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Individual and Work Factors Related to Perceived Work Ability and Labor Force Outcomes

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Abstract

Perceived work ability refers to a worker's assessment of his or her ability to continue working in his or her job, given characteristics of the job along with his or her personal resources. Perceived work ability is a critical variable to study in the U.S., given an aging workforce, trends to delay retirement, and U.S. policy considerations to delay the age at which full Social Security retirement benefits may be obtained. Based on the Job Demands-Resources Model, cognitive appraisal theory of stress and push/pull factors related to retirement, we proposed and tested a conceptual model of antecedents and outcomes of perceived work ability using three independent samples of U.S. working adults. Data regarding workers' job characteristics were from self-report and O*NET measures. Results from relative importance analysis indicated that health and sense of control were consistently and most strongly related to work ability perceptions relative to other job demands and job resources when perceived work ability was measured concurrently or two weeks later in samples with varying occupations. Job demands (along with health and sense of control) were most strongly related to work ability perceptions when perceived work ability was measured in a manufacturing worker sample 1.6 years later. Perceived work ability also predicted lagged labor force outcomes (absence, retirement, and disability leave) while controlling for other known predictors of each. Consistent indirect effects were observed from health status and sense of control to all three of these outcomes via perceived work ability.

Keywords

perceived work ability; older workers; aging workforce; job demands; resources; disability; retirement; Health and Retirement Study

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Work ability refers to a worker's job-related functional capacity, or a worker's ability to continue working in his or her current job, given the challenges or demands of the job and his or her resources (Ilmarinen, Gould, Järvikoski, & Järvisalo, 2008). Ilmarinen and colleagues at the Finnish Institute of Occupational Health (FIOH) first introduced the construct of work ability to the occupational medicine literature in their studies of aging Finnish workers (see Ilmarinen et al., 1991a; Ilmarinen et al., 1991b). The FIOH conducted a longitudinal, multi-phase study on Finnish municipal workers age 51 and older to determine factors that could identify individuals who were at risk for early departure from the workforce. This empirical approach to the development of the work ability construct allowed it to emerge in the occupational medicine literature as a leading indicator of workforce departure (Ilmarinen et al., 1991b). However, it has also resulted in post-hoc theorizing about work ability and lack of integration with psychological and organizational theory.

Importantly, since the original FIOH work ability research was published, researchers have also demonstrated that *subjectively perceived work ability* predicts labor force outcomes in European worker samples, including sick leave (Ahlstrom, Grimby-Eckman, Hagberg, & Dellve, 2010) and workforce departure (von Bonsdorff et al., 2011). The purpose of this study is to improve the understanding of the construct *perceived work ability* by applying and integrating psychological theory with existing research findings to test a conceptual model of perceived work ability antecedents and outcomes in U.S. worker samples.

Background

There are many reasons why research is needed to examine perceived work ability, particularly among U.S. workers. For example, the U.S. workforce is aging; currently more than 20% of the U.S. workforce is age 55 or older (Shultz & Wang, 2011). Also, changes in the U.S. Social Security system have been proposed that will impact retirement benefits and increase the age of eligibility (Urban Institute, 2010), similar to the recent increases in retirement age in Germany and Italy (Associated Press, 2013). It is therefore critically important to identify and understand factors that can predict perceived work ability and workforce departure. Such research can benefit both individual workers and the organizations that employ them by identifying ways to maintain or improve workers' work ability and mitigate premature workforce departure. Although work ability research is thriving in many countries around the world, surprisingly little research has been conducted in the U.S., where public policies for retirement and disability leave are quite different from policies in other countries.

The current study makes three important contributions to the literature. First, we integrate psychological and organizational theory with research findings from the occupational medicine literature to propose and test a conceptual model of work and individual characteristics that relate to perceived work ability, along with outcomes of perceived work ability. Second, we identify the *most important* predictors of perceived work ability in order to provide recommendations for individual and organizational interventions. Third, we replicate previous findings from European samples by examining perceived work ability as a leading indicator of labor force outcomes (absence, retirement, and disability leave).

Altogether, we test a psychological process model wherein job and personal characteristics lead to work ability perceptions, which, in turn, leads to labor force outcomes. We test our model using three separate U.S. working adult samples with time-lagged self-report survey responses and externally-rated job characteristics.

Conceptualizing Perceived Work Ability

Work ability refers to a "balance between personal resources and work characteristics" (Gould, Ilmarinen, Järvisalo, & Koskinen, 2008, p. 165) – in other words, it is a product of both the individual and the working environment (Ilmarinen et al., 2008). Personal health is a key component of work ability; accordingly, the Work Ability Index (WAI; Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tulkki, 1998), the most popular measure of work ability, contains questions that assess diagnosed diseases along with functional impairment. However, *subjective perceptions of one's work ability* also comprise a second important dimension of the work ability construct. Psychometric research on the WAI indicates the existence of these two dimensions, which may be termed "objective" (disease and limitations-based) and "subjective" (perceived) work ability (Martus, Jakob, Rose, Seibt, & Freude, 2010; Radkiewicz & Widerszal-Bazyl, 2005). Subjective perceptions of work ability are more practical for researchers to measure than objective work ability because they can be assessed without asking participants to report diagnosed chronic health conditions.[1] As we demonstrate, perceived work ability can be measured using a brief (4-item) scale, which may be attractive to researchers who find it impractical to administer the entire 60-item WAI.

Prior work ability research from other fields has found empirical support for many individual and work-related correlates of work ability, including physical and mental work demands (Ilmarinen, Tuomi, & Seitsamo, 2005; Lindberg, Vingard, Josephson, & Alfredsson, 2005; Tuomi, Huuhtanen, Nykyri, & Ilmarinen, 2001), along with work resources including autonomy, developmental opportunities, and supervisor support (Ilmarinen et al., 2005; Tuomi et al., 2001). One proposed model of work ability is visually depicted as a "house" (Ilmarinen & Tuomi 2004; Ilmarinen, 2006). At the foundational or core level are individual factors of health and functional capacity, knowledge and skill, and values, attitudes and motivation. Work-related factors comprise another level, including working conditions, work content and demands, work community and organization, and supervisory and management factors. This inductively-derived model integrates research findings, yet it does not provide information on how or why these factors influence work ability or workforce withdrawal, and is not grounded in a broader theoretical framework. We draw upon this previous work in proposing a model of work ability antecedents and outcomes.

We define *perceived work ability* as an individual's self-perception or evaluation of his or her ability to continue working in his or her job. Perceived work ability stems from an individual's experience of various work factors, along with the degree to which he or she possesses personal resources that facilitate positive work ability perceptions. We draw upon

[1]The WAI contains a checklist of 51 chronic diseases that participants report whether they have based on formal diagnoses by a physician. In contrast, subjective perceptions may be assessed using relatively fewer items than the 60-item WAI and without disclosing private health information.

the Job Demands-Resources (JD-R) Model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) to differentiate work characteristics as *demands* that invoke strain or *resources* that promote growth and facilitate work. We also draw upon Lazarus and Folkman's (1984) cognitive appraisal model of stress to explain how demands and resources contribute to perceived work ability. Additionally, we integrate literature on push/pull factors related to the retirement process (Barnes-Farrell, 2003; Shultz, Morton, & Weckerle, 1998) to explain how work ability perceptions result in withdrawal from work (absence) and the labor force (retirement and disability leave). See Figure 1 for the proposed model.

According to the JD-R, job demands are “physical, social, or organizational aspects of a job that require sustained physical or mental effort and are therefore associated with certain physiological or psychological costs” (Demerouti et al., 2001, p. 501). Examples of job demands include physical demands and time pressure at work. Job resources are physical, psychological, social, or organizational aspects of the job that facilitate achieving work goals or reduce job demands and the associated personal costs; examples include supervisor support and autonomy. The JD-R model further stipulates that workers are less likely to experience deleterious effects of demanding work and are more likely to benefit from work if job resources are available to buffer effects of job demands (Bakker, Demerouti, & Euwema, 2005). While the JD-R model was proposed to explain strain and burnout processes, similar to McGonagle et al. (2013), we argue that the underlying frameworks may also be applied to understand perceptions of work ability.

Job Demands and Perceived Work Ability

We propose that work demands contribute to diminished work ability perceptions through a cognitive appraisal process. Lazarus and Folkman (1984) describe the stress process as involving a primary appraisal of an event or situation regarding whether it has the potential to harm the individual (i.e., a threat) or is benign. If the event or situation is appraised as a real or potential threat, a secondary appraisal process is activated, in which resources are invoked to cope. In the absence of sufficient resources, strains (i.e., decrements to psychological or physical well-being) may result from threat appraisals. We propose that, through this process of cognitive appraisal, an individual may perceive that he or she is not able to continue working in his or her job (i.e., perceive low levels of work ability).

We examine role overload, role conflict, time pressure, conflictual contact, negative environmental conditions, physical demands, and unfavorable body positions as job demands that may lead to stressful appraisals and negative perceptions of work ability. Role overload, role conflict, and time pressure are commonly studied work-related stressors (referred to by Karasek, 1979, as psychological job demands). Feeling that one has too much work to do, experiencing conflicting demands, and/or having too little time to complete work may be appraised as threatening and result in strain when combined with inadequate resources to help one manage such demands. Similarly, high levels of conflictual contact (i.e., interpersonal interactions with unpleasant, angry, or physically aggressive people) that invoke the need for emotional labor and potential strain are likely to contribute to appraisals of low levels of work ability. Exposure to various potentially harmful environmental exposures (e.g., working in extreme temperatures, at extreme heights, or with hazardous

chemicals), physically demanding jobs, or jobs with difficult body positions (e.g., repetitive motions or twisting the body) may also invoke concerns about the effects of such exposures on the continued ability to work in such conditions (Barnes-Farrell et al., 2004; Fischer et al., 2006).

> Hypothesis 1: Job demands (role overload, role conflict, time pressure, conflictual contact, negative environmental conditions, physical demands, and unfavorable body positions) are negatively related to perceived work ability.

Job Resources and Perceived Work Ability

Whereas job demands may invoke stressful appraisals, strain, and diminished perceptions of work ability, job resources may contribute to work engagement, the achievement of work goals (Bakker, Demerouti, & Sanz-Vergel, 2014) and, we propose, favorable perceptions of work ability. We examine supervisor and coworker support, along with autonomy – each of which was identified to be particularly important to work engagement in a recent meta-analysis (Christian, Garza, & Slaughter, 2011). Coworker and supervisor support may help bolster workers' ability to circumvent stress appraisals through provisions of instrumental support (helping with job tasks) and/or socio-emotional support (providing encouragement or perspective). A great deal of empirical work has underscored the importance of supervisor and coworker support in relation to worker performance and stress (Eisenberger, Stinglhamber, Vandenberghe, Sucharski, & Rhoades, 2002; Viswesvaran, Sanchez, & Fisher, 1999).

Autonomy at work is another important job resource (Spector, 1986). When workers have flexibility in how they complete or schedule their work, they may be able to perform their work in such a way that fits with their personal needs, thus maximizing their perceived work ability. In addition, control at work likely contributes to challenge (versus threat) primary appraisals, in that events or situations are more likely to be seen as manageable. Weigl, Muller, Hornung, Zacher, and Angerer (2013) demonstrated that job control positively relates to perceived work ability.

> Hypothesis 2: Job resources (autonomy, coworker support, and supervisor support) are positively related to perceived work ability.

Consistent with the JD-R model (Bakker et al., 2005) and the appraisal model of stress (Lazarus & Folkman, 1984), we also propose that job resources will buffer or mitigate the negative effects of demands on work ability perceptions. Specifically, job resources help workers cope with threat appraisals and, therefore, reduce strains or prevent them from occurring (Lazarus & Folkman, 1984). Coworker and supervisor support may help by providing an outlet for emotion-focused coping. Autonomy may also buffer negative impacts of job demands by allowing a worker to take action in the face of a stressful situation, mitigating its negative effects. To the extent that job resources are able to buffer or mitigate negative effects from job demands and strains are diminished, perceptions of work ability should be maintained.

> Hypothesis 3: High levels of job resources will moderate (buffer) relations between job demands and perceived work ability.

Personal Resources and Perceived Work Ability

Although the original JD-R model (Demerouti et al., 2001) excluded personal resources, more recent empirical work has highlighted the importance of personal resources in the strain process (Bakker et al., 2014; Rubino, Perry, Milam, Spitzmueller, & Zapf, 2012; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007, 2009a, 2009b). Personal resources (e.g., emotional stability and health) are internal means for helping individuals function, appraise situations positively, and deal with stress (Hobfoll, 2001). We propose that personal resources will lead to more positive work ability appraisals because they provide a basis for stress management and the achievement of work goals. Availability of personal resources should inhibit primary appraisals of stress in that work will be seen as a challenge that can be met and not a threat (Lazarus & Folkman, 1984). We examine five personal resources that we identified as particularly important to work ability perceptions: personal health, sense of control, positive affectivity, conscientiousness, and emotional stability.

First, health is undoubtedly an important resource; it was included in the original work ability construct and has been subsequently related to work ability in a number of empirical studies (e.g., Ilmarinen et al., 2005). We also propose that having a general sense of control is critical for favorable work ability perceptions. Sense of control refers to “the belief that one can determine one's own internal states and behavior, influence one's environment, and/or bring about desired outcomes” (Wallston, Wallston, Smith, & Dobbins, 1987, p. 5). Feeling able to control one's behaviors and outcomes is critical to dealing positively with stress because events or situations are seen as manageable (Pearlin & Schooler, 1978). Workers with a greater sense of control are also likely to proactively seek ways to maximize their work ability. Sense of control has been empirically associated with a number of positive outcomes, including high levels of life satisfaction (Lachman & Weaver, 1998) and low levels of depressive symptoms (e.g., Archibald, Sydnor, Daniels, & Bronner, 2013; Mirowsky & Ross, 1990), burnout (Westman, Etzion, & Danon, 2001), strain (Chou & Chi, 2000), and exhaustion (Leiter & Robichaud, 1997).

We also examine conscientiousness, emotional stability, and positive affectivity. Emotional stability has direct implications for stress appraisals: those with high levels of emotional stability tend to appraise events as less threatening than those who are more neurotic; they also exhibit more effective ways of coping with stress (Connor-Smith & Flaschbart, 2007). In a recent meta-analysis, Alarcon, Eschleman, and Bowling (2009) found that emotional stability was the most important out of the big five traits in predicting the exhaustion and depersonalization components of burnout. Conscientiousness, which refers to being thorough, reliable, disciplined, and persevering, is related to active coping (Connor-Smith & Flaschbart, 2007). Conscientiousness is also an important buffer of the relation between a workplace stressor (bullying) and job performance (Nandkeolyar, Shaffer, Li, Ekkirala, & Bagger, 2014). Both conscientiousness and positive affectivity have been shown to be positively related to engagement in a meta-analysis (Christian et al., 2011); positive affectivity has also been found to relate positively to resilience and negatively to burnout (Gloria, Faulk, & Steinhardt, 2013).

Hypothesis 4: Personal resources (health, sense of control, positive affectivity, conscientiousness, and emotional stability) are positively related to perceived work ability.

Relative Importance of Demands and Resources

In addition to testing the proposed model regarding job demands and personal and job resources, we examine the relative importance of these factors as they relate to work ability perceptions. To date, no research has examined the relative importance of these characteristics related to perceived work ability, and it is important for identifying optimal ways to intervene to promote work ability. Based on extant research, we expect that physical health status will be the strongest predictor of perceived work ability. Yet, beyond that, our research in this area is exploratory.

Hypothesis 5: Among all resources examined, health status is the strongest predictor of perceived work ability.

Research Question: Which predictors will account for the most variance in work ability perceptions (beyond health)?

Perceived Work Ability and Withdrawal from Work

We integrate retirement theory regarding push/pull factors with the appraisal model and JD-R model to propose that an appraisal of low work ability is likely to result in a decision to withdraw from work via absence or labor force departure via retirement or disability leave. The retirement literature indicates that workers may choose to retire from work as a result of either “push” factors, “pull” factors, or a combination of both (Barnes-Farrell, 2003; Shultz et al., 1998). With reference to decisions to leave work, push factors refer to negative aspects of the work environment that may “push” one out of the workforce (e.g., a stressful work environment; low levels of supervisor support), whereas pull factors refer to positive aspects of the retirement role. We posit that workers may be pushed out of the workforce due to low levels of job or personal resources, along with high levels of job demands, which result in low levels of perceived work ability and a subsequent decision to withdraw from work. This logic may also be applied to decisions to remain at work; workers may be “pulled” toward remaining at work because they perceive that they have high levels of work ability derived from being involved in work with desirable job characteristics and resources and/or having high levels of relevant personal resources (Fisher, Ryan, & Sonnega, in press). Overall, we purport that decisions to leave or remain in the workforce are influenced by an appraisal process wherein individuals consider characteristics of themselves and their jobs, make an assessment of their work ability and, on the basis of this assessment, they are either pushed out of work or pulled toward remaining at work.

Prior research has shown that perceived work ability predicts disability leave (in a longitudinal study of Finnish municipal employees; von Bonsdorff et al., 2011), retirement (in a nationally-representative longitudinal sample of Danish wage workers; Sell et al., 2009), and long-term sick leave (in a longitudinal, study of female workers in Sweden;

Ahlstrom et al., 2010). We expect that perceived work ability will relate to absence, disability leave and retirement in our U.S. samples.

> Hypothesis 6: Perceived work ability is related to subsequent (a) absence, (b) disability leave and (c) retirement.

In addition, we hypothesize that perceived work ability will mediate relations between push/pull factors and outcomes. According to our model, job demands and job and personal resources are “push” and “pull” factors that affect decisions to remain at or withdraw from work, and appraisals of work ability mediate this process.

> Hypothesis 7: Perceived work ability mediates relations between job demands and job and personal resources and a) absence, b) disability leave, and c) retirement.

Method

We tested our study hypotheses using three independent samples. Sample 1 is from the Health and Retirement Study (HRS), a nationally-representative longitudinal panel survey of Americans age 51 and older; Sample 2 is a cross-national lagged sample of U.S. working adults from the web-based Mechanical Turk (MTurk) site from Amazon; and Sample 3 includes employees from six medium-sized manufacturing companies in the Northeast U.S.

Sample 1

Participants and Procedure—The first sample consisted of N=1,656 older working adults in the HRS. The HRS is a cooperative agreement between the U.S. National Institute on Aging (NIA) and the University of Michigan (U01 AG009740). HRS data are collected biennially via in-person or telephone “core” interviews and supplemental paper-and pencil questionnaires that assess psychosocial issues. More information about the HRS design is available at http://hrsonline.isr.umich.edu. The sample included psychosocial questionnaire respondents who were working for pay at the time of their interview in the 2008 wave, were age-eligible for the survey (i.e., born in 1953 or earlier), and answered all of the perceived work ability questionnaire items. The response rate for the HRS psychosocial questionnaire in 2008 was 71%, which factors in the overall HRS 2008 response rate (80%), as well as the response rate for the 2008 psychosocial questionnaire (88.4%; Smith et al., 2013). Slightly more than half of the sample (52%) was male. The sample was predominately white (89%); 8% identified as Black/African American. Six percent of the sample identified as Hispanic. Most (73%) of respondents reported being part of a couple. The average age of respondents was 60.84.[2]

The Sample 1 dataset included HRS respondents’ ratings of perceived work ability, job demands, and job and personal resources measured in a) 2008, along with absence, retirement, and disability leave assessed by the same respondents in the b) 2010 and c) 2012 HRS waves. Because respondents’ assessments of job demands and job resources may be affected by their levels of perceived work ability, we incorporated external ratings of job

[2]Descriptive statistics for sample demographic variables were calculated using respondent-level sampling weights provided by and recommended for use by HRS (Smith et al., 2013).

demands and resources from the Occupational Information Network (O*NET) in addition to the participants' self-reported ratings in our analyses. Specifically, measures of occupation-specific job demands and resources were obtained from the O*NET database (see http://www.onetcenter.org/database.html) and linked to the HRS data using a series of steps (similar to the method used by Fisher et al., 2014). First, participants' occupations reported in the HRS were assigned an appropriate matching 2002 U.S. Census code. Next, the U.S. Census codes were directly linked to an appropriate matching common Standard Occupational Classification (SOC) code through a cross-walk developed specifically for this purpose by the U.S Department of Labor (http://www.xwalkcenter.org/index.php). The SOC codes were used to identify specific occupations in the O*NET databases. Each occupation in the O*NET database has corresponding measures with ratings for job demands and resources as we describe below.

Measures

Perceived work ability—Perceived work ability was measured with four items in the 2008 HRS wave: three items from the WAI (Tuomi et al., 1998) and one additional item adapted from the WAI (Barnes-Farrell et al., 2004; $\alpha = .75$). The items included the WAI subscales of current work ability compared to lifetime best and work ability in relation to physical and mental job demands. The additional item measured work ability in relation to interpersonal demands. The items were: "How many points would you give your current ability to work?" and "Thinking about the [physical, mental, interpersonal] demands of your job, how do you rate your current ability to meet those demands?" The response scale ranged from (0) *cannot currently work at all* to (10) *work ability at its lifetime best*. See the Appendix for some construct validity evidence.

Job Demands

Role overload, role conflict, time pressure, and physical demands: Four single items were rated by HRS participants to assess job demands: "I have too much work to do everything well" (role overload), "In my work I am free from conflicting demands that others make" (reversed; role conflict), "I am under constant time pressure due to a heavy workload" (time pressure), and "My work is physically demanding" (physical demands). The first item was from the 2002 General Social Survey and the latter three from Karasek (1979). The response scale ranged from (1) *strongly disagree* to (4) *strongly agree*.

O*NET work context job demands: In addition to participants' own ratings of job demands just described, additional information about job demands for each HRS participant's occupation was obtained by linking occupations as reported in the HRS to O*NET ratings of job demands (as described above). We constructed multi-item scales to measure *conflictual contact*, *negative environmental conditions*, and *unfavorable body positions* based on the O*NET content model (U.S. Department of Labor, 2012). Three items were used to measure *conflictual contact* - the frequency of interpersonal conflict situations on their job and the extent to which they have to deal with angry and physically aggressive people ($\alpha = .85$). Twelve items were used to measure *negative environmental conditions*, e.g., uncomfortable noise levels, extreme temperatures ($\alpha = .91$). Eight items were used to measure time spent in *unfavorable body positions,* e.g., standing, kneeling,

stooping, (α = .91). Each included O*NET item had a response scale ranging from 1-5; higher scores indicated greater levels of each.

Job Resources

Autonomy: Autonomy was measured in two ways: first via self-report by HRS participants using three items from the 2002 General Social Survey (see Smith et al., 2013). A sample item is, "I have a lot to say about what happens on my job." The response scale ranged from (1) *strongly disagree* to (4) *strongly agree* (α = .64). A second measure of autonomy, which we refer to as *decision freedom*, was a single item obtained from O*NET that measured how much freedom workers have to make decisions without supervision in that occupation.

Coworker support: Three HRS items were used to measure coworker support (Haynes, Wall, Bolden, Stride, & Rick, 1999). A sample item is, "My coworkers listen to me when I need to talk about work-related problems." The response scale ranged from (1) *strongly disagree* to (4) *strongly agree* (α = .91).

Supervisor support: Four items in the HRS were used to measure supervisor support (Eisenberger et al., 2002). A sample item is, "My supervisor is helpful to me in getting the job done." The response scale ranged from (1) *strongly disagree* to (4) *strongly agree* (α = .93).

Personal Resources

Health status: We assessed health in two ways. First, we used a single item of overall self-rated *health status* from the HRS: "Would you say that in general your health is..." The response scale ranged from (1) *excellent* to (5) *poor;* we reverse-coded the item so that higher values indicate better health.[3] Second, we used a comorbidity index - specifically a count of seven chronic diseases each respondent reported having (arthritis, hypertension, heart disease, diabetes, cancer, lung disease, and psychiatric or psychological problems; Weir, 2007). We constructed a variable, *lack of chronic illnesses,* by reversing the count such that higher numbers indicated fewer diseases (i.e., better health).

Sense of control: Two facets of respondents' sense of control were measured in the HRS: *constraints* (5 items; e.g., "I have little control over the things that happen to me") and *mastery* (5 items; e.g., "What happens to me in the future mostly depends on me," Lachman & Weaver, 1998; Pearlin & Schooler, 1978). Response scales for both dimensions ranged from (1) *strongly disagree* to (6) *strongly agree*. Coefficient alphas were .86 (constraints) and .90 (mastery).

Positive affectivity: Thirteen items were used from the expanded PANAS (Watson & Clark, 1994) to assess positive affectivity in the HRS. This measure consisted of adjectives (e.g., "enthusiastic") rated on a 5-point scale ranging from (1) *very much to* (5) *not at all.* The

[3]This item is widely used in epidemiological research, and correlates with other health indicators and mortality in population studies (e.g., Ferraro & Kelly-Moore, 2001; Murata, Kondo, & Tamakoshi, 2006).

scale was reversed prior to analysis so that higher numbers indicated greater levels of positive affectivity (α = .91).

Conscientiousness and emotional stability: Five items were included to assess conscientiousness and four items were included to assess neuroticism/emotional stability from the Midlife Development Inventory (MIDI) personality scales (Lachman & Weaver, 1997). Participants were asked to rate how well each of the adjectives described them, e.g., "hardworking" and "moody" on a 4-point scale ranging from (1) *a lot to* (4) *not at all.* We calculated the means across the items within each personality dimension, and reverse-coded scale values so that higher values indicated higher levels of each.

Outcome Variables

Absence: Respondents were asked, "In the last 12 months, did you miss any days from work because of your health?" Those who responded yes were asked, "About how many days did you miss?" A single variable was created by coding those who responded "no" to the former item with a "0" and using the number of days reported for those who answered "yes."

Disability leave: Respondents were asked to report their current employment situation (e.g., currently working, retired, laid off, unemployed but looking for work, disabled and unable to work, a homemaker). Respondents were coded as disabled (1 = *yes*; 0= *no*) if they self-reported their employment status as not working due to being disabled and unable to work. These values were obtained from both the 2010 and 2012 waves of the HRS.

Retirement: Respondents were asked about their current employment situation as described above, and whether they were currently doing any work for pay. Individuals were classified as "retired" (1=*yes*, 0=*no*) if they indicated that 1) they were retired, 2) not currently doing any work for pay, and 3) not disabled. These values were also obtained from both the 2010 and 2012 HRS waves.

Control Variables—Participants (or their spouses, if the spouse was designated as the financial respondent for the household) reported their *income* from various sources, and a composite was created as part of the RAND HRS public release dataset (additional details are available on the HRS website). Due to its skewed nature, we used a log of income in analyses. Participants' *age* was determined by taking the difference between their self-reported birth date and HRS 2008 interview date. In addition, respondents reported their *marital/partnership status*.

Sample 2

Participants and Procedure—A heterogeneous sample of working U.S. adults (employed at least 20 hours per week) was recruited from the MTurk site from Amazon.com to complete a series of three surveys (a pre-screen, a first survey and a follow-up survey 2-3 weeks later). As with the HRS Sample, O*NET work characteristics data were merged with participants' responses based on the job title through the use of a common SOC code.

We first deployed a pre-screening study to 2,431 individuals in order to 1) recruit only participants from the U.S. who were working 20+ hours per week for an organization for pay, and 2) achieve an age-diverse sample because MTurk workers tend to be younger than the general U.S. population (Goodman, Cryder, & Cheema, 2013). The screening study was only able to be viewed by participants in the U.S., and geographical tracking was used (the region from which the IP address came from was recorded) to verify that all survey responses came from U.S. workers. Individuals were "qualified" (permitted) to take the full survey based on their responses to the prescreening survey. We specifically targeted those who were age 30+ first prior to extending the survey invitation to all those who qualified based on hours worked. Among the 2,431 individuals, 990 (41%) completed the first survey. In addition, three items were included to detect insufficient effort responding (IER; e.g., "Please select "strongly agree" for your response to this question"). Individuals who incorrectly responded to more than one of these items were removed from the dataset (n = 35). Two weeks after the administration of the first survey, a second survey was made available to those who completed the first survey. Of the 955, 499 (52%) completed the second survey administration. Of these 499, 12 were missing identifiers and could not be linked to the first survey, and 21 were removed due to missing >1 IER item. After linking the second wave responses with the first wave, the data were inspected for inconsistencies in reported job titles and age that would indicate haphazard responding, and the amount of time they took to complete the survey was examined. An additional 115 respondents were removed because they reported inconsistent ages (except for those reporting one year older which is possible) and/or inconsistent job titles between wave 1 and wave 2, and/or because they took less than 4 minutes[4] or less than 3.5 minutes to complete the first and second surveys, respectively.

The final sample size for analysis was N= 351. The sample was 53% male (n = 187). Number of hours worked per week ranged from 20 - 90; the average was M = 38.47 hours (SD = 8.73). Participants' ages ranged from 19 – 73; the average age was M = 36.58 (SD = 10.25). Participants' jobs varied, and included, for example, accountant, engineer, computer programmer, marketing analyst, and fifth grade English teacher.

Measures—The measures for Sample 2 replicated those assessed in the HRS for participants' self-reported perceived work ability (α = .90), coworker support (α = .83), supervisor support (α = .88), sense of control (constraints α = .88 and mastery α = .87), health status, and lack of chronic illnesses. Autonomy (α = .91) was measured using two of the three items used in Sample 1, along with, "My job allows me to make a lot of decisions on my own" (Karasek et al. (1998); see also Karasek, Pieper, and Schwartz, 1985). The brief PANAS scale was used (Watson, Clark, & Tellegen, 1988); 5 items measured participants' self-reported positive affectivity, and the items and measurement were similar to that in the HRS (α = .76). To measure absence, participants were asked, "How many days have you missed work in the last 12 months due to your health?" Each participant was asked to report his or her job title on the survey, and to also select his or her job title from a list of all SOC job titles (which have corresponding SOC codes). The primary author then linked the MTurk

[4]Survey 1 was pilot-tested by 10 working adults, and the average time for completion was 5 minutes.

dataset to O*NET data using the common SOC codes. The self-reported job titles were compared with their selected SOC job title; discrepancies were resolved by revising the SOC title to more appropriately match the self-reported job title (45 cases). The same O*NET items reported in Sample 1 were used. In addition, an item to assess time pressure ("How often does your current job require you to meet strict deadlines?") was added because this was not collected via self-report in Sample 2.

Sample 3

Participants and Procedure—Participants were N=649 employees from six mediumsized manufacturing organizations in the Northeast U.S. (ranging in size from 172 to 525 employees) who participated in the first two waves of a longitudinal study on aging, working conditions and musculoskeletal disorders. As part of the overall project, participants completed paper-and-pencil surveys that were distributed and collected by members of the project team on-site during the work day. A total of 772 employees from a cohort of 1,947 eligible employees participated at wave 1 (T1); 649 of wave 1 participants also completed wave 2 data collection, approximately 1.6 years later (T2). This represented a 40% response rate at T1 and a retention rate of 83% from T1 to T2. Participants' ages ranged from 20 to 71 years (mean age at T1 = 48.1 years), 69% were male, and 83% were white. Mean organizational tenure was 15.6 years at T1 and 65% held a college degree. Floor workers comprised 51% of the sample and administrative workers comprised 43% of the sample.

Measures—We used the same self-report perceived work ability and health status measures that were reported in the prior two studies (perceived work ability α = .85 for Time 1 and α = .88 for Time 2). We used the same autonomy scale as in Sample 2 (α = .74).

Negative environmental conditions: Negative environmental conditions were assessed using six items from the Questionnaire for Fourth European Survey on Working Conditions (Parent-Thirion, Fernández-Macías, Hurley, & Vermeylen, 2007). Participants were asked, "In an average day, how many hours are you exposed at work to..." (e.g., "Vibrations from hand tools, machinery"). The response scale ranged from (0) *0 hours* to (4) *>8 hours* (α = .83).

Unfavorable body positions: Unfavorable body positions were assessed using 13 items from the OSHA 1995 checklist (OSHA, 1995). Participants were asked, "In an average day, how many hours do you spend..." (e.g., "Repeatedly bending the neck in any direction"). The response scale ranged from (0) *0 hours* to (4) *>8 hours* (α = .77).

Physical job demands: Physical job demands were measured using four items from Karasek et al. (1985; 1998. A sample item is, "My job requires rapid and continuous physical activity." The response scale ranged from (1) *strongly disagree* to (4) *strongly agree* (α = .88).

Role overload and time pressure: A single item was used to assess role overload: "I am not asked to do an excessive amount of work" and another single item was used to measure time pressure: "I have enough time to get my job done" (Karasek et al., 1985; 1998). We reversed

both items so higher numbers indicated more overload and pressure, and the response scales ranged from (1) *strongly disagree* to (4) *strongly agree*.

Schedule control: A single item measured control over one's schedule: "I have control over my work schedule;" the scale ranged from (1) *strongly disagree* to (4) *strongly agree*.

Coworker and supervisor support: Two items measured coworker support (e.g., "People I work with are helpful in getting the job done" and two items measured supervisor support (e.g., "My supervisor pays attention to what I am saying;" Karasek et al., 1985; 1998). The response scale ranged from (1) *strongly disagree* to (4) *strongly agree* (α = .83 for coworker support and α = .88 for supervisor support).

Sense of control - mastery: Four of the five items used in Samples 1 and 2 were used to measure sense of control (mastery; α = .77); the response scale ranged from (1) *strongly disagree* to (5) *strongly agree*. Constraints were not measured in this sample.

Absence: At Time 2, participants were asked, "During the past 4 weeks, how many days of work have you missed or been absent for any medical problem? (includes unpaid days, paid sick days, and paid vacation days used for health reasons)."

Results

Descriptive Statistics and Inter-Variable Correlations

Descriptive statistics for the three samples are presented in Table 1. Notably, perceived work ability was generally high (> 8 on a scale from 0 - 10) for all three samples. Bivariate correlations are presented in Tables 2-4. An examination of the correlation matrices revealed that job and personal resources were generally more strongly related to perceived work ability than job demands in all three samples, yet demands were relatively more strongly correlated with perceived work ability in time 2 in Sample 3. As expected, perceived work ability was correlated with most of the labor force outcomes in the three samples.

Predictors of Perceived Work Ability and Relative Importance

We tested Hypotheses 1, 2, and 4 by entering all predictor variables into single regression equations predicting perceived work ability scores for the three datasets using Mplus v. 6.11 (Muthén & Muthén, 1998-2010). Due to negative skew in the perceived work ability variable in each sample, we used robust maximum likelihood (MLR) estimation which is robust to non-normality (e.g., Kaplan, 2009). As work ability generally declines with age, and age is also related to retirement and disability, we controlled for age when examining relations of job demands and job and personal resources with work ability. We accounted for the complex sample survey design of the HRS data (Sample 1) by applying respondent level sample weights to estimate parameters and clustering and stratification variables to accurately estimate variances (c. f., Fisher & Willis, 2012).

Results are shown in Table 5[5]. The predictors explained a total of 28% of the variance in perceived work ability in Sample 1, 27% in Sample 2 time 1, 21% in Sample 2 time 2, and 14% and 10% in Sample 3, time 1 and time 2, respectively. In terms of the relations between

job demands and perceived work ability (Hypothesis 1), unfavorable body positions related to perceived work ability in two of the three samples, time pressure related to work ability in Sample 3 (time 1), and negative environmental conditions related to perceived work ability in Sample 3 (time 2). However, no other significant relations of demands with perceived work ability were observed. Regarding the relations between job resources and perceived work ability (Hypothesis 2), although autonomy was significantly related to perceived work ability in Sample 1, this result was not replicated in Samples 2 and 3. In addition, the O*NET decision freedom measure did not relate to perceived work ability in any of the three samples, and the schedule control variable did not relate to perceived work ability in Sample 3. Neither coworker support nor supervisor support related to perceived work ability in any of the samples. In terms of the relations between personal resources and perceived work ability (Hypothesis 4), health status and sense of control (mastery) were related to perceived work ability in all three samples, and sense of control (constraints) was related to perceived work ability in two of the three samples (and was not measured in the third sample). Conscientiousness and emotional stability were both related to perceived work ability in Sample 1 (though these items were not included in the other two samples). Positive affectivity was related to perceived work ability in Sample 1 but not Sample 2. Overall, our results provide limited support for Hypotheses 1 and 2, but more consistent support for Hypothesis 4. Although age was not a primary study variable, regression results indicated that chronological age was negatively related to perceived work ability in Samples 1 and 3 (T2) but not Sample 2. Although these results provide an initial step in understanding predictors of perceived work ability, they are somewhat problematic in that many of the predictor variables are correlated with one another. Therefore, our next step was to run relative importance analyses to determine the amount of variance each predictor uniquely contributed to variance in perceived work ability in each sample.

We used relative importance analysis procedures to address Hypothesis 5 and the Research Question. Specifically, we used procedures that were developed by Johnson (2000) and disseminated by Tonidandel and LeBreton (2011) via a web application that estimates relative weights and confidence intervals using bias-corrected bootstrapping (10,000 draws).[6] Again, we controlled for age. As observed in Table 6, the strongest predictors of perceived work ability (in descending order) for Sample 1 were conscientiousness, health status, positive affectivity, sense of control (constraints), emotional stability, autonomy, sense of control (mastery), lack of chronic illness, coworker support, role overload, physical demands, unfavorable body positions, and supervisor support. Each of these was significant; the rest of the weights were non-significant in Sample 1. In Sample 2, the strongest weights (again, in descending order) were observed for sense of control (mastery) and health status, and both of these were statistically significant. Whole sense of control (constraints) also had a large relative weight (17.5% of the variance accounted for) it was not significant. We

[5]Due to missing data on some of the exogenous predictors and MPlus using listwise deletion for exogenous covariates with missing data, the sample sizes dropped for these analyses; Samples 2 and 3 dropped slightly to N = 348 and N = 632, respectively. However, Sample 1 dropped significantly to N = 1165. Therefore, we also ran regression analyses for Sample 1 using a procedure in MPlus that treats the exogenous variables as dependent variables and avoids listwise deletion. When we ran the regression using this approach and N = 1656, the resulting magnitude and statistical significance of the coefficients were the same as those obtained using listwise deletion.

[6]The HRS sample weights were not applied in the relative importance analysis using the HRS data because doing so would not allow for bootstrapped estimates of statistical significance.

examined Sample 3 weights for predicting both perceived work ability at time 1 and time 2 (1.6 years later). For Sample 3 T1, the strongest weights were for health status and sense of control (mastery); both were significant. For predicting lagged work ability perceptions (Sample 3 T2), the strongest weights were for negative environmental conditions, unfavorable body positions, health status, and physical demands (while sense of control-mastery also had a relatively large weight, it was not significant). Overall, we found limited evidence supporting Hypothesis 5 such that health status was the strongest weighted predictor for Sample 3 (T1). However, health status was second to conscientiousness in predicting perceived work ability in Sample 1, health status fell below sense of control-mastery in Sample 2 and also fell below negative environmental conditions and body positions in Sample 3 (T2). Overall, Hypothesis 5 was only partially supported.

Interactions of Job Demands and Job Resources and Personal Resources

We tested Hypothesis 3 using hierarchical multiple regression analyses. Consistent with Aiken and West (1991), we mean-centered the demands and resources variables and created products of each demand × each job resource. We tested each job demand separately with all resources and demand × resource interactions for that demand entered into a single regression equation predicting perceived work ability. The demand and resources were entered into a first step, followed by the demand × resource interactions for that demand. Statistical significance was determined by a significant change in R^2 for the block of demand × resource interactions, along with significant regression weights for the interaction terms. A total of 28 interactions were tested for job demands (7) by job resources (4) using the HRS data. Only one interaction out of 28 was statistically significant (sense of control – mastery × role overload; $\beta = .05$, $p < .05$). Given the large number of interactions tested, which increases the likelihood of Type 1 error, along with the high level of power afforded by the large HRS dataset (making a Type 2 error unlikely), we did not interpret this interaction and we did not proceed to test interactions using the other two datasets. Therefore, Hypothesis 3 was not supported.[7]

Perceived Work Ability Predicting Labor Force Outcomes and Indirect Effects

We used path analysis in Mplus to assess relations between perceived work ability and absence (all three samples), retirement (Sample 1), and disability leave (Sample 1), along with indirect effects of demands and resources on absence, retirement, and disability leave via perceived work ability. We controlled for age and health status when assessing relations of perceived work ability with absence, retirement, and disability leave, and we controlled for household income when examining retirement.[8] We again accounted for the Sample 1 complex design by applying respondent level sample weights to estimate parameters and clustering and stratification variables to accurately estimate variances. We estimated all equations simultaneously using a single model predicting all of the outcomes in each sample

[7]Full interaction test results are available from the first author upon request. Because we found inconsistent relations between chronological age and perceived work ability, and because we were also interested in further understanding the potential role of age in the demands – perceived work ability relationship, we examined interactions of age with each job demand on perceived work ability in all three samples. We did not find any evidence for statistical interactions of age with demands on perceived work ability.

[8]We also considered being married/partnered as fourth possible control, as it may be considered non-work related personal resource (via social support). Yet, because we found no significant bivariate correlations of this variable with any of the study outcome variables in Sample 1, we did not control for couple status (cf. Carlson & Wu, 2012).

(with a separate model for each sample; see Tables 7, 8, and 9). In Sample 1, bootstrapping is not allowed with the complex sample design, so we estimated indirect effects by creating product terms of the estimated paths as described in Preacher and Hayes (2008). We used bias-corrected bootstrapping procedures (2,000 draws) to estimate indirect effects and standard errors in Samples 2 and 3[9].

In Sample 1, perceived work ability was a significant predictor of absence, retirement, and disability leave (both 2010 and 2012). However, perceived work ability was not a significant predictor of retirement in 2012. For Sample 2, perceived work ability significantly related to absence at time 2 while controlling for both age and health status. For Sample 3, perceived work ability again related to absence at time 2 while controlling for age and health status. Results generally supported Hypothesis 6, with the exception of retirement in 2012.

Prior to testing indirect effects of predictors on absence, retirement and disability leave, we removed exogenous variables that were not significantly related to perceived work ability in each sample (as they should not display significant indirect effects in the absence of a significant path from the predictor to the mediator). In addition, indirect effects were not tested for retirement in 2012 due to its non-significant path from perceived work ability. Direct paths were included from the relevant control variables to their respective outcomes[10]. As displayed in Table 7, in Sample 1 significant negative indirect effects were observed for absence in 2010 via perceived work ability for health status, conscientiousness, and emotional stability. For disability leave in 2010, significant negative indirect effects were observed for health status, emotional stability, conscientiousness, and positive affectivity, and a significant positive indirect effect was observed for sense of control-constraints. Significant indirect effects were observed for retirement in 2010 and disability leave in 2012 in the expected directions for each predictor.[11] Odds ratios (which indicate that an increase of one unit in perceived work ability is associated with decreased odds of the outcome by the odds ratio) were: disability leave (2010): 0.81; disability leave (2012): 0.75; retirement (2010): 0.80.

For Sample 2, we observed significant indirect effects of both health status (negative) and sense of control-constraints (positive) on lagged absence via perceived work ability. For Sample 3, we observed significant negative indirect effects of both health status and sense of control-mastery on lagged absence but no indirect effects for unfavorable body positions. Overall, we observed mixed support for Hypothesis 7; however health demonstrated significant indirect effects related to absence, retirement, and disability leave via perceived work ability in all three samples except for retirement in 2012 in Sample 1. Additionally,

[9]This required the use of ML estimation for Samples 2 and 3 for indirect effects.

[10]For each sample, we tested differences between partial mediation models (including direct paths from non-control predictor variables to each outcome) and full mediation models (excluding direct paths from non-control substantive variables to the outcome variables). In each case, we found non-significant differences between partial and full mediation models using chi square difference testing (model fit attained using ML estimation): Sample 1 $\Delta\chi^2(24) = 31.10$; Sample 2 $\Delta\chi^2(1) = 2.70$; Sample 3 $\Delta\chi^2(2) = 4.79$. We present results from the fully mediated models. Model fit for Sample 1 was $\chi^2(34) = 57.27$; CFI = .99; RMSEA = .02. Model for Sample 2 was: $\chi^2(1) = 2.70$; CFI = .99; RMSEA = .07. Model fit for Sample 3 was $\chi^2(2) = 4.79$; CFI = .96; RMSEA = .05.

[11]We also ran analyses for perceived work ability predicting disability in 2012 while controlling for disability in 2010. We found that the coefficient for perceived work ability predicting disability in 2012 remained statistically significant and the odds ratio was 0.77 (versus a similar 0.75). In addition, the indirect effects results were largely the same in this new model (yet, the indirect effect for conscientiousness became non-significant in the new model).

sense of control displayed significant indirect effects to each of the outcome variables when considering all three samples. Further, in Sample 1, conscientiousness and emotional stability displayed significant indirect effects to each of the outcomes except 2012 retirement. Figure 2 displays a summary of results that combines relative weights of predictors of work ability with relations of perceived work ability to each outcome variable in the final path models.

Discussion

The goal of this study was to propose and test a conceptual model of perceived work ability grounded in psychological theory to improve our understanding of this important construct. We integrated the Job Demands-Resources (JD-R) model (Demerouti et al., 2001), the cognitive appraisal model of work stress (Lazarus & Folkman, 1984), and prior theorizing in the retirement literature regarding push-pull factors (Barnes-Farrell, 2003; Shultz et al., 1998) to propose a model of antecedents and outcomes of perceived work ability. We tested our model using three independent samples of age-diverse workers in the U.S. Results indicated that resources, particularly personal resources, are critical to work ability perceptions. We also found evidence that perceived work ability predicts lagged worker absence from work, retirement, and disability leave. Overall, our results indicate that perceived work ability is an important topic for additional research and a potential target for organizational and individual intervention.

Consistent with the JD-R model, we hypothesized that several job demands and job resources would predict workers' perceptions of work ability. Results indicated that when work ability perceptions were assessed at the same time as demands and resources (Sample 1 and Sample 3) or two to three weeks later (Sample 2), resources (particularly personal resources) were the main contributors to variance in perceived work ability – and surprisingly, on the whole demands were unrelated to work ability perceptions. Yet, when we examined lagged (1.6 years later) work ability perceptions in Sample 3, we did see evidence of relations between job demands and perceived work ability. This is potentially instructive, as it is possible that demands contribute to work ability through a strain process over time, as strains accumulate and have further detrimental effects on health and well-being. This may be particularly true for workers in physically demanding jobs, such as the manufacturing workers in our Sample 3. We recommend additional longitudinal research to replicate these findings.

Our findings underscore the importance of personal resources in understanding perceived work ability. Although the JD-R model originally excluded personal resources such as health and sense of control, more recent research is embracing personal resources and providing empirical support that demonstrates their importance (Bakker et al., 2014; see also Xanthopoulou et al., 2007; 2009a). The most consistently important personal resources in our three samples were sense of control and self-rated health status.

It is interesting that in three samples (Samples 1, 2, and 3 time 1), health status was *not* the strongest contributor to work ability perceptions – conscientiousness, sense of control-mastery, and negative environmental conditions and unfavorable body positions were more

important than health each of these three samples, respectively. This further underscores the differentiation of perceived work ability from "objective" work ability which is strictly based on reports of health and functional limitations. We included two different measures of health: overall self-rated health status and an index of chronic conditions. The comorbidity index was less strongly related to work ability perceptions than self-rated health status overall. It is conceivable that someone could have multiple chronic conditions, but be managing all of them well and, therefore, perceive a high level of work ability. This finding may also be a function of measurement: the comorbidity index did not capture chronic illness *severity*. This may further be due to the fact that both perceived work ability and self-rated health status are ratings of self-perceptions, whereas the index of chronic conditions is a more objective measure of health.

We also observed evidence of the importance of supervisor support, coworker support, and autonomy, as each displayed significant bivariate correlations with perceived work ability in each of the three samples and autonomy emerged as a significant predictor of perceived work ability in Sample 1. Yet, when compared to personal resources, they accounted for less of the variance in perceived work ability. The importance of autonomy is also underscored by Weigl et al. (2013), who found that an overall negative relation of age and perceived work ability in a sample of health care employees was buffered by the use of Selection, Optimization, and Compensation (SOC) coping strategies, but only for those with high levels of job control. Perhaps job resources such as autonomy, coworker, and supervisor support can have optimal effects on perceived work ability when other positive personal resources are in place, but their ability to support positive work ability on their own may not be consistent. Unexpectedly, we did not find evidence supporting interaction effects of job demands with job resources. It is worthy of note that the existence of interactions between demands and control and other job resources is debated (Taris, 2006). In a re-analysis of 64 studies, Van der Doef and Maes (1999) show that, of 31 studies that tested an interaction effect of demands and control, only nine out of 90 individual interaction tests provide unequivocal support for moderation.

Our results also unexpectedly indicated inconsistent relations between age and perceived work ability. Age related only to perceived work ability in Sample 1, and did not relate to perceived work ability in Samples 2 or 3. Inconsistent relations between age and work ability have also been observed in the larger work ability literature. Whereas some researchers have found a negative relation between age and work ability (e.g., Goedhard & Goedhard 2005; Gould, Ilmarinen, Järvisalo, & Koskinen, 2008; Ilmarinen & Tuomi 2004; Weigl et al., 2013), others have not (e.g., Barnes-Farrell et al., 2004; McGonagle et al., 2013). One explanation for our results is age homogeneity within the samples, which may create range restriction. Further range restriction is created because older individuals who remain in the workforce, in general, should have higher levels of perceived work ability than a comparable representative sample of both working and non-working individuals. This is referred to as a "healthy worker effect" (e.g., Osmotherly & Attia, 2006; Sterling & Weinkam, 1986). Future research should assess work ability of the larger U.S. population, including workers as well as those not currently working.

Another explanation regarding the small or insignificant relations between chronological age and work ability is that, with age, workers accrue more job and personal resources (e.g., knowledge, tenure, experience, status). Job and personal resources may buffer any negative effects of the aging process on perceptions of work ability. This is consistent with meta-analyses of the age and job performance relation reported by Ng and Feldman (2008; 2010; 2013). Specifically, Ng and Feldman found that decrements in performance associated with age are not evident in spite of lower levels of some job-related abilities, presumably because workers acquire knowledge and experience that can improve or off-set declines in cognitive processing.

With regard to chronological age, Sample 1 was comprised solely of workers age 51 and older (mean age = 60.84 years), Sample 2 was made up of relatively young workers (mean = 36.58) and Sample 3 (mean = 47.69) was older than Sample 2 but younger and more varied in age than Sample 1. These differences are important to consider when interpreting perceived work ability. For instance, it is likely that older workers pay more attention to their work ability and think more about retirement in general than younger workers. Younger workers may only think about work ability and future employment when they experience chronic health issues. It is also important to note differences in job types between the samples. Samples 1 and 2 were composed of individuals in varied job types, yet Sample 3 included solely manufacturing workers. Therefore, it is not surprising that job demands related to lagged perceptions of work ability to a greater extent than in the other two samples. Overall, sample characteristics including age and job type are important to consider when interpreting work ability research results.

On the whole, our inconsistent findings regarding the relation between perceived work ability and age highlights the need for additional research to better understand nuances of the relationship of perceived work ability and age, in both working and non-working samples. For instance, much of the prior research has used an “older worker” definition based on the U.S. Age Discrimination in Employment Act definition (i.e., age 40 or older). With regard to perceived work ability, age 40 is still relatively young and there may be a great deal of heterogeneity among “younger older workers” and “older older workers.” Additionally, Ng and Feldman (2013) issued a call for more research to focus on *within-person changes* over age rather than comparisons of group differences. It is likely that significant heterogeneity exists between individuals in their trajectories of perceived work ability as they age. Future research may seek to examine predictors of such variability (e.g., levels of personal resources; working conditions). Our results also highlight the possibility that chronological age may not be as important to understanding work ability as personal health and perceived or *subjective/felt age* (e.g., Barnes-Farrell & Piotrowski, 1989). We suggest subjective age is a potentially informative construct with regard to perceived work ability and a good target for future work ability research.

Empirical and Theoretical Implications

We advanced our understanding of perceived work ability by systematically examining the roles of job demands, work resources, and personal resources in relation to workers’ perceptions of their work ability. Our finding that personal resources are relatively more

important to work ability perceptions, particularly when measured at the same time or soon before work ability perceptions is instructive for future researchers. We also demonstrated that the JD-R model may be applied to perceived work ability, where it has typically been applied to burnout and engagement. Further, we integrated appraisal theory of stress and push/pull factors to propose a comprehensive model of job and personal characteristics, perceived work ability and labor force outcomes. Importantly, our findings indicate that perceived work ability contributes to our understanding of the psychological processes underlying individuals' withdrawal from the workforce beyond other known factors, such as health and income.

Our replication of previous European results demonstrating perceived work ability as a leading indicator of labor force outcomes in U.S. worker samples is significant because there are important differences in organizational and national policies regarding retirement and disability leave/pensions between the U.S. and European nations. We also found some evidence to support the notion that work ability functions as a mediator in a psychological process wherein individual resources and job demands lead to labor force outcomes via perceived work ability.

Overall, our results provide support for the importance of studying perceived work ability in U.S. workers, and in the broader psychological and organizational literature. Although health is a commonly-used variable to predict disability leave as well as retirement (e.g., Mortelmans & Vannieuwenhuyze, 2013), our findings suggest that perceived work ability is another key factor in helping us understand work withdrawal behaviors and decisions to leave the workforce and predicts labor force outcomes incrementally over health status. These findings also underscore the importance of identifying workers at-risk for low or declining work ability and intervening to help mitigate work ability declines. Disability researchers may also be interested in perceived work ability to the extent that it can be used to identify workers at increased risk for disability. This link appears to be present across different definitions of disability, including a reduction in the activities of daily living (von Bonsdorff et al, 2011), application for a disability pension (Bethge, Gutenbrunner, & Neuderth, 2013; Roelen et al, 2014), and self-reported disability leave (current study). Collectively, these studies support the position that perceived work ability taps into self-perceptions and underlying health issues that may accelerate over time and eventually lead to premature workforce departure. This underscores the importance of identifying workers with low or declining work ability and intervening to help mitigate further work ability declines.

Practical Implications

Our finding that personal resources are important predictors of work ability perceptions is potentially instructive for designing interventions. Sense of control emerged as particularly important to work ability perceptions, which is an important finding because research indicates that this variable is amenable to change (Lazarus & Folkman, 1984), and therefore intervention may be warranted for those with low levels (Lachman, 2006; Sadow & Hopkins, 1993; Wolinsky et al., 2010). Health status emerged as another key predictor of work ability; our findings suggest that attention to worker health may pay off in terms of

helping workers maintain work ability and prevent early workforce departure. Many organizations are already providing resources to help workers stay healthy and reduce health insurance costs; such programs may also benefit workers' work ability and longevity of working life. Workers who are dealing with declining levels of work ability may benefit from work-related accommodations to help preserve work ability. Additionally, interventions to boost personal psychological resources (c.f. Demerouti, Van Eeuwijk, Snelder, & Wild, 2011; Luthans, Avey, Avolio, Norman, & Combs, 2006) may be helpful for helping workers maintain levels of work ability. One-on-one workplace coaching is a possible option for intervention – as it has been shown to decrease individuals' stress levels and improve their resilience and well-being (Grant, Curtayne, & Burton, 2009), and has also been shown to improve perceived work ability in workers with chronic health conditions (McGonagle, Beatty, & Joffe, 2014).

Another possibility for intervention is Selection, Optimization, and Compensation (SOC; Baltes & Baltes, 1990) training. SOC, which presents a useful framework for understanding perceived work ability (Weigl et al., 2013), is a resource-based life management strategy that involves selecting goals that are most important at a given life stage, optimizing resources to enable successful achievement of goals, and compensating when goal-relevant means are unavailable or diminished. We would expect that when workers have a goal of continued employment, SOC strategies would be helpful in the maintenance of work ability, particularly for aging workers or workers who have been diagnosed with chronic health conditions.

Finally, our study results offer some support for the use of a four-item self-report measure of perceived work ability (see the Appendix for construct validity information). Researchers and practitioners may find the measure of perceived work ability used in the present study to be useful, as well as more practical than the 60-item WAI that asks workers to disclose private information about chronic diseases and functional limitations. Yet, there is also a need for additional research to further develop and validate measures of perceived work ability.

Limitations and Future Research Directions

As with all studies, our research has some limitations that warrant discussion. First, in some cases, the measurement of some of the variables differed between the samples. The external source of job characteristics data (O*NET) is a strength of our study given concerns about common method variance inflating correlations between self-reported variables (e.g., Podsakoff, MacKenzie, & Podsakoff, 2012) and our concerns that individuals with lower levels of perceived work ability may also perceive higher levels of job demands and lower levels of resources, as noted in the Method section. However, O*NET ratings of job characteristics are also not without limitations. For instance, within-occupation variance in demands and resources likely exists, yet it is not captured by the O*NET ratings. Our results did indicate some convergence in findings for variables in which we had both self-report and O*NET ratings (e.g., autonomy; unfavorable body positions). However, future research is needed to determine whether other variables (e.g., conflictual contact, negative environmental conditions) would demonstrate significant relations with perceived work

ability if measured via self-report. An interesting line of future research would be compare relations between “objective” and subjectively reported job characteristics with perceived work ability. Further, while we were able to include many relevant job demands and personal and job resources due to the richness of the HRS database, there may be other important variables to consider. Other variables of interest for future research may include, for example core self-evaluations (e.g., Judge, Locke, & Durham, 1997) and psychological capital (e.g., Luthans & Youssef, 2004).

Additionally, feedback loops may exist between job resources, personal resources, and work ability (similar to those found by Xanthopoulou et al., 2009b). It is likely that through negative effects of stress appraisals and strain on personal resources, perceived work ability is likely to be further diminished. Future work should assess perceived work ability over several years to determine factors that influence work ability trajectories and potentially reciprocal relations with work characteristics.

Future research should also consider other outcomes of importance to organizations, including job performance. For instance, it may be that in an effort to maximize core task performance in the face of declining work ability, workers exhibit fewer organizational citizenship behaviors. Future research may also extend these findings to individual well-being. Since work is an integral part of peoples’ lives and is important to well-being, it follows that declines in work ability may predict variance in psychological distress/well-being beyond other known factors. A review of interventions designed to promote work ability indicated that surprisingly very few methodologically sound interventions have been conducted, and research is needed to design and systematically evaluate such interventions (de Lange et al., 2013).

Conclusion

Perceived work ability is an important construct for understanding psychological processes related to workforce withdrawal. Our results indicate that personal resources in particular, along with some job resources and job demands contribute to perceptions of work ability, which in turn contribute to variance in work-related absence, retirement, and disability leave. We found that personal resources of sense of control and health status were particularly important for participants’ current work ability perceptions in diverse occupations; health status, sense of control, negative environmental conditions, physical demands, and unfavorable body positions were particularly important for subsequent work ability perceptions in a sample of manufacturing workers. Our findings underscore the importance of perceived work ability for U.S. researchers and managers as a topic to consider both for intervention (to improve work ability) and as a predictor of workforce departure in addition to other known predictors. We hope to see increased attention given to perceived work ability in organizational research and practice.

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Appendix

Description of Supplemental Dataset and Measures Used to Evaluate Construct Validity of the Four-Item Perceived Work Ability Measure

Participants and Procedure

For the purposes of providing additional construct validity information for the perceived work ability measure used in this paper, a separate heterogeneous sample of 216 working U.S. adults employed at least 20 hours per week was recruited from Amazon.com's MTurk site to complete an online survey. Initially, 2,000 individuals completed a prescreening survey, 569 of whom were invited to complete a full survey, and 230 responded to the full survey. After data cleaning, 216 individuals were retained. The majority of the sample was male (67%) and White/Non-Hispanic (84%). Sixty one percent had at least a four-year college degree. Hours worked per week ranged from 20 – 112; M = 42.01 hours (SD = 9.52). Participants' ages ranged from 18 – 79; M = 32.20 (SD = 9.84). Average job tenure was 4.7 years (SD = 4.25).

Measures

Response scales ranged from (1) *strongly disagree* to (5) *strongly agree* unless otherwise noted; higher scores indicate greater levels of a construct. We measured ***perceived work ability*** by using the 4-item scale described in the Method section (α = .75). We also used the entire 60-item Work Ability Index (WAI; Tuomi et al., 1998) and calculated scores in accordance with the WAI manual (α = .73). ***Employability*** was measured using a five-item scale from Berntson and Marklund (2007; α =.84). An eight-item scale from Chen, Gully, and Eden (2004) was used to assess ***general self-efficacy*** (α =.91). An eight-item scale from Chen, Goddard, and Casper (2004) was used to measure ***job self-efficacy*** (α =.86). The 12-item WHO-DAS 2.0 was used to measure ***disability*** (WHO, 2010; α =.91). Participants indicated how much difficulty they have had in the past 30 days with, e.g., "standing for long periods such as 30 minutes." The response scale ranged from (0) *none* to (4) *extreme or cannot do*. Three items from Cammann, Fichman, Jenkins, and Klesh (1983) were used to measure ***job satisfaction*** (α =.92). Two items were used from Campbell, Converse, and Rogers (1976) to measure ***life satisfaction*** (α =.69). ***Health status*** was measured using the same item noted in the Method section.

Results

The overall mean work ability score was high: M = 42.20 out of 49 possible points (SD = 5.18). The mean score on the brief work ability measure was also high (M = 8.26, SD = 1.27) out of 10 possible points. All other descriptive statistics available from the first author. The two work ability scales were significantly correlated r = .75 (p < .01). In addition, the

WAI and the 4-item measure exhibited similar bivariate correlations with study variables (see Table 1 below).

Table 1

Bivariate Correlations

		1	2	3	4	5	6	7	8
1.	Work Ability Index								
2.	Perceived Work Ability	.75**							
3.	Employability	.23**	.20**						
4.	General Self-Efficacy	.45**	.40**	.48**					
5.	Job Self-Efficacy	.29**	.42**	.32**	.56**				
6.	Disability	−.72**	−.50**	−.27**	−.48**	−.34**			
7.	Job Satisfaction	.32**	.27**	.28**	.19**	.25**	−.23**		
8.	Life Satisfaction	.42**	.29**	.37**	.44**	.31**	−.47**	.44**	
9.	Health Status	.68**	.42**	.24**	.42**	.24**	−.59**	.14	.46**

Note. N = 216.

*$p < .05$.

**$p < .01$.

All four items of the perceived work ability scale were set to load on a single latent perceived work ability factor using Mplus v.6.11. The one-factor model fit the data well: $\chi^2(2) = 4.68$, $p > .05$; RMSEA = .08; CFI = .99; SRMR = .03. Standardized factor loadings ranged from .44 (physical work ability) to .81 (mental work ability); variance accounted for ranged from .19 (physical work ability) to .65 (mental work ability). Composite reliability = .76.

Discriminant validity was tested using a series of measurement models to examine the factor structure among the hypothesized scales: work ability and (a) employability, (b) general self-efficacy, (c) job self-efficacy, and (d) disability. A model was tested in which indicators for each variable loaded on a separate corresponding latent factor (5 latent factors). For the disability scale, two items each measured the following: cognition, mobility, self-care, getting along, life activities, and participation; the residuals of each of the two pairs of items were freed to correlate (total of 6 correlated residuals). The hypothesized model fit the data significantly better than the fit of a model in which all items loaded on one latent factor according to results of a chi square difference test: $\Delta\chi^2(10) = 1067.99$, $p < .001$. Next, a series of models were compared in which the work ability items were set to load onto each of the other latent variables, and fit comparisons were made to the five-factor model, which had a fit of $\chi^2(613) = 1206.18$. In all cases, the five-factor model demonstrated significantly better fit than the four-factor model (see table below).

Table 2

Tests of Discriminant Validity

Model (Three factors as hypothesized, plus . . .)	Fit of 4-factor model	Chi Square Difference
. . . Employability items loading on PWA	$\chi^2(617)=1461.21$	$\Delta\chi^2(4) = 255.03^{**}$
. . . General Self-Efficacy items loading on PWA	$\chi^2(617)=1392.31$	$\Delta\chi^2(4) = 186.13^{**}$
. . . Job Self-Efficacy items loading on PWA	$\chi^2(617)=1362.18$	$\Delta\chi^2(4) = 156.0^{**}$
. . . Disability items loading on PWA	$\chi^2(617)=1332.58$	$\Delta\chi^2(4) = 126.40^{**}$

Note:

PWA = perceived work ability. The fit of the hypothesized (five-factor) model was $\chi^2(613) = 1206.18$.

$^{**}p < .01$.

Conclusion

A single factor structure for perceived work ability fit the data well. The four-item measure was strongly correlated with the full WAI, and was positively correlated with employability, self-efficacy (job and general), job satisfaction, life satisfaction, and health status and negatively correlated with disability. Further, the 4-item scale displayed evidence of discriminant validity from employability, general and job self-efficacy, and disability scales.

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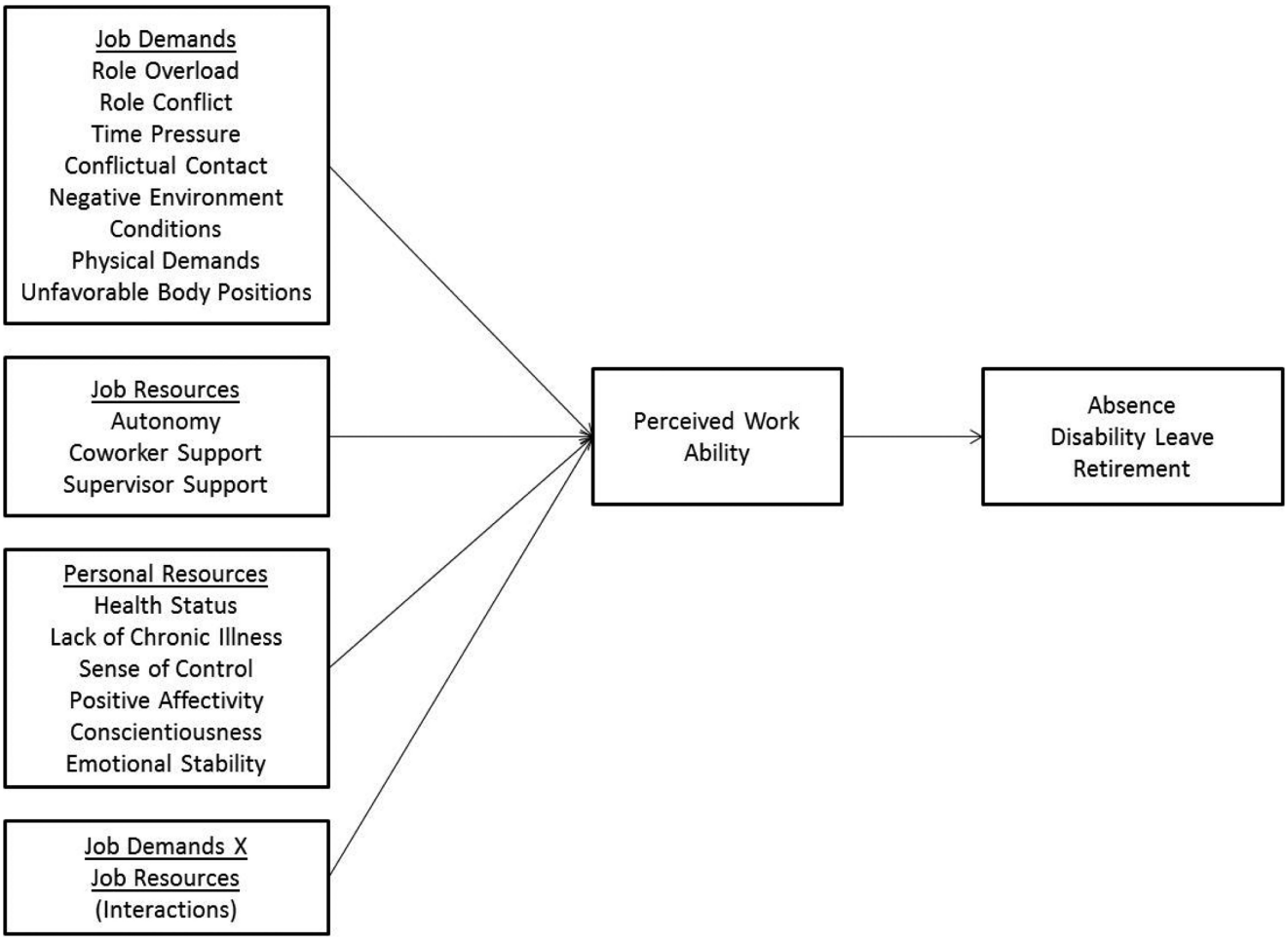

Figure 1.
Proposed Conceptual Model of Perceived Work Ability.

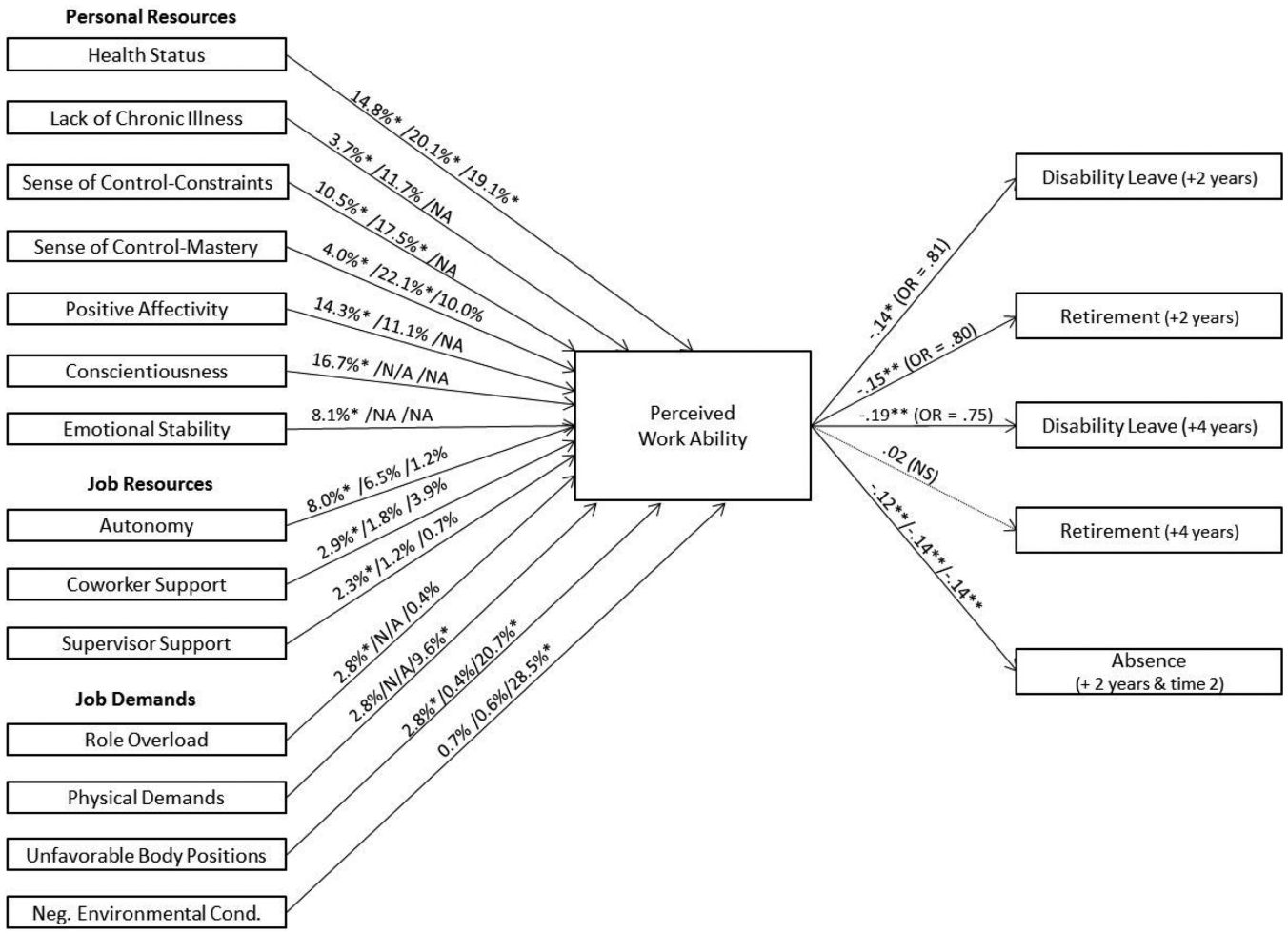

Figure 2.

Summary of Results. This model includes all exogenous variables that had significant relative weights predicting variance in perceived work ability in one of the three samples and all study outcome variables. Estimates are from: Sample 1 / Sample 2 / Sample 3; NA means that the variable was not included for a given Sample. Exogenous variables for Samples 2 and 3 are time 1 predictors of time 2 perceived work ability. Exogenous variables for Sample 1 are time 1 predictors of time 1 work ability. Estimates of exogenous variables to perceived work ability are relative weights (% of variance in perceived work ability) and estimates of perceived work ability to outcomes are odds ratios (OR) and standardized coefficients from final structural models. Analyses of absence and disability leave control for age and health status. Analyses of retirement control for age, household income, and health status. Sample 1 analyses of exogenous variables on perceived work ability control for age (Sample 1, 2, and 3) and Income (Sample 1). See Tables 7, 8, and 9 for estimates of indirect effects from exogenous variables to outcomes and for path model estimates of exogenous predictors at time 1 to perceived work ability at time 1. *$p < .05$. **$p < .01$.

Table 1

Descriptive Statistics.

			Sample 1			Sample 2			Sample 3		
Time	**O*NET**	**Variable**	**Scale**	**Mean or %**	**SE**	**Scale**	**Mean**	**SD**	**Scale**	**Mean**	**SD**
1		Perceived Work Ability	0-10	8.73	.03	0-10	8.86	1.12	0-10	9.39	0.91
2		Perceived Work Ability				0-10	8.73	1.10	0-10	9.28	1.15
		Job Demands									
1		Role Overload	1-4	1.91	.02				1-4	2.47	0.67
1		Role Conflict	1-4	2.37	03						
1	Sample 2	Time Pressure	1-4	3.80	.01	1-5	3.81	0.50	1-4	2.36	0.65
N/A	Samples 1 & 2	Conflictual Contact	1-5	2.64	02	1-5	2.59	0.47			
1	Samples 1 & 2	Negative Environ. Cond.	1-5	1.90	.02	1-5	1.76	0.56	0-4	0.85	0.91
1		Physical Demands	1-4	2.37	.03				1-4	1.85	0.66
1	Samples 1 & 2	Unfavorable Body Positions	1-5	2.33	.02	1-5	2.25	0.56	0-4	1.14	0.59
		Job Resources									
1		Autonomy	1-4	3.06	.02	1-4	2.99	0.73	1-4	2.89	0.59
N/A	Samples 1 & 2	Decision Freedom	1-5	4.11	.01	1-5	4.12	0.42			
1		Schedule Control							1-4	2.49	0.75
1		Coworker Support	1-4	3.22	.02	1-4	3.36	0.57	1-4	2.88	0.50
1		Supervisor Support	1-4	3.01	.02	1-4	3.01	0.69	1-4	2.90	0.63
		Personal Resources									
1		Health Status	1-5	3.51	.04	1-5	3.58	0.87	1-5	3.48	0.76
1		Lack of Chronic Illness	0-7	5.58	.03	0-7	6.37	0.91			
1		Sense of Control-Constraints	1-6	1.92	.03	1-6	2.34	0.98			
1		Sense of Control-Mastery	1-6	4.31	.02	1-6	4.84	0.76	1-5	3.84	0.67
1		Positive Affectivity	1-5	3.72	.02	1-5	3.52	0.70			
1		Conscientiousness	1-4	3.46	.01						
1		Emotional Stability	1-4	2.99	.02						
		Outcomes									
2		Absence	0-365	3.34	0.35	0-365	1.98	2.69	0-28	0.58	2.35
2		Disabled 2010		2.18%							

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				Sample 1			Sample 2			Sample 3	
Time	**O*NET**	**Variable**	**Scale**	**Mean or %**	**SE**	**Scale**	**Mean**	**SD**	**Scale**	**Mean**	**SD**
2		Retired 2010		12.49%							
3		Disabled 2012		3.63%							
3		Retired 2012		23.90%							
		Other Variables									
1		Chronological Age	n/a	60.84	.15	n/a	36.58	10.25	n/a	47.69	10.49
1		Household Income	n/a	100964	4617						

Note. Sample 1 N = 1656. Sample 2 N = 351. Sample 3 N = 649. Sample 1: Time 1 is 2008 wave, Time 2 is 2010 wave, and Time 3 is 2012 wave of HRS. Sample 2: Time 1 is first survey administration; Time 2 is second survey administration, which was 2 - 3 weeks after the first survey administration. Sample 3: Time 1 is first survey administration; Time 2 is, 1.6 years after the first survey administration. SD = standard deviation (reported for Samples 2 and 3). SE = standard error (reported for Sample 1 with sampling weights applied because these are population estimates). Disability and retirement percentages estimated using estimated population counts. O*NET indicates that in the Sample noted, the variable was derived from the O*NET database and merged with the participants' data using common SOC job title codes. N/A indicates that only O*NET variables were used, so time 1 and time 2 self-report data is not applicable.

Table 2

Sample 1 Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1	Perceived Work Ability																									
2	Role Overload	−.22**																								
3	Role Conflict	−.11**	.28**																							
4	Time Pressure	.05	.08**	.04																						
5	†Conflictual Contact	.04	.01	.05*	.03																					
6	†Negative Environ. Cond.	−.10**	.04	.03	.11**	−.02																				
7	Physical Demands	−.13**	.21**	.12**	−.07**	.00	.39**																			
8	†Unfavorable Body Positions	−.14**	.00	.00	−.13**	−.13**	.73**	.40**																		
9	Autonomy	.29**	−.33**	−.33**	.04	−.03	−.10**	−.13**	−.15**																	
10	†Decision Freedom	.06*	.02	.00	.32**	.14**	−.19**	−.13**	−.44**	.19**																
11	Coworker Support	.23**	−.27**	−.22**	.05	.00	−.10**	−.12**	−.13**	.44**	.12**															
12	Supervisor Support	.21**	−.32**	−.27**	.01	−.03	−.10**	−.13**	−.11**	.48**	.07**	.62**														
13	Health Status	.36**	−.13**	−.08**	.04	.03	−.13**	−.15**	−.18**	.22**	.14**	.18**	.15**													
14	Lack of Chronic Illness	.20**	.04	−.01	.09**	−.04	−.03	−.03	−.03	.08**	.05*	.04	.04	.42**												
15	Sense of Control-Constraints	−.33**	.30**	.16**	−.05	−.05*	.09**	.14**	.13**	−.33**	−.15**	−.25**	−.21**	−.28**	−.09**											
16	Sense of Control-Mastery	.23**	−.12**	−.08**	−.01	−.03	−.02	−.01	−.03	.16**	.03	.14**	.11**	.16**	.09**	−.16**										
17	Positive Affectivity	.38**	−.25**	−.15**	.00	.06*	−.12**	−.09**	−.13**	.31**	.11**	.26**	.25**	.33**	.10**	−.49**	.28**									
18	Conscientiousness	.34**	−.14**	−.11**	.01	.08**	−.11**	−.06*	−.11**	.19**	.05*	.15**	.10**	.20**	.11**	−.28**	.20**	.43**								
19	Emotional Stability	.29**	−.22**	−.14**	.03	.00	−.03	−.10**	−.05*	.24**	.07**	.19**	.19**	.28**	.12**	−.38**	.23**	.44**	.26**							
20	Chronological Age	−.12**	−.15**	−.13**	−.09**	−.02	−.01	−.05*	.01	.12**	−.02	.06*	.13**	−.01	−.27**	.03	.01	.05	−.02	.10**						
21	Household Income	.18**	.01	.00	.22**	.06*	−.15**	−.12**	−.32**	.17**	.30**	.15**	.05	.24**	.13**	−.22**	.05*	.13**	.06*	.08**	−.09**					
22	Absence (2010)	−.09**	.02	.04	−.04	−.01	.05	.06*	.01	−.08**	−.02	−.02	−.07*	−.17**	−.14**	.02	−.02	−.01	−.02	−.06*	.02	.00				

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
23	Retired (2010)	−.14**	−.01	−.01	−.03	.02	.02	.01	.04	−.02	−.07**	−.02	.02	−.07**	−.15**	.06*	.01	−.01	−.01	.01	.26**	−.07**	.00			
24	Disabled (2010)	−.11**	.02	.04	−.03	−.03	.02	.06*	.04	−.06*	−.04	−.07**	−.03	−.12**	−.08**	.08**	−.04	−.01	−.07**	−.04	.01	−.06**	.05	−.01		
25	Retired (2012)	−.05	−.05	−.03	−.05	.00	.02	.00	.02	−.02	−.05	−.03	.01	−.06*	−.14**	.02	−.01	.01	.01	.05	.29**	−.06*	.07*	.55**	.08**	
26	Disabled (2012)	−.13**	.02	.00	−.04	−.01	.04	.06*	.08**	−.06*	−.07**	−.09**	−.04	−.13**	−.07**	.07**	−.05*	−.09**	−.07**	−.06*	−.03	−.08**	.13**	.00	.31**	−.02

Note. N = 1656.

*$p < .05$.

**$p < .01$.

†Indicates O*NET variable.

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Table 3

Sample 2 Bivariate Correlations.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Perceived Work Ability (T1)																
2	Perceived Work Ability (T2)	.70**															
3	†Time Pressure	.15**	.12*														
4	†Conflictual Contact	.04	.03	.07													
5	†Negative Environ. Cond.	.01	−.01	.07	.06												
6	†Unfavorable Body Positions	−.03	−.02	−.14**	.06	.78**											
7	Autonomy	.15**	.14**	.14**	−.16**	−.08	−.17**										
8	†Decision Freedom	.00	−.03	.20**	−.05	−.07	−.32**	.28**									
9	Coworker Support	.17**	.09	.05	−.05	.06	.03	.25**	.12*								
10	Supervisor Support	.17**	.13*	.07	−.05	−.06	−.06	.23**	.08	.61**							
11	Health Status	.29**	.31**	−.06	−.05	−.02	−.06	.10	−.01	.05	.15**						
12	Lack of Chronic Illness	.26**	.22**	−.01	−.03	.03	.04	.02	−.06	.03	−.06	.46**					
13	Sense of Control-Mastery	.36**	.34**	.12*	−.01	.03	.03	.18**	−.03	.15**	.18**	.30**	−.18**				
14	Sense of Control-Constraints	−.44**	−.32**	−.10	.01	.00	.00	−.17**	.03	−.15*	−.23**	−.32**	.30**	−.64**			
15	Positive Affectivity	.25**	.25**	.07	.04	.06	.06	.11*	.02	.07	.13*	.25**	−.19**	.42**	−.36**		
16	Chronological Age	−.04	.02	.06	.05	.03	−.04	.06	.10	−.04	−.04	−.08	.25**	−.08	.00	.09	
17	Absence (T2)	−.21**	−.17**	−.04	−.02	.01	.02	.03	.06	.05	−.02	−.26**	−.20**	−.17**	.20**	−.07	.12*

Note. N = 351.

T2 = Time 2 (second survey administration 2-3 weeks after the first); all other self-report variables measured at time 1. Negative Environ. Cond. = negative environmental conditions.

*$p < .05$.

**$p < .01$.

†Indicates O*NET variable.

Table 4

Sample 3 Bivariate Correlations.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Perceived Work Ability (T1)														
2	Perceived Work Ability (T2)	.35**													
3	Role Overload	−.13**	.00												
4	Time Pressure	−.17**	−.06	.49**											
5	Negative Environ. Cond.	−.11**	−.22**	−.07	−.14**										
6	Unfavorable Body Positions	−.14**	−.21**	.02	−.01	.45**									
7	Physical Job Demands	−.14**	−.18**	−.01	−.10*	.59**	.46**								
8	Autonomy	.11**	.09*	−.08*	−.06	−.25**	−.23**	−.35**							
9	Schedule Control	.15**	.10*	−.08*	−.02	−.35**	−.14**	−.34**	.36**						
10	Coworker Support	.13**	.11**	−.10*	−.16**	−.22**	−.15**	−.21**	.36**	.20**					
11	Supervisor Support	.19**	.05	−.15**	−.18**	−.16**	−.08*	−.19**	.37**	.18**	.45**				
12	Health Status	.23**	.17**	−.05	.00	−.17**	−.17**	−.21**	.17**	.17**	.20**	.18**			
13	Sense of Control-Mastery	.22**	.14**	−.17**	−.16**	−.05	−.09*	−.11**	.30**	.18**	.24**	−.30**	.20**		
14	Chronological Age	−.07	−.01	−.07	−.03	.02	.05	−.02	.06	.06	−.06	.03	−.07	−.12**	
15	Absence (T2)	−.14**	−.34**	.05	.03	.08*	.11**	.03	−.06	−.05	−.02	−.03	−.05	−.04	−.02

Note. N = 649.

T2 = time 2 (second survey administration 1.6 years after the first); all other variables measured at time 1. Negative Environ. Cond. = negative environmental conditions.

* $p < .05$.

** $p < .01$.

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Table 5

Regression Weights and R^2 Values for Single Regression Equations Predicting Perceived Work Ability in Each Sample

	Sample 1	Sample 2 T1	Sample 2 T2	Sample 3 T1	Sample 3 T2
	β	*β*	*β*	*β*	*β*
Job Demands					
Role Overload	−.03			.02	.03
Role Conflict	−.03				
Time Pressure	.02	.08	.09	−.14**	−.07
Conflictual Contact	−.01	.06	.03		
Negative Environment Conditions	.10	.02	−.06	−.02	−.17**
Physical Demands	−.05	−.04	.01	−.04	−.01
Unfavorable Body Positions	−.12*			−.09	−.11*
Job Resources					
Autonomy	.10**	.05	.10	−.06	−.02
Decision Freedom	−.03	−.02	−.06		
Schedule Control				.07	−.02
Coworker Support	.05	.11	−.05	−.01	.04
Supervisor Support	−.01	−.02	−.02	.08	−.05
Personal Resources					
Health Status	.17**	.11*	.16*	.16**	.12**
Lack of Chronic Illness	.00	.10	.11		
Sense of Control-Mastery	.08**	.06	.16*	.13**	.10*
Sense of Control-Constraints	−.08*	−.29**	−.09		
Positive Affectivity	.12**	.06	.08		
Conscientiousness	.13**				
Emotional Stability	.09*				
Other Variables					
Chronological Age	−.11**	−.03	.05	−.05	.01

	Sample 1	Sample 2 T1	Sample 2 T2	Sample 3 T1	Sample 3 T2
	β	*β*	*β*	*β*	*β*
Total R^2	.28**	.27**	.21**	.14**	.10**

Sample 1 N = 1165. Sample 2 T1 & T2 N = 348. Sample 3 T1 N = 633. Sample 3 T2 N = 630.

* $p < .05$.

** $p < .01$ (two-tailed).

Table 6

Results of Relative Weights Analysis of Age, Demands and Resources as Predictors of Perceived Work Ability

	Sample 1		Sample 2		Sample 3 T1		Sample 3 T2	
Variable	**Raw Weight**	**% of R^2**	**Raw Weight**	**% of R^2**	**Raw Weight**	**% of R^2**	**Raw Weight**	**% of R^2**
Age	.011*	3.9%	.001	0.6%	.004	3.1%	.000	0.1%
Job Demands								
Role Overload	.008*	2.8%			.006	4.4%	.000	0.4%
Role Conflict	.002	0.8%						
Time Pressure	.000	0.1%	.010	5.0%	.020	14.7%	.004	3.4%
Conflictual Contact	.001	0.2%	.001	0.3%				
Neg. Environment Conditions	.002	0.7%	.001	0.6%	.004	2.7%	.029*	28.5%
Physical Demands	.008*	2.8%			.006	4.5%	.010*	9.6%
Unfavorable Body Positions	.008*	2.8%	.001	0.4%	.011	7.8%	.021*	20.7%
Job Resources								
Autonomy	.023*	8.0%	.014	6.5%	.002	1.3%	.001	1.2%
Decision Freedom	.001	0.4%	.002	1.2%				
Schedule Control					.009	6.7%	.002	2.2%
Coworker Support	.008*	2.9%	.004	1.8%	.003	2.2%	.004	3.9%
Supervisor Support	.006*	2.3%	.002	1.2%	.014	9.9%	.001	0.7%
Personal Resources								
Health Status	.042*	14.8%	.042*	20.1%	.032*	23.3%	.020*	19.1%
Lack of Chronic Illness	.010*	3.7%	.025	11.7%				
Sense of Control-Constraints	.030*	10.5%	.037*	17.5%				
Sense of Control-Mastery	.011*	4.0%	.046*	22.1%	.027*	19.4%	.010	10.0%
Positive Affectivity	.041*	14.3%	.023	11.1%				
Conscientiousness	.047*	16.7%						

	Sample 1		Sample 2		Sample 3 T1		Sample 3 T2	
Variable	**Raw Weight**	**% of R^2**	**Raw Weight**	**% of R^2**	**Raw Weight**	**% of R^2**	**Raw Weight**	**% of R^2**
Emotional Stability	.023*	8.1%						
Total R^2	.28		.21		.14		.10	

Note. In Sample 2, work ability measured at time 2 (2-3 weeks after time 1); all Sample 2 predictors measured at time 1. Sample 3 T1 is time 1 predictors of time 1 perceived work ability. Sample 3 T2 is time 1 predictors of time 2 work ability (1.6 years after time 1).

*$p < .05$ indicated by confidence intervals that exclude zero derived from bias-corrected bootstrapping (10,000 draws). All variables entered into relative importance analysis concurrently. Pairwise deletion was used for missing data.

Table 7

Direct and Indirect Effects Results (Sample 1)

	Work Ability	Absence 2010	Disability 2010	Retirement 2010	Disability 2012
Predictor Variable					
Direct Effects					
Age	−.13**	.01	−.05	.33**	−.12
Household Income				−.02	
Autonomy	.14**				
Health Status	.19**	−.13**	−.35**	−.04	−.27**
Sense of Control-Constraints	−.10**				
Sense of Control-Mastery	.06**				
Positive Affectivity	.13**				
Conscientiousness	.13**				
Emotional Stability	.09**				
Perceived Work Ability		−.12**	−.14*	−.15**	−.19**
Indirect Effects via Perceived Work Ability					
Autonomy		−.26	−.06	−.06**	−.08*
Health Status		−.24*	−.05*	−.06**	−.07*
Sense of Control-Constraints		.12	.03*	.03*	.04**
Sense of Control-Mastery		−.10	−.02	−.02*	−.03*
Conscientiousness		−.37*	−.08*	−.09**	−.11*
Emotional Stability		−.18*	−.04*	−.04*	−.05**
Positive Affectivity		−.22	−.05*	−.05**	−.07**
Total R^2	.28**	.04**	.17*	.15**	.16*

Note. N = 1656.

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Standardized estimates (path coefficients) presented for direct effects; unstandardized coefficients presented for indirect effects. Analyses of absence and disability leave control for age and health status. Analyses of retirement control for age, household income, and health status. Retirement in 2012 was omitted from analyses of indirect effects because it had a non-significant relationship with perceived work ability.

*$p < .05$

**$p < .01$.

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Table 8

Direct and Indirect Effects Results (Sample 2)

	Perceived Work Ability	Absence
Predictor Variable		
Direct Effects		
Age	−.03	.09
Health Status	.17**	−.21*
Sense of Control-Constraints	−.38**	
Perceived Work Ability		−.14*
Indirect Effects via Perceived Work Ability		
Health Status		−.07*
Sense of Control-Constraints		.15**
Total R^2	.22**	.09*

Note. N = 351.

Standardized estimates (path coefficients) presented for direct and indirect effects; unstandardized coefficients presented for indirect effects. Analyses of absence control for age and health status. All exogenous variables and perceived work ability measured at time 1 and absence measured at time 2 (2-3 weeks later).

* $p < .05$

** $p < .01$.

Table 9

Direct and Indirect Effects Results (Sample 3)

	Perceived Work Ability	Absence
Predictor Variable		
Direct Effects		
Age	−.03	−.03
Unfavorable Body Positions	−.10*	
Health Status	.18**	−.03
Sense of Control-Mastery	.18**	
Perceived Work Ability		−.14*
Indirect Effects via Perceived Work Ability		
Unfavorable Body Positions		.06
Health Status		−.08*
Sense of Control-Mastery		−.09*
Total R^2	.10**	.02*

Note. N = 644.

Standardized estimates (path coefficients) presented for direct effects; unstandardized coefficients presented for indirect effects. All analyses of absence control for age and health status. All exogenous variables and perceived work ability measured at time 1 and absence measured at time 2 (1.6 years later).

*$p < .05$

**$p < .01$.