
| Mostly traditional | −0.0730*** | −0.0553* | −0.0299 | −0.0305 |
| | (0.0265) | (0.0326) | (0.0325) | (0.0312) |
| Mostly nontraditional | −0.2783*** | −0.2623*** | −0.1682*** | −0.0774* |
| | (0.0357) | (0.0440) | (0.0454) | (0.0437) |
| Weak attachment | −0.1497*** | −0.1459*** | −0.0864** | −0.0377 |
| | (0.0305) | (0.0370) | (0.0379) | (0.0363) |
| Early retirement | −0.1131*** | −0.0171 | −0.0134 | 0.0114 |
| | (0.0284) | (0.0343) | (0.0344) | (0.0330) |
| Other controls | | | | |
| Black | | −0.1592*** | −0.1617*** | −0.1112*** |
| | | (0.0338) | (0.0336) | (0.0324) |
| Other non-white | | −0.2404*** | −0.2091*** | −0.0648 |
| | | (0.0593) | (0.0590) | (0.0567) |
| Female | | 0.0689*** | 0.0883*** | 0.0458* |
| | | (0.0254) | (0.0254) | (0.0243) |
| Some college | | 0.2082*** | 0.1997*** | 0.1205*** |
| | | (0.0282) | (0.0282) | (0.0271) |
| College degree | | 0.4335*** | 0.3926*** | 0.2765*** |
| | | (0.0291) | (0.0293) | (0.0284) |
| Married | | 0.4655*** | 0.4794*** | 0.1518*** |
| | | (0.0320) | (0.0319) | (0.0329) |
| Number of initial health conditions | | −0.0710*** | −0.0694*** | −0.0472*** |
| | | (0.0129) | (0.0128) | (0.0123) |
| Retirement plan at age 50 | | | 0.1759*** | 0.0452* |
| | | | (0.0261) | (0.0255) |
| Average indexed monthly earnings at age 50 | | | | 0.3626*** |
| | | | | (0.0162) |
| Start wave dummies included? | Yes | Yes | Yes | Yes |
| Number of observations | 3,219 | 2,287 | 2,287 | 2,262 |
| Pseudo-$R^2$ | 0.030 | 0.174 | 0.184 | 0.282 |

*Notes*: Regression is a quintile regression at the median. Standard errors are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.1.
*Source*: Authors' calculations from the Health and Retirement Study (1992–2016).

**Table 8.** Effect of select variables on median retirement income, no benefits with instability definition of nontraditional work

| | Specification | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Sequence (traditional = base case) | | | | |
| Mostly traditional | −0.0904*** | −0.0818** | −0.0709** | −0.0466 |
| | (0.0272) | (0.0331) | (0.0314) | (0.0285) |
| Mostly nontraditional | −0.1526*** | −0.1723** | −0.0835 | −0.0513 |
| | (0.0535) | (0.0669) | (0.0639) | (0.0584) |
| Weak attachment | −0.3102*** | −0.2417*** | −0.1680*** | −0.0565 |
| | (0.0392) | (0.0489) | (0.0478) | (0.0439) |
| Early retirement | −0.0168 | −0.0015 | −0.0115 | −0.0076 |
| | (0.0288) | (0.0344) | (0.0325) | (0.0296) |
| Very early retirement | −0.1566*** | −0.0604 | −0.0365 | 0.0155 |
| | (0.0418) | (0.0503) | (0.0477) | (0.0437) |
| Other controls | | | | |
| Black | | −0.1637*** | −0.1479*** | −0.1199*** |
| | | (0.0365) | (0.0345) | (0.0315) |
| Other non-white | | −0.2148*** | −0.2143*** | −0.0860 |
| | | (0.0635) | (0.0600) | (0.0548) |
| Female | | 0.0739*** | 0.0902*** | 0.0527** |
| | | (0.0274) | (0.0261) | (0.0237) |
| Some college | | 0.2015*** | 0.1946*** | 0.1057*** |
| | | (0.0304) | (0.0289) | (0.0264) |
| College degree | | 0.4438*** | 0.3990*** | 0.2618*** |
| | | (0.0313) | (0.0300) | (0.0276) |
| Married | | 0.4630*** | 0.4696*** | 0.1540*** |
| | | (0.0345) | (0.0326) | (0.0321) |
| Number of initial health conditions | | −0.0618*** | −0.0695*** | −0.0495*** |
| | | (0.0140) | (0.0132) | (0.0120) |
| Retirement plan at age 50 | | | 0.1795*** | 0.0625** |
| | | | (0.0265) | (0.0246) |
| Average indexed monthly earnings at age 50 | | | | 0.3712*** |
| | | | | (0.0158) |
| Start wave dummies included? | Yes | Yes | Yes | Yes |
| Number of observations | 3,219 | 2,288 | 2,288 | 2,263 |
| Pseudo-$R^2$ | 0.030 | 0.171 | 0.184 | 0.282 |

*Notes*: Regression is a quintile regression at the median. Standard errors are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.1.
*Source*: Authors' calculations from the Health and Retirement Study (1992–2016).

three basic categories (see Table 6).[22] The first group is defined by a lack of education: 15.4% of the Mostly Nontraditional sample lacks a high school degree. The second is defined by their marital status: the 35.5% of workers in this sequence are married and have an earning spouse. For these two groups, working in mostly nontraditional jobs makes sense. The less educated group likely has trouble finding good work, and the group with an earning spouse likely has much less need to hold a job with benefits. It is not as clear why a third group ends up in nontraditional work. This group is defined by not having an earning spouse, but otherwise appears fairly similar to the typical worker – albeit more likely to be non-white, slightly less educated, and slightly less healthy. Future work should investigate how workers who appear to be demographically similar end up in different work patterns in their early careers, but this question is beyond the scope of the current paper.

[22]Three groups were chosen because the Bayesian Information Criterion (BIC) was lower for three groups than for either two or four groups. An LCA analysis was also conducted for the more narrow definition of nontraditional work and is available upon request. Overall, the results were similar, with one group composed disproportionately of high school dropouts, the second of individuals in dual-earner relationships, and the third of individuals without an earning spouse. The main differences were that, under the narrow definition, the less-educated group included some high school graduates and the group without an earning spouse included no married individuals at all.

**Table 9.** Effect of select variables on likelihood of depression at age 62, no benefits definition

| | Specification | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Sequence (traditional = base case) | | | | |
| Mostly traditional | 0.0340* | 0.0279* | 0.0263* | −0.0017 |
| | (0.0174) | (0.0146) | (0.0146) | (0.0093) |
| Mostly nontraditional | 0.0591** | 0.0431** | 0.0350* | 0.0504*** |
| | (0.0245) | (0.0198) | (0.0199) | (0.0144) |
| Weak attachment | 0.0884*** | 0.0520*** | 0.0462*** | 0.0211* |
| | (0.0225) | (0.0173) | (0.0175) | (0.0114) |
| Early retirement | 0.1184*** | 0.0618*** | 0.0585*** | 0.0616*** |
| | (0.0222) | (0.0166) | (0.0166) | (0.0117) |
| Other controls | | | | |
| Black | | 0.0112 | 0.0111(0.0122) | −0.0111 |
| | | (0.0122) | | (0.0080) |
| Other non-white | | 0.0495** | 0.0500** | 0.0897*** |
| | | (0.0216) | (0.0216) | (0.0161) |
| Female | | 0.0159* | 0.0146 | 0.0158** |
| | | (0.0096) | (0.0096) | (0.0072) |
| Some college | | −0.0248*** | −0.0237*** | −0.0001 |
| | | (0.0087) | (0.0088) | (0.0068) |
| College degree | | −0.0576*** | −0.0557*** | −0.0351*** |
| | | (0.0077) | (0.0079) | (0.0062) |
| Married | | −0.0208** | −0.0210** | −0.0212*** |
| | | (0.0090) | (0.0090) | (0.0061) |
| Number of initial health conditions | | 0.0414*** | 0.0413*** | 0.0297*** |
| | | (0.0042) | (0.0042) | (0.0029) |
| Retirement plan at age 50 | | | −0.0131 | −0.0170*** |
| | | | (0.0089) | (0.0060) |
| Depression at age 50 | | | | 0.1638*** |
| | | | | (0.0134) |
| Start wave dummies included? | Yes | Yes | Yes | Yes |
| Number of observations | 3,909 | 2,870 | 2,870 | 1,761 |
| Pseudo-$R^2$ | 0.027 | 0.072 | 0.073 | 0.131 |

*Notes*: This table shows the average marginal effect on the probability of depression for each variable. Standard errors are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.1.
*Source*: Authors' calculations from the Health and Retirement Study (1992–2016).

### 5.2 Regression results

The regression results for retirement income are presented in Tables 7 (broad definition) and 8 (narrow definition) and for depression in Tables 9 and 10. In each table, four sensitivities are shown: (1) only sequence groupings (and year dummies) as independent variables; (2) adding demographics and initial health; (3) adding pension coverage; and (4) adding lifetime income or initial depression. Showing the regressions in this manner illustrates how much of the raw relationship between the sequence and the outcome of interest is explained away by the added factors.

Looking first at retirement income, under the broad definition of nontraditional work (Table 7) each sequence shown is associated with lower median retirement income than the base case (which is those in traditional jobs their entire late career). Focusing on those consistently in nontraditional jobs – the way in which most nontraditional jobs are used – this difference is nearly 28%. Moving to the second column, little of this difference is explained by demographics alone, as the coefficient remains at negative 26% even after these controls are introduced. Instead, much – but not all – of the difference is due to the availability of pensions and high lifetime income prior to late career; the coefficient drops to negative 7.7% by the time both these factors are introduced. The decline in the coefficient suggests much of the negative relationship between having a late-career work history defined by nontraditional work and retirement income is due to things that happened prior – perhaps

**Table 10.** Effect of select variables on likelihood of depression at age 62, no benefits with instability definition of nontraditional work

| | Specification | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Sequence (traditional = base case) | | | | |
| Mostly traditional | 0.0489*** | 0.0332** | 0.0317** | 0.0224** |
| | (0.0170) | (0.0136) | (0.0136) | (0.0098) |
| Mostly nontraditional | 0.0469 | 0.0338 | 0.0283 | 0.0483*** |
| | (0.0319) | (0.0259) | (0.0256) | (0.0185) |
| Weak attachment | 0.1620*** | 0.0958*** | 0.0881*** | 0.0577*** |
| | (0.0298) | (0.0225) | (0.0229) | (0.0153) |
| Early retirement | 0.0723*** | 0.0435*** | 0.0433*** | 0.0500*** |
| | (0.0189) | (0.0144) | (0.0143) | (0.0106) |
| Very early retirement | 0.1263*** | 0.0303 | 0.0275 | 0.0712*** |
| | (0.0305) | (0.0201) | (0.0199) | (0.0166) |
| Other controls | | | | |
| Black | | 0.0106 | 0.0105 | −0.0094 |
| | | (0.0122) | (0.0122) | (0.0081) |
| Other non-white | | 0.0456** | 0.0456** | 0.0798*** |
| | | (0.0211) | (0.0210) | (0.0155) |
| Female | | 0.0133 | 0.0121 | 0.0165** |
| | | (0.0096) | (0.0096) | (0.0073) |
| Some college | | −0.0239*** | −0.0228*** | −0.0005 |
| | | (0.0087) | (0.0088) | (0.0069) |
| College degree | | −0.0567*** | −0.0549*** | −0.0357*** |
| | | (0.0077) | (0.0080) | (0.0061) |
| Married | | −0.0240** | −0.0241** | −0.0253*** |
| | | (0.0102) | (0.0102) | (0.0072) |
| Number of initial health conditions | | 0.0420*** | 0.0419*** | 0.0298*** |
| | | (0.0042) | (0.0042) | (0.0030) |
| Retirement plan at age 50 | | | −0.0116 | −0.0188*** |
| | | | (0.0089) | (0.0060) |
| Depression at age 50 | | | | 0.1657*** |
| | | | | (0.0135) |
| Start wave dummies included? | Yes | Yes | Yes | Yes |
| Number of observations | 3,909 | 2,871 | 2,871 | 1,762 |
| Pseudo-$R^2$ | 0.029 | 0.074 | 0.074 | 0.127 |

*Notes*: This table shows the average marginal effect on the probability of depression for each variable. Standard errors are in parenthesis. ***p < 0.01, **p < 0.05, *p < 0.1.
*Source*: Authors' calculations from the Health and Retirement Study (1992–2016).

an entire career of nontraditional work. Still, the fact that the coefficient remains significant (at least at the 10-percent level) suggests that spending a majority of one's late career in nontraditional work likely does lower retirement income. The other coefficients in the regression are largely intuitive, with more education and marriage being associated with more retirement income and minority status and poor initial health with less.

Moving to the narrow definition of nontraditional work (Table 8), the overall interpretation of the results is similar. Perhaps the most notable difference is that, because the coefficient on the mainly nontraditional sequence starts out smaller initially, by the time all controls are introduced the result (negative 6.6%) is no longer statistically significant. The other coefficients are again intuitive.

Turning to a more holistic measure of well-being – depression – the results under the broad definition (Table 9) suggest that those in nontraditional jobs frequently are significantly more likely to be depressed than those consistently in traditional work. Furthermore, the effect is largely invariant to the controls added, with the sequence associated with a 5.9-percent increase in depression at 62 without controls and a 5.0-percent increase with the complete set of controls. Unlike in the case of retirement income, going to the narrow definition of nontraditional work (Table 10) does not affect the interpretation of the depression regression much – in the specification with full controls, being in the mostly

nontraditional sequence is associated with a 4.8-percent increase in the likelihood of depression. Again, the other coefficients are largely intuitive.

## 6. Conclusion

Despite the increased focus on nontraditional jobs in the popular press and academic literature, how older workers use these jobs and their effect on how well older workers are prepared for retirement has not been studied. Yet, working consistently in a job with benefits throughout one's 50s and early 60s is likely key to retirement preparedness. This paper uses sequence analysis to characterize how older workers use nontraditional jobs in their late careers and then regression analysis to see how these patterns relate to their available retirement income.

The results suggest that a third or less of workers have the 'ideal' sequence of late-career employment: a traditional job with benefits consistently from ages 50 to 62. Many retire early or have brief bouts of not working or nontraditional work and, worse, many have a weak attachment to the labor force or are in nontraditional jobs consistently. On the financial side, the regression results show that being employed frequently in nontraditional work during one's late career is associated with lower retirement income. And, while it's worth noting that a large fraction of the result is due to retirement coverage and low lifetime income *prior* to late-career, the result is still marginally significant even once controlling for these factors. The results for emotional well-being are more robust to these controls, and suggest consistent nontraditional work is associated with higher rates of depression. This finding illustrates the importance of attempting to expand benefits to these workers – for example through programs like state-level auto-Individual Retirement Accounts.

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## Appendix

**Table A1.** Transition substitution matrix for benefits only definition of nontraditional work

| Sequence state | Traditional | Nontraditional | Not working | Retired |
|---|---|---|---|---|
| Traditional | 0 | | | |
| Nontraditional | 1.67 | 0 | | |
| Not working | 1.71 | 1.72 | 0 | |
| Retired | 1.87 | 1.82 | 1.63 | 0 |

*Source:* Authors' calculations from Health and Retirement Study (1992–2016).

**Table A2.** Transition substitution matrix for benefits only and unstable hours definition of nontraditional work

| Sequence state | Traditional | Nontraditional | Not working | Retired |
|---|---|---|---|---|
| Traditional | 0 | | | |
| Nontraditional | 1.60 | 0 | | |
| Not working | 1.62 | 1.81 | 0 | |
| Retired | 1.82 | 1.86 | 1.63 | 0 |

*Source:* Authors' calculations from Health and Retirement Study (1992–2016).

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