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Salmela-Aro, Katariina

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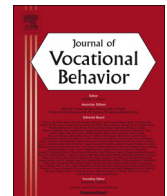
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Role of demands-resources in work engagement and burnout in different career stages^{☆,☆☆}



Katariina Salmela-Aro^{*}, Katja Upadyaya

Department of Educational Sciences, University of Helsinki, Finland

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ABSTRACT

Integrating the life-span approach with the Job-Demands-Resources (JD-R) model, this study examined the associations between personal and job demands and resources and work burnout and engagement during the early, mid, and late career stages. A further aim was to include novel job-related demands caused by digitalization, globalization and diversity. We also examined the extent to which work engagement and burnout were associated with general well-being, i.e., life satisfaction and depressive symptoms, among employees in different career stages. Employees (N = 1415) from three large organizations participated in the study via their occupational health services. The research questions were analyzed using structural equation modeling. In line with the life-span approach, the results for personal demands showed that, especially during the early career stage, economic problems were associated with work burnout symptoms, whereas during the late career stage caregiving demands were associated with work burnout and, negatively, with work engagement. In line with the JD-R model, job resources were related to work engagement in all career stages and high resilience buffered against the associations between demands and work engagement and burnout. The results for job demands showed that ICT demands were associated with work burnout during the early career stage and multicultural job demands with work burnout during the middle career stage. Finally, work engagement was associated with life satisfaction and work burnout was associated with depressive symptoms in all career stages. To conclude, an integrative life-span framework can be applied in the context of the demands-resources model.

1. Introduction

This study integrated the life-span approach with the Job Demands-Resources (JD-R) model to examine the associations of personal and job demands, and personal and job resources with work burnout and work engagement during the early, mid, and late career stages. Besides job-related demands and resources, personal demands and resources also play a role in work burnout and engagement (Salmela-Aro, 2009). With respect to job demands, our aim was to include novel job-related demands caused by digitalization, globalization and diversity (OECD, 2018).

According to previous research in the field of occupational psychology, work burnout and engagement are separate constructs that describe the positive and negative sides, respectively, of employees' well-being (Hakanen & Schaufeli, 2012; Upadyaya,

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^{*} Corresponding author at: Faculty of Educational Sciences, University of Helsinki, BOX 9, 10014 University of Helsinki, Finland.

E-mail address: Katariina.salmela-aro@helsinki.fi (K. Salmela-Aro).

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Vartiainen, & Salmela-Aro, 2016). Work burnout refers to feelings of exhaustion, cynicism, and inadequacy at work (Maslach, Schaufeli, & Leiter, 2001; Schaufeli, Salanova, González-Romá, & Bakker, 2002). Exhaustion refers to feelings of strain and overtaxing from work, whereas cynicism has been described as a distal attitude to and decreased interest in work, lower meaningfulness of work, and feelings of inadequacy as an employee (González-Romá, Schaufeli, Bakker, & Lloret, 2006; Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009; Schaufeli et al., 2002). Work engagement, in turn, is characterized as a fulfilling, positive work-focused state of mind, often manifested by high energy, dedication, and absorption at work (Schaufeli et al., 2002). Vigor and mental resilience while working and willingness to invest effort and persistence in the face of difficulties usually characterize high energy at work (Schaufeli et al., 2002). A sense of significance, enthusiasm, inspiration, and pride in one's work typically characterize dedication at work (Schaufeli et al., 2002). Being fully concentrated and happily engrossed in one's work, so that time passes quickly describe absorption at work (Schaufeli et al., 2002).

In line with the JD-R model (Bakker & Demerouti, 2007, 2008), work burnout and engagement are negatively associated, and often contribute to other occupational health outcomes, such as workaholism and recovery from work (Schaufeli, Bakker, & Van Rhenen, 2009; Shimazu, Schaufeli, Kamiyama, & Kawakami, 2015; Upadyaya et al., 2016), and are also reflected in employees' general well-being, such as in life satisfaction and depressive symptoms (Hakanen & Schaufeli, 2012). Job demands involve physical, psychological, social and organizational demands that require physical and/or psychological effort (Bakker & Demerouti, 2007). However, both job and personal demands as well as job and personal resources contribute to employees' well-being at work. For example, personal resources such as resilience, self-esteem, efficacy, and optimism manifest as increased work engagement (Bakker & Demerouti, 2008; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009), whereas different job demands, such as workload and emotional demands, often contribute to work burnout (Schaufeli & Bakker, 2004). However, according to the life-span approach, different personal demands and resources as well as job-related demands and resources can contribute to engagement and burnout during the career. Thus, the present study integrated the life-span approach with the JD-R model to examine the associations between both personal and job demands, and personal and job resources and work burnout and engagement during the early, mid, and late career stages. Moreover, in line with the JD-R model we examined the associations between work burnout and engagement and employees' general ill- and well-being during the early, mid, and late career stages.

1.1. Life-span approach

According to the life-span approach, personal demands and resources play a different role in occupational well-being in different stages of the life span (Baltes, 1997; Salmela-Aro, 2009; Shane & Heckhausen, 2016). The life-span framework builds on the premise that an individual's resources are limited, and that opportunities and demands arise which compel people to choose how to distribute their limited resources (Baltes, 1997). The life-span model further suggests that in developing their careers people select and construct their personal goals in relation to not only their existing personal demands and resources but also job-related demands and resources (Baltes & Dickson, 2001).

Young adults, who are at the beginning of their occupational trajectories, have often, therefore, not yet accumulated reserve of resources (networks, work experience, identities, income) (Upadyaya & Salmela-Aro, 2017; Wiese, Freund, & Baltes, 2002). At the same time, they potentially have large expectations (Lawton & Nahemow, 1973), the achievability of which they seek to optimize in relation to changes in their existing demands and resources. Research also shows that employees' future time perspective is a more important resource in the earlier than later career stages (Zacher & Frese, 2009, 2011; Zacher, Heusner, Schmitz, Zwierzanska, & Frese, 2010). In the early career stage, when employees are in the process of discovering and developing their personal resources, such as income, networks and competence in the workplace, they often find that their job demands outstrip their job resources (Demerouti, Peeters, & van der Heijden, 2012).

During the mid-career stage, the state of balance between job demands and job resources, particularly job control, often predicts employees' health outcomes (Hurrell & Lindström, 1992), a finding that likely partially reflects the relative accumulation of job and personal demands. Individuals' ability to adapt to varying life situations and to successfully engage in multiple life domains simultaneously is a central mechanism supporting their development across adulthood (Shane & Heckhausen, 2016). Some age-graded patterns that reflect the availability of resources and demands at various life stages have been identified in individuals' engagement in different life domains (e.g., work, family, health) (Demerouti et al., 2012; Shane & Heckhausen, 2016). Life stages determine, to some extent, career development and the availability of specific resources and demands (Demerouti et al., 2012). For example, early and mid-career employees with young children often have to cope simultaneously with both caregiving and job demands, a situation that may exacerbate work-family conflict, especially when the children are young (Demerouti et al., 2012; Grzywacz, Almeida, & McDonald, 2002).

However, caregiving demands, such as taking care of one's elderly parents, also often increase in late adulthood (Salmela-Aro, 2009). Moreover, during the late career stage investing in one's health becomes more important, probably because of the increasing prevalence of health problems during this life phase (Shane & Heckhausen, 2016). As their careers develop, and particularly during the late career stage, people make greater use of compensation in responding to change in their job demands and resources (Salmela-Aro, 2009; Wiese et al., 2002).

In line with the life-span model, personal resources, such as self-efficacy, and personal demands, such as taking care of dependents (e.g., children, elderly parents), long-term illnesses, and economic problems, are likely to vary by career stage, and hence should be examined accordingly (Baltes, 1997; Salmela-Aro, 2009). Individuals in the mid-career stage often experience high job demands, but also high job and personal resources, which, in turn, facilitate their work engagement (Demerouti et al., 2012). According to the life-span model, during the career different personal demands and resources are related to work burnout and engagement, and especially

during the mid- and late career, compensation from personal resources is needed (Baltes, 1997). An insufficiency of resources puts individuals at major risk for experiencing the negative consequences of stress, followed by the inability to cope effectively with stressors and to recover from stress (Spini, Bernardi, & Oris, 2017). Hence, by taking a life-span approach, both personal and job-related resources and demands were examined in the present study.

Thus, we expected that:

Hypothesis 1. Income-related personal demands are positively associated with work burnout during the early career stage, whereas long-term illness and taking care of aging parents are positively associated with work burnout during the late career stage.

Hypothesis 2. Compensatory personal resources are positively associated with work engagement and negatively associated with work burnout, particularly during the mid- and late career stages.

Younger employees are typically more prone to experience burnout symptoms than older employees (Antoniou, Polychroni, & Vlachakis, 2006; Brewer & Shapard, 2004; Maslach et al., 2001), while some studies suggest that work engagement slightly increases with age (Schaufeli, Bakker, & Salanova, 2006). In turn, middle adulthood is a life phase during which people are required to cope simultaneously with more job-related demands and demanding roles than at other ages (Freund, Nikitin, & Ritter, 2009). These differences between career stages may reflect changes in employees' personal and career goals (Salmela-Aro, 2009), adaptation, and resources and demands at different ages and career stages (Demerouti et al., 2012; Shane & Heckhausen, 2016). The individual differences in aging and development posited by the life-span model are closely in line with the assumptions of the demands and resources model used in industrial-organizational (I–O) psychology (Baltes & Dickson, 2001). Recent research has shown that age is negatively related to opportunities (Zacher et al., 2010; Zacher & Frese, 2011, 2009). However, less is known about the extent to which specific job-related demands and resources are associated with employees' work engagement and burnout at different ages and career stages (see also Baltes & Dickson, 2001; Maslach et al., 2001; Salmela-Aro, 2009). Given the lack of research on the role of job-related demands and resources in work engagement and burnout during different career stages, we did not set any hypothesis on this issue.

1.2. Job Demands and Resources model

The JD-R model (Bakker & Demerouti, 2006; Bakker, Demerouti, De Boer, & Schaufeli, 2003; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) has shown that work engagement and burnout are negatively associated and reflect one another (Hakanen, Bakker, & Schaufeli, 2006; Upadyaya et al., 2016). Research following the JD-R model (Bakker, Demerouti, De Boer, & Schaufeli, 2003; Bakker, Demerouti, & Schaufeli, 2003; Demerouti et al., 2001) has shown that multiple physical, psychological, social and organizational demands and resources are related to work burnout and engagement (Salmela-Aro & Upadyaya, 2014; Xanthopoulou et al., 2009). The concept of job demands refers to aspects of work that require sustained physical and psychological effort and are thus associated with certain physical and psychological costs (Demerouti et al., 2001). Not all job demands are initially negative; however, job demands may turn into stressors when the effort required to meet demands is high and when the number of simultaneous demands is high (Bakker, Demerouti, & Schaufeli, 2003). Typical job demands include workload, problems with equipment, long working hours, time pressure (Bakker, Demerouti, De Boer, & Schaufeli, 2003; Bakker, Demerouti, & Schaufeli, 2003) and interpersonal conflicts (Iliès, Johnson, Judge, & Keeney, 2011), all of which often manifest as an increase in employees' burnout symptoms. However, in the present study our primary interest is in the role of novel job-related demands influenced by digitalization, globalization and diversity, such as multiculturalism and ICT-related demands.

According to the demands-resources model, personal resources can buffer against the negative influence of job demands on work engagement and burnout (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Upadyaya et al., 2016), and against their associations with individuals' general ill- or well-being. For example, some studies have shown that positive associations between work burnout and depression are weaker among more resilient employees (Spini et al., 2017). Lack of job and personal resources, in turn, may lead to poor work engagement and increase burnout symptoms (Hakanen et al., 2006). In line with the Demands-resources model, we expected job resources to be positively associated with work engagement throughout the career (Bakker & Demerouti, 2007) and job-related demands to be related to burnout. Based on the JD-R model, we set the following hypotheses:

Hypothesis 3. Job-related resources (e.g., high work ability, positive team climate and high role in the organization) are positively associated with work engagement in each career stage;

Hypothesis 4. New job-related demands (e.g., ICT demands, interpersonal and multicultural demands) are related to work burnout in each career stage;

Hypothesis 5. Interaction between personal resources and job-related demands buffer against work burnout in each career stage;

Hypothesis 6. Work engagement is associated with life satisfaction and work burnout is associated with depressive symptoms in each career stage.

To summarize, this study integrated the life-span approach with the JD-R model to examine the associations between different job and personal demands and job and personal resources and work burnout and engagement during the early, mid, and late career stages. Specifically, we examined to what extent different job-related demands (e.g., ICT demands, interpersonal demands, multicultural demands, authoritarian management) and personal demands (e.g., long-term illnesses, caregiving demands, economic problems) and different job-related resources (e.g., work ability, team climate, role in the organization) and personal resources (e.g.,

resilience) are associated with work engagement and burnout in the early, mid, and late career stages. Based on the life-span model, we expected various personal demands and resources to be associated with burnout and engagement at all three different career stages, whereas according to the JD-R model, we expected job-related demands to be associated with work burnout and job resources to be associated with work engagement at all three career stages. Moreover, we expected personal resources to buffer against work burnout. Finally, we expected work engagement to be associated with life satisfaction and work burnout to be associated with depressive symptoms at each career stage.

2. Method

This study forms part of the Occupational Health Study, in which 1415 employees (586 men, 829 women), recruited through their occupational health services, answered questionnaires (spring 2011). Employees from three large organizations were sent an invitation, including a link to the study questionnaire, to participate in the study by their occupational health care services via their HR person. Those willing filled in an e-mail questionnaire on their work engagement, work burnout symptoms, general ill- and well-being, and perceptions of personal and job-related demands and resources. Mean participant age was 44 (range 20–64; 19% were 20–34, 45% 35–49, and 36% 50–65). The three organizations chosen for the study were a multinational network service provider, a public-sector administration company and a global water chemistry company (each employing over 500 people) whose occupational health service provider was willing to participate in the study by administering and collecting the data. The response rates from the three organizations varied between 34% and 39%. Participants were distributed by educational level as follows: university degree (44%), polytechnic degree (37%), vocational qualification (9%), compulsory education (5%), and double degree (3%). Participants were distributed by their organizational role as follows: customer services workers (19%), specialists (64%), immediate supervisors (7%), middle management (8%), and corporate management (2%).

2.1. Measures

Work Engagement was measured with the short 9-item version of the Utrecht Work Engagement Scale, UWES-S (Schaufeli et al., 2002, Schaufeli et al., 2006; see also Seppälä et al., 2009). The scale consists of 9 items measuring energy (e.g., ‘When I work, I feel that I am bursting with energy’), dedication (e.g., ‘I am enthusiastic about my work’), and absorption (e.g., ‘Time flies when I’m working’) at work (see also Seppälä et al., 2009 for the reliability and validity of the scale). The responses were rated on a 7-point scale (0 = not at all; 6 = daily). Previous research has supported the use of an overall measure of work engagement (Schaufeli et al., 2006), and thus a sum score was formed to measure the participants’ overall engagement at work. The Cronbach’s alpha reliability was 0.95. UWES-S work engagement scale has been used in various countries across the world (e.g., the Netherlands, Norway, Finland, Australia, South Africa, Belgium) (Seppälä et al., 2009) and in the present study well-established Finnish version of the UWES-9 was used.

Work Burnout was measured with the well-established Bergen Burnout Inventory (Näätänen, Aro, Matthiesen, & Salmela-Aro, 2003; Salmela-Aro, Näätänen, & Nurmi, 2004) which consists of 15 items measuring three factors of job burnout (see also Salmela-Aro, Rantanen, Hyvönen, Tilleman, & Feldt, 2011 for the reliability and validity of the scale): (1) exhaustion at work (e.g., ‘I feel overwhelmed by my work’); (2) cynicism about the meaning of work (e.g., ‘I feel lack of motivation in my work and often think of giving up’), and (3) feelings of inadequacy (e.g., ‘I often have feelings of inadequacy in my work’) which were rated on a 6-point scale (1 = strongly disagree; 6 = strongly agree). Previous research has supported the use of an overall job burnout indicator (Schaufeli et al., 2002), and thus sum scores were formed. The Cronbach’s alpha for overall job burnout was 0.90.

Depressive Symptoms were measured with nine questions on the frequency of depressive symptoms. The items (e.g., ‘Feeling down, depressed, hopeless’) were rated on a 4-point scale (1 = not at all; 4 = almost every day). The Cronbach’s alpha reliability for the sum score was 0.84.

Life Satisfaction was assessed using the five-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). The items (e.g., ‘I am satisfied with my life’) were rated on a 5-point scale (1 = totally disagree; 5 = totally agree). Cronbach’s alpha for the sum score of all 5 items was 0.87.

Job Demands, comprising physical, psychological, social, and organizational demands, were measured with four questions focus on novel demands related to digitalization and diversity: *ICT work demands* (‘How demanding is disruption related to computer programs or telecommunications in your work, taking into account their frequency and the effects of such disruption?’), *interpersonal job demands* (‘How demanding are the interpersonal relationships related to your work?’), and *multicultural work demands* (‘How demanding are failures, disturbances, and interference caused by multiculturalism in your work?’) (see OECD, 2018). Answers were rated on a 7-point scale (0 = not at all; 7 = extremely demanding). In addition, organizational level job demands were measured by *authoritarian management* with one statement (‘The management does not forget past mistakes’) which the employees rated on a 5-point scale (0 = completely disagree; 5 = completely agree). The demands and resources questions were translated to English by official language expert. More information on the validity of the job demands items are given in the supplementary data showing relatively high correlations between demands, resources, and work burnout and engagement among early-, mid- and late-career employees.

Personal Demands were measured with questions measuring the following key personal demands: *long-term illness* (‘Do you have any long-term illnesses?’; 1 = none; 4 = yes, many, which influence my work), *caregiving demands* (‘If you have dependents e.g., small children, elderly relatives, close persons who depend on you in other ways, how demanding you feel the situation is for you?’; 1 = not at all demanding; 10 = very demanding), and *economic problems* (‘How good is your and your family’s economic situation,

taking into account total family income and debts?'; 1 = very good economic situation; 4 = very poor economic situation). More information on the validity of the personal demands items are given in the supplementary data.

Job Resources were measured with key questions measuring physical, psychological, social, and organizational resources summarized as *work ability* ('Do you believe that your health will allow you to stay in your present job for the next 2 years?'; 1 = hardly; 5 = almost certainly), *team climate* ('To what extent do relationships between employees function as a resource for you?'; 0 = not at all; 7 = to great extent), and *role in the organization* ('What is your role in the organization?'; 1 = customer services; 5 = top management). More information on the validity of the job resources items is given in the supplementary data.

Personal Resources were measured with questions on *resilience* (e.g., 6 items; 'I recover quickly from difficult situations.'; 'It doesn't take me long to recover from stressful situations.' Answers were rated on a 5-point scale (1 = totally agree; 5 = totally disagree) (Smith et al., 2008). The Cronbach's alpha reliabilities for resilience in each career stage group were 0.86 for the early career group, 0.87 for the mid-career group, and 0.88 for the late career group. More information on the validity of the personal resources items are given in the supplementary data.

Age was coded 1 = under 35 years old; 2 = 35–49 years old; 3 = 50 years old and above. Gender was coded 1 = male; 2 = female.

3. Statistical analysis

The research data were analyzed using structural equation modeling (SEM). The models included paths from work engagement and burnout to life satisfaction and depressive symptoms, and from job and personal demands and resources to work engagement and burnout. All the models included latent variables for work engagement, burnout, life satisfaction, and depressive symptoms. Personal (e.g., caregiving demands, long-term illnesses, economic problems) and job demands (e.g., ICT demands, interpersonal job demands, multicultural demands, and authoritarian management) and job (i.e., work ability, team climate, role in the organization) and personal resources (resilience), and employee gender were included in the models as covariates. Three separate models were constructed for employees in the early, mid, and late stages of their career. In these models, all the endogenous variables were allowed to covariate. The study model is presented in Fig. 1.

Statistical analyses were performed using Mplus (Version 8; Muthén & Muthén, 1998–2018) with the missing data method, which allows the use of all the available data to be estimated without imputing data. Due to the skewed distributions of the variables, the model parameters were estimated using the MLR estimator (Muthén & Muthén, 1998–2018). Goodness-of-fit was evaluated using various indicators: χ^2 test, Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Because the χ^2 test is sensitive to sample size, the Comparative Fit Index (CFI) was also used to evaluate model fit.

The modification indices for all the models suggested that model fit would be improved if the positive association from long-term illnesses (personal demand) to depressive symptoms, and the negative association from economic problems (personal demand) to life satisfaction was included in each of the three models. Hence, these associations were included in all the models (Table 2). Moreover, the modification indices of the final model for the early career employees indicated that the model fit would be improved if the residual correlations between the energy and dedication items of work engagement, and between items 2 and 6, 2 and 9, 3 and 4, 5 and 7, and 6 and 9 of depressive symptoms were added into the model. Similarly, the modification indices suggested that the fit of the model for the mid-career employees would increase if the residual covariances between exhaustion and cynicism (work burnout), and absorption and dedication (work engagement), and between items 4 and 5 of life satisfaction, and between items 1 and 2, 2 and 6, 3 and 4, 4 and 5, 7 and 8, and 8 and 9 of life satisfaction were added into the model. Finally, the modification indices suggested that the fit of the model for the late-career employees would increase if the residual variances between items 3 and 4, 5 and 9, and 7 and 8 of depressive symptoms, and between items 1 and 2 of life satisfaction were added into the model. After including these specifications in the models, the final models fitted the data well (Table 2).

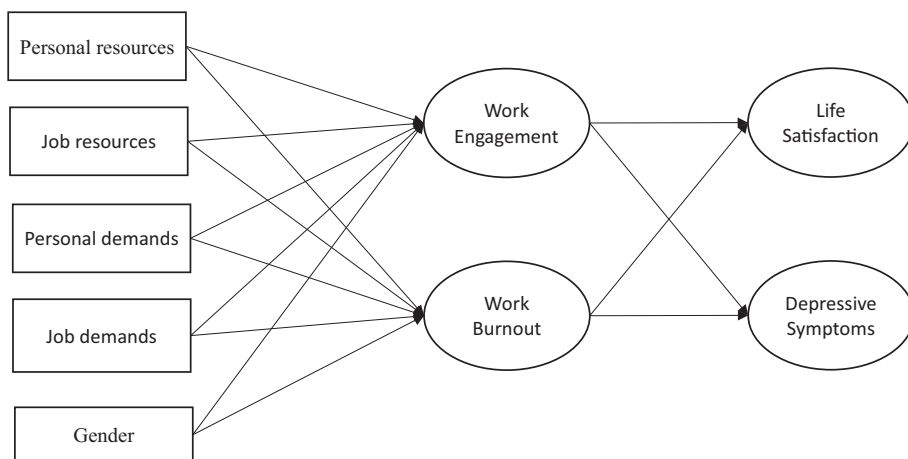


Fig. 1. Study model.

4. Results

Means, variances, and correlations for all the variables are presented in Table 1 (see also supplementary data). The results showed some similarities and differences between the three models for the early, mid, and late career stages. Supporting Hypothesis 6, in all three models, work engagement was positively, and work burnout negatively, associated with life satisfaction (Table 2). Moreover, supporting Hypothesis 6, in all three models work burnout was positively associated with depressive symptoms.

For *personal demands*, supporting Hypothesis 1, the results showed that caregiving demands were negatively associated with work engagement and positively associated with work burnout in the late career stage (Table 2). Economic problems, in turn, were positively associated with work burnout and negatively associated with work engagement in the early career stage. However, long-term illnesses were not related to work burnout.

The results did not support Hypothesis 2. However, the results for *personal resources* showed that at all three career stages employees' resilience was positively associated with work engagement and negatively associated with work burnout (Table 2).

Supporting the Hypothesis 3, the results for *job-related demands* showed that interpersonal job demands were positively associated with work burnout, and negatively associated with work engagement at all three career stages. ICT demands, in turn, were positively associated with work burnout in the early and mid-career stages, whereas multicultural demands were positively associated with work burnout in the mid-career stage. In addition, authoritarian management was positively associated with work burnout at all career stages and negatively associated with work engagement in the early and mid-career stages.

Supporting Hypothesis 4, the results for *job resources* showed that employees' perceptions of their abilities to work were positively associated with work engagement and negatively associated with work burnout in all three career stages. Similarly, team climate was positively associated with work engagement in all career stages and negatively associated with work burnout in the mid- and late career stages (Table 2). In addition, the higher the role the employees had in their organization, the higher their work engagement was in all career stages.

In partial support of Hypothesis 5, the results showed that the interaction between resilience and interpersonal job demands was negatively associated with work engagement and positively associated with work burnout in the early and late career stages.¹

Moreover, employee gender was positively associated with work engagement in the mid- and late career stages, with women experiencing higher work engagement than men, and negatively associated with work burnout in the late career stage, with women experiencing lower work burnout than men.

5. Discussion

This study is among the first to integrate the life-span approach (Baltes, 1997; Salmela-Aro, 2009) with the JD-R model (Bakker, Demerouti, De Boer, & Schaufeli, 2003; Bakker, Demerouti, & Schaufeli, 2003; Bakker & Demerouti, 2006; Demerouti et al., 2001). To do this, we included not only job-related demands and resources but also personal demands and resources in the JD-R model when examining the role of different demands and resources for work burnout and engagement and general ill- and well-being during the early, mid, and late career. Across the lifespan, individuals seek to optimize their development, and maintain a balance between gains and losses, and different demands and resources (Baltes, 1997). According to the life-span development approach, personal demands and resources play a different role in occupational well-being at different stages during the life span (Baltes, 1997). For example, the fact that younger employees typically suffer more than older employees from burnout symptoms (Antonioni et al., 2006; Brewer & Shapard, 2004; Maslach et al., 2001) whereas work engagement slightly increases with age (Schaufeli et al., 2006) may reflect changes in employees' personal and career-related resources and demands (Demerouti et al., 2012; Shane & Heckhausen, 2016). However, studies examining the associations between various physical, psychological, social and organizational demands (Bakker & Demerouti, 2007) and resources and employees' work engagement and burnout at different ages and career stages are lacking. This gap in the research prompted the present attempt to integrate the life-span approach with the JD-R model and examine the associations of both job and personal demands and both job and personal resources with work burnout and engagement and life-satisfaction and depressive symptoms during the early, mid, and late career stages.

Job and personal resources refer to various physical, psychological, interpersonal or organizational aspects of work that 1) reduce job demands and their related physiological and psychological costs, and/or 2) are functional in attaining job-related goals, and/or 3) stimulate employees' personal growth, development, and learning (Demerouti et al., 2001; Demerouti & Bakker, 2011). Job-related resources include characteristics such as team climate and the employee's role in the organization, whereas personal resources often refer to employees' self-efficacy, resilience, and optimism, all of which predict subsequent work engagement (Bakker & Demerouti, 2008; Salmela-Aro & Upadyaya, 2014; Xanthopoulou et al., 2009).

Supporting our Hypothesis 1 on personal demands, we found that caregiving demands were related to work burnout particularly during the late career, whereas economic demands were related to burnout in the early career. Our results showed that different life-span phases partially determine career development and the specific demands and resources that are available during the early, mid, and late career stages (Demerouti et al., 2012). The role of personal resources in work-related burnout and engagement have been

¹ The results for the initial models showed that the interaction term resilience x interpersonal job demands had suppression effects on the original interpersonal job demands variables. Thus, the models were first performed without the interaction variable (Table 2 results) and then with the interaction but without the original interpersonal job demands variable. Consequently, the results in Table 2 for the interaction variable are from the later models, and the remaining results from the models without the interaction variable.

Table 1

Correlations between work and personal demands and resources and between work burnout and engagement among early, mid- and late career employees.

	Employees under age 35 years (N = 1049)				Employees aged 35–49 years(N = 614)				Employees over age 50 years (N = 480)			
	Work engagement	Work burnout	M	Var	Work engagement	Work burnout	M	Var	Work engagement	Work burnout	M	Var
Job demands												
ICT demands	-0.02	0.22**	3.55	3.49	0.02	0.13**	3.66	3.81	-0.09	0.13**	3.71	3.73
Interpersonal work demands	-0.08*	0.18***	2.63	3.41	-0.26***	0.41***	2.64	3.35	-0.13**	0.22***	2.60	3.50
Multicultural demands	-0.22**	0.20*	2.24	3.02	-0.23***	0.37***	2.61	3.78	-0.17*	0.20**	2.57	4.06
Authoritarian management	-0.16*	0.27***	2.23	0.84	-0.22***	0.28***	2.31	1.09	-0.23***	0.34***	2.36	1.20
Personal demands												
Long-term illnesses	-0.13***	0.17***	1.68	0.71	-0.09*	0.17***	1.53	0.64	-0.14**	0.15**	1.82	0.73
Caregiving demands	-0.10**	0.21***	4.11	7.05	0.01	0.10*	4.59	7.08	-0.17**	0.23***	3.49	6.55
Economic problems	-0.12***	0.09**	2.01	0.45	-0.05	0.09*	2.05	0.49	-0.08	0.11*	1.97	0.39
Job resources												
Ability to work	0.12***	-0.12***	4.62	0.63	0.10*	-0.15**	4.73	0.41	0.19***	-0.13*	4.49	0.85
Team climate	0.19***	-0.12**	4.88	2.61	0.24***	-0.09*	4.77	2.76	0.11*	-0.14**	5.02	2.38
Role in the organization	0.17**	0.18***	2.14	0.85	0.20***	-0.10**	2.21	0.84	0.15***	-0.02	2.05	0.82
Personal resources												
Resilience	0.29***	-0.24***	3.60	0.55	0.28***	-0.23***	3.63	0.54	0.31***	-0.25***	3.57	0.55
Demographics												
Gender	0.15***	-0.09**	1.61	0.24	0.14***	-0.07	1.54	0.25	0.17***	-0.13***	1.67	0.22
M	3.33	2.58			3.48	2.64			3.58	2.62		
Var	1.27	0.72			1.53	0.74			1.48	0.76		

Outcomes of engagement and burnout

	Life satisfaction	Depressive symptoms	Life satisfaction	Depressive symptoms	Life satisfaction	Depressive symptoms
Work Engagement	0.34***	-0.29***	0.31***	-0.27***	0.28***	-0.25***
Work Burnout	-0.43***	0.62***	-0.41***	0.59***	-0.39***	0.61***
Long-term illnesses	-0.15***	0.25***	-0.15*	0.32***	-0.16**	0.29***
Economic problems	-0.24***	0.15***	-0.24***	0.13**	-0.34***	0.17**
M	3.56	1.49	3.58	1.44	3.56	1.47
Var	0.58	0.22	0.63	0.19	0.61	0.21

* $p < .05$.
 ** $p < .01$.
 *** $p < .001$.

widely studied recently, whereas little research attention has been paid to the role of personal demands. This study revealed an association between personal demands and work-related burnout in all three career phases. However, in line with the life-span model and our hypotheses, different personal demands played a critical role in the early and late career stages (Baltes, 1997; Salmela-Aro, 2009). Supporting our hypothesis, the results showed that, of the *personal demands* studied, caregiving demands were negatively associated with work engagement and positively associated with work burnout in the late career stage, whereas economic problems were positively associated with work burnout in the early career stage. These results are in line with previous findings showing that, in the late career stage, caregiving demands, especially caring for elderly parents, increase (Salmela-Aro, 2009). Economic problems, in turn, are more prevalent in young families, a life phase when the parents are still building their careers, sometimes with less stable incomes and, simultaneously, additional costs, such as daycare payments. Thus, in different life phases and career stages a variety of personal demands are reflected in employees' work burnout.

The results did not support *Hypothesis 2*, as we found personal resources to be positively associated with work engagement and negatively with work burnout in all career stages. However, these results showing that personal resources are important throughout the career for work engagement and work burnout are in line with the assumptions of the JD-R model (Bakker & Demerouti, 2007). Our results showed that in all three career stages employees' resilience was positively associated with work engagement and negatively associated with work burnout, probably reflecting the fact that resilience is one of the main personal resources supporting individuals' positive functioning in adulthood (see also Baltes, 1997). Moreover, the results showed that personal resources can play a key role in both work-related burnout and work-related engagement in all career stages.

In the context of the JD-R model, we found support for our *Hypothesis 3* according to which new work-related demands are positively associated with work burnout in each career stage. Supporting *Hypothesis 3*, the results for *job-related demands* showed that

Table 2

Associations between work and personal demands and resources and between job burnout and engagement among employees at different career stages.

Antecedents of engagement and burnout	Employees under age 35 years (N = 263)		Employees aged 35–49 years (N = 614)		Employees over age 50 years (N = 480)	
	Work engagement	Work burnout	Work engagement	Work burnout	Work engagement	Work burnout
Job demands						
ICT demands	0*	0.13*	0*	0.07*	0*	0*
Interpersonal work demands	−0.20***	0.21**	−0.08*	0.15***	−0.14**	0.20***
Multicultural demands	0*	0*	0*	0.17***	0*	0*
Authoritarian management	−0.13*	0.21***	−0.10**	0.16***	0*	0.14***
Resilience*interpersonal work demands	−0.19***	0.20**	0*	0*	−0.15***	0.18***
Personal demands						
Long-term illnesses	0*	0*	0*	0*	0*	0*
Caregiving demands	0*	0.0*	0*	0*	−0.10*	0.17***
Economic problems	−0.20***	0.14**	0*	0*	0*	0*
Job resources						
Ability to work	0.24***	−0.29***	0.21***	−0.28***	0.25***	−0.30***
Team climate	0.12*	0*	0.22***	−0.09*	0.13**	−0.14**
Role in the organization	0.15*	0*	0.17***	0*	0.13**	0*
Personal resources						
Resilience	0.15*	−0.27***	0.35***	−0.31***	0.36***	−0.32***
Demographics						
Gender	0*	0*	0.13***	0*	0.16***	−0.09*
Outcomes of engagement and burnout						
	Life satisfaction	Depressive symptoms	Life satisfaction	Depressive symptoms	Life satisfaction	Depressive symptoms
Work engagement	0.25**	0*	0.29***	0*	0.24***	0*
Work burnout	−0.34***	0.73***	−0.32***	0.73***	−0.36***	0.77***
Long-term illnesses		0*		0.19***		0.15**
Economic problems	−0.21***		−0.15***		−0.26***	
Fit of the model	$\chi^2(397) = 671.25$ $p = ns$ CFI = 0.90 RMSEA = 0.05 SRMR = 0.07		$\chi^2(393) = 1037.16$ $p = ns$ CFI = 0.90 RMSEA = 0.05 SRMR = 0.06		$\chi^2(396) = 948.85$ $p = ns$ CFI = 0.90 RMSEA = 0.05 SRMR = 0.06	

* $p < .05$.

** $p < .01$.

*** $p < .001$.

interpersonal job demands were positively associated with work burnout, and negatively associated with work engagement in all three career stages. ICT demands, in turn, were positively associated with work burnout in the early and mid-career stages, whereas multicultural demands were positively associated with work burnout in the mid-career stage. These might reflect life-span development according to which young adults have not yet build up sufficient resources. In addition, authoritarian management was positively associated with work burnout in all career stages and negatively associated with work engagement in the early and mid-career stages.

In support of the JD-R model and Hypothesis 4, the results for job resources showed that all job resources were related to work engagement in each career stage. Employees' work ability, good team climate and role in the organization were all positively associated with work engagement in all three career stages.

Moreover, partially supporting our Hypothesis 5, and in line with the JD-R model, high resilience buffered against a negative association between interpersonal job-related demands and work engagement in the early and late career stages but not during mid-career, thereby also supporting the idea of integrating the life-span and JD-R models. Interpersonal, particularly intercultural, demands and role-related demands tend to be more numerous in midlife, and thus it might be that insufficient personal resources are available to buffer against interpersonal demands in the mid-career stage (Wiese et al., 2002). In turn, interpersonal work demands were negatively associated with work engagement, particularly during the mid-career stage.

Supporting Hypothesis 4, in line with JD-R model, we expected job resources to be positively associated with work engagement throughout the career (Bakker & Demerouti, 2007). Job resources seem to be important for work engagement throughout the career: in all three career stages employees' perceptions of their work ability and team climate were positively associated with work

engagement. Similarly, the higher an employee's role in the organization, the higher their his or her work engagement in all three career stages. Job resources also seem to be important for work burnout throughout the career: in all stages, employees' work ability was negatively associated with work burnout. Team climate was negatively associated with burnout in the mid- and late career stages.

Supporting our [Hypothesis 6](#), and in line with the JD-R model, work burnout and engagement are distinctive albeit negatively associated constructs, both of which reflect different facets of employees' work-related well-being ([Hakanen & Schaufeli, 2012](#)): work engagement was found to be associated with life satisfaction and work burnout to be associated with depressive symptoms in each career stage.

The present study adds to the literature on the role of novel job-related demands during the career by showing that different job-related demands have crucial implications for work burnout and engagement over the life-span. Both interpersonal job demands and ICT-related demands were positively associated with work burnout in the early and mid-career stages. It is possible that interpersonal demands are more often associated with burnout during these stages, when employees are still finding their feet among their colleagues and thus might experience higher interpersonal demands, than in the late career stage when their position in the workplace is already established ([Baltes & Dickson, 2001](#)). In turn, job-related demands played a different role in work engagement during the early and late compared to mid-career stages. Our results showed a negative association between job-related demands and work engagement in the early and late career stages. In all three career stages, interpersonal job demands were negatively associated with work engagement, whereas in the early and mid-career stages ICT demands were negatively associated with work engagement. It is possible that the negative association between ICT demands and work engagement among younger employees is due to increased ICT demands in new occupations. Multicultural demands were positively associated with work burnout among the mid-career employees. The results showed further, in line with previous studies ([Demerouti et al., 2012](#)), that the mid-career employees reported a slight accumulation of both job demands and personal resources.

Further, the results showed that women more often than men experienced high work engagement in the mid- and late career stages, and less burnout in the late career stage. This supports earlier findings showing that, when they reach their official retirement age, women retire less often than men, whereas men more often retire for health-related reasons ([Vuori, Toppinen-Tanner, & Mutanen, 2012](#)). Moreover, the results showed further that in all three career stages economic problems were negatively associated with employee life satisfaction, and that in the mid- and late career stages long-term illnesses were positively associated with depressive symptoms. Our results revealed further that long-term illnesses were associated with depressive symptoms (e.g., personal well-being) rather than work burnout (e.g., work-related well-being).

This study shows both the benefits of integrating the life-span approach ([Baltes, 1997](#); [Salmela-Aro, 2009](#)) with the JD-R model and the important role of demands in both the personal and job-related domains for employees' work engagement and burnout across the career. However, we found more support for the JD-R model than for the life-span model.

6. Practical implications

Integrating the life-span approach ([Baltes, 1997](#); [Salmela-Aro, 2009](#)) with the JD-R model ([Bakker, Demerouti, De Boer, & Schaufeli, 2003](#); [Bakker, Demerouti, & Schaufeli, 2003](#); [Bakker & Demerouti, 2006](#); [Demerouti et al., 2001](#)) provides valuable insights for policy-makers and practitioners in occupational health care. The results shed light on the changing resources needed to cope with workplace demands in different phases during the life span. This topic is extremely relevant for recent policy initiatives aimed at creating decent working conditions for all ([Spini et al., 2017](#)). Our results have important implications for occupational health care when designing interventions for people suffering from work burnout. Work-related issues aside, possible spill-over from personal life to work-related burnout will to some extent differ during the life-span. These results suggest that in future studies and interventions it would be important to take into consideration the life phases and career stages employees are currently in, along with the resources they have and possible demands they face in *those specific stages*. While some resources will be important for sustaining one's career overall, others might become especially important during certain stages. Similarly, in specific life phases and career stages some demands might be more pronounced, a factor that should also be taken into consideration when planning interventions.

7. Limitations

The present study has its limitations. First, despite the life-span perspective on job and personal demands and resources, work engagement and burnout, and ill- and well-being among employees in different career stages, the study design was cross-sectional. Thus, causal inferences cannot be drawn from the results. To investigate causality in similar associations between job demands, resources, engagement, burnout, and well-being requires a longitudinal design. In addition, the results may have been influenced by common method variance ([Podsakoff, MacKenzie, Lee, & Podsakoff, 2003](#)). Moreover, greater diversity and better measures of personal and job-related demands and resources are needed. For example, organizational demands and resources need to be studied in greater detail. There is also a need to develop a scale measuring demands and resources that also includes the emerging novel demands such as digitalization and diversity. Moreover, it is also possible that other employee characteristics that were not examined in the present study might have influenced the results. For example, the values employees attribute to work, and differences in such attributions among young, middle-aged, and older employees might also influence their work engagement and burnout ([Angeline, 2011](#)). Future studies should investigate these associations further.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jvb.2018.08.002>.

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