

Job Characteristics and Transitions Among Older Self-Employed Individuals with Work-Limiting Health Conditions

by

**Tami Gurley-Calvez
Jessica Williams
Kandice Kapinos
Kansas City, KS 66160**

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1 Executive Summary

Older workers are an economically important group as they represent a large and growing portion of the United States workforce. These workers are more likely to experience health conditions that limit their options in terms of the type and amount of work they pursue. Self-employed workers who report a new work-limiting health condition are more likely to remain in the workforce than wage and salary workers who also report a work-limiting health condition. Previous research suggests that self-employment provides more opportunities to accommodate work-limiting health conditions; this report explores whether self-employed workers with work-limiting health conditions report less physically demanding jobs or different hours and weeks worked than wage and salary workers who also report work-limiting health conditions.

Among individuals in the labor force, we generally found no clear patterns of job physicality—how strenuous or physically demanding a job is—between self-employed and wage and salary workers with work-limiting health conditions. There was suggestive evidence that self-employed workers with work-limiting health conditions reported less stooping, lifting, and need for good eyesight, but none of these differences was significant after controlling for other individual and work-related factors.

Self-employed individuals worked more hours per week than their wage and salary counterparts but this was only statistically significant among those with work-limiting health conditions.. However, we found some evidence that those who were self-employed and develop a work-limiting condition did reduce their work time more than wage and salary workers. Self-employed individuals who developed work limitations from one survey wave to the next reduced their work time on average by about two to three hours per week, relative to only one hour among those who were wage and salary employed. Although self-employed individuals with

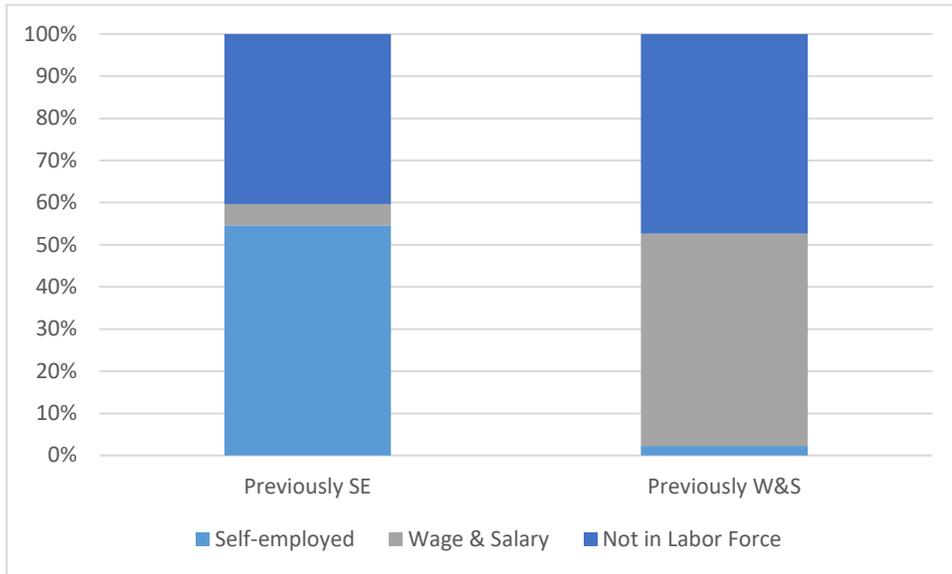
work limitations worked about one more hour per week than their wage and salary counterparts, they worked almost 1.5 fewer weeks per year. We found no systematic differences in weeks worked per year or differences in labor supply by veteran status. Despite differences in unadjusted summary statistics, self-employed workers did not systematically have more disability applications than their wage and salary counterparts after controlling for several personal, family, and job-related characteristics.

In summary, our analysis suggests that among older adults who stay in the workforce, those who experience a work-limiting health condition and were self-employed worked more hours per week but fewer weeks per year than their wage and salary counterparts, and the self-employed who developed work-limiting health conditions reduced hours worked per week more than their wage and salary counterparts. Focusing on those who remain in the labor force, we found no strong evidence of differences in reported job physicality for self-employed workers with work-limiting health conditions compared to wage and salary workers.

2 Introduction

The purpose of this report is to provide evidence regarding job characteristics for people with work-limiting health conditions and whether these characteristics differ between self-employed and wage and salary workers. Previous research suggests that self-employment promotes economic productivity and growth by allowing older people with work-limiting health conditions to remain in the workforce longer. Data for older workers ages 51 and older presented in Figure 1 are consistent with these suggestions. Nearly 60% of self-employed workers who reported a new work-limiting health condition remain in the labor force compared to about 53% of wage and salary workers.

Figure 1. Labor Force Transitions for Individuals with New Work-limiting Health Conditions



Source: Authors' calculations using 1992–2016 Health and Retirement Study data for a nationally representative sample of individuals ages 51 and older.

More information is needed on the underlying mechanisms that lead to these patterns in order to design policies that facilitate work through self-employment for older workers. The analyses in this report, however, provide information on whether job characteristics (physical demands, stress, work hours) differ for self-employed individuals with work-limiting health conditions compared to wage and salary workers who also report work limiting health conditions. Although the focus of the analysis is on comparisons within workers reporting work-limiting health conditions, results for workers without work-limiting health conditions are reported for reference. The analysis also addresses whether self-employed workers with work-limiting health conditions are likely to apply for disability benefits.

2.1 Labor Force Participation among Older Workers

Understanding employment dynamics for older workers is a pressing concern for designing effective policies as more individuals in the United States are working past retirement age and the population is aging, which changes the structure of the labor force. By 2030, more than 20% of the population is projected to be over the age of 65 compared to just 13% in 2010 (Ortman, Velkoff, & Hogan, 2014). Current estimates indicate that one in eight individuals age 65 or older is employed, and these older workers are projected to have the highest annual growth in labor force participation over the next five years (U.S. Bureau of Labor Statistics 2016, Toossi and Torpey 2017). Although the overall labor force is projected to grow by only 0.6% per year on average between 2016 and 2026, labor force growth among workers aged 65 to 74 is projected to be 4.2% annually, with an even higher rate—6.7%—among workers 75 and older (Employment Projections Program, 2017; Special Committee on Aging, 2017). By 2026, workers over the age of 55 will make up about a quarter of the labor force.

As these processes progress, decision makers need an understanding of labor force participation decisions in later life and the role of work-limiting health conditions in those decisions. According to the Current Population Survey, older workers are more likely than younger workers to be self-employed; 9.1% of workers aged 25 to 54 are self-employed relative to 16.4% of workers aged 55 and older and 24.2% of workers aged 65 and older (Special Committee on Aging, 2017). In addition, there are regional differences in the percentages of older workers who are self-employed. Among workers aged 55 and older, employment-to-population ratios are above 40% in the New England (45.7%), West North Central (42.8%), and East North Central (40.5%) regions relative to only 34.3% in the East South Central region (Special Committee on Aging, 2017). Veterans are another population with higher likelihood of

self-employment during much of the study period (U.S. Small Business Administration, 2007, 2012; Sankaran & Battisto, 2018). These broad differences seen in who chooses self-employment provide a starting point for addressing whether there are key differences in employment decision-making later in life.

2.2 Work Limitations and Disability

Every year millions of individuals become injured, ill, or disabled, interfering with their capacity to work. Medical costs and lost wages from time off work induce financial stress for individuals with disabilities and their households (Bronchetti, 2012; Schimmel & Stapleton, 2012; Rennane, 2018). Work-limiting health conditions are more common among older workers, with an estimated 25% reporting a severe work limitation (U.S. Census Bureau, 2012). Veterans represent a distinct group within the broader community of those with work-limiting health conditions; about one in five Veterans have a service-connected disability, but the rate is higher for those who have served more recently (U.S. Bureau of Labor Statistics, 2016). In some cases, facilitating the productivity of workers with work-limiting health conditions, including older workers and veterans, might involve simple efforts to increase lighting, decrease background noise, and design work flow to mitigate the effects of fatigue (National Research Council and Institute of Medicine, 2004). The financial stakes of navigating health-related work disruptions are high as older workers with work-limiting health conditions earn considerably less and are more likely to be in poverty than their peers without these limitations (Schimmel & Stapleton, 2012). Taken together, the research literature suggests that understanding how these older adults navigate labor force participation decisions, including selection into self-employment, is critical to developing and targeting policy interventions to enhance worker productivity.

Research shows distinct correlations between health conditions and self-employment status. Specifically, researchers have noted a recent increase in program participation in Social Security Disability (SSDI) and Supplemental Security Income (SSI) (Autor, 2011; Liebman, 2015; Social Security Administration, 2016) over the past couple decades and have begun to assess the link between disability onset and subsequent labor force participation (McCrery & Pomeroy, 2016). Estimates suggest that individuals with disabilities are substantially more likely to be self-employed (10% versus 6.3%) (U.S. Bureau of Labor Statistics, 2016). Although this and related evidence suggest that selection into self-employment can play a vital role in enhancing employment opportunities for individuals with work-limiting health conditions, little is known about which aspects of self-employment are most beneficial to those who choose to remain employed despite having work-related limitations.

2.3 Key Research Questions & Hypotheses

Previous research provides clear evidence that work-limiting health conditions are more likely among older workers and individuals with these conditions are more likely to be self-employed; however, there is little information on how self-employment differs from wage and salary work for individuals with work-limiting health conditions. Possible differences include the physical nature of the work, work-related stress, and time spent working. Understanding the job characteristics that “pull” people into self-employment is essential for designing policies to facilitate both work in general and self-employment.

In this study we use data from the Health and Retirement Study (HRS)—a nationally representative biennial panel survey of individuals age 51 and older—to investigate key job characteristics among older Americans with work-limiting health conditions in order to address the following research questions and hypotheses:

Research Question 1. Which characteristics of self-employment (e.g., physical job requirements, job-related stress) are associated with employment among individuals 51 and older?

Hypothesis 1a: Older (age 51+) self-employed workers with a work-limiting health condition report less physically demanding job requirements than non-disabled self-employed workers and their wage and salary counterparts.

Hypothesis 1b: Veteran older self-employed workers with a work-limiting health condition are less likely to report physically demanding job requirements relative to non-Veteran self-employed workers with and without limitations and to wage and salary workers.

Research Question 2. Does self-employment provide greater flexibility in adjusting work hours and weeks in response to a new work-limiting health condition?

Hypothesis 2: Changes in work-limiting health conditions among older adults lead to larger adjustments in hours and weeks worked among the self-employed relative to their non-self-employed wage and salary counterparts.

Research Question 3. Are there differences in the frequencies of Social Security Administration disability benefit applications across self-employed (all and Veterans) and wage and salary employed individuals with similar health characteristics?

Hypothesis 3a: Older self-employed workers are less likely than non-self-employed workers to apply for disability programs after controlling for socio-demographic factors, health status, functional limitations, and physical job requirements.

Hypothesis 3b: Older self-employed workers who are Veterans are less likely than their non-Veteran self-employed counterparts to apply for disability programs after controlling

for socio-demographic factors, health status, functional limitations, and physical job requirements.

3 Previous Literature

3.1 Self-employment among Older Individuals

A growing number of research studies have examined self-employment among older Americans. Research suggests that older individuals want to find purpose and meaning in their activities and have control of their own time, but that these goals can be limited by workplace policies (Kojola and Moen 2016). Individuals may also enjoy the additional flexibility and autonomy provided by self-employment, despite the generally longer hours (Blanchflower 2004, Benz and Frey 2008, Lange 2012). Self-employment might provide an opportunity for older workers to achieve these goals while enhancing economic activity.

Studies have also found that older self-employed workers expect to work longer than their wage and salary counterparts and are more likely to enter self-employment during recessions perhaps because of limited opportunities in the wage and salary sector (Gurley-Calvez, Kapinos, & Bruce, 2012; Biehl, Gurley-Calvez, & Hill, 2014). Self-employment can also be a bridge job to retirement, even during the Great Recession, and occupation, financial variables, and health status remain important factors in selecting into self-employment (Cahill, Giandrea, & Quinn, 2013). Additionally, self-employment provides an alternative work environment as research suggests that traditional corporate workplace culture limits opportunities for people with disabilities (Schur, Kruse, & Blanck, 2005).

3.2 Disability

Given the prevalence of work-limiting health conditions among older workers, investigation of the link between work-limiting health conditions and disabilities and self-employment is critical as our population ages. Early research found that wealth was a more important determinant than health insurance in explaining the decision to become self-employed among workers age 51 and older, but this work did not consider health status or the presence of work-limiting health conditions (Bruce, Holtz-Eakin, & Quinn, 2000). Subsequent work has added more nuance to these findings. The self-employed report better health on average, but are more likely to have a work-limiting health condition (Zissimopoulos and Karoly 2003, Stephan and Roesler 2010). Several studies have found that health conditions that limit work substantially increase the probability of self-employment and that self-employment is an important path for accommodating work limitations (Zissimopoulos & Karoly, 2007; Giandrea, Cahill, & Quinn, 2008; Jones & Latreille, 2011; Zucchelli, Harris, & Zhao, 2012).

Health limitations and work-limiting health conditions are associated with an increased probability of self-employment, providing opportunities for individuals who might not otherwise find employment (Schur et al., 2005; Zissimopoulos & Karoly, 2007). One study found a 47% increase in the probability of self-employment for men with a work-limiting health condition and 30% for women with the same (Zissimopoulos & Karoly, 2007). There is some evidence that policy changes can generate large differential effects on self-employment. For example, increased access to health insurance for younger workers through the ACA young adult coverage mandate did not increase self-employment overall, but the increase in self-employment was dramatic—nearly 20%—for young adults with disabilities (Bailey, 2017).

Experiences are similar in Europe, where individuals with a disability are more likely to be self-employed and have higher job satisfaction (Pagán, 2009). In other work using the Survey of Health, Ageing and Retirement in Europe, however, there was no evidence that the positive association between self-employment and job satisfaction differed between disabled and non-disabled individuals (Pagán-Rodríguez, 2011).

There are additional associations with injuries, which is important because of their link with work limitations. Self-employment has also been associated with fewer subsequent occupational injuries, which suggests that self-employment is less likely than wage and salary employment to precipitate a work-related disability (Zwerling, 1996).

3.3 Veterans

There is growing interest in finding ways to re-integrate Veterans into society upon returning from duty, but this is often complicated by disabilities obtained during military service (Ostovary & Dapprich, 2011; Resnik & Reiber, 2012), so understanding how Veteran status affects self-employment decisions in the presence of work-limiting disabilities is critical. Veteran self-employed individuals are often more successful, with higher incomes on average than non-Veteran small business households (Haynes, 2015). Self-employed veterans are likely to be older and more educated than their veteran wage and salary counterparts (Heinz, Freeman, Harpaz-Rotem, & Pietrzak, 2017; Sobota, 2017). Estimates suggest that 20% of Veterans may experience work-limiting health conditions related to a service-connected disability (U.S. Bureau of Labor Statistics, 2016). The prevalence of service-connected disabilities, particularly for those who have served more recently, highlights the importance of understanding how work limitations and disability contribute to self-employment decisions. Previous work has found that, unlike the civilian population, disabled Veterans have lower rates of self-employment than non-

disabled Veterans and that the difference is because of the disability rather than other observable characteristics (Open Blue Solutions, 2007). Veterans, including those with service-connected disabilities, are given extra points in the rating systems used to hire federal and many state workers, potentially giving them slightly different options than non-Veterans in the wage and salary sector. Previous federal work experience and networks may also be important. Research using the American Community Survey found that at a descriptive level, Veterans were more likely to be employed in federal government work than non-Veterans, and that this difference increased with the severity of the service-connected disability (Winters, 2018). Other work has also found increased rates of state and local employment among Veterans relative to non-Veterans, although the differences are less clear (Lewis & Pathak, 2014; Winters, 2018).

3.4 Disability Insurance

The relationships between disability insurance policies and self-employment are multifaceted and complex. We consider two possible relationships: First, self-employment might delay applications for SSDI and SSI programs as individuals are able to participate in work more fully and for longer. Second, SSDI and SSI programs might encourage self-employment over wage and salary work because of limitations on earnings. People eligible for SSDI will continue to receive benefits as long as their earnings do not exceed a maximum threshold (\$1,220 per month in 2019), and SSI beneficiaries see their benefits reduced by \$0.50 for every dollar earned above \$85 per month (U.S. Social Security Administration, 2019). Self-employment might also provide more opportunity to adjust work hours and effort in relation to policy limits and incentives.

Although there is a large amount of literature on the effects of disability insurance on the labor market in general, particularly on the disincentives to work, there is considerably less

evidence on differences in the use of disability insurance among the self-employed relative to wage and salary workers (Maestas, Mullen, & Strand, 2013; French & Song, 2014). Additional work has evaluated how SSDI might impact the choice of blue collar versus white collar occupations (Jacobs, 2016). Jacobs found that the presence of SSDI resulted in three percent more individuals choosing blue collar occupations compared to white collar occupations but did not examine self-employment status. There is some evidence on the role of the U.S. Department of Veterans Affairs Disability Compensation program, which provides disability benefits to slightly less than one in five military veterans in employment decisions among older veterans (Coile, Duggan, & Guo, 2016), but it is limited. Coile and colleagues exploited a policy change in benefits for Vietnam veterans to find that although the increase in program enrollment from the policy change did decrease labor force participation, the policy also induced a much larger change from wage and salary employment to self-employment (Coile et al., 2016).

3.5 Study Contribution

In this study, we contribute to the existing literature by generating evidence on how job characteristics differ among older workers with work-limiting health conditions. We examined older Veterans in addition to the civilian population. Veterans are an important sub-group of individuals with work-limiting health conditions and were also more likely to be self-employed, particularly at older ages. We also examined the extent to which hours and weeks worked vary by someone's self-employment and work-limiting disability status.

Finally, we assessed the frequency of disability applications across self-employed (all and Veterans) and wage and salary employed individuals with similar health characteristics. Knowing how self-employed individuals use existing disability programs is critical for policy evaluation and formation.

4 Methods

We relied on a nationally representative longitudinal dataset to answer our research questions using multivariate regression analyses as described in this section.

4.1 Data & Sample

The Health and Retirement Study (HRS), sponsored by the National Institutes on Aging and fielded by the Institute for Social Research at the University of Michigan, is a nationally representative survey of individuals age 51 and older that has been fielded biennially since 1992 that contains a rich set of information regarding current employment, health, disability program participation, and basic household and individual sociodemographic information. After entering the study, respondents are interviewed every two years with new cohorts added every six years. In this study, we used the RAND version, which has been cleaned and harmonized over time,¹ supplemented with variables from the core HRS files when necessary for the years 1994 to 2016. These data have been used in several prior studies of self-employment among older Americans (Bruce et al., 2000; Zissimopoulos & Karoly, 2007; Zissimopoulos, Karoly, & Gu, 2009; Gurley-Calvez et al., 2012; Biehler et al., 2014).

¹ In other words, as questions may be slightly different from wave to wave, the RAND version attempts to make the variables as consistent as possible over time.

We restricted the sample to individuals who were working (not retired) and for whom key measures are non-missing. We clustered all regressions at the individual level. Our final analytic sample includes 74,308 person-year observations.

4.2 Measures

Our main outcome measures² are as follows:

- **Hypotheses 1a and 1b:** measures of working in a physically demanding job
 - Dichotomous variable equal to one if the job requires significant **physical effort**, and zero otherwise.
 - Dichotomous variable equal to one if the job requires **lifting heavy loads**, and zero otherwise.
 - Dichotomous variable equal to one if the job requires significant **stooping, kneeling, or crouching**, and zero otherwise.
 - Dichotomous variable equal to one if the job requires **good eyesight**, and zero otherwise.
 - Dichotomous variable equal to one if the job involves significant **stress**, and zero otherwise.
- **Hypothesis 2:** measures of **hours** worked per week and **weeks** worked per year
- **Hypothesis 3:** measures of **SS disability applications**
 - Dichotomous variable equal to one if the individual **ever applied for SSDI**.

² See Appendix for more details on outcome measures.

- Continuous variable **equal to the number of SSDI applications**.

For our primary independent variable, we created a mutually exclusive categorical measure of self-employment status and the presence of a work-limiting health condition, defined as a “yes” response to whether the person has a health problem that limits the type or amount of work they can do.³ This is distinct from measures of limitations to daily activities. We separated self-employment and work-limiting health conditions into the following categories (hereafter, we refer to this measure as the employment-limitation type):

- 1) self-employed with a work-limiting health condition,
- 2) self-employed without a work-limiting condition,
- 3) wage and salary employed with a work-limiting condition, and
- 4) wage and salary employed without work-limiting condition.

We identified individuals as having a work-limiting health condition if they reported having any impairment or health problem that affects the kind or amount of paid work.

We defined Veteran status based on whether the respondent reported ever having been in active military service, which we used for Hypotheses 1b and 3b. We used the following additional measures in our set of basic demographic controls: age (vector of age dummies for each year of age), female indicator, race (indicators for White, Black/African American, and other), Hispanic origin indicator, indicator for married, education (vector of the following

³ We note that there are other possible measures of limitation and for reference, we include alternatives in the summary statistics reported below. The measure of work-limiting health condition is preferred for this analysis as we are interested specifically in work-related outcomes.

education indicators: less than GED, GED, high school degree, some college, and college or more), number of children living in the household, and year fixed effects.

To check the robustness of our results, we also estimated models where we used the basic controls and the following additional controls: household wealth (vector of mutually exclusive indicator variables: seven categories ranging from less than zero to greater than \$10 million), self-reported health status (vector of mutually exclusive indicator variables: excellent, very good, good, fair, and poor), body mass index (BMI), health insurance status (vector of non-mutually exclusive indicator variables: Medicare, Medicaid, VA, private plan, other public plan, and through spouse), Census division (vector of mutually exclusive indicator variables for 9 U.S. Census regions), occupation (vector of 16 mutually exclusive indicator variables ranging from 1% in building services/cleaning to 19% in tech support and related professional specialties), industry (vector of 13 mutually exclusive indicator variables ranging from about 2% in entertainment/recreation to almost 30% in professional services), and firm size (vector of mutually exclusive indicator variables representing membership in different size categories).

4.3 Statistical Approach

Below we outline our key multivariate regression models for each hypothesis. In all analyses, we estimated models with an interaction term to examine whether results varied by age category: those who were younger than 65 relative to those who were 65+. As we discuss below, we expect these decisions to vary significantly for individuals who would be age-eligible for Medicare.

4.3.1 Hypothesis 1a

To test Hypothesis 1a, we estimated the following:

$$y_{it} = \beta se_worklim_cat_{it} + \Phi X + \lambda_t + \varepsilon_{it} \quad [1]$$

where y is one of our outcome measures of a physically demanding job (as we describe on in the Measures section) for individual i at time t . Our independent variable of interest —employment-limitation type —is represented by $se_worklim_cat$ and is a categorical variable that identifies four mutually exclusive groups of self-employment and the presence of a work-limiting health condition (see the Measures section). Categories are defined for current working status, as previous research suggests that results are robust to several possible measures (e.g., ever self-employed, always self-employed) (Gurley-Calvez et al., 2012). X is a vector of demographic and other labor force characteristics, λ represents year-specific fixed effects, and ε is the error term clustered at the individual-level to account for multiple observations per person. We estimated equation [1] using pooled data to maximize sample size.

4.3.2 Hypothesis 1b

To test Hypothesis 1b, we estimated the following:

$$y_{it} = \beta_1 se_worklim_cat_{it} + \beta_2 veteran_t + \beta_3 se_worklim_cat_{it} * veteran_t + \Phi X + \lambda_t + \varepsilon_{it} \quad [2]$$

where y represents the same outcome measures in [1] for individual i at time t . We interacted a dichotomous indicator for Veteran status, $veteran$, with the categorical variable for self-employment and work limitation status. Estimates for the interaction term (β_3) indicate whether the job characteristics are more, less, or equally different for Veterans. Estimates for the overall effect of Veteran status were calculated taking into account the main effects and interaction estimates. As above, X is a vector of demographic and other labor force characteristics, λ represents year-specific fixed effects, respectively, and ε is the error term clustered at the individual-level. We also estimated models with an interaction term for self-employment

category and an indicator for age 65+ to test whether results differ for workers who qualify for Medicare based on age.

4.3.3 Hypothesis 2

To test Hypothesis 2, we estimated the following:

$$w_{it} = \gamma_1 se_{it} + \gamma_2 work_lim_{it} + \gamma_3 se_{it} * work_lim_{it} + \Phi X + \lambda_t + \eta_i + \varepsilon_{it} \quad [3]$$

where w is a measure of hours (current week) or weeks (annual) worked for individual i at time t . Self-employment status is a binary measure captured by se , and presence of a work-limiting health condition is also binary and indicated by $work_lim$. Key differences for this specification include the addition of a person-level fixed effect (η), which means that estimates of the effects of work limits ($work_lim$) and self-employment (se) are based on changes in these indicators within the same person. The estimated effect of the interaction term γ_3 indicates whether the effect of a change in work-limiting condition is more, less, or equally pronounced for the self-employed. That is, we assessed whether gaining or losing a work-limiting health condition led to greater changes in work hours and weeks for the self-employed relative to those who did not have any changes in work-limiting health conditions. As above, we explored whether patterns differ for workers ages 65 and older.

4.3.4 Hypothesis 3a

To test Hypothesis 3a, we estimated the following:

$$d_{it} = \rho se_{it} + \pi Health_{it} + \xi Job_{it} + \Phi X_{it} + \lambda_t + \varepsilon_{it} \quad [4]$$

where d is an indicator measure of the number of reported disability application. Our independent variable of interest, se , is again an indicator for self-employment status. $Health$ is a set of control variables for health status and functional limitations. Job is a set of control variables for physical requirements in the respondent's current job. As above, X is a vector of demographic and other

labor force characteristics, λ represents year-specific fixed effects, and ε is the error term clustered at the individual-level to account for repeated observations per person. We used a two-part model to adjust for the significant number of individuals with zero applications. To do this, we used `tpm` in Stata, which adjusts for the probability of having any applications (Belotti, Deb, Manning, & Norton, 2015).

4.3.5 Hypothesis 3b

To test Hypothesis 3b, we augmented equation [4] to include an interaction term for Veteran status. In this specification, ρ_3 captures the effect of being a self-employed Veteran.

5 Results

First, in Table 1, we present frequencies for the number of individuals in each of the employment-limitation categories from one wave (row headings) to the next (column headings). In this descriptive analysis, we included individuals who leave the labor force even though they are dropped from our final analytic sample. We report these frequencies to highlight that changing categories is common. We noted that among individuals who developed a work-limiting condition from one wave to the next, those who were self-employed were more likely to stay in the labor force relative to those who were not, as shown in Figure 2, and that there is significant movement from one wave to the next across all categories. More than 30% of those who are self-employed with a limitation leave the labor force by the next wave, but nearly 30% also report no work-limiting conditions in the next wave. Similarly, about 28% of those who are wage and salary employed with a limitation leave the labor force by the next wave and 35% report no work-limiting conditions in the next wave, so our measure of work-limiting condition is not an absorbing state and the movement from one wave to the next is complex. In fact, we observed 8,225 changes in categories in our analytic sample (shaded cells only).

Table 1. Transition in Category of Employment and Work-Limiting Conditions from One Wave to the Next

		Labor Force Category in Wave $t+1$					
		Self-employed: No Limitation	Self-employed: Limitation	Wage & Salary: No Limitation	Wage & Salary: Limitation	Not in the Labor Force: No Limitation	Not in the Labor Force: Limitation
Labor Force Category in Wave t	Self-employed: No Limitation	9,216 (69.67%)	797 (6.03%)	969 (7.33%)	73 (0.55%)	1,584 (11.97%)	589 (4.45%)
	Self-employed: Limitation	603 (26.45%)	839 (36.8%)	74 (3.25%)	75 (3.29%)	136 (5.96%)	553 (24.25%)
	Wage & Salary: No Limitation	1,095 (2.14%)	109 (0.21%)	39,674 (77.39%)	2,406 (4.69%)	5,717 (11.15%)	2,266 (4.42%)
	Wage & Salary: Limitation	79 (1.46%)	81 (1.49%)	1,864 (34.37%)	1,873 (34.53%)	338 (6.23%)	1,189 (21.92%)
	Not in the Labor Force: No Limitation	940 (2.05%)	101 (0.22%)	1,780 (3.89%)	161 (0.35%)	33,905 (74.02%)	8,919 (19.47%)
	Not in the Labor Force: Limitation	202 (0.53%)	282 (0.74%)	389 (1.01%)	441 (1.15%)	6,495 (16.93%)	30,546 (79.64%)

Source: 1992–2016 HRS respondents and spouses. The table describes the numbers of people and their proportion of their group (rows) based on their labor force status in time t and then in time $t+1$. Within each row, the percentages sum to 100%. The shaded cells represent transitions in our final analytic sample.

We briefly present summary statistics (means/percentages and standard deviations) for key measures in Table 2. We highlight differences by employment-limitation category that we explore further in the multivariate analysis below. In terms of job characteristics, wage and salary workers generally reported more physically demanding job requirements, and requirements were lowest among self-employed with limitations. Hours worked were highest for individuals with no limitations and weeks worked were highest for wage and salary workers.

Self-employed workers were two to five years older on average and considerably more likely to be married. Eighty-nine percent or more of respondents in all worker categories identified as White, with the highest proportion of Black and Hispanic workers in the category of wage and salary workers without work-limiting health conditions. Workers in all categories had more than two children, on average.

Table 2. Means/Percentages and Standard Deviations of Key Measures

	Self-Employed		Wage & Salary Worker	
	<i>Presence of a Work-Limiting Condition</i>			
	Yes	No	Yes	No
Age	63.24 (7.96)	61.40 (6.91)	59.61 (6.13)	58.94 (5.52)
Married - %	80.60 (39.56)	81.66 (38.71)	72.87 (44.47)	75.94 (42.74)
Veteran - %	27.14 (44.50)	26.45 (44.11)	26.49 (44.14)	23.37 (42.32)
Disability (Any ADL limit)-%	21.63 (41.20)	2.42 (15.36)	21.36 (40.99)	2.85 (16.65)
<i>Health Status</i>				
Excellent - %	4.02 (19.65)	26.10 (43.92)	4.74 (21.25)	20.27 (40.20)
Very Good - %	17.43 (37.96)	43.74 (49.61)	19.60 (39.71)	41.16 (49.21)
Good - %	39.65 (48.95)	24.06 (42.75)	37.97 (48.54)	29.63 (45.66)
Fair - %	29.49 (45.63)	5.45 (22.70)	29.23 (45.49)	8.14 (27.34)
Poor - %	9.41 (29.29)	0.65 (8.03)	8.46 (27.84)	0.81 (8.96)
<i>Race/Ethnicity</i>				
White - %	92.09 (27.01)	93.44 (24.76)	91.08 (28.51)	88.74 (31.62)
Black - %	4.52 (20.79)	3.23 (17.69)	5.68 (23.15)	7.48 (26.31)
Other - %	3.39 (18.12)	3.33 (17.93)	3.24 (17.70)	3.78 (19.07)
Hispanic - %	2.01 (14.05)	3.37 (18.04)	3.74 (18.97)	4.77 (21.31)
Number of Children	2.94 (1.71)	2.72 (1.62)	2.84 (1.88)	2.77 (1.77)
<i>Job Requirements</i>				
Significant physical effort-%	18.47 (38.83)	16.15 (36.80)	19.47 (39.61)	15.34 (36.04)
Lifting heavy loads - %	3.94 (19.47)	6.09 (23.91)	8.75 (28.26)	7.01 (25.53)
Wide range of motion (e.g., stooping) - %	11.41 (31.81)	11.92 (32.41)	14.45 (35.16)	13.09 (33.73)
Good eyesight - %	58.96 (49.22)	63.29 (48.21)	67.44 (46.87)	67.21 (46.95)
High Stress - %	59.10 (49.19)	56.52 (49.58)	65.93 (47.41)	61.28 (48.71)
<i>Amount of Time Worked</i>				
Weekly hours worked	31.81 (20.83)	39.12 (19.25)	36.65 (13.10)	40.13 (11.91)
Annual weeks worked	45.49 (11.87)	47.05 (9.92)	49.26 (7.54)	49.65 (6.45)
Number of people (n)	5,591	845	24,160	2,323

Source: 1992–2016 HRS respondents and spouses who report being in the labor force. Entries represent self-reported means using survey weights. Standard deviations in parentheses.

Veterans represented about one quarter of workers in each category. As we might expect, workers reporting at least one limitation on daily living activities (another measure possible measure of disability) were more likely to report a work-limiting health condition. About 21% of workers who reported a work-limiting health condition also had at least one limitation on activities of daily living. This contrasts with only two percent of self-employed workers and three percent of wage and salary workers without work-limiting health conditions. Workers without work-limiting health conditions were far more likely to report excellent or very good health and those with limitations were far more likely to report fair or poor health.

5.1 Hypothesis 1

Analysis for Hypothesis 1 addressed whether older self-employed workers with work-limiting health conditions were less likely to report physically demanding work requirements compared to self-employed workers without work-limiting health conditions and wage and salary workers with and without limitations.

5.1.1 Hypothesis 1a

In Figure 2, we present the predicted probability that an individual will report a particular job requirement/characteristic stratified by our employment-limitation category and whether the worker was < 65 years of age or age 65+ as shown in Panels A –F, respectively, for each job requirement. Each estimate predicted outcome, obtained after estimation using the **margins** command in Stata. Results are from multivariate probit models that controlled for personal, household, and industry and occupation characteristics in addition to accounting for time trends. The bars denote 95% confidence intervals.

Among those with work-limiting health conditions, wage and salary workers reported less physically demanding jobs on average relative to self-employed workers of similar age (17% versus 18% for ages 51–64 and 15% versus 16% for ages 65+); however, the differences are not large and none is statistically significant (Panel A).⁴ Requirements for heavy lifting (Panel B) and stooping, kneeling, crouching (Panel C) were similar for all workers with limitations.⁵

Results were mixed for job requirements for good eyesight and reported job-related stress. Self-employed women with limitations reported less rigorous eyesight standards and somewhat lower stress while men had the same eyesight requirements and lower stress among wage and salary workers. Again, none of these differences was statistically significant, except that older wage and salary women who reported work-limiting conditions (age 65+) were also significantly more likely to report greater eyesight requirements than other groups.

Revisiting our hypotheses, the multivariate results indicate no clear pattern of less physically demanding job requirements among older self-employed workers with work-limiting health conditions. The evidence of reduced physical requirements is most consistent among women workers, but in general, we conclude that physical job requirements are not substantially different for workers with limitations by self-employment

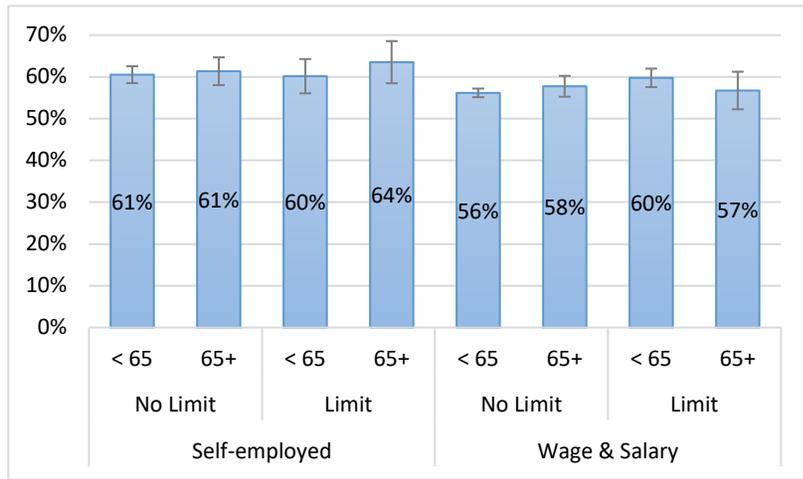
⁴ The pattern of results does not vary by gender. Results not reported here, but available upon request.

⁵ The pattern of results do not vary by gender. Results not reported here, but available upon request.

Figure 2. Predicted Probability of Job Characteristic, by Employment and Limitation Category
(95% Confidence Intervals)



Panel E. Job Requires High Stress



Source: 1992–2016 HRS. Entries are predicted probabilities after probit estimation (from the margins command in Stata). The 95% Confidence Intervals for the estimates are shown with bars. All predicted probabilities adjust for the following controls: age group (51–64, and 65+), sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, and year/wave fixed effects. n = 32,897 (23,16,814 men and 21,16,083 women).

5.1.2 Hypothesis 1b

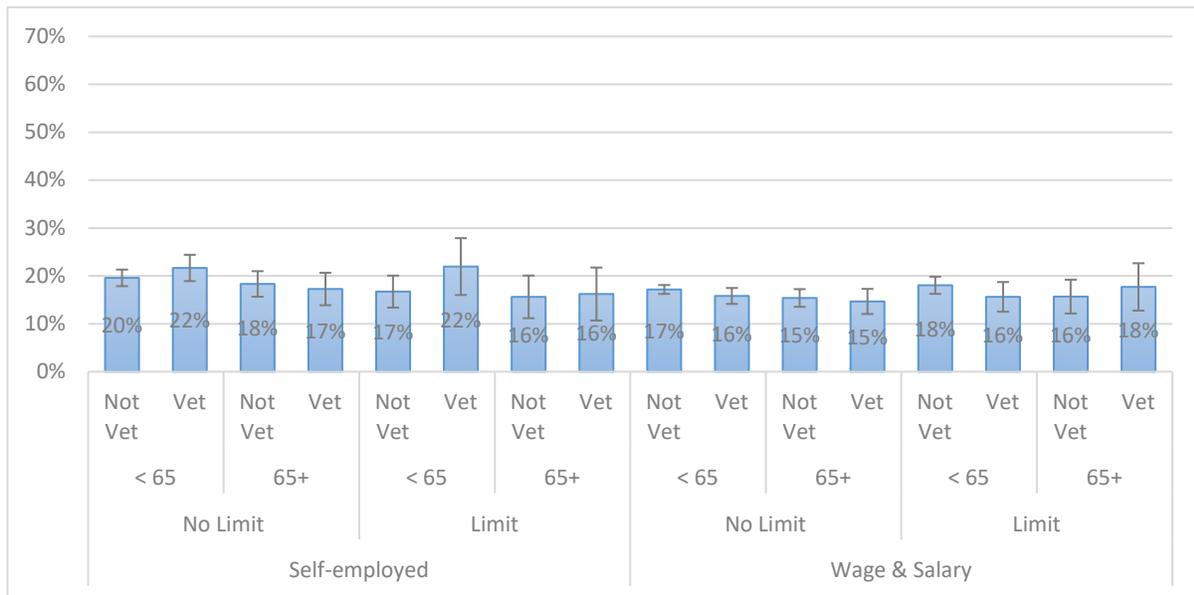
The second part of Hypothesis 1 addressed whether self-employed workers who were Veterans with a work-limiting health condition reported less physically demanding job requirements relative to non-Veteran self-employed workers without these limitations.

Multivariate results are summarized in Figure 3. As foreshadowed by the results for Hypothesis 1a, we did not find clear patterns for Veterans compared to non-Veterans. Confidence intervals are large for most estimates, particularly for groups with smaller relative samples.

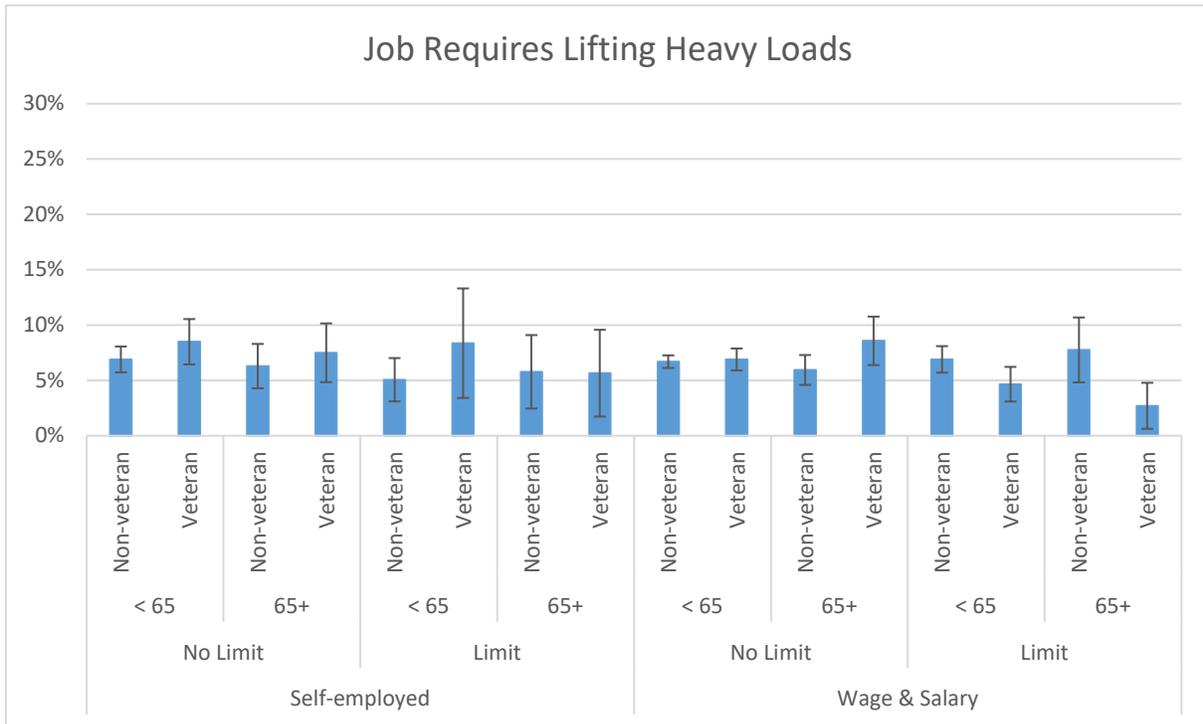
Figure 3. Predicted Probability of Job Characteristic, by Employment-Limitation Category, and Veteran Status Among Men

(95% Confidence Intervals)

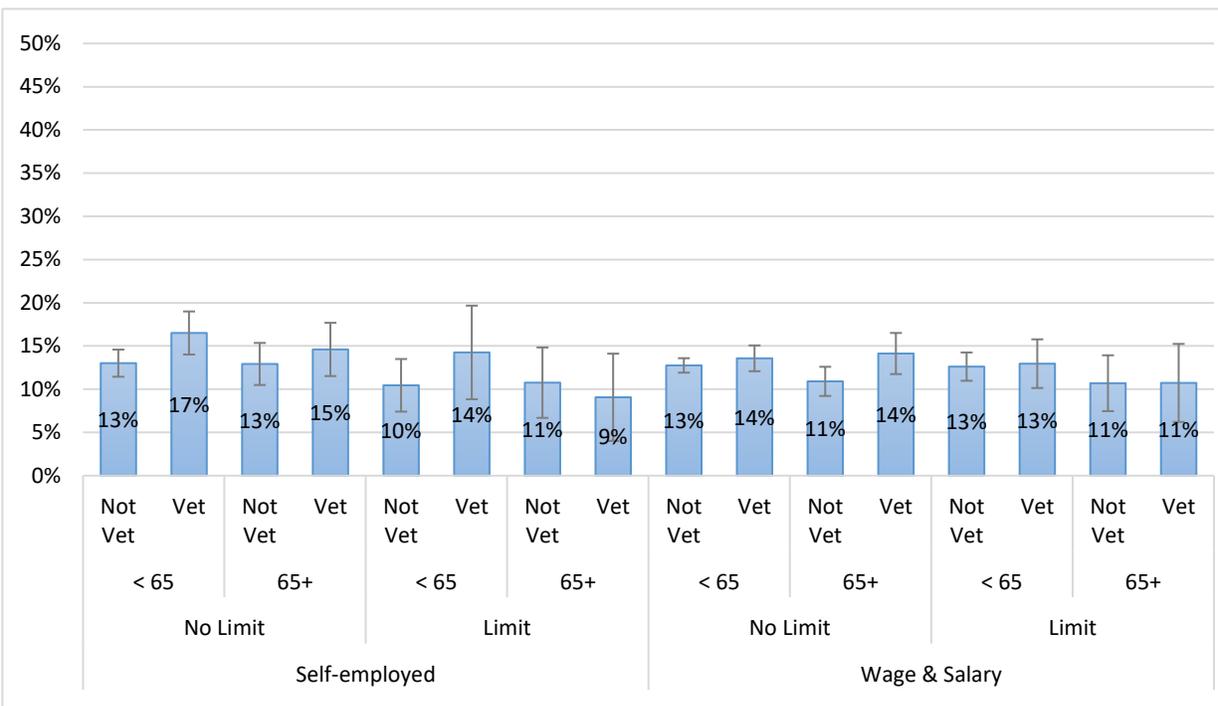
Panel A. Physically Demanding Job



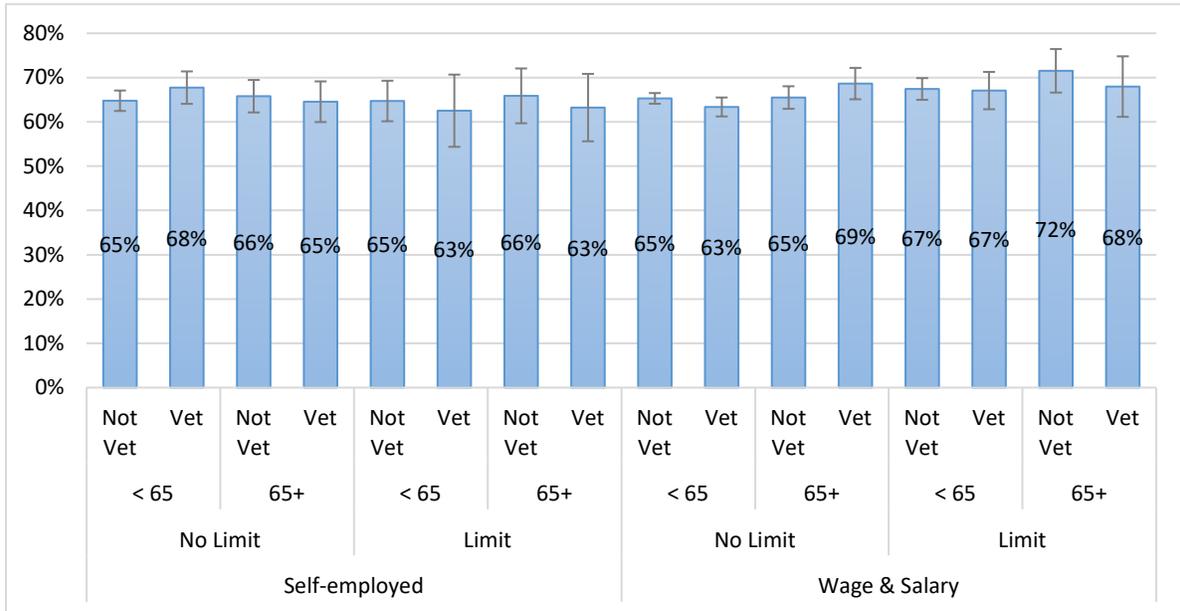
Panel B. Requires Heavy Lifting



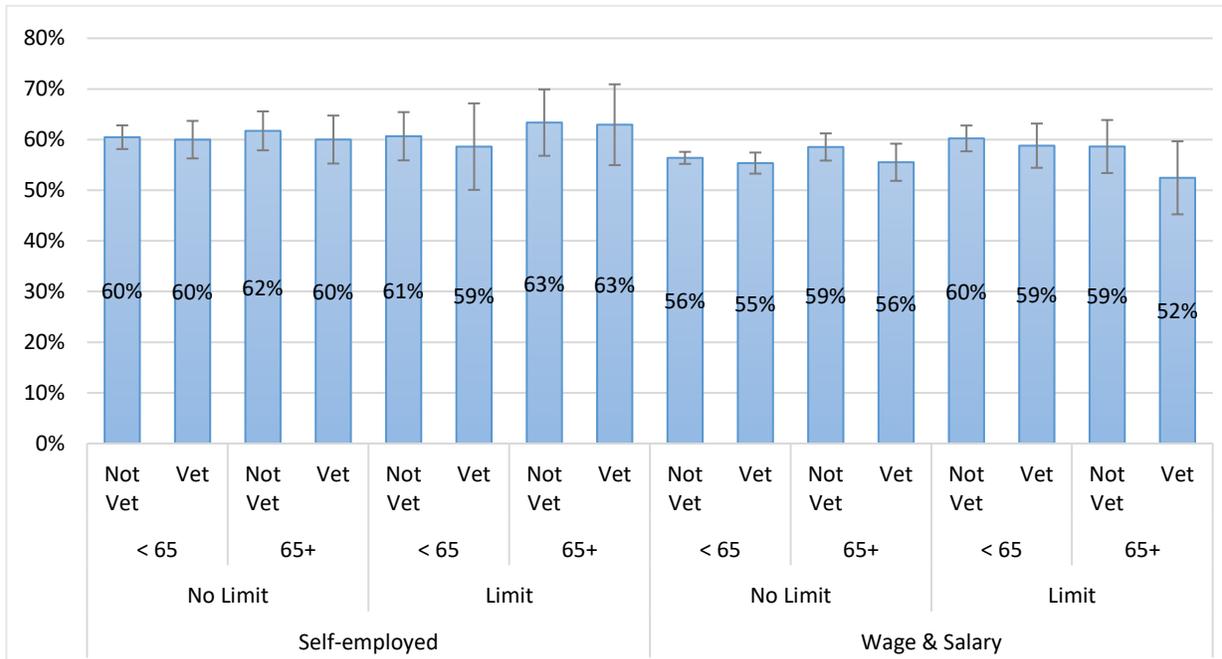
Panel C. Requires Stooping, Crouching



Panel D. Requires Good Eyesight



Panel E. Requires High Stress



Source: 1992–2016 HRS. Entries are predicted probabilities after probit estimation. The 95% Confidence Intervals for the estimates are shown with bars. The sample is restricted to men. All models include the following controls: age group (51–64, and 65+), sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and

uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, and year/wave fixed effects. n = 32,897 (23,16,814 men and 21,16,083 women).

5.2 Hypothesis 2

In Figure 4, we present adjusted average hours worked per week at the primary job across the four self-employed and work limitation categories and by age group. We have adjusted for the following measures: age group, sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, person fixed effects, and year/wave fixed effects.

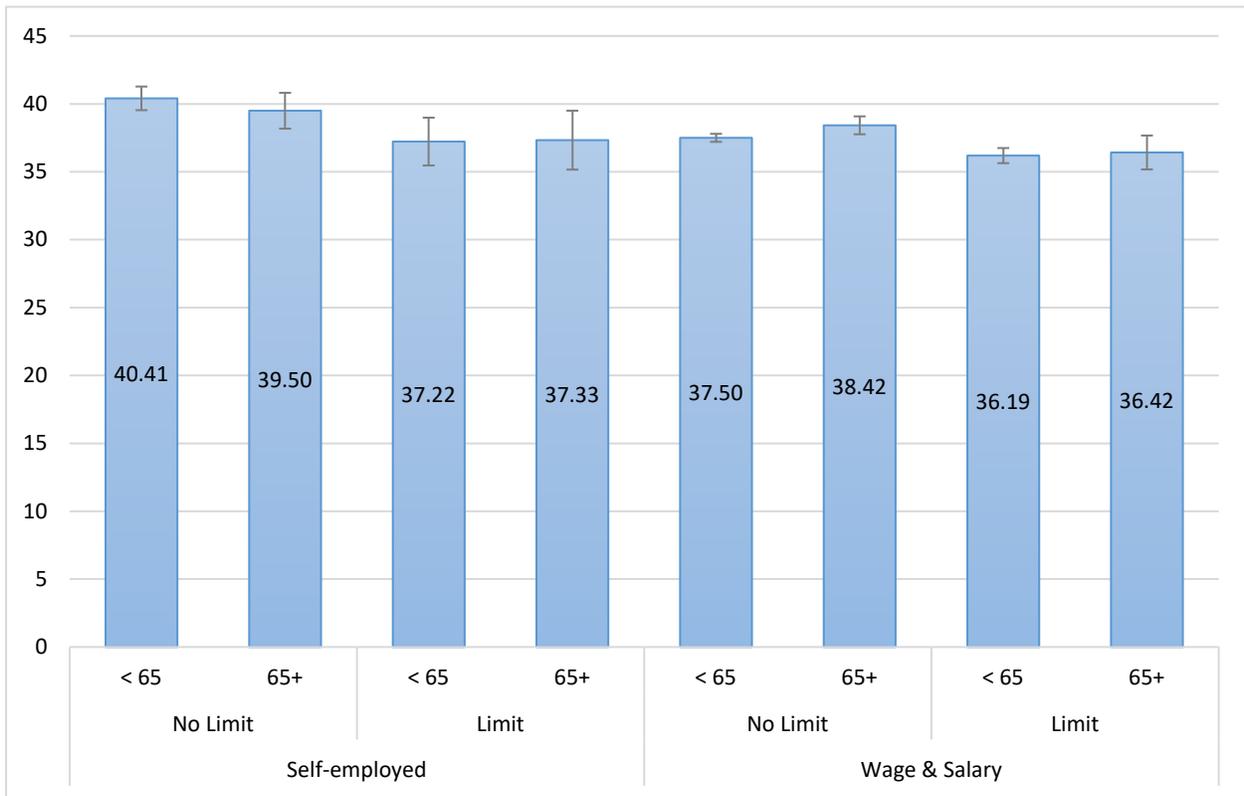
We included person-fixed effects because we are exploiting the panel nature of these data in order to examine changes in work-limiting health conditions. In other words, the estimated differences across different work categories are based on changes within the same person. We observed 8,225 changes in our sample. This allows us to answer the question of whether self-employment provides greater flexibility in adjusting hours and weeks in response to a work-limiting health condition.

On average, self-employed workers who developed a work-limitation worked 3.18 and 2.17 fewer hours per week than those who did not develop a limitation, for those who were

younger than age 65 and those who were aged 65+, respectively ($p < 0.05$). Among wage and salary employed individuals, those who developed a limitation worked about one hour less than their counterparts who did not develop a work-limiting condition, but this difference was not statistically significant and did not vary by age group.

Figure 4. Predicted Weekly Hours, by Employment-Limitation Category

(95% Confidence Intervals)



Source: 1992–2016 HRS. Bars represent 95% confidence intervals. All models include the following controls: age group, sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, person fixed effects, and year/wave fixed effects. Full regression results available in Appendix. $n = 32,564$ (16,620 men and 15,944 women).

We also examined average adjusted weeks worked per year by self-employment status for individuals who did and did not develop work-limiting health conditions, as shown in Figure 5. Overall, we found more weeks worked for wage and salary workers, regardless of limitations. Wage and salary workers with limitations worked about 1.26 and 1.95 more weeks per year than their self-employed counterparts aged < 65 and 65+, respectively (differences significant at $p < 0.05$); however, changes in weeks worked per year upon development of a work-limiting condition were small and not statistically significant.

Figure 5. Predicted Weeks Worked per Year, by Employment and Work-Limiting Category

(95% Confidence Intervals)



Source: 1992–2016 HRS. Bars represent 95% confidence intervals. All models include the following controls: age group, sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some

college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, person fixed effects, and year/wave fixed effects. n = 32,564 (16,620 men and 15,944 women).

5.2.1 Analyses by whether Job is Physically Demanding

Although not one of our proposed project aims, we also investigated the extent to which these results varied by whether individuals had physically demanding jobs. We note that this analysis is limited by the fact that whether the job is physically demanding is self-reported, so there may be unobserved heterogeneity in the sense that individuals in certain employment-limitation types may perceive physical demands differently. The following results should be interpreted cautiously as exploratory. In Table 3, we present predicted weekly hours and annual weeks worked by the employment-limitation category, age, and whether individuals reported a physically demanding job, then the difference in the average hours and weeks by whether individuals reported the job as physically demanding and bolded values are statistically significantly different from zero at $p < 0.05$.

Among the self-employed, there are significant differences in weekly hours reported by physical demands of the job. Those who are self-employed in physically demanding jobs (self-reported) report working between 2.5 to almost 8 hours more per week than their counterparts who do not work in physically demanding jobs, regardless of their age group or whether they have a limitation. For example, individuals who are self-employed with a work-limiting condition and are younger than 65 working in a physically demanding job report working about two and a half more hours per week than those who do not work in physically demanding jobs. Among those who are wage and salary employed, there are mostly insignificant differences by physicality of the job except that those who are 65+ without a limitation, who work almost one

and a half hours more per week. There are few corresponding differences in the average weeks of work per year. Older wage and salary workers with limitations working in physically demanding jobs report 3.33 more weeks per year of work than their counterparts not working in physically demanding jobs.

Table 3. Predicted Weekly Hours, by Employment-Limitation Category, Age, and Self-Reported Physical Demands of Job

	Limits	Age Group	Physical Demands	Average Hours/Week	SE	Difference	Average Weeks/Year	SE	Difference
Self-employed	No Limitations	< 65	Not Demanding	39.93	0.47	2.73	47.62	0.24	-0.12
			Demanding	42.66	0.77		47.50	0.43	
		65+	Not Demanding	38.54	0.70	6.93	47.49	0.44	0.82
			Demanding	45.47	1.16		48.31	0.77	
	Limitations	< 65	Not Demanding	36.81	0.96	2.51	47.17	0.60	-0.69
			Demanding	39.32	1.94		46.49	1.06	
		65+	Not Demanding	36.27	1.09	7.99	46.82	0.83	-0.94
			Demanding	44.26	3.08		45.88	1.92	
Wage & Salary	No Limitations	< 65	Not Demanding	37.53	0.16	-0.26	48.82	0.09	-0.07
			Demanding	37.27	0.26		48.75	0.16	
		65+	Not Demanding	38.24	0.35	1.38	49.24	0.21	0.37
			Demanding	39.62	0.65		49.61	0.43	
	Limitations	< 65	Not Demanding	36.01	0.31	0.86	48.36	0.21	-0.20
			Demanding	36.86	0.65		48.15	0.40	
		65+	Not Demanding	36.42	0.70	-0.11	48.08	0.59	3.33
			Demanding	36.31	1.12		51.41	0.67	

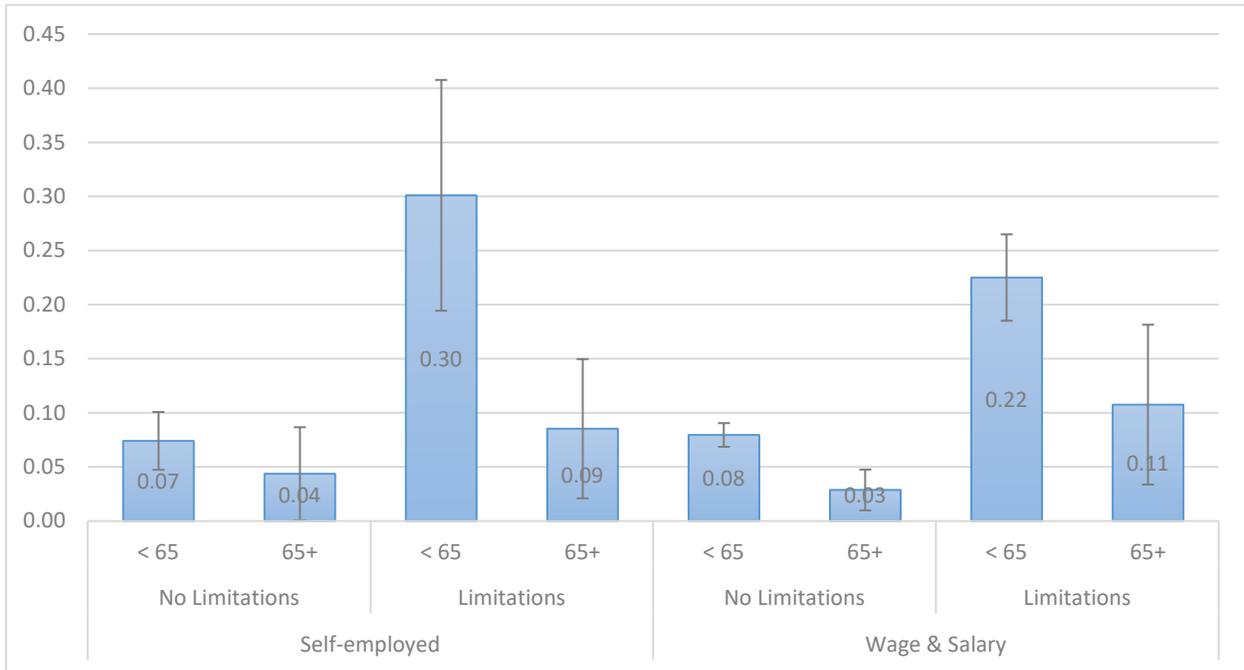
Source: 1992–2016 HRS. All models include the following controls: age group, sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, person fixed effects, and year/wave fixed effects. n = 32,564 (16,620 men and 15,944 women).

5.3 Hypothesis 3

5.3.1 Hypothesis 3a

To test Hypothesis 3—whether self-employed individuals were more likely to apply for disability than their non-self-employed counterparts—we used a smaller sample including only the primary survey respondents (these questions were not asked for spouses). As noted in the methods section, we adjusted for the mass of zeroes in the distribution of applications using a two-part model. In Figure 6, we report the predicted number of applications after this adjustment for the significant number of non-applicants. Overall, individuals with work-limiting conditions had more SSDI applications regardless of their employment type, about 0.30 and 0.22 for individuals working in self-employment and wage and salary positions, respectively. These estimates are not statistically different from each other. We note that application rates were significantly different for the older population (65+), which is not surprising given their eligibility for several other programs.

Figure 6. Predicted Number of SSDI Applications, by Employment and Work-Limiting Category



Source: 1992–2016 HRS. Bars represent 95% confidence intervals. Entries are margins from logit model estimation. All models include the following controls: sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, person fixed effects, and year/wave fixed effects. n = 25,625 (12,739 men and 12,744 women).

5.3.2 Hypothesis 3b

We also investigated whether the probability of SSDI application varied by the interaction of Veteran status and work status (Hypothesis 3b). We report results in Table 4 with the differences by Veteran status shown in the last column (bolded if statistically significant at $p < 0.05$). We found that significant differences in the number of SSDI application varied by Veteran status across self-employment and wage and salary sector employment. The number of applications did not vary among the self-employed with workplace limitation regardless of Veteran status, but self-employed Veterans had more applications than non-Veterans. Older

Veterans employed in wage and salary sector jobs had significantly more applications regardless of limitation status. Younger Veterans employed in wage and salary sector jobs with limitations had fewer applications.

Table 4. Predicted Number of SSDI Application, by Employment-Limitation Category, Age, and Veteran Status

	Limits	Age Group	Physical Demands	Number of Applications	SE	Difference
Self-employed	No Limitations	< 65	Not Vet	0.16	0.04	0.15
			Vet	0.30	0.18	
		65+	Not Vet	0.11	0.06	0.47
			Vet	0.58	0.69	
	Limitations	< 65	Not Vet	0.48	0.10	0.06
			Vet	0.54	0.28	
		65+	Not Vet	0.16	0.07	-0.16
			Vet	0.00	0.68	
Wage & Salary	No Limitations	< 65	Not Vet	0.18	0.02	-0.01
			Vet	0.17	0.11	
		65+	Not Vet	0.06	0.02	0.65
			Vet	0.71	0.46	
	Limitations	< 65	Not Vet	0.45	0.04	-0.28
			Vet	0.16	0.20	
		65+	Not Vet	0.22	0.10	0.40
			Vet	0.62	0.53	

Source: 1992–2016 HRS. All models include the following controls: age group, sex, marital status (married vs. not married), race (White, Black/African American, and other), Hispanic ethnicity, Veteran status, number of children in the household, educational attainment (less than high school/equivalent, GED, high school degree, some college, and college degree or more), health insurance status (Medicare, Medicaid, VA, other public, private, and uninsured), self-reported health status (excellent, very good, good, fair, poor), BMI, Census division fixed effects, household wealth (\$0 to \$99,999, \$100,000 to \$249,999, \$250,000 to \$499,999, \$500,000 to \$999,999, \$1 million to \$4.99 million, \$5 million to \$9.99 million, \$10 million or more), size of the firm/employer (2 to 49 employees, 50 to 99 employees, 100 to 499 employees, and 500+ employees), occupation fixed effects, industry fixed effects, person fixed effects, and year/wave fixed effects. n = 32,564 (16,620 men and 15,944 women).

5.4 Limitations

First, we note that our analyses are exploratory and do not identify a causal pathway. In some analyses, we examined changes in disability status from one wave to the next and how that correlates with employment status in subsequent waves. This allows us to mitigate concerns that unobserved heterogeneity is biasing our results to the extent that time-invariant person-fixed

effects are absorbed in these models. We cannot completely mitigate these concerns because our analysis focuses only on individuals in the labor force. Figure 1 in Section 2 indicates a difference in labor force participation by self-employment status following the onset of a work-limiting health condition. We note that our analysis does not account for this selection out of the labor force.

The analysis has limitations standard with survey data. Information on job requirements is self-reported and subject to inconsistencies including recall and social desirability bias. Although these biases likely affect the data used, we do not anticipate that the degree of bias differs by self-employment or work-limiting health condition status. Another concern is that respondents might have different perceptions of job requirements and health status and that these perceptions might differ systematically by whether the person has a work-limiting health condition. This concern is mitigated in the analysis as there is not a clear pattern of reporting physically demanding job requirements across employment sectors. Survey weights are used to mitigate non-response bias, but this does not address the concern that reporting differs systematically by self-employment and health-related work limitation status. In other words, response rates may vary by characteristics of respondents' jobs and those may be directly related to our key measures of employment status and disability. For example, response rates may be lower among individuals who have a disability that makes responding physically more difficult or by individuals who work in demanding jobs where they may have less time or energy to respond to surveys. To address this issue, results for job characteristics were re-estimated with imputed values for missing items. For each outcome, the signs, significance, and magnitudes of the estimated effects were similar for the non-imputed and imputed data.

Finally, we note that our sample includes individuals age 65 and older. Such individuals are eligible for Medicare and many are eligible for retirement, which may change these decision-making processes significantly. For example, younger individuals are more likely to be “job-locked,” or unable to change jobs easily in order to maintain health insurance coverage. This may be particularly critical for someone who has developed a disability or work-limiting condition that requires frequent treatment and medical care.

6 Discussion & Policy Implications

In this study, we explored the extent to which:

- The physical demands of jobs among individuals age 51 or older varied with respect to self-employment status, the presence of a work-limiting health condition, and Veteran status, as well as the interaction of those measures (Hypothesis 1).
- Hours and weeks worked varied with respect to self-employment status and the development of a work-limiting health condition, as well as their interaction (Hypothesis 2).
- Social Security Administration disability benefit applications varied with respect to self-employment status, the presence of a work-limiting health condition, and Veteran status, as well as the interaction of those measures (Hypothesis 3).

Research Question 1. Which characteristics of self-employment (e.g., physical job requirements, job-related stress) are associated with employment among individuals 51 and older?

The results for Hypotheses 1a and 1b suggest a nuanced story with no clear pattern across physically demanding job requirements by self-employment and work-limiting health condition status. There are three areas that appear most useful for further research and policy design.

First, self-employed workers report higher job-related stress, which is known to have negative implications for measures of health and well-being (Heaphy & Dutton, 2008; Ganster & Rosen, 2013; Goh, Pfeffer, Zenios, & Rajpal, 2015). Further research on the underlying mechanisms causing this stress would allow for the design of effective policy interventions. For example, the main causes of the work-related stress for older self-employed workers might include stress from the financial uncertainty of variable earnings or stress from the scope of activities required of a self-employed worker (e.g., bookkeeping, advertising, lead generation). Addressing stress from financial uncertainty might involve the implicit insurance offered through the U.S. tax code (progressive tax rates and loss offsets) for self-employed workers. Addressing stress related to job scope would likely warrant an entirely different approach such as facilitating shared resources. Further understanding and addressing the underlying causes of stress would likely improve business survival and productivity.

Second, although our estimates do not reflect a causal analysis, we found little evidence for sorting into self-employment to achieve less physically demanding work. Providing more information about the ways self-employment can be used to accommodate work-limiting health conditions might encourage entrepreneurship and increased commitment to the labor force.

Finally, the results do not suggest systematic differences by Veteran status. This indicates that policy interventions affecting older self-employed workers with work-limiting health conditions are likely to impact Veteran and non-Veteran individuals in similar ways.

Research Question 2. Does self-employment provide greater flexibility in adjusting work hours and weeks in response to a work-limiting health condition?

Using the panel nature of the data to track changes to an individual's health status over time, we found that individuals who developed health-related limitations worked fewer hours per

week relative to those who did not develop limitations. Among the self-employed, hours declined two to three hours per week relative to about a one-hour decline among the wage and salary employed individuals who developed a limitation. This is consistent with the notion that self-employment affords greater ability to adjust one's hours weekly. However, we found no evidence that individuals who developed work-limitations changed the number of weeks they worked per year.

Research Question 3. *Are there differences in the frequencies of Social Security Administration disability benefit applications across self-employed (all and Veterans) and wage and salary employed individuals with similar health characteristics?*

Although we hypothesized that self-employed individuals may be less likely to apply for SSDI, we found no support for this. Individuals with work-limiting health conditions were significantly more likely to have applied for SSDI relative to their counterparts without such conditions. These findings suggest that policy efforts to decrease SSDI reliance can be broad and do not need to be tailored based on these characteristics. We note, however, there may be other factors, such as type of occupation, for which there is variation. Further, previous findings in the literature suggest that older workers are less likely to reduce work effort in response to changes in SSDI policy and our results might not hold for younger workers (Maestas et al., 2013).

Although our analyses for Hypotheses 1–3 addressed differences across individuals who remained in the labor force, they can be combined with information from Table 1 to provide context for labor market decisions of older individuals. Much of the literature for this age group, particularly for the 65 year and older group, is focused on retirement decisions (Fisher, Chaffee,

& Sonnega, 2016). Financial incentives to delay retirement, health insurance, caregiving, and health have all been shown to affect the timing of decisions by older adults (Gruber & Madrian, 1995; McGarry, 2004; Lumsdaine & Vermeer, 2015; Manoli & Weber, 2016). Self-employment may also be a bridge move, easing the transition from employment to retirement (Cahill et al., 2013). Older workers may also have less access to wage and salary positions as they age, increasing the relative attractiveness of becoming self-employed (Cahill, Giandrea, & Quinn, 2014).

7 Conclusions

This study points to job-related stress as a concern for self-employed workers. More work is needed to establish the main sources of this stress in order to develop strategies for reducing stress among older self-employed workers with and without work-limiting health conditions. Successfully addressing job-related stress is likely to increase business survival and improve longer term health outcomes.

We found some evidence that those who are self-employed and develop a work-limiting condition can reduce their work time on average about two to three hours per week, relative to only one hour among those who are wage and salary employed. We also find no systematic differences in weeks worked per year or differences in labor supply by veteran status. Despite differences in unadjusted summary statistics, self-employed workers did not systematically have more disability applications than their wage and salary counterparts after controlling for several personal, family, and job-related characteristics.

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7.2 Appendix

We describe our key outcome measures in 5.

Table 5. Key Measures

Information Required	RAND HRS Variable	Description
Self-employment status	slfemp	=1 if respondent answered that they worked for themselves or operated their own business when asked, “Do you work for someone else, are you self-employed, or what?”
Veteran status	avetrn	=1 if respondent answers “Yes” to, “Have you ever been in the active military service?”
Physically demanding job requirements	jphys	Indicates the degree to which the respondent’s job requires lots of physical effort (4 categories)
	jlift	Indicates the degree to which the respondent’s job requires lifting heavy loads (4 categories)
	jstoop	Indicates the degree to which the respondent’s job requires stooping, kneeling, or crouching (4 categories)
	jsight	Indicates the degree to which the respondent’s job requires good eyesight (4 categories)
	jstres	Indicates the degree to which the respondent agrees that his/her job involves lots of stress (4 categories)
Functional Limitations	walk1a	=1 if respondent indicates some difficulty walking one block
	stoopa	=1 if respondent indicates some difficulty stooping, kneeling, or crouching
	lifta	=1 if respondent indicates some difficulty lifting 10 pounds
Work-limiting health condition	hlthlm	=1 if respondent indicates that an impairment or health problem affects the kind or amount of paid work
Instrumental activities of daily life	iadla	Indicates the amount of difficulty experienced reading maps, talking on the phone, managing finances, taking medications, shopping for groceries, and preparing hot meals (4 categories)
Hours worked in last week	jhours, jhour2	Number of hours respondents usually work at their main and secondary jobs
Weeks worked in last year	jweeks, jweek2	Number of weeks per year respondents work at their main and secondary jobs
Disability application(s)	adnepi, adappy, adendy, radstat	Count of disability applications and application year, stop year, and current status for up to 11 applications

Source: Measures constructed by the authors’ from the RAND Health Services Research panel data file.