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Age and Job Fit: The Relationship Between Demands–Ability Fit and Retirement and Health

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Understanding the antecedents of retirement and health is increasingly important given the proportion of older adults in the global workforce. The current study examines the relationship between the demands–ability facet of person–job fit and retirement status and health. The sample consists of older workers and retired adults ($N = 383$) from the Study of Cognition and Aging in the U.S.A. (a national study of age and cognitive abilities). Objective demands–ability fit was operationalized as the fit between a person's cognitive abilities assessed with an extensive battery of reasoning (fluid abilities) and knowledge (crystallized abilities) and relevant job demands taken from the Occupational Information Network. Results indicated that as the congruence between workers' reasoning abilities and job demands increased, workers reported fewer chronic health conditions. When reasoning abilities required by a job exceeded worker abilities, workers reported more health conditions and were more likely to be retired versus working. Fewer health conditions were reported when reasoning abilities exceeded reasoning job demands. Congruence for knowledge abilities and demands fit was significant only at medium levels of knowledge abilities and demands. Overall, these results suggest that demands–ability fit is relevant to the experience of work in older age.

Keywords: aging, cognitive abilities, job demands, retirement, health

Changing workforce demographics due to economic, health, social, and psychological factors have resulted in a higher proportion of workers remaining at work until later ages than in the past. These factors include decreasing fertility rates, increased life expectancies, changes in public policy regarding retirement, and economic and psychological reasons for continued work (Fisher, Chaffee, & Sonnega, 2016; Fisher, Ryan, & Sonnega, 2015). The number of people older than 60 is expected to grow from 12% to 20% between 2015 and 2050 (World Health Organization, 2018). In the past decade, retirement ages have been rising due in part to societal needs, worker financial needs, and the psychological benefits of work (Fisher et al., 2016; Wang & Shultz, 2010). Social science and occupational health research has highlighted the importance of keeping workers healthy and engaged in productive work for longer. When people remain engaged in the workforce, they continue to contribute to, and benefit, society. Depending on the person and the work they are engaged in, working longer might also positively affect the worker's mental, physical, and cognitive health (Fisher, Chaffee, Tetrick, Davalos, & Potter, 2017). There is, however, incredible variability in worker health and retirement intentions. The fit between worker abilities and job demands is one factor that might contribute to worker health and decisions to retire (Zacher, Feldman, & Schulz, 2014). The current study asks the question: What is the relationship between person–job fit and health and retirement decisions? In particular, we examine fit between job demands and worker abilities (demands–ability fit; Kristof-Brown, Zimmerman, & Johnson, 2005) and the reporting of chronic health conditions and work status (working vs. retired) with a sample of older workers and retirees. The predictions in the current study are based on a person–job fit theory, which states that the alignment between job demands (i.e., the cognitive, physical,

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or emotional tasks that contribute to job complexity) and worker abilities is a key determinant of worker burnout and disengagement (Edwards, 1991; Edwards & Van Harrison, 1993). Despite the promise of person–job fit theory to explain retirement decisions and worker health, little research has directly integrated fit theories into the study of workplace aging and health (Zacher et al., 2014). The current study directly addresses this research gap.

Person–Environment Fit

Person–environment fit is the congruence between person-related and environmental factors (Kristof-Brown et al., 2005). Fit theory posits that greater congruence between the abilities of the worker and the demands of the job will lead to more positive outcomes such as higher job satisfaction, better job performance, and reduced turnover intentions (Edwards, 1991), and research generally supports this idea (Kristof-Brown et al., 2005). Fit has been studied in an array of contexts including person–vocation fit (matching people to careers), person–group fit (interpersonal and skill compatibility of workers and their teams), and person–job fit (the extent to which the worker and job align in terms of the worker's abilities and needs; Jansen & Kristof-Brown, 2006). Demands–ability fit concerns the match between the knowledge, skills, and abilities of the individual worker and the demands of a job (Kristof-Brown et al., 2005). Demands–ability fit tends to be linked to task-related behaviors such as job performance, stress, and turnover intentions (Caplan, 1987; Park, Beehr, Han, & Grebner, 2012).

Researchers approach the study of fit in a variety of ways. Perceived fit reflects a person's beliefs about the match between their abilities and the demands of their job, and is typically assessed through self-report. Perceptions of general fit tend to be holistic judgments that represents a worker's values and implicit weighting of different aspects of his or her job and work environment (Kristof-Brown & Billsberry, 2013). That is, workers emphasize different aspects of the work environment in their fit perceptions and will assign the most weight to those aspects they value. Perceived fit is related to outcomes like job satisfaction, organizational commitment, and turnover intentions (Kristof-Brown et al., 2005). Although it is important to understand the subjective experiences of fit (and the antecedents and outcomes of these experiences), perceived fit is by definition idiosyncratic because different workers value different aspects of their jobs.

In contrast to perceived fit, objective fit assessments are more generic and general across situations because they do not rely on the individual weighting of values involved in subjective assessments (Kristof-Brown & Billsberry, 2013). Rather than asking workers directly how well they perceive their fit with the environment, objective fit assessments require separate assessments of person and environment attributes. An overall fit assessment is computed by collapsing the person and environment assessments into one scale through a variety of methods (Shanock, Baran, Gentry, Pattison, & Heggestad, 2010). The separate measures that comprise objective fit assessment can include either self-report or objective measures of person or environment factors. For example, self-report assessments of skills and abilities (e.g., the extent to which a worker agrees or disagrees with a statement such as "I know how to manage a project") can be matched with self-report assessments of the skills demanded in a job (e.g., the extent to which a worker agrees or disagrees with a statement like "My job requires project management"). Alternatively, both person and environment assessments can be objective measures (e.g., a project-management test for the worker and the Occupational Information Network, or O*NET, ratings of project management skills needed for the job). Any combination of these would represent objective fit (e.g., a self-report person assessment matched with an objective job score). Research suggests that objective person–job fit assessments are correlated with job attitudes such as job satisfaction ($r_{\text{average}} = .22$) and organizational commitment ($r_{\text{average}} = .43$) and intentions to quit ($r_{\text{average}} = -.36$; Kristof-Brown et al., 2005).

Research on fit has proliferated recently, and self-report assessments of fit tend to be used more than objective assessments (Kristof-Brown et al., 2005). The trend to use fit perceptions when assessing demands–ability fit is perhaps a function of the relative difficulty of using objective versus subjective measures for assessing cognitive abilities. That is, it is less time-consuming and relatively easier to ask people about their abilities and skills than it is to directly assess those abilities and skills. However, the accuracy of self-reports of abilities can be low and moderated by myriad factors such as the breadth of the ability assessed (e.g., general ability vs. knowledge about specific events) and whether or not the person knows that the self-estimate will be followed by an objective assessment (Ackerman, Beier, & Bowen, 2002; Ackerman & Wolman, 2007; Mabe & West, 1982). The current study uses an extensive cognitive battery as an objective assessment of worker abilities (McArdle, Fisher, Rodgers, & Kadlec, 2009). This approach permitted the examination of demands–ability fit for different types of abilities, which is particularly important given the differential effects of aging on cognitive abilities (Kanfer & Ackerman, 2004; Salthouse, 2010; Schaie, 2013).

Age-Related Ability Changes

In the context of the aging workforce, demands–ability fit is dynamic because cognitive abilities change with age (Feldman & Vogel, 2009). Age-related cognitive changes are typically conceptualized as cognitive decline, but can also include growth and development (Kanfer & Ackerman, 2004). Age-related decline is observed in abilities associated with solving novel problems and memory (Salthouse, 2010). These types of abilities tend to be correlated and their common variance forms a factor that has been called fluid intelligence or reasoning ability. Here we call these abilities and their corresponding factor reasoning abilities to simplify our presentation (Carroll, 1993; Salthouse, 2010). The decline of reasoning abilities is expected to affect the relative amount of attentional/cognitive resources that a person has available to perform any given task. Although there is no evidence that overall job performance is negatively related to age-related declines in reasoning abilities (Ng & Feldman, 2008), the decline in reasoning abilities may negatively affect performance on tasks that rely heavily on learning new information or skills (Kubeck, Delp, Haslett, & McDaniel, 1996), novel problem-solving, sustained attention, quick response, and extensive memory (Klein, Dilchert, Ones, & Dages, 2015).

In contrast to the decline in reasoning abilities, cognitive growth is expected with age in the form of the knowledge and expertise acquired through education, vocational, and avocational experiences (called crystallized ability or knowledge; Carroll, 1993; Salthouse, 2010). Measures of knowledge can show increases into middle and older ages (mid to late 60s; Schaie, 2013). Indeed, middle-aged adults typically outperform younger adults in both academic and nonacademic knowledge domains such as literature, history, current events, and health (Ackerman, 2000). In sum, up until the late 60s, age is typically positively related to knowledge, even if, as they age, people might process information more slowly, experience memory loss, or have a more difficult time reasoning through novel problems (Salthouse, 2010). Changes in cognitive abilities with age will affect person–job fit because these changes impact the cognitive resources that a worker brings to bear on task performance.

Fit and Health

Fit theories explain how job demands relative to worker abilities can lead to worker burnout and other negative outcomes (Edwards, 1991; Edwards & Van Harrison, 1993). Zacher et al. (2014) have further described the importance of fit in the context of age-related changes in worker abilities for both objective and perceptions of fit. According to Zacher et al., age-related changes in abilities will precipitate incongruence in fit, which will lead to occupational stress and strain. Experienced stress and strain will lead workers to reassess their job fit. Thus, objective fit should theoretically be directly related to occupational stress and strain, and also indirectly related to stress and strain through fit perceptions (Edwards & Shipp, 2007). The current study includes neither measures of stress and strain nor an index of fit perceptions due to limitations associated with using an existing data set. Rather, we examine the direct relationship between objective fit and health outcomes, which are related to occupational stress and strain (Zacher et al., 2014).

Despite the compelling argument that person–job fit can affect worker health and well-being (Zacher et al., 2014), few empirical studies have examined demands–ability fit with older workers. There is evidence that worker misfit negatively impacts well-being for workers of all ages, however. For example, a study using two cohorts from the National Longitudinal Survey of Youth database and over 15,000 subjects found that worker alcohol use was more likely when job complexity was relatively high and worker ability was relatively low, suggesting that demands–ability misfit may lead to stress and self-medicating (Oldham & Gordon, 1999). These effects were consistent across cohorts but small (.04% of variance accounted for) using objective assessments of cognitive ability (i.e., a general factor derived from the Armed Services Vocational Aptitude Battery) and job complexity assessments derived from the Dictionary of Occupational Titles (Roos & Treiman, 1980).

Caldwell and O'Reilly (1990) also found that the greater congruence between competencies required for a job (derived through a Q-sort procedure) and worker competencies, the higher workers were ranked on job performance (large effects from $r = .98$ for manufacturing supervisors to $r = .65$ for engineering managers). Congruence between required competencies and worker competencies was negatively correlated with perceived ambiguity, physical stress and strain ($r = -.55$) and intent to leave ($r = -.45$), but positively correlated with overall ($r = .34$) and intrinsic job satisfaction ($r = .52$). These findings imply that when job demands and worker abilities are both relatively higher or lower, workers are likely to experience better job-related outcomes (performance and job satisfaction) and fewer negative health outcomes related to stressors and strain.

The large effects reported by Caldwell and O'Reilly (1990) are perhaps a result of the use of the same competency model to rate the job functions and the individual worker. The current study uses job demand and worker ability ratings from different sources to derive an objective index of demands–ability fit. We examined the relationship between congruence and incongruence of job demands and worker abilities on health using polynomial regression with response surface plots (Shanock et al., 2010). Polynomial regression has been used to study the effect of congruence and incongruence of job demands and worker personality on income (Denissen et al., 2018) and permits examination of the effects of different types of incongruence in three dimensional space. As such, it allows investigation of congruence when job demands and worker abilities are both relatively higher or lower, and incongruence when job demands are relatively greater than worker abilities and incongruence when worker abilities are relatively greater than job demands (Edwards & Van Harrison, 1993).

The discussion above provides the rationale for expecting a negative impact on worker health when job demands exceed worker abilities (Edwards, 1991; Edwards & Van Harrison, 1993; Zacher et al., 2014), but does not explicitly describe the effects on health when worker abilities exceed job demands. Less demanding jobs might, for instance, lead to worker boredom, which would introduce a different type of worker stress and strain (although there is to date limited empirical evidence of this claim; Park et al., 2012). In the context of an aging workforce, however, where future time at work is perceived as limited (Zacher & Frese, 2009), there may be few negative effects on worker health when worker abilities exceed job demands. A relatively less complex job may provide mature workers with the flexibility to take care of their health concerns, develop interests outside of the work environment, and may generally lead to worker well-being. There is evidence, for example, that older workers are likely to gravitate toward less complex jobs, as they perceive that their remaining time at work is increasingly limited (Rudolph, Kooij, Rauvola, & Zacher, 2018).

Demands–ability fit theories describe the benefits of congruence of job demands and person abilities in terms of stress and strain, particularly for older workers (Zacher et al., 2014). It may be, however, that the relationship between fit congruence and health also depends on the levels of job demands and person abilities. For example, in the domain of needs–supplies fit, research on workers of all ages suggests that when perceived job complexity and preference for job complexity are congruent and both low, then experienced boredom is high, but as perceived job complexity and preference for complexity both increase, boredom decreases (Edwards & Van Harrison, 1993). In the context of demands–ability fit, we anticipate that workers who are highly able would benefit from having complex jobs in that those jobs would provide them the benefits associated with remaining cognitively engaged as they age (Truxillo, Cadiz, & Rineer, 2012). Although prior research has not been conducted to support this claim, studies suggest that increased job complexity is positively related to employee perceived opportunities at work (Zacher & Frese, 2011). It may be then, that provided workers have the abilities, high-complexity jobs permit older workers to capitalize on their abilities and to remain engaged and active in ways that positively impact worker health.

The current study uses a cognitive ability battery composed of multiple reasoning and knowledge tests (McArdle et al., 2009). Fit is operationalized by matching these abilities with cognitive job demands as assessed by O*NET (Peterson, Mumford, Borman, Jeanneret, & Fleishman, 1999), which provides publicly available data on over 900 jobs in the United States. In the context of fit theories, we propose the following hypotheses:

Hypothesis 1: Demands–ability fit congruence will relate to the reporting of chronic health conditions such that when job demands and worker abilities are aligned and when they are both relatively larger (i.e., more complex jobs and more highly able workers) people will report fewer health conditions.

Hypothesis 2: Demands–ability incongruence, when demands are greater than abilities, will relate to the reporting of more chronic health conditions. Demands–ability incongruence, when abilities are greater than demands, will relate to the reporting of fewer chronic health conditions.

Demands–Ability Fit and Retirement

Despite increased attention on the importance of extending work lifespans in general, and theoretical advances that point to the importance of person–job fit on retirement expectations (Feldman & Beehr, 2011; Fisher et al., 2016; Kooij, 2015; Shultz, Morton, & Weckerle, 1998; Wang & Shultz, 2010), there is relatively little research on demands–ability fit and retirement behaviors. Feldman and colleagues (Feldman, 2013; Feldman & Beehr, 2011; Feldman & Vogel, 2009) suggested that perceptions of misfit—for example, due to age-related changes in abilities (Kanfer & Ackerman, 2004)—will lead workers to begin to entertain ideas related to retirement. Feldman and Vogel (2009) further expected that age will be negatively related to person–job fit because as people age, they will either become bored if the job has become routine or frustrated if the job exceeds their abilities.

The general prediction that workers may be more likely to retire if their jobs become either boring or frustrating seems reasonable, and due to age-related changes in abilities older workers may be more likely to experience job misfit for these reasons (Feldman & Vogel, 2009). However, because of the increasing difficulty of finding new work with age (Wanberg, Kanfer, Hamann, & Zhang, 2016) and because of older worker perceptions of the onerousness of the job search process (Kanfer, Beier, & Ackerman, 2013), older workers may be less likely to leave current jobs if they experience misfit. Workers for whom work becomes routine may want to remain in less complex jobs to enable them to focus their attention on building their interests outside of work (i.e., as their future time perspective shortens; Rudolph et al., 2018). Conversely, workers who have difficulty keeping pace with job demands of work may choose to retire versus continue working.

Research supports the view that person–job misfit is related to retirement decisions. For example, Oakman and Wells (2016) found that perceptions of demands–ability fit (i.e., work ability; Ilmarinen & Ilmarinen, 2015) were significantly related to retirement expectations even after accounting for individual (age, gender, and family status) and job characteristics (satisfaction, autonomy, and job demands). Sonnega, Helppie-McFall, Hudomiet, Willis, and Fisher (2018) examined the fit between cognitive, physical, and emotional job demands relative to self-reported abilities and found that mismatch in the physical and emotional domains was related to early retirement decisions relative to when there was no mismatch. The Sonnega et al. study did not, however, find an effect for cognitive job demands and abilities. It may be that the single-item measures used in the Sonnega et al. study did not adequately assess cognitive demands and abilities. Given theory and empirical research on retirement, we hypothesize the following:

Hypothesis 3: Demands–ability fit will relate to work status such that the probability of being retired versus working will be higher when job demands related to cognitive abilities are greater than workers' cognitive abilities.

The sample of older workers and retirees and the extensive ability battery used in the current study provided the opportunity to examine demands–ability fit related to two different types of cognitive abilities (reasoning and knowledge). Because reasoning abilities start declining around age 25 or so (Salthouse, 2010), we expected that incongruence would be particularly detrimental when the reasoning ability demands of the job outweighed worker reasoning abilities. In such cases, workers may perceive that the demands of the job are simply beyond their capabilities, regardless of their extensive knowledge. Nonetheless, *any* ability-related incongruence—reasoning or knowledge—should affect retirement and health. In the context of reasoning demands of a job, for instance, a relatively older computer programmer may have difficulty learning a new, but required, programming language, which causes stress and strain leading to health concerns, and potentially a decision to retire. In the context of knowledge demands of a job, a relatively older educator could experience difficulty integrating vast amounts of information into a coherent lecture, which would also potentially lead to health concerns and work versus retirement decisions. Because a situation where job demands are greater than worker abilities should be stressful regardless of whether the incongruence stems from reasoning or knowledge demands and abilities, we continue to expect incongruence in knowledge to relate to health and retirement. However, the effect of incongruence of knowledge might be smaller than that related to reasoning ability given the importance of knowledge in adult performance and in new learning (Ackerman, 2000; Beier & Ackerman, 2005). Given that incongruence should be detrimental for any ability, we simply pose the question: Will the pattern of relationships between demands–ability fit and health and retirement be similar for reasoning and knowledge?

Method

Participants and Procedure

Participants were a subset of the sample in the study of Cognition and Aging in the U.S.A. (CogUSA; McArdle et al., 2009; McArdle, Rodgers, & Willis, 2015). CogUSA is a longitudinal panel study focused on aging, cognition, and health outcomes funded by the National Institute on Aging and conducted by the University of Southern California and University of Michigan

Survey Research Center between May 2007 and August 2014 (National Institutes of Health–National Institute on Aging R37 AG007137). Protocols for data collection followed the institutional review board where the data were collected. The CogUSA sample was drawn from a two-stage random digit dialing (RDD) sample supplemented with household age and residence location information from Genesys database to target households with at least one individual born in 1956 or earlier (i.e., age 51 or older) located in 28 primary sampling unit locations across the United States. Participants were eligible for CogUSA if they were cognitively able to complete the survey on their own (as determined by a trained and experienced survey interviewer) and in English.

Figure 1 provides a flowchart of the CogUSA waves relevant to the current study. Wave 1 collected demographic information, and included telephone interviews between May and December 2007. CogUSA participants were contacted via telephone by trained survey interviewers employed by the Survey Research Center at the Institute for Social Research at the University of Michigan. Forty-seven percent ($N = 1{,}514$) of the targeted sample of $N = 3{,}224$ participated in the telephone survey, which took an average of 38 min to complete. The second wave (Wave 2), which was conducted face-to-face in participants' homes, took an average of 181 min to complete and occurred between June 2007 and January 2008, on average about 3 weeks after Wave 1. Data collected in Wave 2 included cognitive ability measures and occupational information. The second wave response rate was 81% of those participating in Wave 1 ($N = 1{,}222$). Waves 3 through 5 occurred between 2008 and 2012 and included additional measures not pertinent to the current study (i.e., personality assessments) and some of the same measures as previous waves (self-reported health, work status). To simplify our approach, we used the final wave of the CogUSA study (Wave 6), which occurred in 2014, for the work and health outcomes relevant to the current study.

Participants were eligible for the study if they completed Wave 1 and Wave 2 and if they reported a longest held occupation and a recent work history (i.e., participants who were employed or who had retired within the past 10 years upon study start; $N = 565$). Only participants who completed relevant outcome measures (i.e., chronic health conditions and retirement status) in Wave 6 were eligible for the current study ($N = 383$; 58.5% women; $M_{age} = 61.0$ years, $SD = 8.0$ at Wave 1; see Figure 1). Of these participants, 198 participants reported that they were currently working for pay during Wave 1 (185 not currently working for pay but had a longest held occupation). Participants in the current study had on average 14.4 years of education ($SD = 2.3$) and the majority were White/Caucasian (86.7%). We report the frequency of occupational categories for longest held jobs in Table 1, with the most frequent occupational groups being office and administrative support occupations, management occupations, education, training, and library occupations, and production occupations.

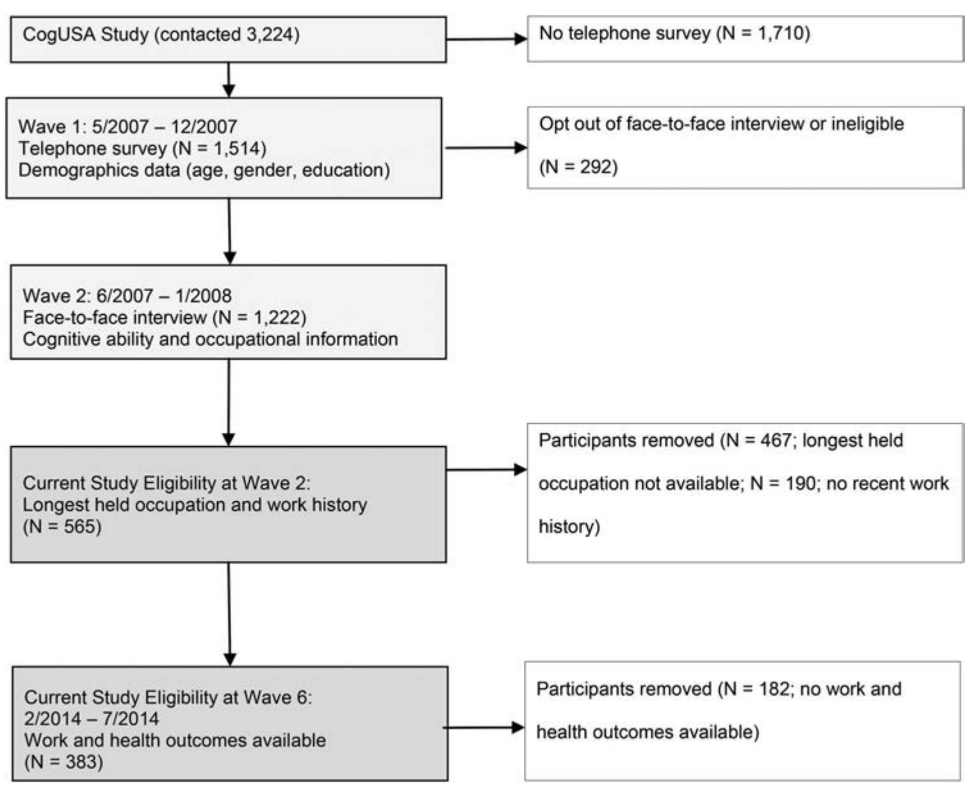

Figure 1. Flowchart for CogUSA participants in the current study. Lighter shaded boxes indicate eligibility for the CogUSA study; darker shaded boxes indicate eligibility for the current study. To be eligible for the current study, participants must report a longest held occupation and work history at Wave 2 and must provide work and health outcomes (i.e., retirement status, report chronic health conditions) at Wave 6. CogUSA = Study of Cognition and Aging in the U.S.A.

Table 1
Percentage of Sample and Standardized Reasoning and Knowledge Demands of Occupational Categories

Occupational category *(example occupations)*	Percentage of sample	Reasoning demands	Knowledge demands
Management (*e.g., social and community service managers, construction managers*)	15.40	0.42	0.64
Business and financial operations (*e.g., management analysts, accountants, and auditors*)	5.48	0.26	0.49
Architecture and engineering (*e.g., aerospace engineers, electrical engineers*)	2.87	0.86	0.71
Education, training, and library (*e.g., school teachers, librarians*)	12.27	0.08	1.11
Arts, design, entertainment, sports, and media (*e.g., photographers, editors, public relations specialists*)	2.61	−0.05	0.16
Healthcare practitioners and technical (*e.g., registered nurses, veterinarians, medical records technicians*)	7.31	0.49	0.65
Sales and related (*e.g., retail salesperson, sales representatives, travel agents*)	7.31	−0.31	0.01
Office and administrative support (*e.g., executive secretaries, office clerks, data entry keyers*)	18.02	−0.57	−0.28
Construction and extraction (*e.g., brickmasons, carpenters, electricians*)	2.87	−0.38	−1.10
Production (*e.g., sewing machine operators, machinists, assemblers, and fabricators*)	8.88	−0.49	−0.98
Transportation and material moving (*e.g., truck drivers, packers and packagers, taxi drivers, and chauffeurs*)	3.13	−0.22	−0.70
Other	13.84	−0.17	−0.05

Note. Occupational categories shown for longest held occupations reported in Wave 2 for participants ($N = 383$). Occupational categories with fewer than 10 participants have been collapsed under "Other." Mean standardized reasoning demands and knowledge demands for occupational categories are shown.

Similar to the power analysis approach used in prior research (Denissen et al., 2018), we assessed power for the polynomial regression by considering regression coefficients. To detect a small effect size ($f^2 = .02$) in a regression model with nine predictors with power of .80 and α of .05, we needed a sample size of 395 participants, which was just above the sample size in the current study ($N = 383$).

We assessed the effect of attrition with multinomial logistic regression with the sample of eligible participants ($N = 565$) using participation in the final wave (Wave 6) of the study ($N = 383$) as the dependent variable (Goodman & Blum, 1996). Predictor variables were age, gender, education, the cognitive ability measures (assessing reasoning and knowledge ability), and the job ability demands (assessing reasoning and knowledge demands). This model was significant, −2Log Likelihood = 657.073, $\chi^2(5) = 37.04$, $p < .001$. Reasoning abilities distinguished those who remained in the study, with an odds ratio of 2.226 indicating that the odds of dropping out of the study were approximately two times greater for those in Wave 2 who were relatively lower in reasoning abilities. Although this finding was not surprising, as previous research has highlighted the relationship between attrition and lower ability scores at baseline for older participants (Van Beijsterveldt et al., 2002), differential attrition may serve to restrict the range of abilities included in the final wave (Wave 6) and attenuate our results.

Measures

Ability and demand predictors (Wave 1/Wave 2).

Cognitive abilities. We used data from 13 cognitive ability measures administered in CogUSA. Eleven measures were from the Woodcock Johnson III Test Battery (Schrank, McGrew, & Woodcock, 2001): Number Series, Retrieval Fluency, Verbal Analogies, Spatial Relations, Picture Vocabulary, Auditory Working Memory, Visual Matching, Incomplete Words, Concept Formation, Calculation, and Word Attack. Two measures were from the Wechsler Adult Intelligence Scale: Vocabulary and Matrix Reasoning. Assessments from the Woodcock–Johnson III battery have been found to be valid (i.e., showing concurrent validity with other ability measures and predictive validity in relation to achievement in academic contexts, with medium to large correlations; Cohen, 1988; Schrank et al., 2001). The validity of the Wechsler Adult Intelligence Scale has also been shown across populations, particularly for predicting achievement (Feingold, 1983; Wechsler, 1997).

Two members of the research team a priori categorized the ability assessments in terms of their representing reasoning or knowledge. We then conducted a confirmatory factor analysis (CFA) using the a priori designation on a reasoning versus knowledge factor with the CogUSA participants ($N = 1{,}222$). The CFA indicated empirical support for a two-factor solution distinguishing reasoning and knowledge, $\chi^2(N = 1222, 64) = 607.12$, $p < .001$, comparative fit index = .91, root mean square error of approximation = .10, over a unidimensional factor, $\chi^2(N = 1222, 65) = 709.82$, $p < .001$, comparative fit index = .89, root mean square error of approximation = .10; $\Delta\chi^2(N = 1222, 1) = 102.65$, $p < .001$. The two factors were highly correlated in the CFA ($r = .77$), which was expected and aligned with prior research on reasoning and knowledge (Beier & Ackerman, 2003). A description of the ability measure by reasoning and knowledge factors is shown in the first column of Table 2. We created a reasoning-abilities composite by taking the mean across standardized reasoning ability scores and a knowledge-abilities composite by taking the mean across standardized knowledge ability scores. To avoid overfitting our objective index of demands–ability fit, we standardized ability scores based on the CogUSA database ($N = 1{,}222$ participants for whom ability assessments were available).

Job ability demands. The O*NET database reports the knowledge, skills, abilities, and other attributes (work styles and values) required to perform over 900 jobs in the United States. O*NET data were collected through the systematic ratings of jobs with job incumbents, supervisors, and occupational experts (Peterson et al., 1999). We used level ratings in O*NET to derive the ability demands of jobs. O*NET level ratings represent whether a certain ability is important for a job and the depth of the ability that is important (on a 100-point scale). For instance, mathematical reasoning may be important for both a middle school math teacher and a calculus professor, but the level of the ability

Table 2
*Categorization of Ability Measures From the CogUSA Study and Job Demands From O*NET*

Cognitive ability (CogUSA)	Job ability demands (O*Net)
Reasoning	Reasoning
1. Number series—ability to reason by using mathematical relationships	1. Mathematical reasoning—ability to choose correct mathematical method or formula for problem solving
2. Retrieval fluency—ability to retrieve information from stored knowledge	2. Fluency of ideas—ability to generate ideas on a topic
3. Verbal analogies—ability to use lexical knowledge for reasoning	3. Inductive reasoning—ability to integrate information to come to a conclusion
4. Spatial relations—ability to use visual–spatial thinking to predict how objects change positions in space	4. Visualization—ability to visualize how object will appear after object has been rearranged in some manner
5. Auditory working memory—ability related to short-term auditory memory span	5. Information ordering—ability to use specific rules to arrange things or actions
6. Visual matching—ability to quickly make visual symbol discriminations	6. Time sharing—ability to shift back and forth when engaged with multiple activities
7. Incomplete words—ability to use auditory analysis and presence of phonemic awareness	7. Perceptual speed—ability to quickly compare objects or items for similarities and differences
8. Concept formation—ability related to flexibility in thinking and inductive logic	8. Oral comprehension—ability to understand spoken words and sentences
9. Calculation—ability to perform mathematical computations	9. Category flexibility—ability to group objects by using or generating rules
10. Word attack—ability to use phonic and structural analysis skills to pronounce unfamiliar written words	10. Number facility—ability to perform mathematical functions (e.g., add, subtract)
11. Matrix reasoning—ability to use nonverbal fluid reasoning	11. Deductive reasoning—ability to use rules to produce appropriate conclusions
	12. Spatial orientation—ability to orient oneself relative to an environment or object
Knowledge	Knowledge
12. Picture vocabulary—ability to use lexical knowledge to identify objects	13. Memorization—ability to remember information (e.g., numbers, words, pictures)
13. Vocabulary—ability to use expressive vocabulary and verbal knowledge	14. Oral expression—ability to clearly communicate to others by speaking
	15. Written comprehension—ability to read and understand writing
	16. Written expression—ability to clearly communicate to others in writing

Note. CogUSA = Cognition and Aging in the U.S.A.; O*NET = Occupational Information Network.

demanded for the calculus professor is higher than for the teacher. Job ability demands are described in the second column of Table 2.

O*NET ratings were linked to the CogUSA participant data as follows: CogUSA participants reported details about their longest held occupation, including a job title, a brief description of their primary job duties, and the industry in which they worked. We focused on longest held occupation because workers sometimes switch to a different occupation (e.g., bridge employment) for a short time prior to retirement and go in and out of the workforce before leaving the labor force altogether (Beehr & Bennett, 2015). There were 565 CogUSA participants with longest held occupation data available (see Figure 1). A trained coder assigned a standard occupational classification (SOC) code to the occupation that matched the self-reported occupational information for CogUSA participants. The process of linking self-reported occupation information to SOC codes in O*NET has been performed successfully with other archival data sets, including the Health and Retirement Study (Fisher et al., 2014; McGonagle, Fisher, Barnes-Farrell, & Grosch, 2015). We created a reasoning-demands composite for each occupation code in the O*NET database by taking the mean across O*NET level ratings for standardized reasoning demand scores and a knowledge-demands composite by taking the mean across standardized knowledge-demands scores. To avoid overfitting these standardized scores to the sample of jobs in the current study, we used all jobs in the O*NET database for this purpose. These reasoning-demand and knowledge-demand composites were used as the job demands for participants with longest held occupation data available. For participants with SOC codes that did not directly match O*NET (19% of participants in the current study), two members of the research team obtained median values of job demands across relevant occupations.

Matching abilities and job demands. There was not a one-to-one match between cognitive ability measures assessed in the CogUSA study and the occupation level abilities in O*NET. For example, the CogUSA study included the Number Series measure, which is defined as the ability to reason using mathematical relationships. Number Series was matched to multiple job-related abilities from O*NET such as mathematical reasoning and number facility. Four members of the research team independently matched the cognitive ability tests to job ability demands based on the constructs assessed by each cognitive ability test in CogUSA and job ability demands as described in the O*NET content model (Peterson et al., 1999). Rater disagreements were discussed and resolved. Only those cognitive abilities in the CogUSA study that aligned with at least one of the job ability demands as described in O*NET and vice versa were considered. This process resulted in the linkages between cognitive abilities in the CogUSA and the job demands from O*NET as shown in Table 2. We grouped both CogUSA abilities and their matched job demands from O*NET into general categories for reasoning and knowledge, as determined by the ability CFA described earlier. As shown in Table 2, there were 11 reasoning abilities from CogUSA matched to 12 reasoning job demands from O*NET and two knowledge abilities from CogUSA matched to four knowledge job demands from O*NET. In total there were 13 abilities from CogUSA and 16 ability job demands from O*NET used in the current study.

Work and health outcomes (Wave 6).

Work versus retirement status. In Wave 6 of CogUSA, participants reported their current work status. Specifically, they were asked "In terms of your current employment situation, are you currently doing any work for pay?" Participants answered either yes, no, or retired. We created a dichotomous variable such that participants were either working (work status = 1, $N = 240$) or not working/retired (work status = 0, $N = 143$).

Chronic health conditions. Participants were asked to report the prevalence of nine health conditions; specifically, has a doctor ever told participants that they have (a) high blood pressure, (b) heart disease, (c) diabetes, (d) stroke, (e) cancer, (f) lung disease, (g) arthritis, (h) emotional or psychiatric problems, or (i) a memory-related disease. The chronic health conditions items were identical to those used in large-scale epidemiological studies of health, including the National Health Interview Survey, the National Health and Nutrition Examination Survey, and the Health and Retirement Study. We constructed a comorbidity index by summing the number of chronic health conditions that participants reported based on a list of nine health conditions; thus, values on this variable ranged from 0 to 9. This approach to combining reports of chronic diseases is widely used (Diederichs, Berger, & Bartels, 2011; Stenholm et al., 2015).

Control variables. Because gender, years of education, and marital status have been shown to be related to health and retirement timing in prior research (Sonnega et al., 2018; Szinovacz & Deviney, 2000; Wood, Goesling, & Avellar, 2007), we controlled for them in our analyses. Education was measured in Wave 1 by asking participants to report the total number of years they received formal education. Possible values ranged from 0 to 17 years. Marital status was assessed in Wave 6 by asking participants to report their marital status. We created a dichotomous variable such that participants were either married or not married but living with a partner (marital status = 1, $N = 272$) or participants were single, divorced, or widowed (marital status = 0, $N = 111$).

To better isolate the effects of objective fit on retirement, we controlled for self-rated health when predicting the retirement outcome (we did not control for self-rated health when predicting chronic health conditions). Participants rated their overall health status in Wave 6 by responding to the question "Would you say your health is excellent, very good, good, fair, or poor?" Responses were reverse-coded such that higher numbers reflected better health status.

Analytical approach. As described earlier, health was operationalized as a continuous variable (i.e., the number of chronic health conditions reported), and retirement a dichotomous variable (i.e., 1 = working and 0 = retired), which required two different analytical approaches to examine how demands–ability fit affected these outcomes. We conducted a series of polynomial regression analyses to examine the relationship between fit and chronic health conditions (Shanock et al., 2010). The polynomial regression formula was as follows:

$$Z = b0 + b_1X + b_2Y + b_3X^2 + b_5Y^2 + b_4XY + e$$

In this formula, Z represents the outcome (i.e., health conditions index) and X and Y represent the predictors (e.g., reasoning ability and reasoning job demands). The outcome is determined by the predictors (X and Y), the squared predictors (X^2 and Y^2), and the interaction between the predictors (XY). Response surface analyses were completed by using the unstandardized regression coefficients to compute four surface test values (i.e., a_1, a_2, a_3, and a_4). The a_1 surface test value was calculated by ($b_1 + b_2$), and it represents the slope of the congruence line (ability = job demands) or the agreement between the two predictors and its effect on the outcome. The a_2 surface test value was calculated by ($b_3 + b_4 + b_5$), and it represents the curvature of the congruence line or the nonlinear relationship between two predictors that are in agreement and the outcome. The a_3 surface test value was calculated by ($b_1 - b_2$), and it represents the slope of the incongruence line (ability = −job demands) or the response of the outcome when one predictor is higher than the other predictor or vice versa. The a_4 surface test value was calculated by ($b_3 - b_4 + b_5$), and it represents the curvature of the incongruence line or the response of the outcome as the degree of discrepancy between two predictors increase. Finally, we used three-dimensional graphs of the data to help interpret the results.

For the retirement outcome, we used logistic regression to examine incongruence. A difference score variable was created by subtracting ability scores from job demand scores such that negative scores represented higher abilities than demands and positive scores represented higher demands than abilities. The logistic regression model predicting retirement controlled for gender, education, marital status, and self-rated health.

Results

Descriptive statistics and bivariate correlations for all study variables and reliability estimates are shown in Table 3. There were missing data across variables (as reported in the *N* column in Table 3), representing less than 1% missing data overall. Reasoning ability was positively related to reasoning job demands, $r = .351$, $p < .001$. Similarly, knowledge ability was positively related to knowledge job demands, $r = .377$, $p < .001$. There were also significant relationships between reasoning ability and work and health outcomes. Reasoning ability was positively related to retirement status meaning those with higher abilities were more likely to be working for pay, $r = .249$, $p < .001$, and negatively related to the health conditions index, $r = -.253$, $p < .001$. In contrast, knowledge ability was not significantly related to work status, but was negatively related to the health conditions index, $r = -.112$, $p = .030$, a correlation that was smaller in magnitude than the relationship between reasoning ability and the health conditions index, $z = -3.47$, $p < .001$.

Health

Polynomial regression analyses for demands–ability fit on health is shown in Table 4. The models control for gender, education, and marital status and include separate results of polynomial regression analyses for reasoning and knowledge abilities and demands. As can be seen in Table 4, we found significant effects of fit for reasoning and knowledge abilities and demands.

Reasoning demands–ability fit. Including all participants, we found support for congruence (i.e., significant a_1 coefficient) between job demands and worker abilities on the health conditions index ($a_1 = -.490$, $p = .004$) such that when the reasoning ability demands of the job and the reasoning abilities of the person are both higher relative to lower, the worker is less likely to report chronic health conditions, supporting Hypothesis 1. That is, workers who are highly able and who have complex jobs that demand reasoning abilities are less likely to report chronic health conditions compared with workers who are less able and who have relatively simple jobs. Further, we found that when reasoning abilities were higher than reasoning job demands, participants reported fewer health conditions and when reasoning job demands exceeded the worker's reasoning abilities, participants reported more health conditions ($a_3 = -.614$, $p = .004$), in support of Hypothesis 2.

In addition to examining these effects for the entire sample, we wanted to know if our results differed for those in our sample who were relatively younger (i.e., at or below the usual retirement age in the United States) and those who were relatively older. As a post hoc analysis, we ran the analysis separating workers who were 65 years of age and younger at Wave 1 (young–old; $N = 274$, $M_{age} = 57.1$ years, $SD = 5.1$) from those who were over 65 years of age at Wave 1 (old–old; $N =$

Table 3
Descriptive Statistics and Intercorrelations Among Study Variables

Variable	*M*	*SD*	*N*	1	2	3	4	5	6	7	8	9	10	11
1. Reasoning ability	0.14	0.64	383	(.89)										
2. Knowledge ability	0.02	0.82	383	.674**	(.70)									
3. Reasoning demands	0.05	0.64	383	.351**	.314**	(.90)								
4. Knowledge demands	0.19	0.78	383	.373**	.377**	.841**	(.95)							
5. Work vs. retirement status	0.37	0.48	383	.249**	.067	.043	.038	—						
6. Chronic health conditions	2.01	1.40	380	−.253**	−.112*	−.052	−.079	−.239**	—					
7. Age	61.01	7.97	383	−.408**	−.104*	.003	.076	−.370**	.228**	—				
8. Self-rated health	3.31	0.97	380	.201**	.110*	.085	.129*	.204**	−.438**	−.065	—			
9. Gender	1.58	0.49	383	−.067	−.157**	−.282**	−.115*	−.040	−.005	−.005	−.022	—		
10. Education	14.40	2.27	383	.576**	.449**	.404**	.523**	.225**	−.114*	−.148**	.202**	−.134**	—	
11. Marital status	0.71	0.45	383	.213**	.107*	.098	.023	.172**	−.187**	−.220**	.137**	−.305**	.067	—

Note. Cronbach's α reliability estimates appear in parentheses along the diagonal, which were calculated at the scale level. Work vs. retirement status coded "0 = retired/not working for pay" and "1 = currently working for pay." Gender coded "1 = male" and "2 = female." Marital status coded "1 = married or not married but living with a partner" and "0 = single, divorced, or widowed."
* $p < .05$. ** $p < .01$.

Table 4
Polynomial Regressions of Demands–Ability Fit on Chronic Health Conditions

				Chronic health conditions					
	All			Young–old			Old–old		
Variables	b	95% CI	p	b	95% CI	p	b	95% CI	p
Reasoning									
Constant	2.391	[1.089, 3.693]	<.001***	2.193	[.619, 3.767]	.006**	2.786	[.297, 5.276]	.029*
Gender	−.138	[−.442, .166]	.371	−.126	[−.473, .220]	.474	−.003	[−.686, .680]	.993
Education	.012	[−.065, .089]	.760	.027	[−.066, .121]	.569	−.033	[−.173, .107]	.640
Marital status	−.475	[−.798, −.151]	.004**	−.545	[−.943, −.148]	.007**	−.363	[−.990, .263]	.253
Reasoning ability (RA; b_1)	−.552	[−.830, −.273]	<.001***	−.762	[−1.136, −.388]	<.000***	−.076	[−.787, .635]	.833
Reasoning demands (RD; b_2)	.062	[−.188, .313]	.625	.037	[−.310, .384]	.833	.296	[−.193, .785]	.232
RA^2 (b_3)	.102	[−.169, .374]	.458	.284	[−.071, .639]	.116	.099	[−.637, .835]	.790
RA × RD (b_4)	−.292	[−.673, .089]	.133	−.395	[−.994, .204]	.195	−.064	[−.724, .597]	.848
RD^2 (b_5)	.200	[−.046, .446]	.111	.203	[−.149, .556]	.257	.254	[−.127, .635]	.189
R^2	.096		<.001***	.111		<.001***	.063		.595
Surface tests									
Congruence (RA = RD) line									
a_1 (slope)	−.490	[−.820, −.196]	.004**	−.725	[−1.141, −.431]	.001**	.220	[−.571, .514]	.587
a_2 (curvature)	.010	[−.308, .304]	.951	.092	[−.314, .386]	.657	.289	[−.394, .583]	.409
Incongruence (RA = −RD) line									
a_3 (slope)	−.614	[−1.027, −.320]	.004**	−.799	[−1.384, −.505]	.008**	−.372	[−1.280, −.078]	.424
a_4 (curvature)	.594	[−.091, .888]	.090	.882	[−.182, 1.176]	.105	.417	[−.837, .711]	.516
Knowledge									
Constant	3.343	[2.107, 4.580]	<.001***	3.280	[1.708, 4.853]	<.001***	3.248	[.927, 5.570]	.007**
Gender	−.214	[−.513, .086]	.161	−.197	[−.543, .150]	.265	−.205	[−.869, .459]	.541
Education	−.048	[−.123, .028]	.216	−.047	[−.142, .048]	.328	−.035	[−.173, .103]	.619
Marital status	−.649	[−.971, −.327]	<.001***	−.688	[−1.090, −.286]	.001**	−.466	[−1.086, .153]	.138
Knowledge ability (KA; b_1)	−.056	[−.263, .152]	.597	−.100	[−.344, .143]	.419	.144	[−.288, .576]	.509
Knowledge demands (KD; b_2)	−.024	[−.236, .187]	.821	−.051	[−.308, .206]	.697	−.057	[−.482, .369]	.792
KA^2 (b_3)	.079	[−.084, .243]	.340	.098	[−.100, .295]	.330	.054	[−.270, .377]	.743
KA × KD (b_4)	.029	[−.238, .296]	.830	.051	[−.291, .394]	.769	−.033	[−.525, .459]	.894
KD^2 (b_5)	.154	[−.039, .346]	.118	.134	[−.105, .372]	.271	.182	[−.170, .533]	.307
R^2	.070		.001**	.077		.006**	.042		.828
Surface tests									
Congruence (KA = KD) line									
a_1 (slope)	−.080	[−.348, .188]	.559	−.151	[−.470, .168]	.355	.087	[−.458, .632]	.755
a_2 (curvature)	.262	[.089, .435]	.003**	.283	[.028, .538]	.030*	.203	[−.290, .697]	.422
Incongruence (KA = −KD) line									
a_3 (slope)	−.032	[−.352, .288]	.845	−.049	[−.434, .336]	.803	.201	[−.447, .849]	.545
a_4 (curvature)	.204	[−.275, .683]	.405	.181	[−.454, .816]	.577	.269	[−.579, 1.117]	.536

Note. CI = confidence interval; $N = 380$ for all; $N = 274$ for young–old; $N = 106$ for old–old. Models control for gender, education, and marital status. The unstandardized regression coefficients (b) are shown. $a_1 = (b_1 + b_2)$, $a_2 = (b_3 + b_4 + b_5)$, $a_3 = (b_1 - b_2)$, $a_4 = (b_3 - b_4 + b_5)$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

106, $M_{age} = 71.1$ years, $SD = 4.5$). We found similar congruence and incongruence effects for young–old participants ($a_1 = -.725$, $p = .001$; $a_3 = -.799$, $p = .008$) but no significant effects when including only old–old participants, suggesting that the effect of fit on health is mostly driven by those participants who are more likely to be working age.

We provide response surface plots to aid in the interpretation of the effects of reasoning demands–ability fit (see Figure 2). Similar congruence and incongruence effects for reasoning demands–ability fit are found for all participants (left surface plot) and for young–old participants (right surface plot). The solid line represents the line of congruence. Following the line of congruence, there is a negative slope from the front corner to the far corner of the figure showing that the number of health conditions reported by participants decreased as reasoning ability and reasoning demands both increased. Figure 2 also shows a negative slope from the left corner to the right corner of the line of incongruence, indicating that there were fewer health conditions reported when incongruence was such that reasoning ability was higher than the reasoning demands of the job and more health conditions reported when the incongruence was such that the reasoning demands of the job were higher than reasoning ability.

Knowledge demands–ability fit. For knowledge demands–ability fit, we did not find a significant effect of congruence or incongruence. However, we did find support for curvature (i.e., significant a_2 coefficient) when examining congruence between job demands and worker abilities on the health conditions index ($a_2 = .262$, $p = .003$). A significant a_2 coefficient suggests a nonlinear relationship between demands–ability agreement and health. We found that more health conditions were reported when there were high levels of knowledge abilities and demands and also when there were low levels of knowledge abilities and demands. This suggests that an ideal match between knowledge demands and abilities for health outcomes is related to moderate levels of complexity and abilities. We found similar support for curvature when examining congruence between job demands and worker abilities on the health conditions index for young–old participants ($a_2 = .283$, $p = .030$), but there were no significant effects when including only old–old participants.

The response surface plot showing the nonlinear effect of agreement and number of health conditions reported when following the line of congruence (solid line) is in Figure 3. Similar nonlinear effects of agreement and health are found when including all participants (left surface plot) and when including only young–old

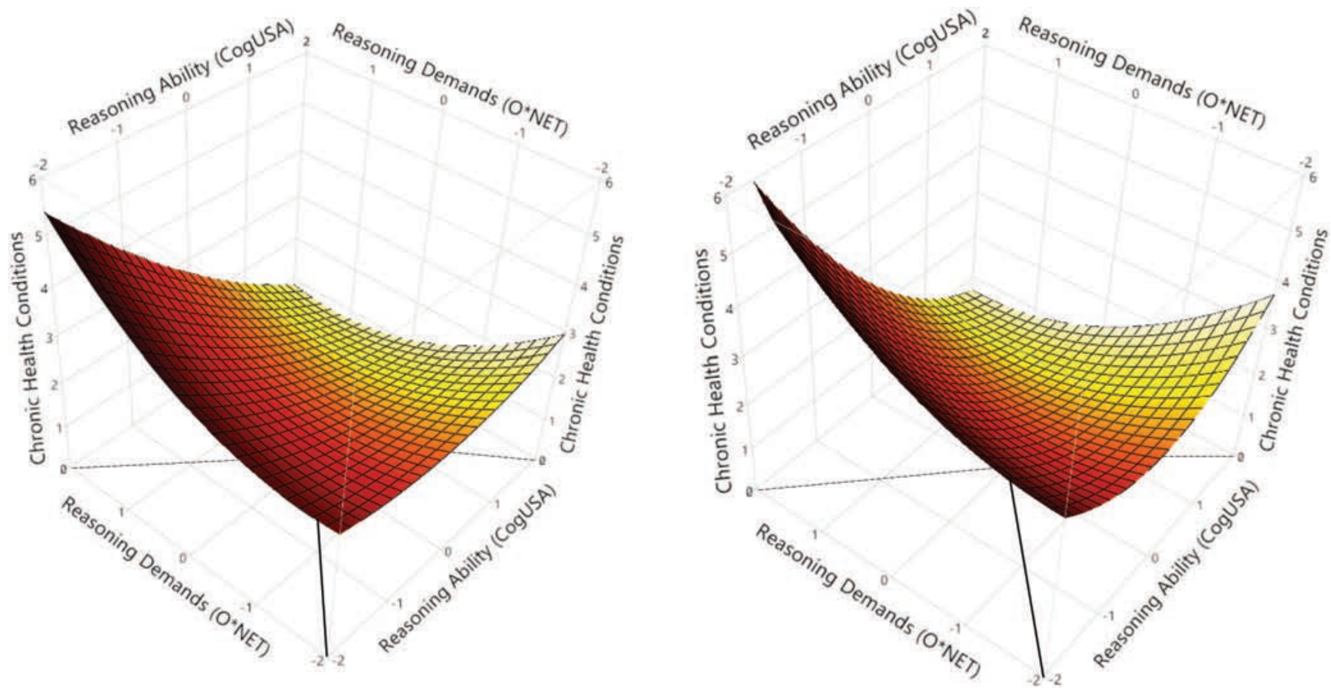

Figure 2. Response surface plots for chronic health conditions as predicted by reasoning demands–ability fit (see Table 4). Left plot is all participants ($N = 380$), and right plot is young–old participants aged 65 and younger ($N = 274$). Standardized reasoning ability and demands composites shown; axis tick marks represent ± 1 or 2 *SD* away from the mean. Solid line (—) from the front corner to the far corner is the congruence line (i.e., ability = demands line); dashed line (---) from the left corner to the right corner is the incongruence line (i.e., ability = −demands line).

participants (right surface plot). Relative to participants with average levels of knowledge ability and demands, participants reported more health conditions with high levels of knowledge ability and knowledge demands and also low levels of knowledge ability and knowledge demands.

Retirement

Using logistic regression and controlling for gender, education, self-rated health, and marital status, we found that as the reasoning difference score variable increased by one unit (i.e., as reasoning demands of the job increased beyond the reasoning abilities of the workers), the odds of working decreased by 33.5%, Exp(B) = .665, $p = .014$, in support of Hypothesis 3, and as shown in Table 5. As a post hoc analysis, we found a similar pattern when including only young–old participants, Exp(B) = .694, $p = .062$, but results did not reach levels of statistical significance. No such pattern was found when including only old–old participants. We did not find significant results when considering knowledge abilities and demands.

Discussion

Based on person–environment fit theory (Edwards, 1991; Kristof-Brown et al., 2005), the current study used an objective fit index of cognitive abilities and job demands to examine congruence and incongruence between job demands associated with a person's longest held occupation and abilities in relation to retirement and health in a national sample of older workers and retirees. Using an extensive cognitive ability test battery (McArdle et al., 2009) matched to a job demand index derived from O*NET, we found evidence for the importance of person–job fit for both health and retirement. Using polynomial regression and response surface plots to examine health, we found that congruence of job demands and abilities was related to reporting fewer chronic health conditions, suggesting that not only is fit between demands and abilities important, but also that when job demands and abilities are both relatively higher, health is better. This finding implies that older workers can handle highly complex jobs, as long as they have resources to match job demands. Furthermore, we found, as predicted, that when job demands exceed abilities, workers are more likely to report more chronic health conditions, and fewer health conditions when abilities outpace job demands. Similarly for retirement, workers were likely to be retired (vs. working) when the demands of their longest held job were relatively greater than their abilities. In summary, we found support for demands–ability fit theory for predicting worker health and retirement behavior (Zacher et al., 2014). Post hoc analyses based on age groups demonstrated that these effects were mainly driven by relatively younger participants (i.e., 65 years old or younger).

Because reasoning and knowledge have different trajectories throughout the life span (Carroll, 1993; Cattell, 1963; Schaie, 2013), we were interested in understanding if demands–ability fit had a different relationship with our outcomes depending on the ability in question. Our results supported many of the predictions

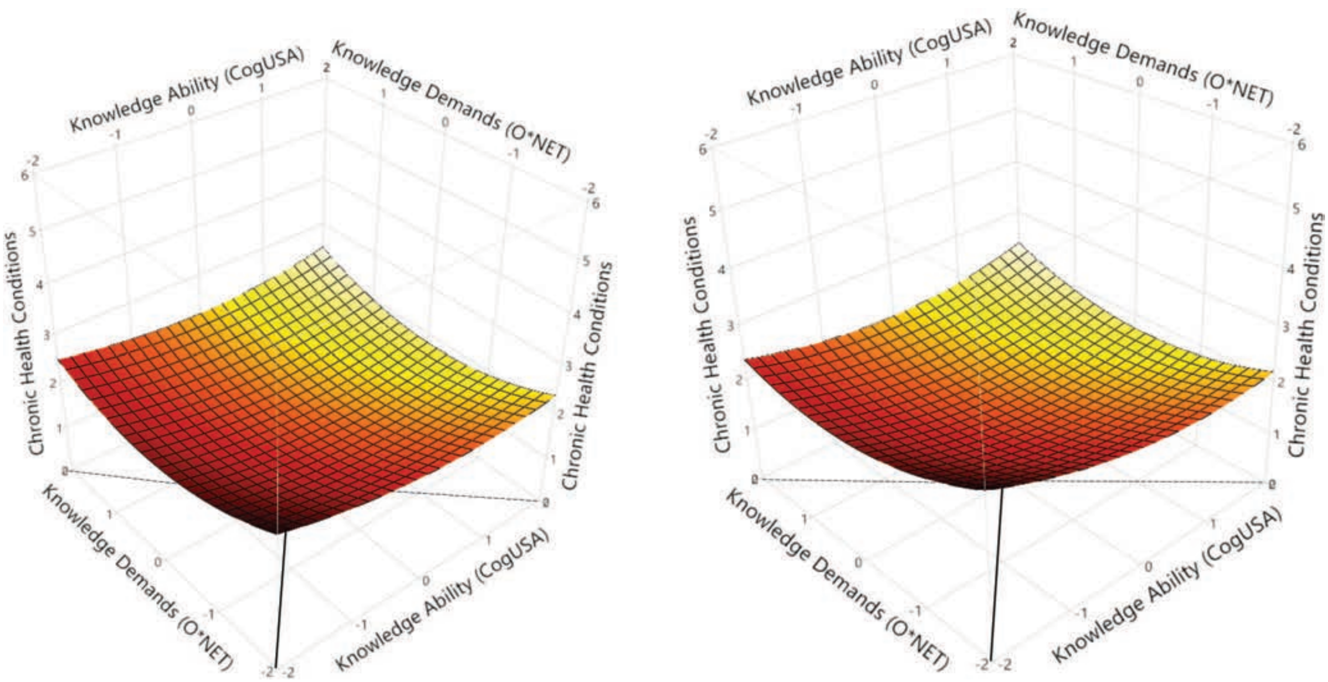

Figure 3. Response surface plots for chronic health conditions as predicted by knowledge demands–ability fit (see Table 4). Left plot is all participants ($N = 380$), and right plot is young–old participants age 65 and younger ($N = 274$). Standardized knowledge ability and demands composites shown; axis tick marks represent ±1 or 2 *SD* away from the mean. Solid line (—) from the front corner to the far corner is the congruence line (i.e., ability = demands line); dashed line (---) from the left corner to the right corner is the incongruence line (i.e., ability = −demands line).

about the relationship between demands–ability fit for reasoning, but not for knowledge. The polynomial regression found only one significant effect for knowledge, which showed that a medium level of job demands and worker abilities resulted in the reporting of fewer health conditions, suggesting that jobs that are simple and complex can cause stress even when worker knowledge is well matched to job demands. This finding may be a function of expected changes in demands–ability fit with age associated with executing simple well-learned tasks leading to boredom and complex tasks leading to challenge, even when workers have the knowledge to meet task demands (Feldman & Vogel, 2009). In any event, this unexpected finding is fodder for future research.

One important question is why we did not find support for our hypotheses for knowledge demands and abilities. After all, it seems likely that congruence between what one knows and the demands of a job would lead to positive health and intentions to work longer and that—similar to reasoning ability—incongruence would negatively affect these outcomes. We considered three reasons for this null result. First, lack of support for our hypotheses may be a function of the knowledge ability measures used in this study. By number alone, there were many fewer knowledge indicators than reasoning indicators on both the person and job sides of the demands–ability equation (two of 13 assessments from CogUSA assessed knowledge on the person side and four of 16 indicators assessed knowledge job demands from O*NET). As such, measurement of knowledge is less robust than the measurement of reasoning abilities in the data set.

Second, the knowledge abilities and demands that were assessed in CogUSA were quite broad (e.g., picture vocabulary, vocabulary, written and oral expression, written comprehension, and memorization) and may not be reflective of the type of job knowledge that is most relevant to jobs (Beier, Young, & Villado, 2018). Although general knowledge is relevant across many jobs, it may not differentiate levels of fit for any particular job. Moreover, the use of general knowledge measures in this study may be somewhat problematic because the sample was relatively educated (i.e., two years past of postsecondary education on average), and we controlled for education in our statistical analyses. The use of a highly educated sample and controlling for education may have attenuated the relationships between knowledge-related demands–ability fit and the outcomes. More specific job knowledge (e.g., knowledge about project management or about how an engine works) may be more relevant to differentiate people enough to predict health and retirement in future studies.

A third, and perhaps more theoretically interesting, reason for our null findings for knowledge may be related to the preservation of knowledge in older adults (Ackerman, 2000; Beier & Ackerman, 2001, 2003). Because knowledge does not necessarily decline with age, the knowledge demands of a job relative to knowledge possessed may not have as much of a negative effect on retirement behavior and health compared with reasoning abilities and reasoning demands. In any event, given the results of this study, it is premature to conclude that the fit between knowledge abilities and knowledge job demands is unimportant for older

Table 5
Logistic Regression of Demands–Ability Fit (Wave 2) on Work Versus Retirement Status (Wave 6)

	All			Work vs. retirement status: Young–old			Old–old		
Variables	*OR*	95% CI	*p*	*OR*	95% CI	*p*	*OR*	95% CI	*p*
Reasoning									
Gender	0.994	[0.613, 1.612]	.979	1.209	[0.708, 2.065]	.486	0.444	[0.129, 1.529]	.198
Education	1.198	[1.075, 1.336]	.001**	1.199	[1.057, 1.358]	.005**	1.140	[0.902, 1.442]	.273
Self-rated health	1.405	[1.098, 1.797]	.007**	1.402	[1.059, 1.857]	.018**	1.522	[0.887, 2.612]	.127
Marital status	1.988	[1.152, 3.432]	.014*	1.656	[0.880, 3.119]	.118	1.827	[0.514, 6.493]	.352
Difference score (demands–ability)	0.665	[0.482, 0.919]	.014*	0.694	[0.473, 1.018]	.062	0.903	[0.426, 1.913]	.790
Knowledge									
Gender	1.169	[0.735, 1.860]	.510	1.361	[0.808, 2.310]	.249	0.456	[0.134, 1.484]	.195
Education	1.221	[1.096, 1.359]	<.001***	1.215	[1.076, 1.379]	.002**	1.149	[0.917, 1.479]	.249
Self-rated health	1.418	[1.112, 1.808]	.005**	1.421	[1.081, 1.886]	.013*	1.536	[0.899, 2.708]	.124
Marital status	2.158	[1.256, 3.708]	.005**	1.720	[0.922, 3.273]	.092	1.858	[0.542, 6.959]	.333
Difference score (demands–ability)	0.916	[0.716, 1.171]	.484	0.946	[0.709, 1.260]	.702	0.931	[0.505, 1.714]	.816

Note. *OR* = odds ratio; CI = confidence interval. $N = 380$ for all; $N = 274$ for young–old; $N = 106$ for old–old. Models control for gender, education, self-rated health, and marital status. Work vs. retirement status coded "0 = retired/not working for pay" and "1 = currently working for pay." Models predict currently working for pay.
* $p < .05$. ** $p < .01$. *** $p < .001$.

workers. Future research with more robust and specific job-related knowledge measures would be necessary to answer these questions.

Theoretical Implications

Researchers have remarked that current theory and most empirical research on person–environment fit has been conducted with young samples (Feldman & Vogel, 2009). Recently researchers have modified person–environment fit theories to integrate consideration of aging workers including age-related changes in abilities, goals, and motivation through the life span (Zacher et al., 2014). The current study provides empirical support for age-relevant fit theories by considering the relationship between objective fit and health and retirement outcomes (Feldman & Beehr, 2011; Feldman & Vogel, 2009; Zacher et al., 2014). In particular, our findings provide support for Zacher et al.'s proposition that demands–ability fit is negatively related to worker health when job demands exceed worker abilities. Although the use of an existing data set limits our ability to examine potential mediators of the relationship between object fit and health (e.g., perceived fit, stress, and strain), the relationship between objective fit and health outcomes in this study should compel research investigating these mediators. The importance of health cannot be overstated given extended lifespans and the necessity to remain active and engaged for successful aging (Rowe & Kahn, 2015).

The current study also provides support for theories of retirement behavior. One such theory considers the push and pull determinants of retirement decisions (Barnes-Farrell, 2003; Shultz et al., 1998). The push/pull model of retirement suggests that worker misfit might cause older workers to experience stress and strain that serves to push them out of the workforce. Additionally, push factors may operate simultaneously with pull factors such as family, nonwork hobbies, and other activities that serve to pull workers toward retirement (Barnes-Farrell, 2003). Prior to the current study, little research had been conducted to investigate the push/pull model of retirement. Although our study only highlights the relationship between a potential push factor (job demands exceeding worker abilities) and retirement decisions, future research can incorporate simultaneous examination of pull factors.

Practical Implications and Future Research

Organizations are increasingly focused on retaining talent as many of their most experienced and knowledgeable workers prepare to exit the workforce through retirement (Toossi, 2013; Zhan & Wang, 2015). Simultaneously, many workers continue to work well past what is considered normal retirement age (e.g., around 65 in most industrialized countries). Understanding the antecedents of retirement decisions and the health of workers is an important step in retaining mature workers. Our findings point to the importance of demands–ability fit in retirement decisions and health. Specifically, the finding that incongruence related to greater demands relative to abilities was related to worse health and retirement suggests the power of job-design interventions to benefit workers. Jobs or work roles designed to emphasize relatively fewer tasks requiring employees to reason through novel problems may keep older workers healthier and working longer. This should be relatively easy to do, as most jobs—even if they include reasoning demands—rely on worker prior knowledge to a large extent (Beier, Torres, & Beal, in press). Furthermore, in addition to the knowledge and ability demands examined here, mature workers benefit the organization through sharing their extensive knowledge and mentoring younger workers. Again, we cannot comment on the extent to which the fit between job demands and worker interpersonal skills and knowledge affect mature worker performance, retirement, and health, but theory would suggest that mature workers may be uniquely qualified for mentoring and emotionally demanding roles (Carstensen, Isaacowitz, & Charles, 1999).

It may be tempting to interpret the findings of this study as indicating that older workers should not be given challenging work assignments. We think that this would be an unfortunate conclusion that misrepresents our findings for two reasons. First, even in our sample of older workers and retirees, there was a lot of variance in cognitive ability scores for both knowledge and reasoning abilities. Indeed, one tenet of aging research is that variability often trumps averages when examining cognitive growth and decline (Hertzog, Kramer, Wilson, & Lindenberger, 2008). Otherwise stated, some 65-year-old workers will have cognitive profiles that resemble 30-year-olds; others will more resemble 80-year-olds. Second, our research reflects findings for older workers only. Indeed, we have ideas about how the relationships examined here may emerge in a more age-diverse sample. For example, it would be interesting to examine the age-conditional effects related to motivation and other attitudinal variables. In particular, socioemotional selectivity theory predicts that as people age, their goals will shift from achievement focused to emotional and generative (Carstensen et al., 1999). This may lead to older workers placing less value on so-called stretch work assignments in which job demands outpace worker abilities relative to younger workers, who may desire such assignments for developmental reasons. It is also possible, however, that we would find the same patterns of relationships between demands–ability fit and health conditions and turnover with a middle-aged or younger sample. Future research should examine the effect of fit when demands exceed worker abilities for workers of all ages to examine these ideas. Our findings suggest that examining how age moderates the relationship between person–job fit and important work and health outcomes is a fruitful avenue for future inquiry.

Another important consideration related to the age of the sample in the current study is that it is likely that many of the older workers and retirees in this study had continuously sought opportunities to improve their job satisfaction and improve their fit perceptions throughout their careers by engaging in job crafting (Kooij, van Woerkom, Wilkenloh, Dorenbosch, & Denissen, 2017; Wrzesniewski & Dutton, 2001). As such, fit should be relatively better for older workers than it would be for younger workers. It may be that the range of fit may be restricted in this sample and that the relationship between demands–ability fit and the outcomes was attenuated in the current study. A more age-diverse sample may provide larger effects than found here and should be considered for future research.

Limitations

The limitations of this study are related to one of its strengths: the use of existing data from the CogUSA study and O*NET database. The many advantages of using the large national sample and rich ability assessment in the CogUSA study, and objective details about job requirements available in O*NET are balanced by difficulties in using archival data (Fisher & Barnes-Farrell, 2013). In particular, some of the measures included in the CogUSA data set and O*NET were not ideal for our purpose given that these data sets were not designed with our study in mind. For example, the CogUSA study did not include assessment of potentially important control variables such as financial resources and likely mediators such as stress and strain and perceived fit. CogUSA did include assessment of work ability, which is defined as a person's job-related functional capacity, a self-assessment of one's ability to meet job demands and to continue working in a job (Ilmarinen & Ilmarinen, 2015; McGonagle et al., 2015). However, work ability was only assessed at the final wave (Wave 6) of data collection (after many participants in our sample were already retired), so we were unable to include it in the current study as a predictor or mediator (McArdle et al., 2009).

Another limitation relevant to the measures used in the CogUSA study is that fewer knowledge assessments were administered compared with reasoning assessments. As such, the measurement of cognitive abilities did not capture job-relevant knowledge as much as a targeted assessment designed for our purposes would have. Moreover, the CogUSA data set did not include assessment of needs–supplies fit (the fit between what the job provides and worker needs related to an array of factors such as salary, emotional and social support, flexibility, and so on; Edwards, 1991), which would have permitted a broader assessment of person–job fit. Moreover, the CogUSA sample was relatively homogeneous (majority White/Caucasian) and relatively highly educated, with 2 years of postsecondary education on average. Thus, it is not clear how well our findings would generalize to more diverse populations of aging workers. This is particularly noteworthy because education and minority status are related to health and poverty concerns in the United States (Abrams & Mehta, 2019; Kail, Taylor, & Rogers, 2018). In addition, some of the participants included in the current study were not working during the initial study waves (Wave 1 and Wave 2), limiting the causal inferences that can be made relative to health and retirement behavior from our results. Despite these limitations, the CogUSA data set provided an approach for studying objective fit and health and retirement outcomes that was less prone to common method bias than cross-sectional and self-report research. In our judgment, the value of using the CogUSA study vastly outweighed its limitations.

Although we controlled for self-reported health status, chronic diseases that increase in incidence and prevalence with age, such as heart disease, stroke, and diabetes, are major sources of disability and are each associated with a greater risk of cognitive decline (Gottesman et al., 2014; Norton, Matthews, Barnes, Yaffe, & Brayne, 2014; Yaffe, Falvey, & Hoang, 2014). Therefore, it is plausible that the prevalence of certain chronic diseases associated with cognitive functioning (e.g., hypertension and heart disease) may have been present before participation in the study, and/or developed in relation to lifestyle factors not examined in the study. Moreover, according to Zacher et al. (2014), a lack of demands–ability fit would theoretically lead to strain and declines in physical health, which in turn would negatively affect cognitive functioning. As a result, a lack of fit and resulting strain may compound the association between chronic diseases and unhealthy cognitive aging. Job strain is of particular concern among older workers, who tend to take longer to recover from work stress and who show greater physiological stress in response to high job demands (Kiss, De Meester, & Braeckman, 2008; Ritvanen, Louhevaara, Helin, Väisänen, & Hänninen, 2006). In sum, definitive answers to questions about how work affects health throughout the life span would require a more focused study on a broader range of ages than included here.

Conclusion

Research on health and retirement has become increasingly popular over the past few decades—particularly in the context of aging baby boomers and mass retirements for many industries (Toossi, 2013; Wang & Wanberg, 2017)—the current study is one of few that links demands–ability fit to retirement behavior and health (Park et al., 2012). It is also one of the few that provides empirical research on age-related fit perspectives (Zacher et al., 2014). We found that objective measures of cognitive abilities, matched with objective measures of ability demands of a worker's longest held job, taken from two completely separate sources, can be combined to predict retirement and health. Although admittedly an inexact analysis in terms of retirement timing, causal explanations, and explanatory mechanisms, our study provides important evidence that person–job fit affects important work and life outcomes worthy of future study. The results of this study can inform work-design strategies that could increase work ability perceptions and perhaps extend the careers of valuable older workers, which can be beneficial for organizations and workers alike (Parker, Morgeson, & Johns, 2017).

References

Abrams, L. R., & Mehta, N. K. (2019). Changes in depressive symptoms over age among older Americans: Differences by gender, race/ethnicity, education, and birth cohort. *SSM - Population Health, 7,* 100399. http://dx.doi.org/10.1016/j.ssmph.2019.100399

Ackerman, P. L. (2000). Domain-specific knowledge as the "dark matter" of adult intelligence: Gf/Gc, personality and interest correlates. *The Journals of Gerontology Series B, Psychological Sciences and Social Sciences, 55,* 69–84. http://dx.doi.org/10.1093/geronb/55.2.P69

Ackerman, P. L., Beier, M. E., & Bowen, K. R. (2002). What we really know about our abilities and our knowledge. *Personality and Individual Differences, 33,* 587–605. http://dx.doi.org/10.1016/S0191-8869(01)00174-X

Ackerman, P. L., & Wolman, S. D. (2007). Determinants and validity of self-estimates of abilities and self-concept measures. *Journal of Experimental Psychology: Applied, 13,* 57–78. http://dx.doi.org/10.1037/1076-898X.13.2.57

Barnes-Farrell, J. L. (2003). Beyond health and wealth: Attitudinal and other influences on retirement decision-making. In G. A. Adams & T. A. Beehr (Eds.), *Retirement: Reasons, processes, and results* (pp. 159–187). New York, NY: Springer.

Beehr, T. A., & Bennett, M. M. (2015). Working after retirement: Features of bridge employment and research directions. *Work, Aging and Retirement, 1,* 112–128. http://dx.doi.org/10.1093/workar/wau007

Beier, M. E., & Ackerman, P. L. (2001). Current-events knowledge in adults: An investigation of age, intelligence, and nonability determinants. *Psychology and Aging, 16,* 615–628. http://dx.doi.org/10.1037/0882-7974.16.4.615

Beier, M. E., & Ackerman, P. L. (2003). Determinants of health knowledge: An investigation of age, gender, abilities, personality, and interests. *Journal of Personality and Social Psychology, 84,* 439–448. http://dx.doi.org/10.1037/0022-3514.84.2.439

Beier, M. E., & Ackerman, P. L. (2005). Age, ability, and the role of prior knowledge on the acquisition of new domain knowledge: Promising results in a real-world learning environment. *Psychology and Aging, 20,* 341–355. http://dx.doi.org/10.1037/0882-7974.20.2.341

Beier, M. E., Torres, W. J., & Beal, D. J. (in press). Workplace aging and jobs in the 21st century. In S. J. Czaja, J. Sharit, J. James, & J. Grosch (Eds.), *New and emerging topics in aging and work*. New York, NY: Springer.

Beier, M. E., Young, C. K., & Villado, A. J. (2018). Job knowledge: Its definition, development and measurement. In D. S. Ones, N. Anderson, C. Viswesvaran, & H. K. Sinangil (Eds.), *The SAGE handbook of industrial, work and organizational psychology: Personnel psychology and employee performance* (2nd ed., Vol. 3, pp. 279–298). Los Angeles, CA: Sage Publications Ltd. http://dx.doi.org/10.4135/9781473914940.n11

Caldwell, D. F., & O'Reilly, C. A., III. (1990). Measuring person-job fit with a profile-comparison process. *Journal of Applied Psychology, 75,* 648–657. http://dx.doi.org/10.1037/0021-9010.75.6.648

Caplan, R. D. (1987). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior, 31,* 248–267. http://dx.doi.org/10.1016/0001-8791(87)90042-X

Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511571312

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously. A theory of socioemotional selectivity. *American Psychologist, 54,* 165–181. http://dx.doi.org/10.1037/0003-066X.54.3.165

Cattell, R. B. (1963). Theory of fluid and crystallized intelligence: A critical experiment. *Journal of Educational Psychology, 54,* 1–22. http://dx.doi.org/10.1037/h0046743

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.

Denissen, J. J. A., Bleidorn, W., Hennecke, M., Luhmann, M., Orth, U., Specht, J., & Zimmermann, J. (2018). Uncovering the power of personality to shape income. *Psychological Science, 29,* 3–13. http://dx.doi.org/10.1177/0956797617724435

Diederichs, C., Berger, K., & Bartels, D. B. (2011). The measurement of multiple chronic diseases—A systematic review on existing multimorbidity indices. *The Journals of Gerontology: Series A, 66,* 301–311. http://dx.doi.org/10.1093/gerona/glq208

Edwards, J. R. (1991). Person-job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 6, pp. 283–357). Oxford, UK: Wiley.

Edwards, J. R., & Van Harrison, R. (1993). Job demands and worker health: Three-dimensional reexamination of the relationship between person-environment fit and strain. *Journal of Applied Psychology, 78,* 628–648. http://dx.doi.org/10.1037/0021-9010.78.4.628

Edwards, J. R., & Shipp, A. J. (2007). The relationship between person-environment fit and outcomes: An integrative theoretical framework. In C. Ostroff & T. A. Judge (Eds.), *Perspectives on organizational fit* (pp. 209–258). Mahwah, NJ: Erlbaum Publishers.

Feingold, A. (1983). The validity of the information and vocabulary subtests of the WAIS for predicting college achievement. *Educational and Psychological Measurement, 43,* 1127–1131. http://dx.doi.org/10.1177/001316448304300422

Feldman, D. C. (2013). Feeling like it's time to retire: A fit perspective on early retirement decisions. In M. Wang (Ed.), *The Oxford handbook of retirement* (pp. 280–292). New York, NY: Oxford University Press.

Feldman, D. C., & Beehr, T. A. (2011). A three-phase model of retirement decision making. *American Psychologist, 66,* 193–203. http://dx.doi.org/10.1037/a0022153

Feldman, D. C., & Vogel, R. M. (2009). The aging process and person-environment fit. In S. G. Baugh & S. E. Sullivan (Eds.), *Research in careers* (pp. 1–25). Charlotte, NC: Information Age Press.

Fisher, G. G., & Barnes-Farrell, J. L. (2013). Use of archival data in OHP research. In M. Wang, R. R. Sinclair, & L. E. Tetrick (Eds.), *Research methods in occupational health psychology: State of the art in measurement, design, and data analysis* (pp. 290–322). New York, NY: Routledge.

Fisher, G. G., Chaffee, D. S., & Sonnega, A. (2016). Retirement timing: A review and recommendations for future research. *Work, Aging and Retirement, 2,* 230–261. http://dx.doi.org/10.1093/workar/waw001

Fisher, G. G., Chaffee, D. S., Tetrick, L. E., Davalos, D. B., & Potter, G. G. (2017). Cognitive functioning, aging, and work: A review and recommendations for research and practice. *Journal of Occupational Health Psychology, 22,* 314–336. http://dx.doi.org/10.1037/ocp0000086

Fisher, G. G., Ryan, L. H., & Sonnega, A. (2015). Prolonged working years: Consequences and directions for interventions. In J. Vuori, R. Blonk, & R. H. Price (Eds.), *Sustainable working lives: Managing work transitions and health throughout the life course* (pp. 269–288). Dordrecht, the Netherlands: Springer. http://dx.doi.org/10.1007/978-94-017-9798-6_15

Fisher, G. G., Stachowski, A., Infurna, F. J., Faul, J. D., Grosch, J., & Tetrick, L. E. (2014). Mental work demands, retirement, and longitudinal trajectories of cognitive functioning. *Journal of Occupational Health Psychology, 19,* 231–242. http://dx.doi.org/10.1037/a0035724

Goodman, J. S., & Blum, T. C. (1996). Assessing the non-random sampling effects of subject attrition in longitudinal research. *Journal of Management, 22,* 627–652. http://dx.doi.org/10.1177/014920639602200405

Gottesman, R. F., Schneider, A. L. C., Albert, M., Alonso, A., Bandeen-Roche, K., Coker, L., . . . Mosley, T. H. (2014). Midlife hypertension and 20-year cognitive change: The atherosclerosis risk in communities neurocognitive study. *Journal of the American Medical Association Neurology, 71,* 1218–1227. http://dx.doi.org/10.1001/jamaneurol.2014.1646

Hertzog, C., Kramer, A. F., Wilson, R. S., & Lindenberger, U. (2008). Enrichment effects on adult cognitive development: Can the functional capacity of older adults be preserved and enhanced? *Psychological Science in the Public Interest, 9,* 1–65. http://dx.doi.org/10.1111/j.1539-6053.2009.01034.x

Ilmarinen, J., & Ilmarinen, V. (2015). Work ability and aging. In L. M. Finkelstein, D. M. Truxillo, F. Fraccaroli, & R. Kanfer (Eds.), *Facing the challenges of a multi-age workforce: A use-inspired approach* (pp. 134–156). New York, NY: Routledge/Taylor & Francis Group.

Jansen, K. J., & Kristof-Brown, A. (2006). Toward a multidimensional theory of person-environment fit. *Journal of Managerial Issues, 18,* 193–212.

Kail, B. L., Taylor, M. G., & Rogers, N. (2018). Double disadvantage in the process of disablement: Race as a moderator in the association between chronic conditions and functional limitations. *The Journals of Gerontology: Series B.* Advance online publication. http://dx.doi.org/10.1093/geronb/gby027

Kanfer, R., & Ackerman, P. L. (2004). Aging, adult development, and work motivation. *The Academy of Management Review, 29,* 440–458. http://dx.doi.org/10.5465/amr.2004.13670969

Kanfer, R., Beier, M. E., & Ackerman, P. L. (2013). Goals and motivation related to work in later adulthood: An organizing framework. *European Journal of Work and Organizational Psychology, 22,* 253–264. http://dx.doi.org/10.1080/1359432X.2012.734298

Kiss, P., De Meester, M., & Braeckman, L. (2008). Differences between younger and older workers in the need for recovery after work. *International Archives of Occupational and Environmental Health, 81,* 311–320. http://dx.doi.org/10.1007/s00420-007-0215-y

Klein, R. M., Dilchert, S., Ones, D. S., & Dages, K. D. (2015). Cognitive predictors and age-based adverse impact among business executives. *Journal of Applied Psychology, 100,* 1497–1510. http://dx.doi.org/10.1037/a0038991

Kooij, D. T. A. M. (2015). Successful aging at work: The active role of employees. *Work, Aging and Retirement, 1,* 309–319. http://dx.doi.org/10.1093/workar/wav018

Kooij, D. T. A. M., van Woerkom, M., Wilkenloh, J., Dorenbosch, L., & Denissen, J. J. A. (2017). Job crafting towards strengths and interests: The effects of a job crafting intervention on person-job fit and the role of age. *Journal of Applied Psychology, 102,* 971–981. http://dx.doi.org/10.1037/apl0000194

Kristof-Brown, A. L., & Billsberry, J. (2013). Fit for the future. In A. L. Kristof-Brown & J. Billsberry (Eds.), *Organizational fit: Key issues and new directions* (pp. 1–18). Hoboken, NJ: Wiley-Blackwell. http://dx.doi.org/10.1002/9781118320853.ch1

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individual's fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology, 58,* 281–342. http://dx.doi.org/10.1111/j.1744-6570.2005.00672.x

Kubeck, J. E., Delp, N. D., Haslett, T. K., & McDaniel, M. A. (1996). Does job-related training performance decline with age? *Psychology and Aging, 11,* 92–107. http://dx.doi.org/10.1037/0882-7974.11.1.92

Mabe, P. A., & West, S. G. (1982). Validity of self-evaluation of ability: A review and meta-analysis. *Journal of Applied Psychology, 67,* 280–296. http://dx.doi.org/10.1037/0021-9010.67.3.280

McArdle, J. J., Fisher, G. G., Rodgers, W. L., & Kadlec, K. (2009). *The study of cognition and aging in the USA (CogUSA): Study design and methods*. Ann Arbor, MI: Institute for Social Research, University of Michigan.

McArdle, J. J., Rodgers, W., & Willis, R. (2015, April). *Cognition and aging in the USA (CogUSA) 2007–2009*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]. http://dx.doi.org/10.3886/ICPSR36053.v1

McGonagle, A. K., Fisher, G. G., Barnes-Farrell, J. L., & Grosch, J. W. (2015). Individual and work factors related to perceived work ability and labor force outcomes. *Journal of Applied Psychology, 100,* 376–398. http://dx.doi.org/10.1037/a0037974

Ng, T. W. H., & Feldman, D. C. (2008). The relationship of age to ten dimensions of job performance. *Journal of Applied Psychology, 93,* 392–423. http://dx.doi.org/10.1037/0021-9010.93.2.392

Norton, S., Matthews, F. E., Barnes, D. E., Yaffe, K., & Brayne, C. (2014). Potential for primary prevention of Alzheimer's disease: An analysis of population-based data. *The Lancet Neurology, 13,* 788–794. http://dx.doi.org/10.1016/S1474-4422(14)70136-X

Oakman, J., & Wells, Y. (2016). Working longer: What is the relationship between person–environment fit and retirement intentions? *Asia Pacific Journal of Human Resources, 54,* 207–229. http://dx.doi.org/10.1111/1744-7941.12075

Oldham, G. R., & Gordon, B. I. (1999). Job complexity and employee substance use: The moderating effects of cognitive ability. *Journal of Health and Social Behavior, 40,* 290–306. http://dx.doi.org/10.2307/2676353

Park, H. I., Beehr, T. A., Han, K., & Grebner, S. I. (2012). Demands-abilities fit and psychological strain: Moderating effects of personality. *International Journal of Stress Management, 19,* 1–33. http://dx.doi.org/10.1037/a0026852

Parker, S. K., Morgeson, F. P., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of Applied Psychology, 102,* 403–420. http://dx.doi.org/10.1037/apl0000106

Peterson, N. G., Mumford, M. D., Borman, W. C., Jeanneret, R., & Fleishman, E. A. (1999). *An occupational information system for the 21st century: The development of O*NET*. Retrieved from http://www.apa.org/pubs/books/4318810.aspx

Ritvanen, T., Louhevaara, V., Helin, P., Väisänen, S., & Hänninen, O. (2006). Responses of the autonomic nervous system during periods of perceived high and low work stress in younger and older female teachers. *Applied Ergonomics, 37,* 311–318. http://dx.doi.org/10.1016/j.apergo.2005.06.013

Roos, P. A., & Treiman, D. J. (1980). DOT scales for the 1970 census classification. In A. R. Miller (Ed.), *Work, jobs, and occupations: A critical review of the dictionary of occupational titles* (pp. 336–389). Washington, DC: National Academies Press.

Rowe, J. W., & Kahn, R. L. (2015). Successful aging 2.0: Conceptual expansions for the 21st century. *The Journals of Gerontology Series B, Psychological Sciences and Social Sciences, 70,* 593–596. http://dx.doi.org/10.1093/geronb/gbv025

Rudolph, C. W., Kooij, D. T. A. M., Rauvola, R. S., & Zacher, H. (2018). Occupational future time perspective: A meta-analysis of antecedents and outcomes. *Journal of Organizational Behavior, 39,* 229–248. http://dx.doi.org/10.1002/job.2264

Salthouse, T. A. (2010). *Major issues in cognitive aging*. Oxford, UK: Oxford University Press.

Schaie, K. W. (2013). *Developmental influences on adult intelligence: The Seattle longitudinal study* (2nd ed.). Oxford, UK: Oxford University Press.

Schrank, F. A., McGrew, K. S., & Woodcock, R. W. (2001). *Technical abstract* (Woodcock-Johnson III Assessment Service Bulletin No. 2). Itasca, IL: Riverside Publishing.

Shanock, L. R., Baran, B. E., Gentry, W. A., Pattison, S. C., & Heggestad, E. D. (2010). Polynomial regression with response surface analysis: A powerful approach for examining moderation and overcoming limitations of difference scores. *Journal of Business and Psychology, 25,* 543–554. http://dx.doi.org/10.1007/s10869-010-9183-4

Shultz, K. S., Morton, K. R., & Weckerle, J. R. (1998). The influence of push and pull factors on voluntary and involuntary early retirees' retirement decision and adjustment. *Journal of Vocational Behavior, 53,* 45–57. http://dx.doi.org/10.1006/jvbe.1997.1610

Sonnega, A., Helppie-McFall, B., Hudomiet, P., Willis, R. J., & Fisher, G. G. (2018). A comparison of subjective and objective job demands and fit with personal resources as predictors of retirement timing in a national U.S. sample. *Work, Aging and Retirement, 4,* 37–51. http://dx.doi.org/10.1093/workar/wax016

Stenholm, S., Westerlund, H., Head, J., Hyde, M., Kawachi, I., Pentti, J., . . . Vahtera, J. (2015). Comorbidity and functional trajectories from midlife to old age: The Health and Retirement Study. *The Journals of Gerontology: Series A: Biological Sciences and Medical Sciences, 70,* 332–338. http://dx.doi.org/10.1093/gerona/glu113

Szinovacz, M. E., & Deviney, S. (2000). Marital characteristics and retirement decisions. *Research on Aging, 22,* 470–498. http://dx.doi.org/10.1177/0164027500225002

Toossi, M. (2013, December). *Labor force projections to 2022: The labor force participation rate continues to fall: Monthly Labor Review: U.S. Bureau of Labor Statistics*. Retrieved from http://www.bls.gov/opub/mlr/2013/article/labor-force-projections-to-2022-the-labor-force-participation-rate-continues-to-fall.htm

Truxillo, D. M., Cadiz, D. A., & Rineer, J. R. (2012). Designing jobs for an aging workforce: An opportunity for occupational health. *Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice, 2,* 109–125. http://dx.doi.org/10.1002/9781119942849.ch7

Van Beijsterveldt, C. E. M., van Boxtel, M. P. J., Bosma, H., Houx, P. J., Buntinx, F., & Jolles, J. (2002). Predictors of attrition in a longitudinal cognitive aging study: The Maastricht Aging Study (MAAS). *Journal of Clinical Epidemiology, 55,* 216–223. http://dx.doi.org/10.1016/S0895-4356(01)00473-5

Wanberg, C. R., Kanfer, R., Hamann, D. J., & Zhang, Z. (2016). Age and reemployment success after job loss: An integrative model and meta-analysis. *Psychological Bulletin, 142,* 400–426. http://dx.doi.org/10.1037/bul0000019

Wang, M., & Shultz, K. S. (2010). Employee retirement: A review and recommendations for future investigation. *Journal of Management, 36,* 172–206. http://dx.doi.org/10.1177/0149206309347957

Wang, M., & Wanberg, C. R. (2017). 100 years of applied psychology research on individual careers: From career management to retirement. *Journal of Applied Psychology, 102,* 546–563. http://dx.doi.org/10.1037/apl0000143

Wechsler, D. (1997). *WAIS III: Administration and scoring manual*. San Antonio, TX: The Psychological Corporation.

Wood, R. G., Goesling, B., & Avellar, S. (2007). *The effects of marriage on health: A synthesis of recent research evidence* (No. 6306–033; pp. 1–68). Princeton, NJ: Mathematica Policy Research, Inc.

World Health Organization. (2018). *World health statistics 2018: Monitoring health for the SDGs*. Retrieved from http://apps.who.int/iris/bitstream/handle/10665/272596/9789241565585-eng.pdf?ua=1

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review, 26,* 179–201. http://dx.doi.org/10.5465/amr.2001.4378011

Yaffe, K., Falvey, C. M., & Hoang, T. (2014). Connections between sleep and cognition in older adults. *The Lancet Neurology, 13,* 1017–1028. http://dx.doi.org/10.1016/S1474-4422(14)70172-3

Zacher, H., Feldman, D. C., & Schulz, H. (2014). Age, occupational strain, and well-being: A person-environment fit perspective. In P. L. Perrewé, C. C. Rosen, & J. R. B. Halbesleben (Eds.), *The role of demographics in occupational stress and well being* (Vol. 12, pp. 83–111). Bingley, UK: Emerald Group Publishing Limited. http://dx.doi.org/10.1108/S1479-355520140000012002

Zacher, H., & Frese, M. (2009). Remaining time and opportunities at work: Relationships between age, work characteristics, and occupational future time perspective. *Psychology and Aging, 24,* 487–493. http://dx.doi.org/10.1037/a0015425

Zacher, H., & Frese, M. (2011). Maintaining a focus on opportunities at work: The interplay between age, job complexity, and the use of selection, optimization, and compensation strategies. *Journal of Organizational Behavior, 32,* 291–318. http://dx.doi.org/10.1002/job.683

Zhan, Y., & Wang, M. (2015). Retirement and bridge employment: People, context, and time. In L. M. Finkelstein, D. M. Truxillo, F. Fraccaroli, & R. Kanfer (Eds.), *Facing the challenges of a multi-age workforce: A use-inspired approach* (pp. 230–249). New York, NY: Routledge/Taylor & Francis Group.

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