Latent Work Capacity and Retirement Expectations

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Introduction

Dramatic changes in life expectancy in recent decades have increased the proportion of an individual's life spent in retirement, imposing challenges on the financial sustainability of Social Security and other public pension programs (Gruber and Wise 2004). These changes have triggered an increasing interest in understanding the factors that drive the timing of retirement among American workers. One important driver of early retirement is age-related decline in health (see e.g. McGarry 2004). Declining health over time can limit individuals' work capacity, increasing the likelihood of mismatch between individuals' abilities to perform certain tasks and the minimum demands of the jobs available to them.

In this study, we develop a new method of assessing individuals' work capacity and relate it to their current employment status, as well as to their expectations about the timing of retirement. We use a unique data set containing individuals' self-reported ratings of their abilities that correspond exactly to the 52 dimensions of ability included in the Occupational Information Network (O*NET) database of job demands for nearly 800 occupations in the U.S. By comparing individuals' own ability levels to the minimum levels required to perform different jobs—including jobs they may not have held in the past but could *potentially* hold in the future—we construct a one-dimensional summary measure of individuals' work capacity that we hypothesize is predictive of both current and future labor supply decisions and therefore relates to expectations about the timing of retirement.

Previous work estimating individual's work capacity has mostly been based on self-assessments of health-related work limiting problems (Kreider 1999) or has focused by necessity on a limited number of dimensions rather than a comprehensive assessment of mismatches between multiple job demands and actual level of abilities (see e.g., Hudomiet et al. 2017). Instead, our comprehensive measure compares individuals' abilities to perform

certain tasks and the minimum demands of the jobs available to them across 52 abilities identified in the O*NET database, and for nearly 800 occupations in the economy. Moreover, recent empirical work suggests that productivity does not decrease with age (Börsch-Supan and Weiss 2016; Burtless 2013). We show that, while this is true for those who continue to work, work capacity declines with age in the general population.

Data and Measures

We use two data sources. The first data set is an occupation-level data from the O*NET database, which contains data for 52 types of abilities on the importance of certain ability (measured in a scale from 1 to 5) and the minimum level required of that ability (measured in a scale from 1 to 7) to perform nearly 800 occupations classified at the 6-digit level of Standard Occupational Codes (SOC). The second data set is a unique survey modeled on the O*NET abilities survey and fielded to respondents in the RAND American Life Panel (ALP), a nationally representative sample of Americans ages 18 and above. We adapted the O*NET questions on the required level of abilities to perform jobs to instead ask individuals to rate their *own* level of a given ability, regardless of their current job. Following the O*NET survey and using the same language, we define the ability and then ask respondents to rate their level of ability on 1-7 scale, with 3 anchor points (e.g. 4 is “thread a needle” for arm-hand steadiness). Our survey contains respondents’ current occupation and industry, as well as standard questions eliciting subjective expectations of retirement at ages 65 and 70.

The sample consists of 2,270 individuals between 25 and 70 years old in July-September 2018. Of them, 69% were active workers, 6% unemployed or temporarily laid-off, 6% disabled, 12% retired and 5% homemakers at the time of the survey (self reported). Regarding education, 38% has a high school degree or less, 28% some college education,

19% a bachelor's degree, and 15% an advanced degree. These results are weighted to be nationally representative.

Our proposed measure of work capacity relates an individual's abilities—a function of their health status—to the job demands required to work in any occupation in the national economy. Specifically, each worker i is endowed with K abilities (e.g., "arm-hand steadiness"), where $\theta_{i,k}$ is the level of ability *k* that individual *i* is able to perform. At the same time, each job j in the economy has *K* job demands defined by $c_{j,k}$, the minimum level of ability *k* required to perform job *j* successfully, and by $\pi_{j,k}$, the importance of ability *k* to perform job *j*. We define the individual's *job-specific work capacity* ($WC_{i,j}$) as **the weighted percentage of times the individual's ability is larger than the minimum level of ability required to perform job *j***, where the weight is the importance of the ability for that job (rescaled to sum to one):

$$WC_{i,j} = \frac{1}{K}\sum_{k=1}^{K} \pi_{j,k} 1\left(\theta_{i.k} \geq c_{j.k}\right). \qquad (1)$$

The individual's *total work capacity (TWC)* is then defined as **the weighted percentage of jobs an individual can perform across all jobs in the economy,** where the weights are the shares of jobs occupied by individuals with the same level of education (to reflect educational requirements to access certain jobs). The index is:

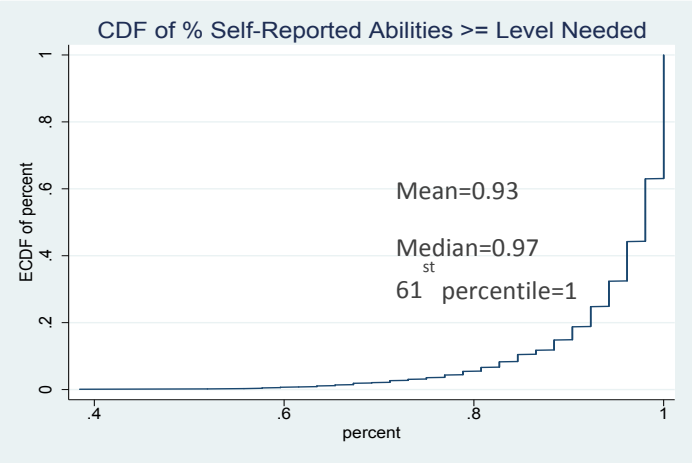
$$TWC_{i,Ed} = \sum_{j=1}^{J} \omega_{j,Ed} * WC_{i,j}. \quad (2)$$

Findings

We start by examining the usefulness of our measure for predicting whether workers are able to perform their current jobs. Figure 1 shows the cumulative distribution of job-specific work capacity, or the weighted percentage of their current jobs workers can do. We find that on

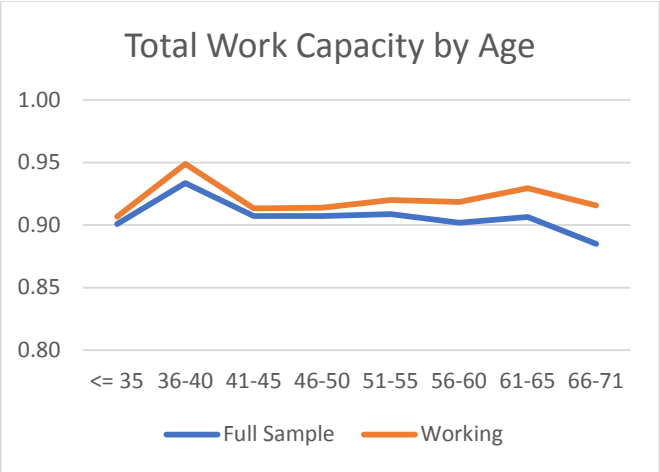
average workers are able to perform 93% of the abilities required in their current job, and half of workers are able to perform at least 97% of the abilities in their current job. Nearly 40 percent of workers in our sample can perform 100% of the abilities in their current job.

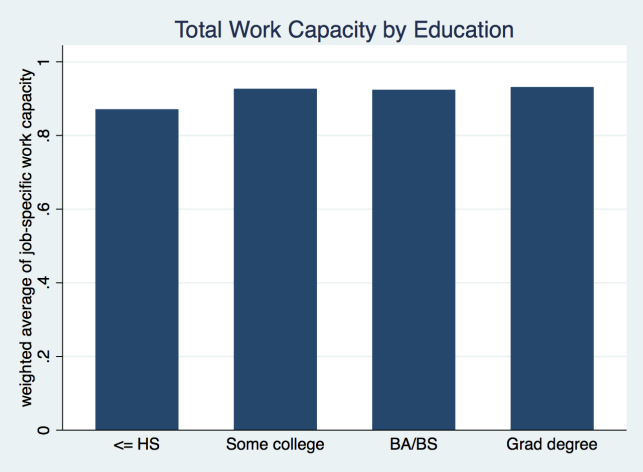
Figure 1: Cumulative distribution of job-specific work capacity



We next describe how our measure of total work capacity correlates with age and education. Figure 2a shows that overall work capacity tends to decline with age, though it increases with age in a selected sample of workers and decreases with age in the non-working population. Figure 2b shows that work capacity increases with education level both among workers and non-workers.

Figure 2: Individual's total work capacity by a) age (left); b) education (right)





Finally, Table 1 presents preliminary results of regressions relating individual's work capacity to current employment status (Column 1) and to the probability that active workers will continue to work after the age of 65 (Column 2). As reflected in Figure 2, total work capacity is positively related to decision to work or not work. Specifically, a 10% increase in total work capacity is related to a 2.9% increase in the likelihood of working at a given age. We also find that individual's work capacity strongly predicts retirement expectations among workers. Indeed, a 10% increase in total work capacity, or (weighted) percentage of jobs in the economy an individual can do, is correlated with a 3% increase in an individual's subjective probability of working beyond age 65. The effects of work capacity on work and retirement expectations are in addition to other significant factors such as education, age, gender and marital status.

Table 1: Effect of work capacity on labor supply outcomes

	(1) Probability of Work		(2) Probability will continue working after age 65	
	coef	**se**	**coef**	**se**
Work Capacity	0.287***	0.076	0.304***	0.078
Education				
Some College	0.109***	0.023	0.050**	0.021
College Degree	0.180***	0.026	0.051**	0.024

Post-graduate	0.184***	0.028	0.076***	0.027
Age				
36-40	0.044	0.032	0.009	0.027
41-45	0.143***	0.033	0.050*	0.026
46-50	0.018	0.035	0.004	0.029
51-55	0.073**	0.032	0.004	0.026
56-60	-0.056*	0.034	0.004	0.029
61-65	-0.184***	0.032	0.071**	0.033
66-71	-0.469***	0.034		
Female	-0.050***	0.018	0.125***	0.033
Married	0.050***	0.019	0.008	0.032
Constant	0.345***	0.070	0.262***	0.071
Number of observations	2,355		1,424	

Note: *** denotes significance at 1%, ** at 5% and * at 10%.

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