Introduction

The present study attempts to bridge two distinct areas of research in work and health among older adults in the United States: one on diversification in employment patterns among older adults in the United States in the past 20 years, and the other on health as a correlate of employment among older adults. For many decades, social scientists from Sociology, Gerontology, Economics, and Developmental Psychology have documented these intimately related issues. My approach to this long-debated topic is to introduce a health variable more proximal to work: individual perceptions of whether or not they felt limited at work due to their health issues. Perceived work limitations are dependent on, among many things, levels of physical and cognitive demands at work. However, there is limited quantitative evidence on the role of such occupational characteristics in the trajectory of perceived work limitations and work status. The present study therefore attempts to address the gap in the literature by fitting multi-variate linear latent growth curves to longitudinal data from the Health and Retirement Survey (HRS). With this approach, the present study quantifies the following three overlapping trajectories among older workers aged between 50 and 64: individual perceptions of health-related work limitations, employment, and various aspects of health. The following research questions encompass the aim of this study:

1) To what extent do individual trajectories of work status vary by the initial perceptions of work limitations as well as perceptional changes over time?
2) To what extent do occupational characteristics of a long-term career influence the inter-related trajectories of work-status and perceptions of work limitations?
3) Which aspects of health influence individual trajectories in perceptions of work-related health? When conditioned by varying occupational characteristics, are there any differences in how health translates to perceptions of work limitations?
Notes: I limit this extended-abstract to describing the methods, analytical approach, and results relevant for the first two questions.

Background

Few doubt that perceptions of work-related health limitations play into the calculus of conscious choice among older workers as they contemplate on their career trajectory. A decline in cognitive and physical abilities is an indisputable part of the aging process; and, every older worker eventually reaches a point where they withdraw themselves from the labor force altogether. To be sure, health is one of the many factors identified as important to individual transition into full-retirement (For a detailed review, see Insler 2014). In recent years, a larger proportion of older adults prolong their work life past the Normal Retirement Age, reversing the several decade-long trend of early retirement in the United States (Giandrea, Cahil, and Quinn 2011). Since the Great Recession, increased economic uncertainty is felt by many; employment is a reliable way to counteract mounted threats to retirement security (Tang, Choi, and Goode 2013). A continued rise in the labor participation rate among older adults perhaps reflects such a commonly shared sentiment.

As the labor market values more flexible exchanges of labor, traditional career trajectories become increasingly less age-normative (Warner, Hayward, and Hardy 2009). This also means a retreat from corporate welfare that used to promise economic security during and past one's work life, and towards the era of independent retirement accounts (Hardy 2011). Some call this shift "individualization of risk (Shuey and O'Rand 2006)." Many employers now see themselves overburdened by defined

benefit plans. Deficits of the Pension Guaranty Agency swell as defined benefit plans from large corporate companies go bankrupt, weighing heavily on the government coffer. In the face of such a crisis and economic pressure, employers and the government moved from sharing risk with workers to shifting it onto them (Quin 2011).

An ongoing influx of graying baby boomers to the pre-retiree age group brings about the idea that their late life experiences will be quite different from their parents and grand parents. In the midst of fiscal risk-shifting towards older adults, the advent of public discourse such as "successful aging (Baltes and Baltes 1990)" transforms our perceptions of late life stages as autonomous, independent and comforting. In the narrative of this public discourse, aging does not necessarily take away personal autonomy and a sense of agency; rather, it is a transition of one's life to a new journey. While such a new retirement regime encourages economic independence and independent life styles, such normative/economic incentives are not sole determinants of work status, as many often end up working for a less number of years than they expect (Dewey and Mitchell 1999). Nevertheless, a steady increase in active life expectancy and life expectancy of the U.S. population challenge our notion of late life as fixed and constant. Scholars of human development document the ontogeny of successful aging, documenting individual capabilities of adaptability and resilience to limitations and obstacles that are associated with aging, thereby adding scientific credibility to the discourse (DiPietro et al. 2012).

Perceptions of health-related limitations at work can be conceived as the extent of individual adaptability and resilience to health conditions. As such, it takes into account the fact that not all health conditions are translated into obstacles and limitations at work in a uniform way. Hence, a better understanding of health and employment trajectories can be gained by incorporating the levels and changes of their perceptions of work-related health limitations. I therefore hypothesize that the initial perceptions of health limitations are related not only to the initial likelihood of employment, but also changes in work status over time. That is, one would prolong their work life longer if limitations are not perceived (#1 hypothesis).

As an increased number of older workers strive to engage in economic activities, the nature of their work constrains the extent to which individuals can negotiate their physical and cognitive declines at work. Scholars of human development show that the occurrence of cognitive disabilities is significantly later than that of physical disabilities (Rajan et al. 2012). While disabilities and perceived limitations are not interchangeable, it is possible that physical limitations often become perceivable at an earlier age than cognitive limitations.

Physical limitations are, of course, critical to physically demanding jobs, though it is much less so for sedentary jobs. Conversely, cognitive limitations may not be felt as limiting work if the job is less demanding in terms of cognitive abilities. I therefore argue that often age-graded changes in one's perceptions of their limitations at work vary considerably, depending on the nature of their work (#2 hypothesis). Experiences from a long term job often create a reference to which one gauges their limitations. This leads us to my second hypothesis that cognitive and physical demands of a long-term job affect the initial perceptions of health limitations and also its changes over time. In other words, through perceptions, physical/cognitive demands indirectly influence one's initial work status and a decline in the propensity of employment with age. The following section briefly describes data, methods and preliminary results relevant to the first two hypotheses.

Data and Methods

I use multiple wave data from the Health Retirement Survey administered from 1992 (wave 1) to 2008 (wave 10). My analytic sample is limited to men and women who reported that they were employed in 1992 and also that the tenure of their job is 5 years or longer. Work status and health limitations are measured every two years. Often a full-time career is defined as a full time- job of tenure longer than 10 years; however, this definition is unnecessarily strict to address my research questions where a job is loosely defined as any work that generates income. I employ the full information approach to include respondents who were not present in all waves. Attrition at each wave is explicitly coded and used to adjust growth vectors. The following preliminary analysis consists of 3411 men and 3092 women. The analytic sample varies in age from 50 to 64, thus prior to the normal retirement age.

Variables used to address the first two hypotheses include work status (1 = employed, 0 = not employed), the presence of health-related work limitations (1 = yes , 0 = no), latent constructs for cognitive and physical demand at the job they reported in 1992. Age is collapsed into three: 50-54; 55-59; and 60-64. Cognitive and physical demands are latent variables based on a series of questions related to their job in 1992. The respondents are asked to strongly agree, agree, disagree, or strongly disagree to eight statements such as "your job requires you to learn new things" and "your job requires lifting heavy things." EFA analysis identifies two as the optimal number of factors among these items. CFA analysis confirmed that one has high loadings on three questions related to physical demand, and the other has high loadings on the other five related to cognitive demand. No cross-loadings improved the model fit, and two factors are nearly orthogonal (r = .01). Model statistics of this two-factor CFA model show that it fits data pretty well (CFI = .981 and RMSEA <.05 at P <.001). This CFA model is used as measurement models for two latent variables, cognitive demand and physical demand. Higher factor scores indicate higher demand for cognitive and physical abilities.

Analysis

I use the multi-variate latent growth curve approach to simultaneously estimate varying levels in the initial likelihood of work status in 1994 and its change over the next 16 year period, as well as the initial likelihood of reporting health limitations at work in 1992 and its change over the next 18 year period. Sample statistics show that a decline in the proportions of the employed and those who reported health limitations at work is linear, despite a significant minority of individuals making multiple transitions in and out of the labor force.

Two sets of a linear growth vector (intercept and slope) are estimated, one for work status and the other for health limitations, separately for men and women. The slopes are fixed at two-year increments per time point so that they represent annual linear changes in the likelihood of employment and reporting health limitations. The initial threshold of work status, which is allowed to vary for each individual, is regressed on the slope for work limitations. I also regress the intercept and slope of health limitations on the slope for work status. In addition, I define the intercepts and slopes for both trajectories as functions of age groups (age 50-54 as a reference) and physical/cognitive demands at work in 1992. Endogeneity is of great concern in estimating the association between health and work status. To address this issue, residuals of the intercept and slope are allowed to correlate for both sets, which adjusts for a portion of the change associated with stabile (time-invariant) unobserved heterogeneity determining the origin. Measurement errors from work status and perceived work limitations are set to correlate at each point.

The full paper will fully expand the discussion of endogeneity and also introduce the instrumental variable approach (Inslar 2014). I use Mplus 6.12 for all the following analyses. Mplus estimates the latent growth curve model with a multivariate (as opposed to multi-level) framework. One of the notable features is that residuals at each time point are allowed to freely vary, better suited for addressing endogeneity.

Brief summary of preliminary results

The following description of results is based on the analysis of male workers. The model described above fits the data really well (CFI = 9.8 and RMSEA = .03). R-squares for work status are over .8 on average (9 waves), and .5 for the presence of work limitations (10 waves). As expected, for male workers aged 50-54 with a job that requires an average level of physical/cognitive demands, Reporting work limitations in 1992 has a stronger negative effect on the likelihood of employment in 1994 (-.510, fully standardized). However, those with work limitations at the origin experience a slower decline by approximately 10% in the likelihood of employments for the next 8 years ((.142 + -1.074)/ -1.074, fully standardized). As mentioned, these estimations take into account the covariance between time-stable unknown effects at the origin and change over time, as well as correlations between measurement errors for health limitations and employment at each time point. A rate of decline in the propensity of employment is accelerated by an annul increase in the likelihood of reporting health limitations (-.490, fully standardized); thus, changes in health limitations over the 10 years vastly differentiate experiences among workers who initially had work limitations in 1992.

Cognitive or physical demand had no significant ($P < .05$) effects on the intercept or slope for employment. However, a higher level of cognitive demand decreases the initial likelihood of reporting work limitations (-.072, fully standardized). On the other hand, higher physical demand accelerates the annual increase in the chance of reporting work limitations (.1, fully standardized). That is, high physical demand from a long-term career, not cognitive demand, makes it more likely for one to perceive limitations every year. Though job characteristics do not directly affect one's work trajectory, given its strong associations with work limitations, the indirect effects of physical demand is non-negligible, particularly over a long period of time.

To illustrate the point, figure 1 compares two lines connecting expected probabilities at each time point. Two male workers in this example are between 55 and 59 years old in 1992. One had a physically demanding job and reported some work limitations 4 years after 1992, while the other had the lowest of level of physical demand and no work limitations throughout the observation period. While they have the same likelihood of employment at the beginning, divergence between the two trajectories becomes evident. The expected number of years of employment over the next 18 years is 15.94 for the worker with no physical demand and 11.5 for the worker with high physical demand. Figure 2 shows that among those with little to no physical demand from their long career, those had limitations eventually experience a rise in the likelihood of employment. Having limitations in 1992 causes the inflection point to occur earlier than those who had limitations later; however, it creates such a gap that the former never reaches the point where they surpass the latter in the level of employment propensity. Though preliminary, these results show that the trajectory of work status is very sensitive to one's perceptions of health limitations at work, and also that the level of physical demand from a long career heavily influences a rate of decline in employment propensity through perceiving health limitations.

Figure 1. Expected Probabilities of Employment for Two Workers With Varying Levels of Physical Demand At Work in 1992

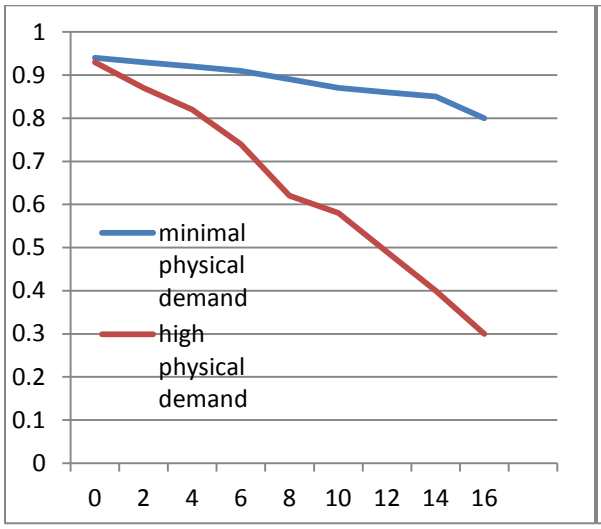
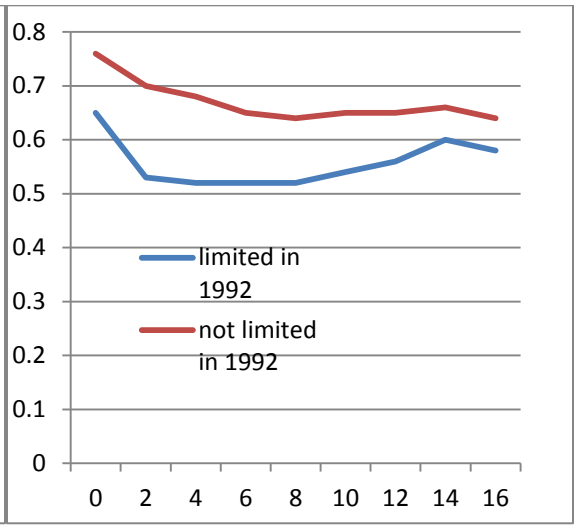


Figure 2. Expected Probabilities of Employment for Two Workers With Different Timing s of Work Limitations



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