

Article

Work Ability Mediates the Relationships between Personal Resources and Work Engagement

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Abstract: Research on job resources suggests strong links with work engagement, but less is known about its association with personal resources and possible mechanisms linking personal resources to work engagement. Based on the job demands-resources (JD-R) model and lifespan development theories, we develop and test a model of the indirect relationships between personal resources (i.e., adaptive coping in the form of selection, optimization, and compensation and personal health in the form of subjective health complaints) and work engagement through work ability. To test this model, a sample of employees ($n = 520$) was recruited from a panel of employed older (i.e., aged 40+) workers. Results suggest that work ability mediates the relationships between selection, optimization, and compensation and subjective health complaints and work engagement.

Keywords: selection, optimization, and compensation; subjective health complaints; work ability; work engagement



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1. Introduction

The job demands-resources (JD-R) model is a common theoretical framework for understanding the relationships between job resources and work engagement [1]. According to this model, job resources are particularly important facilitators of work engagement [2]. Highly engaged workers experience a sense of connectivity to their work and are more psychologically present at work, such that they are more likely to integrate their self-concept with their work roles [3,4]. Despite empirical support for this framework, one early criticism of the JD-R model is that it focused exclusively on job resources as precursors to work engagement. To address this, more recent expansions of the JD-R model have considered the reciprocal interplay between job and personal resources as antecedents to motivational processes, including work engagement [5].

To address this advancement in the JD-R model, some research has begun to address the role of personal resources in this framework. However, a relatively narrow range of personal resources have so far been investigated to date (e.g., self-efficacy, optimism) [6]. This is unfortunate, because it has been suggested that personal resources operate similarly to job resources, in that they protect individuals from the costs associated with various demands, aid in goal achievement, and facilitate growth and development [1,7]. In the present study, we examine an expanded range of personal resources as precursors to engagement via work ability—specifically subjective health and adaptive coping via selection, optimization, and compensation (SOC).

As such, the goals of this study were two-fold. First, we sought to expand research on the association between personal resources and work engagement. Second, we sought to add clarity to the literature about potential intermediary mechanisms that link personal resources to work engagement. In doing so, we contribute to expanded theorizing on the JD-R model by (a) considering an expanded range of personal resources therein, and (b) by laying the groundwork for integrating lifespan development perspectives into theorizing on

the personal resources—work engagement linkage. In the following sections, we describe the substantive variables under investigation here, and build out the arguments for our theoretical model.

1.1. Selection, Optimization, & Compensation

Selection, optimization, and compensation (SOC) is a meta-theoretical framework that explains how people actively manage developmental challenges. SOC suggests that individuals respond to shifts in functional capacity by prioritizing specific goals. This is accomplished by optimizing a process of selectively dividing effort and personal/environmental resources towards goal accomplishment while simultaneously compensating for experienced losses. More specifically, SOC outlines a set of adaptive coping strategies that can be defined in terms of either elective selection (e.g., the selection of goals), loss-based selection (e.g., focusing on one's most important goals), optimization (e.g., persistence in goal pursuit), and compensation (e.g., using external aids or seeking help from others behaviors [8]). Importantly, through their orchestration, SOC strategies enable the optimal allocation of resources to address demands, and research has found that use of SOC strategies is positively associated with work ability [9,10].

1.2. Subjective Health Complaints

Subjective health complaints are a very common occurrence [11]. Importantly, one's health concerns are not always directly linked to specific diseases, rather people's experiences with or subjective feelings about their (un)wellness are reflected in their subjective evaluations of their own health. In general, subjective health complaints are what people generally mean when they refer to their "health" [12]. One's personal health status, including subjective health complaints, can have a significant impact on the management of work demands [13–15]. For example, the presence of a chronic health condition is negatively associated with work ability [13]. Research suggests that decreases in personal health can negatively influence one's capacity to manage job demands [14]. Research investigating the relationship between work ability and personal health has either examined serious health problems [13,14] or used work ability and engagement to predict perceived health [16]. In this study, we seek to understand how personal health contributes to work ability, and subsequently work engagement.

1.3. Work Ability

Work ability describes one's perceived functional capacity to manage work demands, and the capability to deploy personal resources towards managing such demands [17,18]. More broadly, "possessing" work ability has been described along two related lines:

Having work ability, in the first sense, means having the occupational competence, the health required for the competence, and the occupational virtues that are required for managing the work tasks, assuming that the tasks are reasonable and that the work environment is acceptable. In the second sense, having work ability is having the health, the basic standard competence and the relevant occupational virtues required for managing some kind of job, assuming that the work tasks are reasonable and that the work environment is acceptable. [18] (p. 275)

Consistent with past research, we adopt a job-demands specific view of the work ability construct, and conceptualize work ability in terms of one's capacity to manage specific work demands. Meta-analytic evidence finds positive relations ($\bar{r} = 0.151$) between SOC and work ability, and negative relations ($\bar{r} = -0.389$) between subjective health complaints (i.e., in the form of health symptoms) and work ability [19].

1.4. Work Engagement

Work engagement refers to, "...a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption." [20] (p. 74). Owing to its centrality in the JD-R model, work engagement is one of the most commonly studied outcomes in

the study of occupational health. Originally conceptualized as the antithesis of burnout, research on work engagement has broadened such that research now generally conceptualizes the construct not only in affective, but also motivational terms [21]. Regarding empirical relationships involving the substantive variables considered here, a meta-analysis found positive relations ($\bar{r} = 0.377$) between SOC and work engagement [22]. Moreover, meta-analytic research finds positive relations between work ability and similar positively-valenced job attitudes (e.g., job satisfaction, organizational commitment, $\bar{r} = 0.262$) and work motivation ($\bar{r} = 0.304$) [19].

Despite research suggesting relations between health and work engagement, there is some degree of mixed evidence for the strength of this relation in the literature. For example, meta-analytic evidence suggests a modest, positive relation between health and work engagement ($\bar{r} = 0.130$) [23]. However, the 95% credibility interval $[-0.450:0.670]$ associated with this finding is rather wide and encompasses both positive and negative associations between these two variables, suggests a high degree of heterogeneity in this estimate. One potential reason for this mixed evidence may be that studies have not considered potential intermediary mechanisms that explain the relation between personal health status and work engagement; we consider work ability as one such mechanism.

1.5. Theoretical Model

In the present study, we draw from the JD-R framework and lifespan developmental perspectives on adaptive coping to develop a theoretical model (see Figure 1) of the indirect association between personal resources (i.e., SOC and subjective health complaints) and work engagement through work ability. Several lines of theorizing support this model. According to the JD-R model, personal resources are important precursors to work engagement [6,7]. What is less clear in this model, is the role of intermediary mechanisms, such as work ability, that may serve to link personal resources to work engagement. However, borrowing again from the JD-R model, the ability to manage one's job demands, as is afforded by high levels of work ability, should result in higher levels of work engagement.

The lifespan meta-theory of selection, optimization, and compensation offers that adaptive coping strategies can be employed to meet demands [9]. Work ability reflects one's capability to deploy personal resources towards managing work related demands [17], and as such, it should be positively associated with one's ability to optimally allocate resources in service of addressing demands, such as those captured by SOC [24]. Accordingly, those who exhibit higher levels of SOC should have higher levels of work ability. Moreover, subjective health complaints present challenges to one's ability to effectively manage specific work demands [25]. As such, the experience of more subjective health complaints should be associated with lower levels of work ability [26]. As such, our model tests the following hypotheses:

Hypothesis 1. *Selection, optimization, and compensation (SOC) is positively associated with work ability.*

Hypothesis 2. *Personal health (i.e., subjective health complaints) is negatively associated with work ability.*

Hypothesis 3. *Work ability is positively associated with work engagement.*

Hypothesis 4. *Work ability mediates the positive association between selection, optimization, and compensation and work engagement.*

Hypothesis 5. *Work ability mediates the negative association between personal health (i.e., subjective health complaints) and work engagement.*

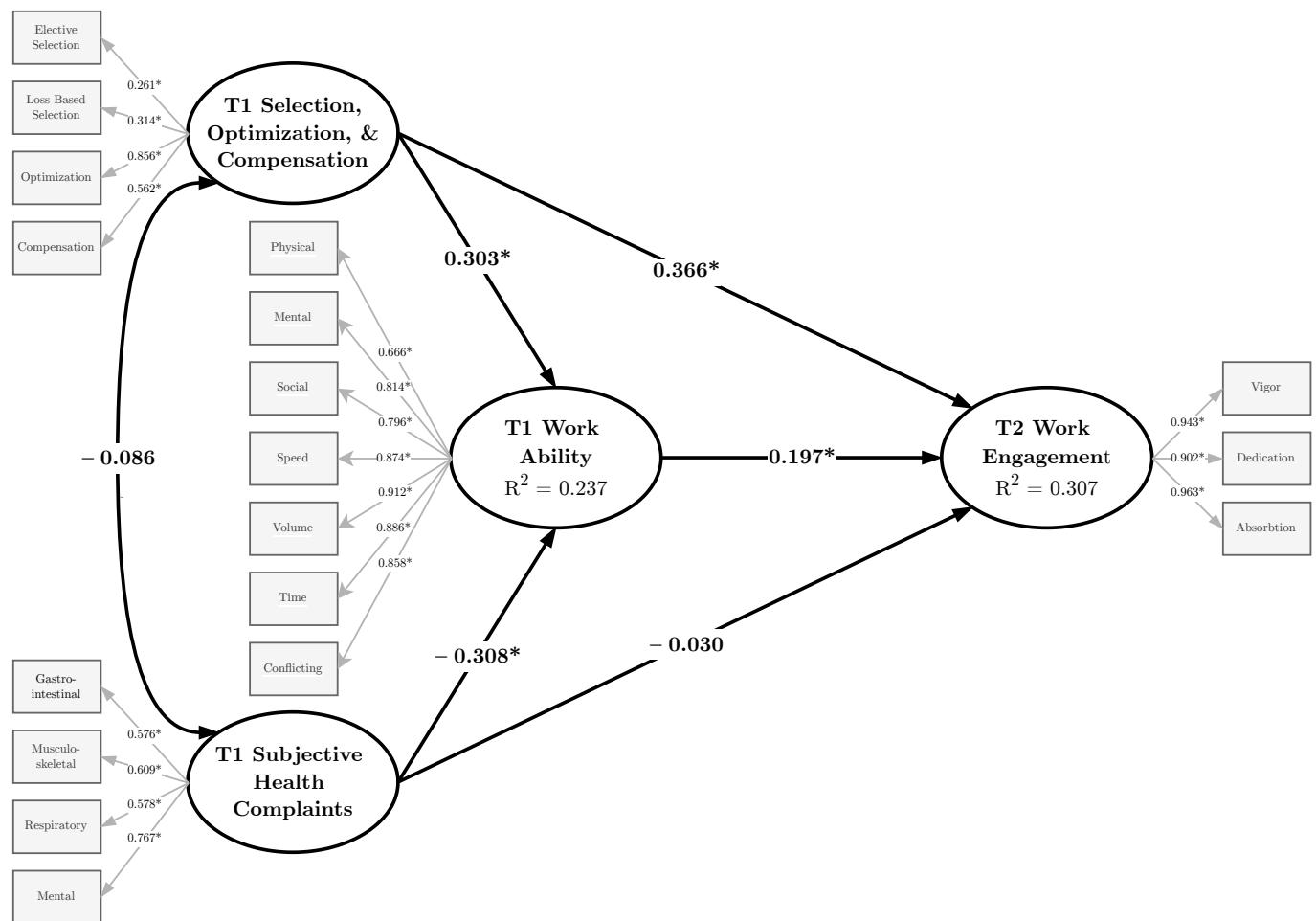


Figure 1. Summary of structural equation model (SEM). Model fit: $\chi^2_{(213)} = 480.985$, CFI = 0.948, RMSEA = 0.052, SRMR = 0.039. Standardized factor loadings and path coefficients are reported here. For the sake of parsimony, covariates (i.e., age, sex, education, income, work hours, and job role) are omitted from this representation. * = $p < 0.05$.

2. Materials and Methods

2.1. Participants

Participants ($n = 520$) were recruited from a representative panel of employed older (i.e., 40+) workers with the help of a survey sampling company ($M_{age} = 51.64$, $SD_{age} = 7.35$; see Table 1) in the United States. A panel of older workers was chosen here, as SOC, work ability, and personal health are all age-related constructs that are especially important to understand among older members of the workforce.

The sample was 47.50% female, and worked an average of $M = 44.77$ ($SD = 6.93$) hours/week in a wide variety of occupational categories (e.g., office/administrative support staff, 11.50%; education, 12.30%; management/professional, 11.30%). For additional demographics, see Table 1.

Table 1. Participant demographics.

Variable	Participants <i>n</i> = 520
Age	
Mean (SD)	51.64 (7.35)
Median [Min, Max]	52 [40, 65]
Sex	
Female	247 (47.50%)
Male	273 (52.50%)
Race/Ethnicity	
White/Caucasian	444 (85.40%)
African American	27 (5.20%)
Hispanic	19 (3.70%)
Asian	20 (3.80%)
Native American	5 (1.00%)
Pacific Islander	1 (0.20%)
Other	4 (0.80%)
Education	
Grammar School	0 (0.00%)
High School or equivalent	63 (12.10%)
Vocational/Technical School (2 year)	42 (8.10%)
Some College	131 (25.20%)
College Graduate (4 year)	174 (33.50%)
Master's Degree (MS)	83 (16.00%)
Doctoral Degree (PhD)	9 (1.70%)
Professional Degree (MD, JD, etc.)	18 (3.50%)
Other	0 (0.00%)
Annual Household Income (USD\$)	
under 20,000	7 (1.30%)
20,000–29,999	26 (5.00%)
30,000–39,999	59 (11.30%)
40,000–49,999	53 (10.20%)
50,000–59,999	60 (11.50%)
60,000–69,999	67 (12.90%)
70,000–79,999	56 (10.80%)
80,000–89,999	35 (6.70%)
90,000–99,999	26 (5.00%)
100,000–109,999	31 (6.00%)
110,000–119,999	11 (2.10%)
120,000–129,999	23 (4.40%)
130,000–139,999	6 (1.20%)
140,000–149,999	19 (3.70%)
150,000+	41 (7.90%)

Note. See online appendix for additional work-relevant demographics.

2.2. Study Design

A two-wave incomplete panel design was used, wherein data were collected from participants at two time points, approximately two weeks apart. Measures of SOC strategies, subjective health complaints, and work ability were collected at time one (T1); work engagement was collected at time two (T2). A lag of two weeks was chosen, as research has shown that work ability is susceptible to short term influences [27]. Data were collected in early 2013. Data were collected anonymously; the survey sampling company ensured anonymity through the use unique identification codes to link survey responses over time.

2.3. Measures

2.3.1. Time 1 Selection, Optimization, & Compensation

SOC similarity scores were derived from the instrument described by Freund and Baltes [28]. This measure tasks participants with making choices between 12 pairs of behaviors. For each pair, one choice is indicative of a SOC behavior (e.g., “I concentrate all my energy on few things.”) and one represents a non-SOC “distractor” choice (e.g., “I divide my energy among many things.”). For each pair of behaviors, participants are asked, “Which behavior best describes how you act at work?” and participants choose among the two possible behaviors. Then, participants are asked to rate the degree of similarity between themselves and the behavior they selected on a 1 = “a little like me” to 4 = “just like me” scale. The SOC choice is scored a 0 = “did not select the SOC behavior” or 1 = “selected the SOC behavior.” This score is then multiplied by the similar rating, yielding values between 0 = “did not select the SOC behavior” and 4 = “selected the SOC behavior; just like me.” Four SOC scores are derived as such, representing elective and loss-based forms of selection, optimization, and compensation; these four scores were used as indicators in our latent variable models. Reliability estimates were a bit lower than standard expectations: $\alpha = 0.562$, $\omega = 0.616$, $AVE = 0.341$.

2.3.2. Time 1 Subjective Health Complaints

Personal health status was assessed in terms of subjective health complaints, using a 24-item version of the Subjective Health Complaints Inventory (SHCI, [29]). The SHCI presents respondents with 24 different symptoms. Respondents are asked, “Over the past 15 days, how troubled have you been with the following health complaints? That is, how severe were your symptoms, and how long did they last?” Each symptom is then rated on both an intensity scale ranging from 0 = “no symptoms” to 4 = “severe intensity” and a duration scale ranging from 0 = “not applicable” to 4 = “11–15 days.” The intensity and duration scales are then multiplied together, resulting in each symptom ranging from 0 = “no symptoms” to 9 = “severe intensity, lasting from 11 to 15 days.”

Symptoms are classified into four broader symptom categories, and scored by summing the resulting values of the procedures described above: (1) musculoskeletal (e.g., upper back pain, arm pain), (2) gastrointestinal (e.g., heartburn, stomach discomfort), (3) respiratory (e.g., breathing discomfort, coughing, and 4) mental (e.g., anxiety, sleep problems). These four scores were used as indicators in our latent variable models. Higher scores on this measure indicate higher subjective health complaints. Reliability estimates were acceptable: $\alpha = 0.711$, $\omega = 0.735$, $AVE = 0.432$.

2.3.3. Time 1 Work Ability

Work ability was assessed with an expanded version of the work ability scale used in the Health and Retirement Study [30]. Specifically, we asked participants to assess their current level of work ability with respect to the ability to perform their job given seven specific work demands (i.e., physical, mental, interpersonal/social, speed, volume of work, time, and conflicting demands). Participants were asked, “How would you rate your current level of work ability with respect to...,” and then presented with the seven specific work demands. Ratings for each demand were collected on a 1 = “very poor” to 5 = “very good” scale. Each of these seven demands were used as indicators in our latent variable models. Reliability estimates were acceptable: $\alpha = 0.939$, $\omega = 0.940$, $AVE = 0.694$.

2.3.4. Time 2 Work Engagement

Work engagement was assessed using the Utrecht Work Engagement Scale (UWES) [31]. This 17-item measure includes items assessing dimensions of vigor (e.g., “At my work, I feel bursting with energy”), dedication (e.g., “When I get up in the morning, I feel like going to work”), and absorption (e.g., “Time flies when I’m working”). Participants are asked, “The following statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job.” Ratings are collected on

a 1 = “never” to 7 = “always” scale. Three scale scores representing vigor, dedication, and absorption are derived by averaging across corresponding items; these three scale scores were used as indicators in our latent variable models. Reliability estimates were acceptable: $\alpha = 0.954$, $\omega = 0.954$, $AVE = 0.874$.

2.4. Analyses

All models were specified in R {lavaan} in a structural equation modeling (SEM) framework using a robust maximum likelihood estimator (i.e., MLR). Appropriately scaled test statistics and robust fit indices are thus reported here. Following recommendations from the literature [32], models were said to exhibit “good” fit to the data if the observed CFI ≥ 0.90 , RMSEA ≤ 0.08 , and SRMR ≤ 1.00 . The Monte Carlo method for assessing mediation (MCMAM) was used to derive asymptotically appropriate 95% confidence intervals for indirect effects estimates [33]. In addition to the substantive variables described here, we included a number of demographic control variables that are both theoretically and empirically related to the process implied by our model (i.e., age, sex, education, income, work hours, and job role).

2.5. Open Science Practices

In service of openness and transparency, all data, code, and outputs supporting the result presented here have been made available in an online appendix via the open science framework (OSF): <https://osf.io/398zh/> (accessed on 1 October 2022).

3. Results

For descriptive statistics and correlations among observed substantive variables, variables, see Table 2.

Table 2. Correlations and descriptive statistics for observed variables.

Variable	Mean	SD	1.	2.	3.	4.
1. T1 SOC	1.79	0.63	0.562			
2. T1 Subjective Health Complaints	2.91	3.81	−0.042	0.711		
3. T1 Work Ability	4.17	0.67	0.243	−0.256	0.939	
4. T2 Work Engagement	4.92	1.04	0.319	−0.083	0.327	0.934

Note. Coefficient alpha (α) reliability estimates appear in the diagonal. T1 = time 1, T2 = time 2, SOC = selection, optimization, & compensation. Correlations (r_{xy}) $\geq |−0.243|$ are $p < 0.05$. Correlations are based on the full sample of $n = 520$ considered here.

3.1. Confirmatory Factor Analysis

We initially specified a confirmatory factor analysis (CFA) to assess the measurement structure of our substantive variables. A four-factor CFA fit the data well ($\chi^2_{(129)} = 300.085$, CFI = 0.963, RMSEA = 0.056, SRMR = 0.049), and better than a one-factor CFA ($\chi^2_{(135)} = 1953.013$, CFI = 0.586, RMSEA = 0.161, SRMR = 0.133).

3.2. Structural Equation Model

A structural equation model was specified to test our hypotheses (see Figure 1); the hypothesized indirect effects model fit the data well ($\chi^2_{(213)} = 480.985$, CFI = 0.948, RMSEA = 0.052, SRMR = 0.039). Considering statistically significant ($p < 0.05$) structural components of interest, SOC was positively associated with work ability ($\beta_a = 0.303$) such that higher levels of SOC were associated with higher levels of work ability. Likewise, subjective health complaints were negatively associated with work ability ($\beta_a = −0.308$) such that higher levels of subjective health complaints were associated with lower levels of work ability. In turn, work ability was positively related with work engagement ($\beta_b = 0.197$). As such, hypotheses 1, 2, and 3 were supported.

The total effect of SOC on work engagement was statistically significant ($\beta_c = 0.426$), whereas the total effect of subjective health complaints on work engagement was not

($\beta_c = -0.091$). In terms of the proposed process, the indirect effect for SOC was significant and positive ($B_{ab} = 0.070$, 95% CI: [0.026; 0.121], $\beta_{ab} = 0.060$), whereas the indirect effect of subjective health complaints was significant and negative ($B_{ab} = -0.072$, 95% CI: [-0.131; -0.024], $\beta_{ab} = -0.061$). As such, Hypotheses 4 and 5 were supported.

This model accounted for 23.70% of the variance in work ability and 30.70% of the variance in work engagement. Moreover, the direct effect of SOC on work engagement was significant once accounting for the indirect effect through work ability ($\beta_{c'} = 0.366$), suggesting evidence for partial mediation. However, the direct effect of subjective health complaints on work engagement was non-significant once accounting for the indirect effect through work ability ($\beta_{c'} = -0.030$). Given the non-significant total effect observed and the opposing signs of the a- and b-path relations, this indirect association may be considered as evidence for inconsistent mediation [34].

4. Discussion

In general, the results of this study support our hypothesized model (see Figure 1). We found a positive association between selection, optimization, and compensation and work ability and a negative relationship between subjective health complaints and work ability, supporting Hypotheses 1 and 2. Likewise, work ability was positively associated with work engagement, supporting Hypothesis 3. Combining Hypotheses 1, 2, and 3, we likewise found support for Hypotheses 4 and 5, in that work ability mediated the positive association between selection, optimization, and compensation and work engagement and the negative association between personal health (i.e., subjective health complaints) and work engagement.

4.1. Theoretical Implications

As suggested, a criticism of early conceptualizations of the JD-R model was its rather narrow and exclusive focus on job resources as antecedents. This narrow focus limited the scope of the JD-R model, by generally ignoring the role of individual resources in the development of work engagement. However, more recent revisions to the JD-R model include personal resources (along with job resources) as antecedents to motivational processes, more broadly defined (e.g., work engagement, commitment, flourishing) [5]. This study helps to address the role of personal resources in this framework, expanding upon earlier works that likewise sought clarity on the role of personal resources within the JD-R model [6].

The results presented here underscore the importance of examining a broader range of personal resources along with work ability to fully understand the development of work engagement, and especially in samples of older workers. In particular, the observation of inconsistent mediation of subjective health complaints on work engagement might suggest that mixed results in past research regarding the association between health and work engagement may be due to missing mediators. That is, failing to model intermediary mechanisms, such as work ability, linking subjective health complaints to work engagement may result in the total effect being “cancelled out.” More broadly speaking, this study has implications for the integration of lifespan development theory with the JD-R model and the concept of work ability [35]. As such, this work represents one of the first studies to integrate theories of lifespan development [9] with the JD-R perspective [1].

4.2. Practical Implications

The results of this study have a number of practical implications, namely for the development of interventions aimed at improving work ability and work engagement. Indeed, both SOC and subjective health complaints are malleable factors that could be intervened upon in service of increased work ability and work engagement. Future research on employee health interventions to decrease subjective health complaints may consider whether simultaneously training SOC strategies is efficacious in bolstering work ability and work engagement. Of note, interventions designed to increase SOC strategy use have

shown promise for increasing employee wellbeing [36]. Researchers have made suggestions for the development of SOC-based training programs, offering that it may be important to train people both on the content and theoretical background of SOC and the practical use of SOC strategies [37]. We suggest that, beyond training employees regarding the theoretical background of SOC and the practical use of SOC strategies, such interventions should also consider various way to best support employees who are experiencing subjective health complaints, and work to develop healthy work climates that help mitigate such experiences in the first place. Given the potent role of leadership in the development of such climates, one potential mechanisms to facilitate this is to encourage leaders to be more attuned to the health-related concerns of their followers [35].

4.3. Limitations & Directions for Future Research

There are a few limitations associated with this study, which also represent opportunities for future research. First, our two-wave incomplete panel design does not allow for a complete temporal separation of predictor, mediator, and outcome variables in our model. This design also means that substantive variables are treated as static within our model, and that changes in these variables over time cannot be modeled. Future research should endeavor to collect data across multiple (i.e., 3+ timepoints) and adopt complete panel designs, which would allow more complex modeling of dynamic and reciprocal within-person relations over time [38].

Second, all measures were self-reported, which may raise questions about common method/common source bias. Additionally, the pattern of loadings of SOC manifest variables onto the SOC latent variable suggest that “optimization” may be over-represented in this conceptualization relative to other SOC dimensions (see Figure 1). Research may consider how to (re)develop SOC measures to better balance out construct representation. Future research should consider multiple sources of data collection, for example, colleague or supervisor reports of work engagement.

Third, we have focused here on only two personal resources (i.e., SOC and subjective health complaints). Future research should consider other personal resources (e.g., socioeconomic status; SES). Of note, we do control for education, income, and job role, which to some extent, could be considered as alternative forms of personal resources that map onto SES. Still, future research would benefit from a more complete treatment and test of the core tenets of the JD-R model, including a consideration not only of job and personal resources but also job demands [5]. To this end, an interesting direction for future research would be to consider expansions of the JD-R model to also include personal demands (e.g., family care obligations) along side job demands, similar to the way job and personal resources are assumed to operate reciprocally therein.

5. Conclusions

Based on theoretical propositions from the JD-R model and lifespan development perspectives on adaptive coping, this study examined personal resources (i.e., selection, optimization, and compensation strategies; subjective health complaints) as predictors of work engagement, and considered work ability as a mediator of these associations. Consistent with our hypotheses, work ability serves as an important intermediary mechanism in the linkage between personal resources and work engagement.

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Data Availability Statement: Data are available here: <https://osf.io/398zh/> (accessed on 1 October 2022).

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Abbreviations

The following abbreviations are used in this manuscript:

SOC	selection, optimization, and compensation
JD-R	job demands-resources
SHCI	subjective health complaints inventory
UWES	Utrecht work engagement scale
MCMAM	Monte Carlo method for assessing mediation
OSF	open science framework
SES	socioeconomic status
CFI	comparative fit index
RMSEA	root mean square error of approximation
SRMR	standardized root mean residual

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