

# Employment Pathways during Economic Recession and Recovery and Adult Health

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## Abstract

Our study bridges literatures on the health effects of job loss and life course employment trajectories to evaluate the selection into employment pathways and their associations with health in the short and medium terms. We apply sequence analysis to monthly employment calendars from a population-based sample of working-age women and men observed from 2009 to 2013 (N = 737). We identify six distinct employment status clusters: stable full-time employment, stable part-time employment, stably being out of the labor force, long-term unemployment, transition out of the labor force, and unstable full-time employment. After adjustment for sociodemographic characteristics and health at baseline, those who transitioned out of the labor force showed significantly poorer self-rated health at follow-up, whereas steadily part-time employed respondents still showed a greater risk of meeting criteria for major or minor depression. The findings have important implications for how social scientists conceptualize and model the relationship between employment status and health.

## Keywords

disparities, employment, recession, trajectory

Unstable employment arrangements have been linked to a range of health penalties (Bambra 2010; Benach et al. 2014), a troubling association given that recent decades have brought declining employment stability to many workers in the United States. Layoffs, restructuring, outsourcing, and nonstandard contracts have increased as employers have adapted to the changing global market (Kalleberg 2009). Prior research has demonstrated that job loss, unemployment, and even perceived job insecurity are all associated with worsened mental and physical health (Brand 2015; Burgard, Kalousova, and Seefeldt 2012). However, although the health penalties associated with job loss and unemployment are well documented, we know less about the health consequences of short- and medium-term employment *pathways* that may combine one or more job losses, unemployment periods, and “flexible” or part-time arrangements.

Research in the area of employment and health has usually conceptualized job loss as an isolated

disruptive event and unemployment as a well-defined period. However, even during periods of economic expansion, this conceptualization has missed considerable heterogeneity in the experience of these discrete, well-defined statuses. A typical working pathway measured by the Panel Study of Income Dynamics in the later twentieth-century United States included multiple experiences of job displacement, and a worker that experienced one disruption was more likely to experience another (Stevens 1997). In the twenty-first century, layoffs, restructuring, outsourcing, and nonstandard contracts have only increased as employers have adapted

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to the changing global market (Kalleberg 2009). Designating individuals as employed, unemployed, or not in the labor force at a single point in time thus obscures both variation in the actual experience of instability and the selection processes that lead to systematic stability or instability in employment pathways. This is problematic because opportunities for stable, full-time, and full-year employment arrangements that are often considered ideal and most healthful are not equally available to all adults.

Research by life course scholars offers an alternative, pathway-oriented approach to the study of complex employment and unemployment experiences and their connections to health. Using a very different temporal window, life course researchers have sought to capture individuals' entire working lives, characterizing and grouping common trajectories of labor force attachment. They have identified common career-long trajectories: being stably employed, stably not being in the labor force, employment that wanes across the career or ends earlier than is normative, a growing attachment to employment over the career, or intermittent employment across the career (García-Mangano 2015; Halpern-Manners et al. 2015). Research in this tradition has found better health outcomes among stably employed, occupationally upwardly mobile adults and worse prospects for those with disorderly or atypical life course work histories (Pavalko, Elder, and Clipp 1993; Wilensky 1961). Such studies can illustrate cumulative advantage and disadvantage in labor force attachment patterns over decades and their implications for health in late life. However, they must necessarily summarize many years' worth of labor force experiences, potentially disguising meaningful variant pathways over shorter periods. If entire careers are the focus, the potential connections between economic fluctuations and health changes in the shorter run become invisible.

A final challenge to understanding the associations between employment pathways and well-being is to accommodate the multiple causal directions in which they can run. Selection of healthier persons into employment and more challenging employment pathways is a well-known occurrence labeled the "healthy worker" effect (Li and Sung 1999). Our study provides a bridge between these research traditions and combines them to capitalize on their strengths. By implementing the pathway approach embraced by life course researchers to study short- and medium-term employment experiences, we overcome the limitations of the single-event, transition-oriented approach while capturing short-term variation that

life course studies sometimes have to forego. By considering how health and other characteristics may shape the pathways workers take, we address the complex reciprocal associations of employment and health.

We ask three research questions that aim to advance our understanding of employment pathways during and in the immediate aftermath of a major economic downturn and their connections to health. First, what were the typical patterns of working-age U.S. adults' employment pathways during and after the Great Recession in southeastern Michigan? Second, what sociodemographic characteristics predicted selection into specific pathways? Finally, what were the associations between specific pathways and health net of health and other selective factors at baseline? We use monthly employment status data from a population-representative sample collected in southeastern Michigan and identify typical pathways by sequence analysis and cluster analysis. Our regression results show the importance of gender, race, socioeconomic status, and health in channeling adults into distinctive pathways but that even net of these selection forces, in some cases, short-term differences in the nature and stability of employment pathways are linked to differences in subsequent health.

## BACKGROUND

### *Employment Status and Health*

The work benefits model proposes that employment is associated with health because of the positive resources that it brings, including power, health-enhancing social networks, positive social identity, and access to critical material resources, such as income and health insurance (for a discussion, see Pavalko and Smith 1999). These benefits of employment are expected to increase with employment intensity. Some conceptual approaches situate all employment arrangements between "full standard employment" and being permanently out of the labor force as "precarious" employment, and it is potentially the most harmful of the three arrangements (Benach et al. 2014). Intermittent employment means the opportunity to accumulate at least some of the benefits of work, which may be especially valuable when work is scarce, but those frequently moving in and out of paid work are more likely to see human capital erode between employment spells, experience poor-quality employment arrangements when they do find work, fail to achieve a normatively stable career path, and

undergo the strain of frequent transitions. In comparison to those who are stably full-time employed, those who consistently work part-time accumulate fewer of the material and social benefits that accrue on the job, and they may also be more likely to work nonstandard hours and less likely to have access to health insurance and other benefits (Frech and Damaske 2012).

Consistent with expectations of the work benefits model, a wide variety of studies that compared the health and well-being of people in different employment statuses have shown that employed adults have the best mental and physical health (Klumb and Lampert 2004; Repetti, Matthews, and Waldron 1989) compared to both the unemployed (Wanberg 2012) and working-aged adults who are not in the labor force (Andersen et al. 2016; Montez et al. 2015). Among those working for pay, part-time workers have generally been found to be less healthy than full-time workers (Kleiner and Pavalko 2010). In contrast, the healthy worker hypothesis suggests that poor health influences the likelihood of becoming or staying employed. It argues that workers are healthier because health predicts working, rather than due to salutary benefits of working. Past studies have confirmed the importance of poor health as a predictor of labor force activity but have found that positive associations between employment status and subsequent health typically remain (Klumb and Lampert 2004).

A third perspective emphasizes that changes in employment status, particularly those that are involuntary and mark a departure from the role norm, are stressful life events that can negatively affect health (Kessler 1997; Pearlin et al. 2005). Considerable evidence links job loss with poorer health (Brand 2015), and other types of employment transitions may also increase stress and eliminate work benefits. For example, U.S. early retirees had less favorable changes in self-reported physical health than those who left work at the normal retirement age even after adjusting for the possibility that health or other factors precipitated their early retirements (Calvo, Sarkisian, and Tamborini 2013). Recent research on stay-at-home mothers shows that even a voluntary withdrawal from the labor force in midlife can have negative implications for subsequent physical and mental health (Frech and Damaske 2012). Additionally, a review of recent studies found that moving from unemployment into employment is linked to a lower risk of depression compared to remaining unemployed, although associations with general health were more mixed (van der Noordt et al. 2014).

The consequences of job loss on the duration of unemployment and the magnitude of wage penalties are more severe during economic downturns, and the consequences last longer. A study of mass layoffs during the 1982 recession showed that even 15 to 20 years after workers were laid off, their annual earnings were still 20% lower than those of comparable workers who did not suffer a layoff (Von Wachter, Song, and Manchester 2009). Research on how economic conditions might moderate the relationship between job loss, unemployment, and health has been more limited. Work by Pearlman (2015) using the Wisconsin Longitudinal Study found that health consequences of job loss were longer lasting when it was experienced during a period of high unemployment.

### *Long-Term Employment Pathways and Health*

Researchers have increasingly recognized the need to consider statuses and changes in the context of longer employment pathways as they unfold over time and over varied economic conditions. Studies applying a life course perspective and examining employment experiences over many decades have shown the importance of employment status durations and the way they are sequenced in stable and normative—or more volatile and atypical—employment careers (Hynes and Clarkberg 2005; Pavalko and Smith 1999; Sabbath et al. 2015). For example, a study of U.S. women who became mothers between 1978 and 1995 found that Short Form 12-item (SF-12) physical health scores at follow-up were significantly worse among those with subsequent part-time or waning labor force attachment, intermittent attachment, or labor force withdrawal in comparison to those who were full-time employed. SF-12 mental health scores were worse among the intermittently employed (Frech and Damaske 2012). Swedish women and men born in 1965 also experienced substantially greater psychological distress and poorer self-rated health at age 42 if they showed a 12-year work history of poor labor market attachment than if they were permanently employed over the period. Those whose employment waned slightly or strengthened over follow-up showed greater depressive symptoms and slightly worse self-rated health profiles (Waenerlund et al. 2014).

Research in this stream has generally suggested that intermittent attachment, instability, and atypical sequencing are associated with poorer health outcomes. Other research has suggested that the

negative consequences of unemployment increase with its duration (Janlert, Winefield, and Hammarström 2015; McKee-Ryan et al. 2005), although some have argued for a waning of negative impacts with duration as adaptation to circumstances is made by some groups of workers (Warr, Jackson, and Banks 1982).

### *Medium- and Short-Term Pathways and Health*

Most recently, researchers have begun to combine the employment status and job loss literatures with the pathway-oriented approach of life course researchers to examine short- and medium-term trajectories and their relationship to health over periods of economic growth and contraction. For example, Finnish female workers with temporary contracts at baseline reported their labor market status at four time points from 1998 to 2002, a period of declining unemployment in Finland followed by economic stagnation. Researchers found that trajectories that moved workers toward the labor market periphery were associated with poorer health, whereas those moving them toward more permanent employment were associated with better health (Virtanen et al. 2005). A study of Italian adults followed from 2007 to 2010, identified eight common employment pathways: stable employed, stable self-employed, discontinuously employed, entrants to the labor force, precarious workers with frequent job changes, workers who left the labor market, long-term unemployed, and those not in the labor force over follow-up, with the precarious, ejected, and unemployed more likely to worsen in self-rated health over follow-up (Sarti and Zella 2016). Another study, focusing on short-term trajectories of new mothers in the United States, found a great deal of heterogeneity in their labor force attachment both before and after birth. The authors showed that new mothers who had stable full-time employment before delivery were very likely to continue working in the year that immediately followed birth. The study also highlighted the sociodemographic factors associated with selection into stable pathways (Lu, Wang, and Han 2017).

Although these studies point toward considerable variation in short-run employment arrangements that predict health change over medium- and short-term, they have been carried out in societies with differing social contexts and social welfare arrangements than the United States or only for very particular subgroups, leaving their implications for

the broad range of U.S. workers unclear. Moreover, no study has focused on employment pathways during and in the aftermath of a major economic downturn.

### *Anticipated Predictors and Consequences of Divergent Employment Status Pathways*

Our first goal is to characterize common employment status pathways of adults over several years in a regional U.S. labor market. Based on previous studies, we anticipate that most pathways will include spells of full- or part-time employment of varying durations. Employed periods may be punctuated by periods of unemployment or time out of the labor force and will likely show variation in overall levels of stability or volatility.

Our second goal is to assess key predictors of employment pathways among working-aged adults experiencing the Great Recession and its aftermath. Selection into different pathways on the basis of sociodemographic characteristics and health drives their potential to influence inequality, and adjusting for these predictors is important when assessing whether they are associated with changes in subsequent health. Past research suggests that gender strongly shapes patterns of paid employment and that due to women's dual roles as workers and primary caregivers, they show greater heterogeneity in employment pathways and have a lower likelihood of steady, full-time employment than men (e.g., Han and Moen 1999; Lacey et al. 2015; Wahrendorf 2015). Because they often leave early or delay entry into the labor force due to childbearing and primary parenting responsibilities in early adulthood to midadulthood, women are more likely to show a growing attachment to the labor force or intermittent paid work histories, although there is considerable variation among women by socioeconomic status, race and ethnicity, and other sociodemographic characteristics (Lu et al. 2017). Women are also more likely to consistently work part-time than men and to not be in the paid labor force during midlife.

Educational attainment and race and ethnicity are major determinants of stability and predictability of employment experiences over adulthood because they mark variation in credentials and other human capital resources as well as differences in access to good jobs based on community of residence, the availability of employment opportunities embedded in social networks, and employer discrimination

(Alon and Haberfeld 2007; Spilerman 1977). Members of some racial and ethnic minority groups, people with low socioeconomic status, and women are more likely to work in contingent jobs (Kalleberg 2009) and to face challenges in getting the work hours they would prefer (Reynolds 2003). Additionally, as noted by the healthy worker hypothesis and prior research, poor health also shapes subsequent labor market attachment patterns (Ross and Mirowsky 1995). For example, a study of midlife U.S. men and women found that part-time workers had worse physical health and more depressive symptoms than their full-time counterparts and that these health differences could be explained partly by their greater likelihood of having health problems earlier in life in addition to their lower education and lesser likelihood of having an employed spouse (Kleiner and Pavalko 2010).

Evidence from past studies thus suggests that on average, women, members of some racial and ethnic minority groups, and adults with low education and poor health status will experience less favorable employment status pathways in terms of the potential healthfulness of statuses they inhabit, their sequencing, and their stability over time (O'Rand 2011). We expect that compared to men, non-Hispanic whites, the highly educated, and healthy adults, these less advantaged groups will be on average more likely to work part-time, experience long-term unemployment, not be in the labor force over the period of observation, or experience intermittent employment or otherwise volatile employment status pathways. Moreover, even workers who traditionally would be expected to be stable and secure in their employment, such as older workers, might suffer instability during a period of a severe economic downturn (Hoynes, Miller, and Schaller 2012).

Our final aim is to assess whether any employment status pathways during and in the immediate aftermath of the Great Recession were associated with changes in self-rated health or depression and whether any differences across pathway types persist after we account for sociodemographic and health selection.

We anticipate the most unfavorable health changes among the long-term unemployed, who have lost all benefits of work and face potential degradation of job-specific skills, seniority, and job-relevant networks as well as the stressfulness of uncertain future opportunities and the failure to fulfill a desired role (Janlert et al. 2015). Stably being out of the labor is least promising in terms of accumulating work benefits, although it may be less

stressful than the persistent uncertainty of unemployment or the volatility of many status changes, depending on the reasons for not being employed. However, adults who do not work for pay may have serious health problems that limit their ability to work (Pavalko, Gong, and Long 2007) or may be engaged in full-time caregiving that brings its own stresses (Pavalko and Woodbury 2000). We also anticipate that adjusting for gender, race, educational attainment, health, and other factors at baseline will account for some but not all the differences in health changes experienced by those in employment status pathways diverging from stable, full-time employment.

Like prior studies of women's work pathways (Frech and Damaske 2012; Pavalko and Smith 1999), we explore the way that both physical and mental health may be predictors and consequences of distinctive employment pathways for women and men. Given the limited previous research considering the detailed employment pathways of U.S. adults, we chose to explore measures of self-rated health and symptoms of major or minor depression to provide a view of commonly used health indicators. Studies have found, for example, that earlier poor self-rated was a predictor of who would go on to become unemployed (Virtanen et al. 2005) but also that self-rated health decreases following unemployment (Trias-Llimós et al. 2017). However, there is insufficient previous evidence to form strong expectations about how each may be linked to distinctive employment pathways, particularly in the United States, where protections for unemployed and nonemployed adults are weaker than in many of the nations where previous research has been conducted.

## DATA AND METHODS

### *Data*

Michigan Recession and Recovery Study (MRRS) data were initially collected for a stratified random sample of English-speaking adults 19 to 64 years old who lived in southeastern Michigan (Macomb, Oakland, and Wayne counties) during the Great Recession. MRRS was designed with an oversample of African Americans and included mainly African American and non-Hispanic white respondents, reflecting the local residents. The baseline wave was fielded from October 2009 to April 2010, second-wave interviews were conducted from April to August 2011, and the third wave was collected from June to October 2013. Most interviews were conducted in person and a small number by phone for Waves 1 and 2, whereas for Wave 3, most were

administered over the phone. Wave 1 included 914 respondents with a response rate of 83%, Wave 2 reinterviewed 847 respondents with a response rate of 94% of survivors from Wave 1, and Wave 3 reinterviewed 791 respondents with a response rate of 90% of survivors from Wave 2. Survey weights calculated for each wave make the MRRS representative of adults 19 to 64 years old who were living in the three-county area of southeastern Michigan in late 2009; in Waves 2 and 3, survey weights address attrition.

The analytic sample included respondents who were interviewed in all waves and provided their employment status for each month between their first and last interview ( $N = 737$ ). Exploration of attrition showed that those in the analytic sample were more likely to have at least a bachelor's degree and were more likely to be married and to have health insurance at baseline but did not differ significantly from the original sample in sex, race, age, baseline health, or the presence of children in the home. Approximately 13% of respondents did not report their household income at baseline, and there was a minimal amount of item missing data on other indicators. We multiply imputed missing values using IVEware software, generating five imputed data sets, and used these for all analyses. Imputed values for dependent variables were not used in regression analysis.

### Measurement of Employment Status and Change

Monthly employment status was collected retrospectively at each of the three interviews. Early in their interview, the respondent consulted a calendar worksheet with the following instructions:

For each of the months, starting with [January 2007 (for the baseline interview)/the last month recorded at their previous interview], please tell me if you were working full-time, that is, working 35 or more hours per week; working part-time, that is working less than 35 hours per week; unemployed; or not in the labor force, meaning that you are not working and not seeking work.

After they filled out the worksheet, a trained interviewer coded their responses and continued with the remainder of the interview. Respondents interviewed over the phone received the employment calendar worksheet by mail as a part of their survey booklet. Nearly all had filled out the calendar in

person in the first two interviews and were familiar with the format by the time they did so over the phone in the third interview. We constructed an individual employment pathway for every respondent based on their monthly employment status.

### Health Measures

At each wave, all respondents were asked: "Would you say that your health in general is excellent, very good, good, fair, or poor?" We used this standard measure of poor self-rated health in its continuous form, where poor health equaled 5 and excellent health equaled 1. Depression was measured using the Patient Health Questionnaire, a validated nine-item scale based on the diagnostic criteria for major depressive disorder in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders*. Respondents were classified as meeting the symptomatic criteria for major or minor depression (1) or not (0) according to standard guidelines (Martin et al. 2006).

### Other Measures

We adjusted for other characteristics that predict employment or health, including age in years, male gender, bachelor's degree or more versus less education, married status versus any other marital status, the number of children residing in the household, natural log of household income per capita for 2008, health insurance status, and whether a respondent had any health condition that limited their ability to work, all measured at baseline. African American race versus other racial identity was also included because of the substantial disadvantages this group faces in the labor market and the very small number of respondents who were not non-Hispanic white or non-Hispanic black, a function of the population in the sampling frame. In some models, we also included the baseline value of the health measure at follow-up that was being evaluated as the outcome in that model.

### Analytic Strategy

First, we constructed an employment status sequence for each respondent based on the monthly employment calendar using mutually exclusive statuses: employed full-time, employed part-time, unemployed, or not in the labor force (defined here as months in which the respondent was a student, a homemaker, retired, or stopped looking for work for another reason). The entire sequence, from the



**Figure 1.** Michigan Recession and Recovery Study (MRRS) Sample Employment over Time. Note: NILF = not in labor force; Waves 1 through 3.

month after their first interview to the month prior to their last interview, spanned between 38 and 44 months, depending on each respondent's first and last interview dates. We then applied an optimal matching algorithm developed by Needleman and Wunsch (1970) that summarized the difference between every possible pair of sequences by calculating the minimal cost of transforming one sequence into another by inserting, deleting, or substituting other elements. The indel cost, or the cost of a single change, was set to 1. By applying the optimal matching algorithm to every possible pair, we obtained a symmetrical substitution cost matrix. The matrix was then used to supply the starting values of an agglomerative hierarchical clustering procedure. We employed Ward's method of agglomeration, which joins clusters based on evaluating which two of all possible cluster merges will have the lowest within-cluster variance. In agglomerative clustering, the decision of how many clusters are appropriate is driven by the investigator's theoretical knowledge and analytic preferences. After visually inspecting the dendrogram of agglomeration, we concluded that a six-cluster solution was optimal. We also explored alternative algorithms, which placed greater importance on local matching, matching of ordered sequences, and matching of spells. Results were similar to the optimal matching strategy we selected.

We examined sociodemographic predictors of employment status sequence type with bivariate

descriptive statistics and a multinomial regression model. Then, we estimated ordinary least squares and logistic regression models with sequence type as the focal predictor of health at Wave 3. To account for selection into sequence type due to baseline sociodemographic characteristics or health, we progressively adjusted for these in nested models. All descriptive statistics, comparisons, and multivariable regression models used survey weights. Survey weights were also incorporated into imputation models. Sequence analysis was conducted in R using the *TraMineR* package (Gabadinho et al. 2011). Following convention, survey weights were not used in sequence analysis. Regression analysis was performed in Stata 15 using methods appropriate for multiply imputed data (StataCorp 2017).

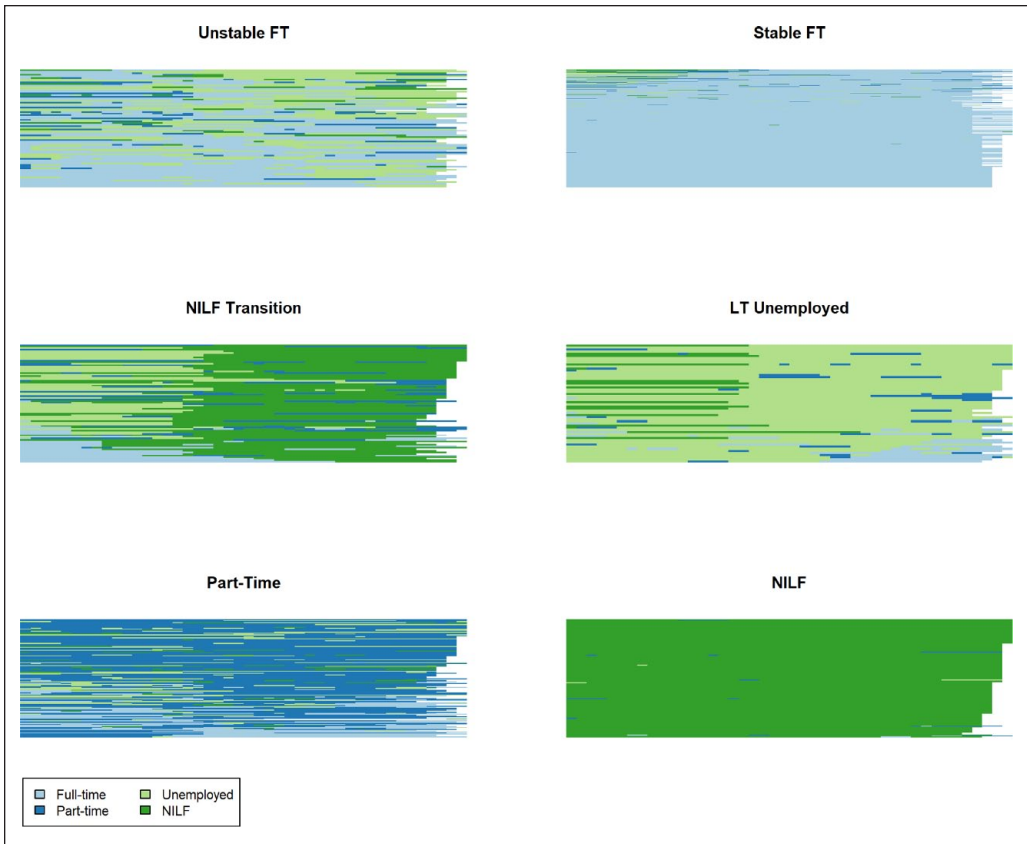
## RESULTS

### *Employment Status Sequences*

The top panel of Figure 1 shows that about 45% of MRRS respondents were full-time employed in both the first and the last month of observation, whereas the percentage working part-time increased slightly from about 17% to 19%.

Considering the aggregate experiences of the sample masks the individual-level sequence heterogeneity evident in the bottom panel of Figure 1. Although about one-third of the sample experienced no interruptions or only very short interruptions to full-time employment over this period (reflected in the solid blue sequence lines at the bottom of the panel), the remainder of the sample were stably in less optimal employment statuses or experiencing volatility.

Figure 2 shows the results of the clustering procedure, yielding six sequence types that we consider common employment status pathways in our sample. Type 1 (15% of weighted sample) is comprised of respondents who were unstably full-time employed, spending some spells in full- or part-time employment, and others unemployed or not in the labor force. Type 2 (44%) captures those who were most stably full-time employed. Type 3 (8%) includes respondents who were transitioning out of the labor force from long spells of unemployment or from full- or part-time employment. Type 4 (6%) captures the long-term unemployed, whereas those in Type 5 (13%) spent most of the study period working part-time, although some spent spells in other statuses. Respondents classified in sequence Type 6 (14%) were stably out of the labor force.



**Figure 2.** Michigan Recession and Recovery Study (MRRS) Analytic Sample Individual Employment Trajectories across Time Stratified by Employment Trajectory Cluster.

Note: FT = full-time; LT = long-time; NILF = not in labor force; Waves 1 through 3; Unstable FT = Type 1; Stable FT = Type 2; NILF Transition = Type 3; LT Unemployed = Type 4; Part-Time = Type 5; NILF = Type 6.

### Predictors of Employment Status Pathways

Table 1 presents characteristics of respondents stratified by employment status pathway. Stably full-time employed Type 2 respondents are the most socially advantaged group on every dimension. Fifty-nine percent of those in stably full-time employed were male, whereas men made up only about a third of those who transitioned out of the labor force (Type 3)—and 26% of those who mainly worked part-time (Type 5). African Americans accounted for about half of those in long-term unemployment (Type 4) and in the group transitioning out of the labor force (Type 3), whereas they made up only 25% of the sample overall and 16% of the stably full-time employed (Type 2). Nearly 40% of the stably full-time employed had a bachelor's degree or more compared to only 13% of the long-term unemployed (Type 4), 14% of the unstably

employed (Type 1), and 17% among those not in the labor force (Type 6).

We find little variation in marital status across employment status pathways except for the long-term unemployed (Type 4), among whom only about a third were married. Unstably employed respondents (Type 1) were youngest, with an average age of 38.0, whereas those not in labor force (Type 6) were oldest, with an average age of 51.7 when the study started. Stably full-time employed respondents (Type 2) reported the highest household income per capita, averaging \$32,785, whereas the long-term unemployed (Type 4) reported the lowest, at \$12,737. Stably full-time employed respondents were also among the most likely to have some type of health insurance, at 88%, compared to only about 61% of the long-term unemployed. Over half of those not in the labor force (Type 6) reported a work-limiting condition—nearly 3 times as many as in the analytic sample overall.



**Table 1.** Descriptive Characteristics of the Michigan Recession and Recovery Study Analytic Sample Stratified by Employment Trajectory Clusters, Presented as Means with Standard Deviations or Percentages.

	% or Mean						
	Sample Overall	Type 1: Unstable Full-Time	Type 2: Stable Full-Time	Type 3: Out of Labor Force Transition	Type 4: Long-Term Unemployed	Type 5: Part-Time	Type 6: Not in the Labor Force
<i>Measured at Wave 1</i>							
Male	48%	58%	59%	34%	47%	26%	37%
African American	25%	27%	16%	50%	45%	22%	32%
BA or more	30%	14%	39%	29%	13%	31%	17%
Married	56%	56%	59%	49%	35%	57%	56%
Age	41.63	38.00	39.74	44.10	39.45	40.10	51.70
SD	12.62	12.63	10.50	13.58	13.06	13.01	11.05
Household income in 2008 per capita	\$26,654	\$24,188	\$32,785	\$20,359	\$12,737	\$22,449	\$21,436
SD	\$24,124	\$22,229	\$34,010	\$18,377	\$11,854	\$18,007	\$16,098
Health insurance	82%	67%	88%	82%	61%	70%	90%
Work-limiting condition	18%	13%	9%	22%	21%	17%	53%
Any children in the household	47%	58%	51%	48%	47%	52%	19%
<i>Measured between Wave 1 and Wave 3</i>							
Any unemployment	37%	99%	20%	53%	100%	53%	1%
Months unemployed	5.34	15.24	.98	7.13	33.52	5.68	.03
SD	6.28	6.32	2.41	7.74	8.24	7.67	.58
<i>Measured at Wave 1 and at Wave 3</i>							
Self-rated health at Wave 1 (poor = 5)	2.45	2.63	2.16	2.77	2.38	2.44	3.15
SD	1.20	1.24	.99	1.14	1.19	1.07	1.28
Self-rated health at Wave 3 (poor = 5)	2.51	2.69	2.22	2.98	2.71	2.37	3.17
SD	1.17	1.12	.93	1.20	1.19	1.13	1.26
Minor or major depression at Wave 1	14%	23%	7%	14%	34%	17%	21%
Minor or major depression at Wave 3	12%	18%	5%	20%	17%	19%	15%
N (unweighted)	737	76	276	75	55	118	116

Note: Population survey weights were applied. BA = bachelor's degree; Waves 1 through 3.

Table 1 also shows that those who were stably full-time employed (Type 2) were healthiest, with a mean poor self-rated health value of 2.2 (approximately very good health) at baseline, whereas those not in the labor force (Type 6) reported scores that averaged 3.2 (good health). Over the study period, stably full-time employed respondents and those not in the labor force maintained a consistent gap in levels of self-rated health, whereas long-term unemployed (Type 4) showed the largest worsening, rising from 2.4 to 2.7. Stably full-time employed respondents were also least likely to meet criteria for major or minor depression over the study period (7% at baseline, 5% at Wave 3). The

long-term unemployed (Type 4) were most likely to meet criteria for depression at baseline, although over follow-up, this percentage dropped substantially from 34% to 17%.

In Table 2, we present results from a multinomial logistic regression model evaluating the predictors of each employment pathway compared to being stably full-time employed (Type 2). These relative risk ratios show that even after adjusting for other characteristics, men were significantly less likely than women to transition out of the labor force (Type 3), to be stably working part-time (Type 5), or to be stably out of the labor force (Type 6) compared to staying stably full-time employed.

**Table 2.** Relative Risk Ratios and Standard Errors (in Parentheses) from Multinomial Logistic Regression Model Predicting Trajectory Type in the Michigan Recession and Recovery Study Analytic Sample.

	Model 1				
	Type 1 vs. Type 2	Type 3 vs. Type 2	Type 4 vs. Type 2	Type 5 vs. Type 2	Type 6 vs. Type 2
Male	.93 (.22)	.34** (.11)	.62 (.32)	.21*** (.08)	.34* (.17)
African American	1.62 (.55)	4.53** (2.14)	3.47* (1.62)	1.32 (.40)	1.96 (.77)
BA+	.32** (.09)	1.02 (.26)	.35* (.15)	.93 (.27)	.48† (.17)
Married	1.85 (1.06)	.88 (.27)	.82 (.50)	1.54 (.56)	.74 (.30)
Age	1.00 (.02)	1.04† (.02)	1.03 (.03)	1.02 (.01)	1.08** (.03)
LN household income in 2008 per capita	1.07 (.09)	.87 (.09)	.88 (.12)	.95 (.09)	.78** (.06)
Has health insurance	.30* (.14)	.54 (.28)	.25* (.15)	.18** (.09)	.62 (.42)
Work limitation	1.08 (.93)	1.36 (.83)	1.77 (1.18)	1.62 (.87)	3.40** (1.44)
Children in the household	1.56 (1.11)	.51 (.25)	.48 (.26)	.74 (.28)	.13*** (.06)
Self-rated health at Wave 1	1.10 (.24)	1.36* (.18)	.77 (.20)	1.07 (.16)	1.51* (.27)
Major or minor depression at Wave 1	3.02* (1.23)	1.20 (.69)	5.78* (4.53)	1.68 (.96)	1.85 (1.19)
N			737		

Note: Population survey weights were applied. LN = natural log; Type 1 = unstable full-time; Type 2 = stable full-time; Type 3 = out of labor force transition; Type 4 = long-term unemployed; Type 5 = part-time; Type 6 = not in the labor force; Waves 1 through 3.

† $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

African Americans were more likely than others to transition out of the labor force over follow-up (Type 3) or to be long-term unemployed (Type 4). Respondents with a bachelor's degree or more were significantly less likely than those with less education to be unstably employed (Type 1) or to be long-term unemployed (Type 4). Net of other factors, respondents who were stably out of the labor force (Type 6) were older than the stably full-time employed and more likely to have a work-limiting condition. Those with worse self-rated health were more likely to transition out of the labor force (Type 3) or to be stably out of the labor force (Type 6), whereas respondents meeting criteria for major or minor depression at baseline were substantially more likely to be unstably employed (Type 1) or long-term unemployed (Type 4) than to be stably full-time employed.

### Employment Status Pathways and Self-Rated Health and Depression

In Table 3, we examine the associations between membership in each employment pathway and poor self-rated health at follow-up with a set of ordinary least squares regression models. In Model 2, before adjustment for any sociodemographic differences across groups, we find that respondents in every pathway except part-time work (Type 5) report significantly poorer self-rated health when compared to stable full-time workers, and in most cases, these differences are substantial in magnitude. After adjusting for sociodemographic characteristics across pathway type groups in Model 3, the magnitude and significance of differences in self-rated health at follow-up weakens, but respondents who transitioned out of the labor force (Type 3) and those

**Table 3.** Coefficients and Standard Errors (in Parentheses) from Ordinary Least Squares Regression Models Predicting Self-Rated Health at Wave 3 (1 = Excellent, 5 = Poor) by Employment Trajectory Type in the Michigan Recession and Recovery Study Analytic Sample.

	Model 2	Model 3	Model 4
	SRH at W3	SRH at W3	SRH at W3
Cluster type <sup>a</sup>			
Type 1 (unstable full-time)	.47* (.18)	.25 (.16)	.14 (.10)
Type 3 (out of the labor force transition)	.77*** (.15)	.47** (.12)	.28** (.10)
Type 4 (long-term unemployed)	.50 <sup>†</sup> (.26)	.13 (.29)	.23 (.18)
Type 5 (part-time)	.16 (.12)	-.05 (.16)	-.09 (.12)
Type 6 (not in the labor force)	.95*** (.23)	.46* (.18)	.18 (.14)
Male	—	-.05 (.13)	-.02 (.09)
African American	—	.31* (.15)	.12 (.12)
BA+	—	-.22* (.09)	.03 (.09)
Married	—	-.03 (.15)	-.05 (.11)
Age	—	.01* (.004)	.01 <sup>†</sup> (.004)
LN of household income in 2008	—	.02 (.02)	.01 (.02)
Health insurance	—	-.51** (.14)	-.28** (.09)
Work-limiting condition	—	.74*** (.14)	.25 <sup>†</sup> (.12)
Any children in the household	—	.24 (.19)	.07 (.14)
SRH at W1	—	—	.58*** (.04)
Constant	2.22*** (.07)	2.01*** (.23)	.80** (.27)
F	8.13	54.93	165.75
df	5	14	15
Prob > F	<.001	<.001	<.001
N	737	737	737

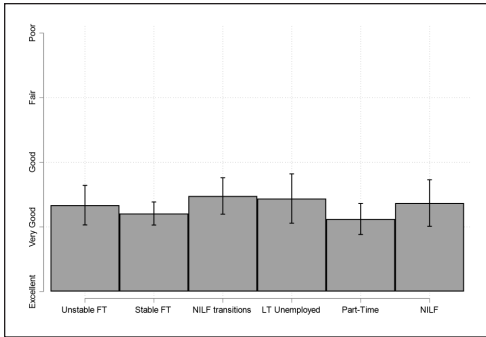
Note: Population survey weights were applied. LN = natural log; BA+ = bachelor's degree or higher; SRH = self-rated health; W1 = Wave 1; W3 = Wave 3.

<sup>a</sup>Type 2 (stable full-time omitted).

<sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

who were stably out of the labor force (Type 6) continue to show statistically significantly worse self-rated health. These models also reveal poorer self-rated health for African Americans, older

respondents, and those with a work-limiting condition and significantly better health for those with at least a bachelor's degree and those with health insurance. In Model 4, we further adjust for



**Figure 3.** Predicted Self-Rated Health at Follow-Up for a 45-Year-Old Man in Very Good Health at Baseline Based on Model 4 (All Other Covariates Held at Means),  $N = 737$ .

Note: Statistically significant differences in expected values to .05 level: Type 2 and Type 3, Type 3 and Type 5, and Type 5 and Type 4. Type 1 = unstable full-time; Type 2 = full-time; Type 3 = out of the labor force transition; Type 4 = long-term unemployment; Type 5 = part-time; Type 6 = not in the labor force; FT = full-time; LT = long-time; NILF = not in labor force; Unstable FT = Type 1; Stable FT = Type 2; NILF Transition = Type 3; LT Unemployed = Type 4; Part-Time = Type 5; NILF = Type 6; Waves 1 through 3 of the Michigan Recession and Recovery Study.

self-rated health at baseline and find that this accounts for the difference between those who were stably out of the labor force (Type 6) and the stably full-time employed. Those who transitioned out of the labor force during the study period (Type 3) continue to show significant worsening in self-rated health, although the difference is further reduced.

Figure 3 presents the results from Model 4 visually. We estimated the predicted self-rated health score for a 45-year-old man with less than a bachelor's degree who reported very good health (2.0) at baseline (other predictors were set at their mean values). The figure shows that although respondents in all pathways report some worsening from very good self-rated health at follow-up, the worsening appears most notable for those transitioning out of the labor force (Type 3), the long-term unemployed (Type 4), and those not in the labor force (Type 6). Below the figure, we show whether the difference between the predicted probabilities for all trajectory pairs was statistically significant based on Wald tests. Please see Appendix Table A1 for full test results.

Table 4 presents results of logistic regression models predicting whether respondents met criteria for major or minor depression at follow-up. For ease of interpretation, we report the results as average

marginal effects, which allow for comparison across nested models (Mood 2010). The results presented for Model 5 show that compared to the stably full-time employed, respondents in most other pathways (with the exception of the long-term unemployed) have significantly higher likelihood of depression. After adjusting for sociodemographic characteristics that select respondents into these different pathways in Model 6, differences are reduced and are no longer statistically significant except for the unstably employed group (Type 1) and those working part-time (Type 5), although the latter was statistically significantly different at the .1 level only. Net of other adjustments, the only other statistically significant predictors increasing the likelihood of meeting criteria for major or minor depression were having a work-limiting condition and the presence of children in the household. After adjusting for depression at baseline in Model 7, respondents working mainly part-time over follow-up remained more likely to meet criteria for depression at follow-up. The difference between unstable and stable full-time employed was statistically significant at the .1 level.

In Figure 4, we display the results from Model 7 in Table 4 graphically, showing the predicted probabilities of meeting criteria for minor or major depression for a 45-year-old man with less than a bachelor's degree who was not classified as depressed at baseline. These predicted values highlight the greater risk of those stably working part-time (Type 5), unstably full-time (Type 1), and transitioning out of the labor force (Type 3) over follow-up. Although the predicted probability does not exceed .10 for the long-term unemployed, stably full-time employed, or those who were not in the labor force over the observation period, people in Type 1, 3, and 5 trajectories with the same characteristics have an estimated probability of depression more than twice as high. Below the figure, we show whether the difference between the predicted probabilities for all trajectory pairs was statistically significant based on Wald tests. Please see Appendix Table A1 for full test results.

### Sensitivity Analyses

We considered several alternative specifications of the cluster solutions and regression models. In calculating sequence similarity, we assigned varying indel costs for different types of operations and for transforming one type of status sequence point into another. Although these alternate specifications led to cluster reassignment for several respondents on the fringes of their groups, our solution was generally robust to cost changes. We also considered cluster

**Table 4.** Average Marginal Effects and Standard Errors (in Parentheses) from Logistic Regression Models Predicting Major or Minor Depression at Follow-Up.

	Model 5	Model 6	Model 7
	Major or Minor Depression at W3	Major or Minor Depression at W3	Major or Minor Depression at W3
Cluster type <sup>a</sup>			
Type 1 (unstable full-time)	.13** (.04)	.10* (.04)	.06† (.03)
Type 3 (out of the labor force transition)	.15** (.05)	.08 (.05)	.08 (.05)
Type 4 (long-term unemployed)	.08 (.06)	.03 (.04)	.00 (.03)
Type 5 (part-time)	.14* (.06)	.10† (.05)	.09* (.04)
Type 6 (not in the labor force)	.10* (.04)	.01 (.03)	-.003 (.02)
Male	—	-.02 (.03)	-.004 (.03)
African American	—	.02 (.03)	.03 (.02)
BA+	—	-.06 (.05)	-.05 (.04)
Married	—	-.01 (.04)	-.01 (.03)
Age	—	.0003 (.001)	.0002 (.001)
LN of household income in 2008	—	.01† (.01)	.01 (.00)
Health insurance	—	-.02 (.04)	.003 (.03)
Work-limiting condition	—	.15*** (.03)	.10** (.03)
Any children in the household	—	.09* (.03)	.04 (.03)
Major or minor depression at W1	—	—	.14** (.04)
<i>F</i>	8.94	45.95	67.97
<i>df</i>	5	14	15
Prob > <i>F</i>	.001	<.001	<.001
<i>N</i>	737	737	737

Note: Population survey weights were applied. LN = natural log; BA+ = bachelor's degree or higher; SRH = self-rated health; W1 = Wave 1; W3 = Wave 3; Waves 1 through 3 of the Michigan Recession and Recovery Study.

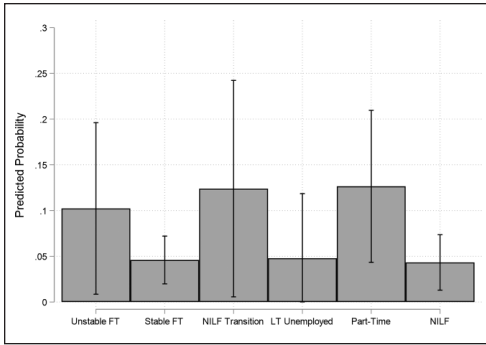
<sup>a</sup>Type 2 (stable full-time omitted).

† $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

solutions that yielded greater number of clusters than the one ultimately chosen. We closely examined a seven-cluster solution and replicated our analysis using this alternative grouping. This solution pointed to the potential split in the group transitioning out of the labor force, Type 3. Upon closer inspection,

however, we did not find conceptually meaningful differences between the two groups and opted for the more parsimonious six-cluster solution.

We also tested whether the associations between our employment status pathways and health held in multivariable regressions after



**Figure 4.** Predicted Major or Minor Depression at Follow-Up for a 45-Year-Old Man in Very Good Health at Baseline Based on Model 8 (All Other Covariates Held at Means),  $N = 737$ .

Note: Statistically significant differences in predicted probabilities to .05 level: Type 1 and Type 2, Type 1 and Type 6, Type 2 and Type 5, Type 3 and Type 6, Type 4 and Type 5, and Type 5 and Type 6. Type 1 = unstable full-time; Type 2 = full-time; Type 3 = out of the labor force transition; Type 4 = long-term unemployment; Type 5 = part-time; Type 6 = not in the labor force; Unstable FT = Type 1; Stable FT = Type 2; NILF Transition = Type 3; LT Unemployed = Type 4; Part-Time = Type 5; NILF = Type 6; Waves 1 through 3 of the Michigan Recession and Recovery Study.

further adjustment for simpler measures of employment status at the baseline interview and an indicator of any unemployment over follow-up that has been most often used to study these relationships in the past. We discovered that in almost all cases, the simpler employment indicators were not themselves strongly predictive of health at follow-up even when we omitted the more detailed sequence type categories from the models. The exception was a further weakening of the association between depression and unstable full-time employment.

Because of the gendered expectations of men's and women's employment pathways, we hypothesized that deviating from a stably full-time employment pathway may be associated with a greater increase in the probability of depression among men. Our gender-stratified models did not confirm this hypothesis, but their statistical power was limited because, as expected, men were underrepresented in the employment paths that deviated from the normative expectations of full-time work. Future analysis with larger samples will be in a better position to evaluate how the relationships we presented might be modified by gender.

## DISCUSSION

The U.S. labor market has been characterized by growing unpredictability, complexity, and inequality in employment experiences. The potential implications of these changes for health has not been adequately evaluated by studies focusing on employment status at one point in time, a specific employment status change, or trajectories of workforce experiences covering decades or entire careers. Moreover, previous studies have not focused on heterogeneity in short- and medium-term employment pathways shaped by recessionary downturn. We build on prior work to examine social and health statuses that select people into different employment pathways over a few economically volatile years and their subsequent health implications. We implement sequence analysis, an optimal matching technique that enables us to consider holistically a range of employment statuses as well as their duration, ordering, and volatility. We examine the nature and correlates of the resulting employment pathways and their associations with self-rated health and depression in a population-based sample of adults observed from 2009 to 2013 from the Great Recession to its aftermath in the metro Detroit area.

Our first aim was to characterize typical employment status pathways over several years in our sample of southeastern Michigan residents. Sequence and cluster analysis yielded six distinct pathways: stable full-time employment, stable part-time employment, stably being out of the labor force over follow-up, long-term unemployment, transition out of the labor force, and unstable full-time employment. Several of these sequence types are similar to those found in studies using decades' worth of employment status information, although distinctive sequence types marked by persistent unemployment and by a departure from the labor force emerged in our analyses. Departure from the labor force is notable given that most respondents in this sample were too young to be considered early retirees, a group identified in some prior studies of older employees. A wider array of employment status pathways emerged in our study because of our more detailed than usual view of employment experiences over the short term. These distinctive sequence types add value over more aggregated career-long trajectories by distinguishing the long-term unemployed from working-aged adults who have left paid work and are not currently looking to return, intermittently employed adults, and others.

We then assessed the predictors of different employment status sequence types. As expected,

men, those with a bachelor's degree or more, and nonblack respondents were overrepresented in stable full-time employment, whereas traditionally less advantaged workers and women were more likely to follow other employment status pathways. Net of their other characteristics, those with less than a bachelor's degree and black respondents were more likely to be unstably employed and to be long-term unemployed. Women were substantially more likely to work part-time or to not be in the labor force at all over the observation period, and they were also more likely to transition out of the labor force. In results not shown here, we found that those leaving paid work did not show greater changes in the presence of children than other groups, suggesting that it may not have been family composition changes motivating the departure. This finding is also supported by evidence from qualitative studies that have often found women do not transition out of the labor force on account of children, unless their caregiving roles become incompatible with labor participation (Blair-Loy 2009; Stone 2008). Further research using larger samples and detailed, time-varying measures of family structure, the presence of dependent persons, and type and intensity of caregiving activity is needed.

As expected by the healthy worker hypothesis, health also operated as a selection factor into particular pathways. Those with work-limiting health conditions or poorer health at baseline were overrepresented in less favorable stable conditions (not being in the labor force, long-term unemployed) or in more volatile sequences (transitioning out of the labor force, unstably full-time employed). These results underscore how even in the short run, social and health disadvantages put adults at risk of accumulating disadvantage in inferior labor force experiences (or lack of labor force attachment) and their consequences.

Our final aim was to assess the associations between employment status pathways and self-rated health and depression. Before accounting for their other characteristics, self-rated health and depression at follow-up were significantly worse for those in all other employment status pathways compared with those in stable full-time employment, with the only exception that part-time workers fared as well on self-rated health. After adjusting for sociodemographic characteristics and health at baseline, the magnitude of differences in health across sequence types weakened considerably. However, those who transitioned out of the labor force still showed significantly poorer self-rated health at follow-up, whereas part-time employed

respondents still showed a greater risk of depression compared with those in stable, full-time employment.

The less favorable short-run change in self-rated health among those who transitioned out of the labor force adds to findings from prior studies using different measurement strategies and lengthier follow-up periods. Among midlife U.S. women, labor force exits were linked to further increase in physical limitations (Pavalko and Smith 1999), and pulled-back or interrupted histories were associated with poorer self-rated physical health (Frech and Damaske 2012). Swedish adults with poor labor market attachment or waning attachment over a 12-year period also showed worse self-rated health than those with stable, high-level attachment (Andersen et al. 2016; Waenerlund et al. 2014). In addition, findings from studies of older workers have found that those who retire early have less favorable changes in self-reported physical health than their counterparts who leave work on time even after adjusting for the possibility that health or other factors precipitate early retirements (e.g., Calvo et al. 2013).

The results presented here provide some support for the idea that the loss of work benefits upon leaving the labor force is associated with the worsening of health. However, another potential explanation is that a new health problem emerged between survey waves that precipitated a departure or intermittent employment. In results available on request, we found that respondents who transitioned out of the labor force by the second survey wave were more likely than those in other employment status pathways to subsequently report a new work-limiting condition at the final survey wave. This finding suggests the continued importance of addressing how health events may catalyze diverging employment pathways in midlife. Loss of work benefits coupled with a new health condition to manage may be particularly problematic, but future research could consider whether retraining programs or other interventions might help adults adapt to paid employment in the presence of a health change.

We also found that stably part-time employed respondents were more likely to meet criteria for major or minor depression at follow-up than stably full-time employed adults. In other studies using different analytical approaches and longer periods of observation, midlife U.S. women showed more depressive symptoms if they spent less time in employment (Pavalko and Smith 1999). Steady part-time employment deserves further study, given the strong association found here with increasing

likelihood of meeting criteria for major or minor depression by the end follow-up without any accompanying decline in self-rated health.

Future research might explore whether similar or distinctive mechanisms underlie the associations with health change found here and help to account for variation in the findings across our measures of physical and mental health. The loss of previously held work benefits may be a particularly salient issue for those who leave the paid labor force for an extended period, whereas other mechanisms could underlie the link between depression risk and stable part-time employment. Studies using larger samples also could consider potentially moderating influences of factors we did not measure here, such as age and birth cohort. Further research considering varying periods of adulthood would likely reveal differences in the relative contribution of health and other forms of selection into pathways, their potential to influence subsequent health, and the mechanisms through which they do so. They could also explore the role of the voluntariness of different types of employment arrangements. For example, some who are stably working part-time may prefer this schedule, whereas others would prefer full-time work. In supplementary analysis, we found that between one-half and two-thirds of those who were unstably employed, long-term unemployed, or stably working part-time would have preferred to be working more hours at one point during follow-up, although slightly more than a third of those working stably full-time also desired more hours.

Preferences for different employment arrangements are tied to other major roles, such as child-bearing and parenting, not addressed directly in this study. Our models adjust for marital status and the presence of children, but future work is needed to better understand how contemporary men and women sequence and balance these responsibilities with different patterns of labor force attachment in the short run (Lu et al. 2017) and the implications for health. It is critical to better understand how preferences and constraints are contributing to cumulating inequalities in midlife in the context of contemporary labor market conditions of greater flexibility and diversity of employment pathways. For less advantaged adults, these conditions may generate greater employment precariousness, an erosion of benefits and working conditions, and increasing health disadvantage relative to their more socioeconomically advantaged counterparts (Benach et al. 2014; Tompa et al. 2007). By contrast, more advantaged individuals and families

may be able to pursue nonstandard pathways with less concern, from part-time employment to labor force exit, for several years to meet obligations of other roles. Additionally, well-resourced adults may embrace the growing likelihood of instability in their working lives, exploiting the more normative frequent job changes and interruptions to build a path toward occupational mobility.

An important advantage of the MRRS sample is that it provides detailed data documenting employment experiences and hardship of a spatially well-defined sample. This means that we can place individuals' labor force experiences within a specific labor market and study the sociodemographic characteristics that are associated with sorting into specific sequences in a specific context. The sequences we obtained are data driven and provide a rich description of local employment fluctuations during and in the aftermath of the Great Recession. We were able to consider the working lives of contemporary men and women across the range of labor force attachment patterns when all shared the same difficult economic conditions in a single regional labor market. This reduced the influence of unmeasured variation and diverse selection processes that differ across labor markets. However, it also limited our claims to generalizability. Other studies should consider how much our characterization generalizes beyond the conditions prevailing in the aftermath of the 2007 to 2009 recession in the metropolitan Detroit context, with its long-term history of industrial decline and relatively high unemployment. Following this study, future work should be obtained using samples from other locations and alternative methods for characterizing employment status pathways and their consequences.

Identification of clusters from the results of a sequence analysis is driven by investigator preferences and depends on the characteristics of the sample used. We chose six clusters of employment status sequences, basing our decision on sensitivity analyses, our knowledge of typical labor market experiences, and the constraints posed by the sample size. Fortunately, a comparison of different strategies for characterizing life course pathways found that the value added from using detailed pathways to predict economic well-being in later life was evident, regardless of which specific method was used (Halpern-Manners et al. 2015). The unique context of the MRRS sample shaped the sequences and clusters we identified.

Sequence analysis has a great deal of promise for advancing the literature on employment and health. However, it is important to note some of its



limitations. The cluster assignment is probabilistic, and the estimated cluster membership was subsequently used as a main predictor of health changes in the health outcome models. It is likely that using the estimated cluster membership as a main predictor yields overly precise standard errors because our models do not account for the fact that cluster membership is not directly measured but estimated. The standard errors reported in the sections where we assess selection into employment pathway cluster and health outcomes are therefore lower bounds and may suffer increased potential of Type 1 error.<sup>1</sup> Moreover, sequence analysis is only one of several promising new methods for holistic studies of short- and medium-term transitions and status changes. Future researchers may wish to consider alternative methods in their analysis, such as latent class analysis with repeated measures.

## CONCLUSION

The results presented here provide a novel view of dynamically evolving working lives during a period of a severe economic downturn and expand our understanding of the links between work and health. Even over a span of several years, we find considerable heterogeneity and complexity in employment status pathways. We also show that socially disadvantaged groups and less healthy people are more likely to experience either greater volatility or persistent exposure to employment statuses with less potential to improve or maintain health. We complement prior research showing strong selection into employment status measured at a single time point by demonstrating similarly strong selection into employment pathways comprised of multiple connected statuses. Additionally, the results presented here underscore the importance of capturing heterogeneity among the group of people not steadily attached to paid work. We show that the predictors and consequences of being intermittently employed, being long-term unemployed, leaving paid work, or being out of the paid workforce vary substantially. Future research should explore how these short- and medium-term differences aggregate or shift over longer periods, with attention to heterogeneity and

divergence and their implications for inequality across adulthood.

In particular, the results presented here contribute yet another piece of the puzzle to the body of literature that refers to a rise in “deaths of despair,” which has argued that economic instability and the unavailability of upward trajectories for economically disenfranchised Americans has contributed to their greater mortality in the middle age (Case and Deaton 2015). We find little evidence of job recovery among people in less favorable employment trajectories over the course of the study, which suggests that once an unfavorable employment trajectory becomes established, it may be difficult to escape, even as the economic situation of the region is recovering. A more comprehensive understanding of the leverage points for improving adult health and reducing the growth of health disparities across adulthood will require closer scrutiny of diverse and dynamic employment pathways across a range of temporal windows, the social and health statuses that predict what pathway is followed, and consideration of health outcomes with shorter and longer latency periods.

This call for further study is particularly poignant at the present historical moment given that the recession precipitated by the COVID-19 pandemic in the United States has already been described as the most devastating economic downturn since the Great Depression (Rappeport and Smialek 2020). In April 2020, the U.S. unemployment rate rose to a record 14.7% (Bureau of Labor Statistics 2020), and the Bureau of Labor Statistics estimated that about 20% of all U.S. workers were employed in sectors affected by the COVID-19 shutdown (Dey and Loewenstein 2020), with many more impacted more peripherally. These figures and our findings suggest future consequences of labor market turmoil that could compound the direct population health impacts of COVID-19. Further study of interventions to interrupt unfavorable employment trajectories or provide support to those unable to avoid them will be essential for guiding improvements of population health in the recovery from a protracted global pandemic.

## APPENDIX

**Table A1.** Tests of Differences of Predicted Values Based on Models 4 and 7.

Self-Rated Health				Depression			
Cluster Comparison	Difference in Predicted Values	SE	95% Confidence Interval	Cluster Comparison	Difference in Predicted Values	SE	95% Confidence Interval
Type 2–Type 1	-.14	.10	-.35 .08	Type 2–Type 1	-.86	.33	-1.54 -.19
Type 3–Type 1	.15	.13	-.13 .42	Type 3–Type 1	.22	.59	-1.00 1.44
Type 4–Type 1	.09	.18	-.28 .46	Type 4–Type 1	-.82	.67	-2.20 .56
Type 5–Type 1	-.23	.14	-.52 .07	Type 5–Type 1	.24	.50	-.80 1.28
Type 6–Type 1	.04	.12	-.20 .29	Type 6–Type 1	-.92	.37	-1.70 -.15
Type 3–Type 2	.28	.10	.09 .48	Type 3–Type 2	1.08	.58	-.11 2.27
Type 4–Type 2	.23	.18	-.14 .60	Type 4–Type 2	.04	.65	-1.29 1.38
Type 5–Type 2	-.09	.12	-.33 .15	Type 5–Type 2	1.10	.39	.30 1.90
Type 6–Type 2	.18	.14	-.10 .46	Type 6–Type 2	-.06	.37	-.83 .70
Type 4–Type 3	-.06	.22	-.51 .39	Type 4–Type 3	-1.04	.79	-2.67 .60
Type 5–Type 3	-.37	.17	-.73 -.02	Type 5–Type 3	.02	.45	-.91 .96
Type 6–Type 3	-.10	.17	-.46 .26	Type 6–Type 3	-1.14	.51	-2.20 -.08
Type 5–Type 4	-.32	.15	-.62 -.01	Type 5–Type 4	1.06	.65	-.29 2.41
Type 6–Type 4	-.05	.23	-.52 .43	Type 6–Type 4	-.11	.65	-1.44 1.23
Type 6–Type 5	.27	.14	-.02 .56	Type 6–Type 5	-1.16	.45	-2.10 -.23

Note: Data are from the Michigan Recession and Recovery Study, Waves 1 through 3. Type 1 = Unstable FT; Type 2 = Stable FT; Type 3 = NILF Transition; Type 4 = LT Unemployed; Type 5 = Part-Time; Type 6 = NILF.

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## NOTE

1. We thank an anonymous reviewer for the insightful comment.

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