Ergonomics

ISSN: 0014-0139 (Print) 1366-5847 (Online) Journal homepage: https://www.tandfonline.com/loi/terg20

The impact of work-related and personal resources on older workers' fatigue, work enjoyment and retirement intentions over time

Dave Stynen, Nicole W. H. Jansen & IJmert Kant

To cite this article: Dave Stynen, Nicole W. H. Jansen & IJmert Kant (2017) The impact of work-related and personal resources on older workers' fatigue, work enjoyment and retirement intentions over time, Ergonomics, 60:12, 1692-1707, DOI: 10.1080/00140139.2017.1334094

To link to this article: https://doi.org/10.1080/00140139.2017.1334094

© 2017 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

Published online: 28 Jun 2017.

Submit your article to this journal

Article views: 1851

View related articles

View Crossmark data

Citing articles: 7 View citing articles

Full Terms & Conditions of access and use can be found at
https://www.tandfonline.com/action/journalInformation?journalCode=terg20

ERGONOMICS, 2017
VOL. 60, NO. 12, 1692–1707
https://doi.org/10.1080/00140139.2017.1334094

Taylor & Francis
Taylor & Francis Group

OPEN ACCESS Check for updates

The impact of work-related and personal resources on older workers' fatigue, work enjoyment and retirement intentions over time

Dave Stynen, Nicole W. H. Jansen and IJmert Kant

Faculty of Health, Medicine and Life Sciences, Department of Epidemiology, CAPHRI School for Public Health and Primary Care, Maastricht University, Maastricht, The Netherlands

ABSTRACT

This study aims to examine the impact of work-related and personal resources on older workers' retirement intentions by studying the pathways (fatigue and work enjoyment) from resources to retirement intentions, the buffering role of resources for psychological job demands, in a cross-sectional and longitudinal timeframe. Longitudinal results on a subsample of full-time, older workers (n = 1642) from the Maastricht Cohort Study suggest that over four years of follow-up personal resources like personal mastery and perceived health related to less (prolonged) fatigue and more work enjoyment. Personal mastery also related to later retirement intentions. A work-related resource like decision authority related to less prolonged fatigue. (Prolonged) fatigue related to earlier retirement intentions, suggesting that fatigue may be a pathway to early retirement. Finally, little evidence was found for effect modification by resources. This prospective study indicates that work-related and personal resources may be useful for prolonging working careers.

Practitioner Summary: To date, the impact of work-related and personal resources on older workers' retirement intentions is rarely studied. As this prospective study shows that resources may impact older workers' (prolonged) fatigue, work enjoyment and retirement intentions, the monitoring and fostering of resources is of importance for prolonging their working careers.

ARTICLE HISTORY
Received 11 March 2016
Accepted 18 May 2017

KEYWORDS
Older worker; work-related resources; retirement intentions; fatigue; work enjoyment

1. Introduction

Low birth rates and an ageing population are impacting labour supplies and the financial sustainability of pension systems worldwide (Loeppke et al. 2013). Therefore, enhancing the labour participation of older workers (workers aged 45 years or older, WHO 1993) is a common goal throughout the European Union. A multifactorial etiology of retirement has been suggested in prior research. Working conditions are assumed together with personal factors to impact (early) retirement decisions (Wang and Shultz 2010). Yet, far more attention has been given to the impact of personal factors (e.g. gender, health, family status) upon the retirement decision process compared to work-related factors (Beehr et al. 2000; Schreurs, De Cuyper et al. 2011). Research that has been conducted on the role of work-related factors has often been concerned with the impact of demanding working conditions (e.g. work pressure) in the retirement decision process rather than on the stimulating working conditions or work-related resources (e.g. Wang and Shi 2014). To date, little is known about what particular work-related resources are important to older workers in the light of extending their working careers (Boone-James, McKechnie, and Swanberg 2010). In this study, we focus on retirement intentions and regard early retirement intentions as a proxy for actual retirement behaviour: indicating that workers are not extending their working careers until their statutory retirement age.

Two important work-related resources that received attention in earlier research are job control and social support. However, for both job control (Beehr et al. 2000; Blekesaune and Solem 2005; Elovainio et al. 2005; Friis et al. 2007; Henkens and Leenders 2010; Mein et al. 2000; Robroek et al. 2013) and social support (Henkens and Leenders 2010; Oude Hengel et al. 2012) studies found mixed associations with retirement (intentions). Relevant work-related resources in this area may not only be located at the level of the task or the social relationships but may also be situated at the level of the organisation at large. Work-related resources like developmental (e.g. training) and accommodative support (e.g. additional leave) that either enhance workers' motivation and skills or sustain

CONTACT Dave Stynen dave.stynen@maastrichtuniversity.nl

© 2017 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (http://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

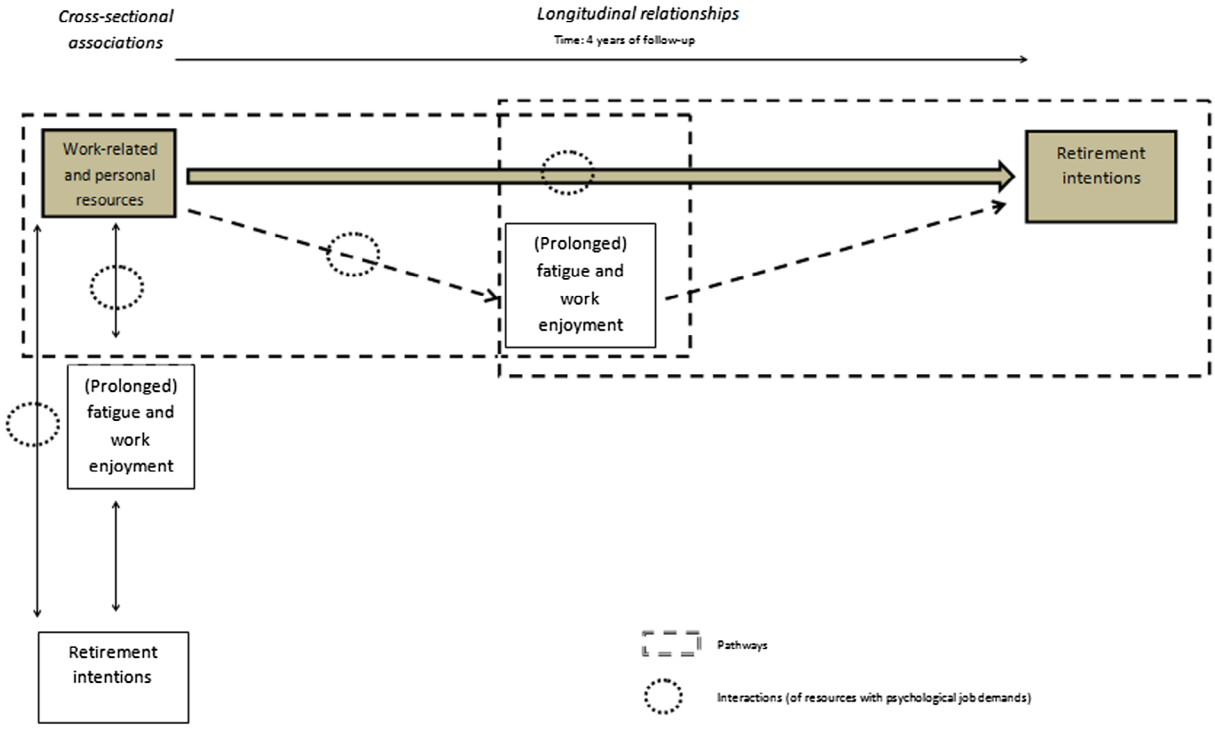

Figure 1. Overview of research model.

their health (Kooij and van de Voorde 2015; van Solinge and Henkens 2014) may be of particular value for the forming of retirement intentions among older workers. Thus far, several studies found that opportunities for development, like training and growth, were negatively associated with early retirement intentions (Henkens and Leenders 2010; Herrbach et al. 2009; Thorsen et al. 2012), whereas other studies found no clear relationship (Kooij 2010; Sejbaek, Nexo, and Borg 2013; van Solinge and Henkens 2014). Relationships between accommodative support (e.g. flexible work options, additional leave) and retirement intentions were generally not found in earlier research (Armstrong-Stassen and Ursel 2009; Herrbach et al. 2009; Kooij 2010; van Solinge and Henkens 2014). In sum, research on the role of work-related resources in relation to retirement (intentions) has produced mixed findings and needs further empirical exploration also because several of the aforementioned studies rely on a cross-sectional design.

In this longitudinal study, we focus on a broad set of work-related resources (skill discretion, decision authority, co-worker social support, supervisor social support, developmental support, and accommodative support). Along with work-related resources also personal resources might be of high relevance. Personal resources are aspects of the self that relate to resiliency, adding to one's sense of ability to control and impact upon their environment successfully (Xanthopoulou et al. 2007). In this study, we focus on perceived health (i.e. workers' overall perceived health state), educational level (i.e. highest level of education the person completed) and feelings of personal mastery (i.e. having a sense of control over one's life). Such personal factors are considered important antecedents of retirement because they may either contribute to a person's capacity or opportunities to continue working (van Solinge and Henkens 2014; Wang and Shultz 2010). The aim of this study is to examine the impact of work-related and personal resources on older workers' retirement intentions (represented by the grey arrow in Figure 1). More specifically, we investigate the pathways from resources to retirement intentions, the buffering role of resources in the relationships between psychological job demands and retirement intentions, and address these relationships in a cross-sectional and longitudinal timeframe. These contributions are all depicted in Figure 1.The first way in which to advance our understanding is to focus on the pathways that may explain the relationship between work-related and personal resources and early retirement (intentions). According to others, research on this domain may benefit from more guidance of appropriate theoretical frameworks in an effort to elucidate the underlying processes (Schreurs, De Cuyper et al. 2011). In this study, we focus on (prolonged) fatigue and work enjoyment as possible intermediates between resources and early retirement intentions. Fatigue refers to a subjective sensation of being overly tired constituting emotional, behavioural and cognitive components (Kant et al. 2003), is impacted amongst others by working conditions and

personal characteristics (Bültmann et al. 2002; Zoer et al. 2011) and may lead to severe health problems (Ekmann et al. 2013), diminished work participation and sickness absence (Huibers et al. 2006; Janssen et al. 2003) and has earlier been linked to early retirement intentions (Schreurs, De Cuyper et al. 2011). Another potential pathway is work enjoyment, which refers to the direct outcome of the motivational process: 'the extent to which people experience their work as pleasant and gratifying' (Spence and Robbins 1992). Work enjoyment is known to be affected by working conditions and personal characteristics (Demerouti and Bakker 2011; Schreurs, De Cuyper et al. 2011), and has also been linked with early retirement intentions in earlier research (Schreurs, De Cuyper et al. 2011). By focusing on health impairment (fatigue) and work motivation (work enjoyment) (Ilmarinen 2006; Schreurs, De Cuyper et al. 2011; Wang and Shultz 2010) we try to advance our understanding on the pathways from work-related and personal resources to retirement intentions. Resources may reduce fatigue, enhance work enjoyment or both. To understand these relationships we use the Job Demands-Resources (JD-R) model (Demerouti et al. 2001; Xanthopoulou et al. 2007). In line with this model, work-related demands as well as work-related and personal resources are expected to relate to more distal work-related outcomes like early retirement (intentions): through the health impairment and/or motivational process of which fatigue and work enjoyment are considered key indicators, respectively (Demerouti and Bakker 2011). Because these processes may to some extent also operate differently across different work settings and occupational groups (Schreurs, van Emmerik et al. 2011) we try to account for it by studying relationships in a homogenous sample of full-time day workers. These possible relationships are visualised in Figure 1 by the dashed arrows and rectangles.

The second way in which to enhance our insight concerns the potential buffering role that resources can play. In line with the JD-R model, work-related as well as personal resources have value on their own and may therefore impact the retirement decision process. Additionally, it is also assumed that resources may also buffer the impact of work-related demands because of their instrumental value in dealing with demanding working conditions (Demerouti and Bakker 2011; Xanthopoulou et al. 2007). In this paper, we study the modifying effect of resources in the relationships between one specific work-related demand (psychological job demands, Karasek 1979) and its outcomes. Buffering effects may be relevant in an ageing population, since – as also suggested by lifespan theories such as the theory of Selective Optimization with Compensation (SOC; Baltes, Staudinger, and Lindenberger 1999) – in the face of age-related decreases in capacity constraints older workers may not passively undergo new limitations in their functioning but may instead actively strive to maintain or re-establish good health and well-being (Ng and Feldman 2013). Although such interaction effects may be of major importance, they have been barely studied in the context of the retirement decision process of older workers so far (Elovainio et al. 2005; Robroek et al. 2003). These possible relationships are visualised in Figure 1, by dotted circles.

Finally, several studies earlier described have relied on cross-sectional designs (e.g. Armstrong-Stassen and Ursel 2009; Beehr et al. 2000; Elovainio et al. 2005; Henkens and Leenders 2010; Kooij and van de Voorde 2015; Oude Hengel et al. 2012; Schreurs, De Cuyper et al. 2011; Schreurs, van Emmerik et al. 2011; Thorsen et al. 2012). As also suggested by others, more longitudinal research is needed to establish the impact of work-related and personal resources on the retirement decision-making process of older workers (Sejbaek, Nexo, and Borg 2013). Whereas cross-sectional studies provide insight in associations between resources and retirement intentions on a single point in time, longitudinal research addresses whether these relationships may also exist over time. Thereby, more clarity can be gained about cause and effect relationships, as one may also argue that perceptions of work-related demands and resources could also be affected by workers' wellbeing, motivation or even mindset about retirement (Bakker and Demerouti 2007). The JD-R model assumes complex pathways involving health impairment and work motivation. For these to occur and eventually leading to the forming of retirement intentions, a sufficient time lag between determinant and outcome needs to be considered. For these reasons cross-sectional studies need to be complemented with longitudinal research. In this study, we consider a follow-up of four years, as also visualised in Figure 1 by the black arrow.

In sum, this paper examines the impact of work-related and personal resources on older workers' retirement intentions and addresses two issues: (1) the pathways from work-related and personal resources to retirement intentions, (2) the buffering role of resources for psychological job demands both in a cross-sectional and longitudinal timeframe (four years). By studying these relationships amongst full-time day workers, our sample is more homogeneous in terms of exposure to other important work-related demands, while at the same time sufficient individual variation in work-related and personal resources is maintained. For the purpose of interpreting our findings amongst older workers, also relationships amongst younger workers (aged younger than 45 years) are analysed as they serve as a point of reference.

We study these relationships in the context of the Dutch labour market. The Dutch pension system consists of three pillars: the public pension which provides in a basic

income for all, the supplementary pension schemes by virtue of the employer or sector (about 90% of all employees) depending on earlier wage and the number of years for which contributions were payed, and private savings (Vermeer, Mastrogiacomo, and Soest 2014; de Wind et al. 2016). At the time of our study, statutory retirement age was 65 years, i.e. the age people were eligible for their public pension as well as for their supplementary pension. Retiring at that age can be considered as 'on time' retirement. However, collective labour agreements, determined at the industry level, specified at what age workers were allowed to retire at an earlier age. Also, working beyond statutory retirement age was feasible under certain conditions (e.g. agreement of the employer). Against this background an important striving is to improve working conditions enabling older workers to participate longer on the labour market in a healthy, productive and enjoyable way (Cloostermans et al. 2015; Schreurs, De Cuyper et al. 2011).

2. Methods

2.1. Sampling and procedures

This study was based on data from the Maastricht Cohort Study (MCS), conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The MCS was set up in May 1998 and included 12,140 participants from 45 different companies. At baseline measurement, all included participants were aged between 18 and 65 years and were followed up on an individual basis over time (Kant et al. 2003; Mohren et al. 2007).

In the present study, the measurement in October 2008 was defined as study baseline. Information on the timing of subsequent follow-up waves and response rates between October 1998 and October 2008 is described elsewhere (Mohren et al. 2007; Szerencsi et al. 2013). The follow-up duration in this study was four years (i.e. the first follow-up wave in October 2012). Earlier waves were less suitable as study baseline because specific retirement intentions were assessed only from October 2008 onwards. At study baseline, $n = 6082$ respondents participated. At the follow-up wave in 2012 $n = 5894$ questionnaires were sent out and $n = 4783$ valid questionnaires were received. Eligible participants were all currently employed respondents at baseline excluding those on disability or that made use of the Sickness Benefits Acts. Subsequently, we made our sample more homogenous in terms of exposure to work-related demands by excluding those workers participating in shift or night work and in part-time work (<36 h per week). This resulted in a study population at study baseline of 2080 workers, further distinguished as older ($n = 1642$) and younger workers ($n = 438$). Of both groups of workers $n = 1339$ and $n = 319$ were still participating at the follow-up wave in 2012, respectively. Dropout in our study was acceptable: about 80% of all eligible respondents at baseline also completed the follow-up. Compared to responders, dropouts were at study baseline younger, lower educated, were more frequently living alone, found their job more strenuous and reported lower levels of skill discretion.

2.2. Measures

2.2.1. Retirement intentions

In the Netherlands, the statutory retirement age during the follow-up of our study was 65 years. Yet, early retirement schemes arranged by collective labour agreements, determined at the industry level, provide workers with the opportunity to retire at an earlier age (often around 62 years) at the cost of the worker's savings in his or her capital funded occupational old-age pension (second pillar) (van Oorschot and Jensen 2009). In alignment with others (Harkonmaki et al. 2006), one item was used to measure whether workers were considering to retire at an earlier age: 'Have you considered retiring before reaching your statutory retirement age'. Response options 'No' and 'Yes, sometimes' were classified as having weak early retirement intentions and the response option 'Yes, often' was classified as having strong early retirement intentions.

2.2.2. Work enjoyment

One dichotomous item from the Dutch questionnaire on work and health (Dutch abbreviation: VAG) (Gründemann, Smulders, and de Winter 1993) was used to assess whether participants considered their job as enjoyable 'Do you most often have fun in your work' ('Yes' or 'No'). The 'Yes' category was classified as high work enjoyment, whereas the 'No' category was classified as low work enjoyment.

2.2.3. Fatigue and prolonged fatigue

Fatigue was measured with the twenty-item, seven-point ('Yes, that is true' to 'No, that is not true') scale of the Checklist Individual Strength (CIS) which has been validated in the working population (Beurskens et al. 2000; Vercoulen, Alberts, and Bleijenberg 1999). The items cover several aspects of fatigue, including severity, concentration problems, decreased motivation and levels of physical activity. In addition to a continuous score ($\alpha = 0.94$) (further referred to as 'fatigue'), a cut-off point of >76 was used to define cases of prolonged fatigue (Bültmann et al. 2000). Employees scoring above the cut-off point were considered to be 'at risk' for sickness absence or work disability, and were designated as probable fatigue cases (further referred to as 'prolonged fatigue') (Bültmann et al. 2000).

2.2.4. Psychological job demands

At baseline psychological job demands were measured by the sum of five items (e.g. 'My job requires working very hard'), all specified by the validated Dutch version (Houtman 1995) of the Job Content Questionnaire (JCQ; Karasek 1985). All items had four response options, ranging from 'Strongly disagree' to 'Strongly agree'. The reliability of the scale was acceptable ($\alpha = 0.73$)

2.2.5. Work-related resources

Skill discretion (six items, e.g. 'My job requires a high level of skill'), decision authority (four items, e.g. 'I have a lot to say about what happens on my job'), co-worker social support (four items, e.g. 'People I work with are helpful in getting the job done') and supervisor social support (four items, e.g. 'My supervisor is helpful in getting the job done') were all measured by subscales of the validated Dutch version (Houtman 1995) of the JCQ (Karasek 1985) at baseline. The reliability of the scales were all acceptable ($\alpha = 0.73$; $\alpha = 0.70$; $\alpha = 0.73$; $\alpha = 0.86$, respectively). In addition, we also measured at the follow-up wave in 2012, two resources at the level of one's work unit: opportunities for developmental and accommodative support. Developmental support was assessed by six and accommodative support by seven items. In line with previous research (Bal et al. 2012; Stynen 2013) respondents had to rate two items for each of the three key developmental practices (e.g. training, job enrichment/rotation and career development): e.g. 'In my team or department there are opportunities to learn new skills or expand skills', 'In my team or department one is encouraged to enrich one's jobs with new tasks' and 'In my team or department active support is provided for career development'. Accommodative support measures centre on flexible work schemes (three items, e.g. 'In my team or department adjustments in working hours are made whenever needed (e.g. reduced work week, flexible hours)'), work adaptations and exemptions from demanding work (three items, e.g. 'In my team or department adaptations to tasks are made when a given situation (e.g. poor employee health) hinders a good performance') and demotion (e.g. 'In my team or department it is possible to make use of demotion'). All items were rated on a five-point Likert scale, ranging from 'Totally disagree' to 'Totally agree'. A 'Don't know' alternative was also provided. The reliability of the scales of developmental ($\alpha = 0.84$) and accommodative support ($\alpha = 0.80$) were good.

2.2.6. Personal resources

Educational level was measured according to the highest level of education the person completed, classified in three categories: low (primary and lower vocational school), medium (lower secondary school, intermediate vocational school, and secondary school) and high (higher vocational school and university). Perceived health status was measured with one item from the Short Form-36 Health Survey (Aaronson et al. 1998): 'How would you rate your health in general?'. This item was scored on a five-point scale ('Poor' to 'Excellent'). Finally, personal mastery was assessed with Pearlin and Schooler's (1978) seven item Self-Mastery Scale e.g. 'I have little control over things that happen to me'. All items were scored on a four-point scale ('Strongly disagree' to 'Strongly agree'). The reliability of the scale was acceptable ($\alpha = 0.83$). All personal resources were measured at baseline (October 2008), except educational level which was assessed in May 1998 when the MCS was set up. Our measure for educational level therefore reflects educational attainment in earlier life.

2.2.7. Confounders

We took two other work-related demands and two personal characteristics at baseline into account as prior research has suggested that the retirement decision process is impacted by emotional and physical demanding work (Blekesaune and Solem 2005; Gommans et al. 2016; Sluiter and Frings-Dresen 2007) as well as personal factors like gender and household situation (Henkens 1999; Wang and Shultz 2010). Emotional demands were measured with one dichotomous ('Yes' or 'No') item from the Dutch Questionnaire on the Experience and Evaluation of Work (Dutch abbreviation: VBBA) (van Veldhoven and Broersen 2003). One dichotomous item from the VAG (Gründemann, Smulders, and de Winter 1993) was used to assess whether participants consider their job to be strenuous ('Yes' or 'No'). Concerning household situation participants indicated whether or not they were living alone.

2.2.8. Statistical analysis

Differences at study baseline (October 2008) across age groups were investigated by means of one-way ANOVA for continuous measures and χ^2-tests for categorical variables. Since developmental and accommodative support were only measured at the follow-up wave (October 2012), the same inclusion and exclusion criteria were applied at that follow-up wave to test differences across age groups by means of one-way ANOVA for continuous measures and χ^2-tests for categorical variables at that time point.

Next, potential relationships were estimated in different models. In model 1, the associations of each individual work-related and personal resource with retirement intentions, (prolonged) fatigue, and work enjoyment were estimated separately. Next, to investigate the potential pathways between work-related and personal resources with retirement intentions, also associations of (prolonged) fatigue and work enjoyment with retirement intentions were estimated in model 2. Finally, to

explore the potential modifying effect of resources in the relationships between psychological job demands and each of the outcomes (retirement intentions, (prolonged) fatigue, or work enjoyment), the main effect of psychological job demands as well as the interaction terms between psychological job demands and the corresponding resource were separately estimated in model 3 (Aiken and West 1991). All variables included in these interaction terms were centred to their mean. To interpret statistically significant interactions involving continuous independent variables, graphical plots (not depicted in this paper) were made for lower (−1 SD) and higher (+1 SD) levels of psychological job demands and resources.

To explore associations on a single point in time as well over time both cross-sectional and longitudinal analyses were conducted. Cross-sectional associations were tested by means of linear and logistic regression at study baseline (October 2008). Cross-sectional analyses involving developmental and accommodative support were investigated at follow-up wave (October 2012). In the longitudinal analyses either linear or cox regression analysis was performed to study these relationships over time. In the linear regression analyses of fatigue scores, baseline levels of fatigue were added as a control variable. When cox regression was used cases of prolonged fatigue, strong retirement intentions and low work enjoyment at baseline were excluded in their analysis, respectively. In the longitudinal analysis of work enjoyment the outcome at the follow-up wave in 2012 was defined as low work enjoyment. The reason for this is that the vast majority of respondents (>90%) experienced high work enjoyment at baseline. Examining the impact of work-related and personal resources on high work enjoyment over time would then imply exclusion of cases of high work enjoyment at baseline. As a consequence, estimated relationships would in that case then concern the impact of work-related and personal resources on becoming a case of high work enjoyment in a relative small group of workers with low work enjoyment at baseline.

Finally, multivariable longitudinal analyses were conducted to explore the independent impact of all resources simultaneously on retirement intentions, (prolonged) fatigue and work enjoyment, respectively.

In all analyses results were reported after controlling for confounders. Results were stratified for age. Retirement intentions were however not explored amongst younger workers, because for these workers retirement lies in a too distant future. SPSS 22.0 was used to analyse the data.

3. Results

3.1. Descriptive results

The prevalence of early retirement intentions varied across age groups, being higher among older, compared to younger workers, at both times of measurement (Table 1). No age differences were noted concerning fatigue scores, prolonged fatigue and work enjoyment. The prevalence of four of the nine resources studied, differed slightly but statistically significantly across age groups. At both times of measurement: older workers perceived less social support by supervisors compared to younger workers. At baseline, older workers reported lower personal mastery and a lower level of education, compared to younger workers. At follow-up, older workers reported lower perceived health compared to younger workers.

3.2. Results of cross-sectional analysis

3.2.1. Associations of resources with retirement intentions, (prolonged) fatigue and work enjoyment

Results (Table 2) indicated that several work-related and personal resources were associated with older workers' retirement intentions, our primary study outcome. Skill discretion, decision authority, supervisor and co-worker social support, perceived health and personal mastery were associated with a lower likelihood of having early retirement intentions amongst older workers.

Almost all resources were associated with less fatigue, a lower likelihood of prolonged fatigue and a higher likelihood of high work enjoyment amongst older workers. Only the association between accommodative support and prolonged fatigue and the association between educational level and high work enjoyment were not statistically significant.

Also amongst younger workers most resources were associated with less fatigue, a lower likelihood of prolonged fatigue and a higher likelihood of high work enjoyment. However, accommodative support and educational level were not associated with fatigue, prolonged fatigue and high work enjoyment, and developmental support was not associated with high work enjoyment.

3.2.2. Associations of (prolonged) fatigue and work enjoyment with retirement intentions

Table 2 further shows that amongst older workers, fatigue and prolonged fatigue were associated with a higher, and high work enjoyment with a lower likelihood of having early retirement intentions.

Table 1. Description of study population at baseline measurement (October 2008) and follow-up wave (2012) according to age group.

	October 2008[a]			October 2012[b]		
	<45 years	≥45 years		<45 years	≥45 years	
Age group	*N* = 438	*N* = 1642	*p*-value	*N* = 165	*N* = 1316	*p*-value
Fatigue (20–140) (M)	50.3	50.3	0.95	50.7	51.1	0.82
(SD)	19.7	21.3		21.7	21.9	
Prolonged fatigue (%)						
Yes	11.3	13.7	0.19	16.0	15.6	0.90
No	88.7	86.3		84.0	84.4	
Work enjoyment (%)						
Yes	96.1	93.9	0.08	95.8	95.6	0.92
No	3.9	6.1		4.2	4.4	
Early retirement intentions (%)						
Yes	10.3	17.5	<0.001	9.7	19.8	0.02
No	89.7	82.5		90.3	80.2	
Psychological job demands (12–48) (M)	31.7	31.8	0.88	32.2	31.5	0.12
(SD)	5.5	5.6		5.4	5.6	
Skill discretion (12–48) (M)	38.0	37.7	0.26	38.0	38.1	0.81
(SD)	5.0	5.0		5.2	4.9	
Decision authority (12–48) (M)	38.0	37.4	0.06	38.3	38.2	0.75
(SD)	6.1	6.4		6.5	6.4	
Co-worker social support (4–16) (M)	12.1	12.0	0.30	12.2	12.0	0.19
(SD)	1.3	1.4		1.3	1.5	
Supervisor social support (4–16) (M)	11.1	10.6	<0.001	11.4	10.9	<0.01
(SD)	2.2	2.3		2.0	2.3	
Developmental support (1–5) (M)	N/A	N/A	N/A	3.4	3.5	0.08
(SD)				0.9	0.8	
Accommodative support (1–5) (M)	N/A	N/A	N/A	3.9	4.0	0.12
(SD)				0.9	0.9	
Educational level (%)						
Low	6.9	11.8		6.7	10.1	
Medium	40.8	38.8	0.01	33.5	38.6	0.09
High	52.3	49.5		59.8	51.3	
Perceived health (1–5) (M)	3.3	3.2	0.26	3.3	3.2	0.02
(SD)	0.8	0.8		0.8	0.8	
Personal mastery (7–28) (M)	22.9	22.3	0.03	N/A	N/A	N/A
(SD)	3.2	3.5				
Living alone (%)						
Yes	10.2	10.3	0.96	13.0	10.7	0.38
No	89.8	89.7		87.0	89.3	
Strenuous work (%)						
Yes	14.0	15.5	0.43	11.9	13.6	0.55
No	86.0	84.5		88.1	86.4	
Emotional demands (%)						
Yes	23.1	25.8	0.25	16.4	21.3	0.14
No	76.9	74.2		83.6	78.7	
Gender (%)						
Male	84.3	89.8	0.01	82.0	88.2	0.02
Female	15.7	10.2		18.0	11.8	
Age (M)	40.6	53.1	<0.001	42.2	54.8	<0.001
(SD)	3.2	4.5		2.2	4.7	

Note: N/A: Not Applicable, because not measured at that wave.
[a]Study population at study baseline in October 2008 for the analyses of all work-related and personal resources except developmental and accommodative support.
[b]Study population at follow-up wave in October 2012 for the analyses of developmental and accommodative support.

3.2.3. Effect modification by resources

Table 2 shows that amongst older workers, psychological job demands were associated with more fatigue, a higher likelihood of prolonged fatigue and a lower likelihood of high work enjoyment. Yet, amongst this age group several resources seemed to buffer these associations. More specifically, the likelihood of experiencing lower work enjoyment amongst older workers with higher psychological job demands was reduced when workers had a medium or high level of education. In addition, psychological job demands were less strongly associated with more fatigue when workers also reported better perceived health or a higher level of education. Also, the likelihood of prolonged fatigue amongst older workers with higher psychological job demands was reduced when workers had a medium or high level of education. However, the likelihood of prolonged fatigue amongst older workers with higher psychological job demands was elevated amongst workers with better perceived health.

Amongst younger workers, psychological job demands were overall not associated with the outcomes. Yet, statistically significant interaction effects were noted regarding

Table 2. Cross-sectional results on the associations of work-related and personal resources with retirement intentions, the pathways of (prolonged) fatigue and work enjoyment and effect modification by resources across age groups.

	<45 years			≥45 years			
	Fatigue (continuous)	Prolonged fatigue (caseness)	High work enjoyment	Fatigue (continuous)	Prolonged fatigue (caseness)	High work enjoyment	Early retirement intentions
Age category	B (SE)	OR (95% CI)		B (SE)	OR (95% CI)		
Model 1[a]							
Skill discretion	−0.91*** (0.19)	0.89*** (0.84–0.95)	1.28*** (1.15–1.43)	−0.82*** (0.11)	0.93*** (0.91–0.96)	1.19*** (1.15–1.25)	0.93*** (0.91–0.96)
Decision authority	−0.72*** (0.16)	0.91*** (0.86–0.96)	1.27*** (1.15–1.40)	−0.85*** (0.08)	0.92*** (0.90–0.94)	1.18*** (1.14–1.22)	0.95*** (0.93–0.97)
Co-worker social support	−2.12** (0.73)	0.74* (0.59–0.94)	1.99*** (1.37–2.88)	−1.60*** (0.37)	0.85** (0.76–0.94)	1.56*** (1.34–1.83)	0.91* (0.83–1.00)
Supervisor social support	−2.22*** (0.44)	0.77*** (0.67–0.88)	1.63*** (1.30–2.04)	−1.25*** (0.23)	0.89*** (0.84–0.94)	1.37*** (1.26–1.49)	0.89*** (0.84–0.94)
Developmental support[b]	−8.28*** (2.02)	0.40** (0.22–0.70)	1.59 (0.61–4.13)	−4.48*** (0.76)	0.68*** (0.56–0.81)	2.23*** (1.68–3.09)	0.87 (0.73–1.03)
Accommodative support[b]	−1.03 (2.07)	0.90 (0.54–1.48)	1.30 (0.51–3.45)	−2.02** (0.75)	0.89 (0.73–1.07)	1.83*** (1.33–2.53)	0.92 (0.78–1.09)
Perceived health	−10.17*** (1.10)	0.24*** (0.14–0.42)	2.79* (1.28–6.08)	−13.86*** (0.62)	0.14*** (0.10–0.19)	1.92*** (1.41–2.62)	0.71*** (0.59–0.85)
Personal mastery	−3.50*** (0.25)	0.58*** (0.50–0.68)	1.44*** (1.20–1.73)	−3.18*** (0.13)	0.70*** (0.66–0.74)	1.30*** (1.22–1.38)	0.91*** (0.88–0.94)
Educational level							
Low (vs. medium and high)	2.97 (3.97)	1.17 (0.37–3.77)	1.11 (0.13–9.59)	4.31* (1.76)	1.46 (0.93–2.28)	0.59 (0.32–1.12)	0.79 (0.50–1.25)
High (vs. medium and low)	−2.70 (1.97)	0.54 (0.28–1.04)	1.95 (0.66–5.81)	−2.61* (1.10)	0.71* (0.52–0.97)	1.17 (0.76–1.81)	0.92 (0.70–1.21)
Model 2 [a]							
Fatigue (continuous)	N/A	N/A	N/A	N/A	N/A	N/A	1.02*** (1.02–1.03)
Prolonged fatigue (caseness)	N/A	N/A	N/A	N/A	N/A	N/A	2.89*** (2.09–3.98)
Work enjoyment	N/A	N/A	N/A	N/A	N/A	N/A	0.19*** (0.13–0.29)
Model 3 [a]							
Psychological job demands	0.27 (0.18)	1.04 (0.98–1.10)	0.91 (0.83–1.00)	0.41*** (0.10)	1.04** (1.02–1.07)	0.95** (0.91–0.98)	1.02 (1.00–1.04)
X Skill discretion	0.01 (0.03)	1.00 (0.99–1.01)	0.99 (0.97–1.01)	0.01 (0.02)	1.00 (1.00–1.01)	1.00 (0.99–1.00)	1.00 (1.00–1.01)
X Decision authority	−0.00 (0.03)	1.00 (0.99–1.01)	1.00 (0.98–1.02)	−0.01 (0.01)	1.00 (1.00–1.01)	1.00 (1.00–1.01)	1.00 (1.00–1.00)
X Co-worker social support	0.08 (0.11)	1.01 (0.98–1.05)	1.02 (0.95–1.09)	0.00 (0.06)	1.00 (0.99–1.02)	0.99 (0.97–1.02)	1.00 (0.99–1.02)
X Supervisor social support	−0.11 (0.07)	1.00 (0.98–1.02)	1.05* (1.00–1.09)	−0.06 (0.04)	0.99 (0.98–1.00)	1.00 (0.98–1.01)	0.99 (0.99–1.00)
X Developmental support[b]	0.21 (0.32)	1.02 (0.93–1.12)	0.97 (0.84–1.13)	−0.10 (0.12)	0.97 (0.94–1.00)	1.03 (0.98–1.08)	0.99 (0.97–1.02)
X Accommodative support[b]	0.35 (0.41)	0.97 (0.87–1.08)	1.04 (0.87–1.25)	−0.12 (0.13)	0.98 (0.95–1.01)	1.02 (0.97–1.07)	0.99 (0.96–1.02)
X Perceived health	−0.18 (0.20)	0.98 (0.89–1.08)	1.18* (1.04–1.33)	−0.22* (0.10)	1.06* (1.01–1.11)	1.00 (0.95–1.05)	0.98 (0.95–1.01)
X Personal mastery	−0.05 (0.04)	1.00 (0.97–1.02)	1.00 (0.97–1.02)	−0.02 (0.02)	1.01 (1.00–1.01)	1.00 (0.99–1.01)	1.00 (0.99–1.00)
X Educational level							
Low (vs. medium and high)	0.27 (0.66)	0.99 (0.82–1.21)	1.01 (0.69–1.48)	0.64* (0.27)	1.08* (1.00–1.16)	0.88** (0.79–0.97)	1.03 (0.96–1.11)
High (vs. medium and low)	−0.11 (0.35)	0.97 (0.86–1.09)	1.22* (1.00–1.48)	−0.03 (0.19)	1.04 (0.98–1.09)	1.05 (0.98–1.13)	0.98 (0.94–1.03)

Notes: B = Unstandardized beta; SE = Standard Error; OR = Odds Ratio; 95% CI = 95% Confidence interval.
Model 1: associations of work-related and personal resources with (prolonged) fatigue, work enjoyment and retirement intentions, additionally controlled for psychological job demands.
Model 2: associations of (prolonged) fatigue and work enjoyment with retirement intentions.
Model 3: model 1 with additional interaction terms between psychological job demands and the corresponding resource.
[a]Adjusted for gender, living alone, emotional demands and strenuous work; N/A: Not Applicable, because irrelevant.
[b]Analysed at follow-up wave in October 2012.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

the outcome of high work enjoyment. More specifically, psychological job demands were associated with a higher likelihood of experiencing high work enjoyment when younger workers also reported more social support from their supervisor, better perceived health and a high level of education.

3.3. Results of longitudinal analysis

3.3.1. Relationships of resources with retirement intentions, (prolonged) fatigue and work enjoyment

Results (Table 3) showed that personal mastery was related to a lower likelihood of having early retirement intentions amongst older workers. No other personal or work-related resources were related to retirement intentions over time, which was our primary study outcome.

Amongst older workers better perceived health and personal mastery were related to less fatigue, and a lower likelihood of both prolonged fatigue and low work enjoyment. In addition, a low educational level was related to a higher likelihood of prolonged fatigue. Concerning work-related resources, decision authority was related, albeit weakly, with a lower likelihood of prolonged fatigue amongst older workers.

Amongst younger workers, both personal and work-related resources played a role. Skill discretion was related to less fatigue, and was together with decision authority also related, albeit weakly, with a lower likelihood of low work enjoyment. In addition, better perceived health and more personal mastery were related to a lower likelihood of prolonged fatigue, and personal mastery was also related to a lower likelihood of low work enjoyment within these workers.

The multivariable analysis (Table 4), including all resources simultaneously, showed that better perceived health and more personal mastery were related to a lower likelihood of prolonged fatigue amongst both younger and older workers. Amongst older workers, these personal resources were also related to less fatigue. In addition, better perceived health was related to a lower likelihood of low work enjoyment amongst older workers. Amongst younger workers, skill discretion was related to less fatigue, and decision authority was related to a higher likelihood of prolonged fatigue.

3.3.2. Relationships of (prolonged) fatigue and work enjoyment with retirement intentions

As shown in Table 3, fatigue and prolonged fatigue related to a higher likelihood of having early retirement intentions amongst older workers. The relationship between work enjoyment and retirement intentions was however not statistically significant.

3.3.3. Effect modification by resources

There was only little evidence for the modifying effect of resources in the relationship between psychological job demands and outcomes over time (Table 3). Two interactions were statistically significant. These interactions could however not be interpreted as a typical buffering effect. The overall patterns of these interactions rather suggest that older workers with more resources (better perceived health or more decision authority) were less likely to report higher fatigue or low work enjoyment when they were also exposed to lower (vs. higher) psychological job demands. No significant interactions were noted amongst younger workers.

4. Discussion

The aim of this study was to examine the relationships of work-related and personal resources with older workers' retirement intentions. Cross-sectional results suggest that when older workers perceived more work-related (skill discretion, decision authority, supervisor support and co-worker-support) and personal resources (perceived health, personal mastery), they were less likely to report having early retirement intentions. This is in line with several earlier studies (Blekesaune and Solem 2005; Elovainio et al. 2005; Oude Hengel et al. 2012; Robroek et al. 2013). In our study, we found no direct association between developmental and accommodative support and older workers' retirement intentions, as also found by others (Armstrong-Stassen and Ursel 2009; Kooij 2010), suggesting that these organisational resources may be more distal in steering workers' retirement intentions compared to work-related resources like skill discretion or decision authority. Longitudinally, it was found that older workers with more personal mastery were less likely to develop early retirement intentions over time. Hence, although many cross-sectional associations were observed, personal and work-related resources had overall little direct impact on the forming of early retirement intentions over time.

In addition to studying direct relationships between resources and retirement intentions, an important aim of this study was to explore the pathways from resources to retirement intentions. In line with the JD-R model, it was hypothesised that resources may impact retirement intentions through the pathways of (prolonged) fatigue and work enjoyment (Demerouti and Bakker 2011; Schreurs, De Cuyper et al. 2011). Consistent with the pathway-hypothesis is the following pattern of longitudinal findings: more decision authority, better perceived health, and having more personal mastery made (prolonged) fatigue less likely, and in turn less (prolonged) fatigue prevented the forming of early retirement intentions. Thereby, this longitudinal study extends earlier cross-sectional research

Table 3. Longitudinal results on the relationships of work-related and personal resources with retirement intentions, the pathways of (prolonged) fatigue and work enjoyment and effect modification by resources across age groups over four years of follow-up.

	<45 years			≥45 years			
	Fatigue (continuous)	Prolonged fatigue (caseness)	Low work enjoyment	Fatigue (continuous)	Prolonged fatigue (caseness)	Low work enjoyment	Early retirement intentions
Age category	B (SE)	HR (95% CI)		B (SE)	HR (95% CI)		
Model 1[a]							
Skill discretion	−0.54* (0.22)	0.95 (0.89–1.00)	0.85* (0.76–0.96)	−0.10 (0.10)	0.96 (0.92–1.00)	0.99 (0.92–1.06)	1.00 (0.96–1.04)
Decision authority	−0.07 (0.19)	0.99 (0.93–1.04)	0.89* (0.81–0.99)	−0.06 (0.08)	0.97* (0.94–1.00)	0.95 (0.90–1.01)	0.98 (0.95–1.01)
Co-worker social support	−0.31 (0.77)	0.85 (0.67–1.07)	0.67 (0.45–1.01)	−0.35 (0.34)	0.93 (0.80–1.07)	0.92 (0.72–1.18)	0.97 (0.86–1.10)
Supervisor social support	−0.28 (0.51)	0.93 (0.80–1.07)	0.81 (0.61–1.06)	−0.03 (0.21)	0.98 (0.89–1.07)	0.91 (0.78–1.05)	0.95 (0.88–1.02)
Perceived health	−1.51 (1.49)	0.54** (0.36–0.83)	1.01 (0.49–2.05)	−1.88* (0.74)	0.42*** (0.30–0.59)	0.47** (0.27–0.80)	0.84 (0.66–1.07)
Personal mastery	−0.51 (0.42)	0.86** (0.78–0.95)	0.77** (0.63–0.92)	−0.46** (0.16)	0.87*** (0.82–0.93)	0.90* (0.81–0.99)	0.95* (0.91–1.00)
Educational level							
Low (vs. medium and high)	2.67 (5.22)	0.96 (0.22–4.16)	N/A	3.13 (1.64)	2.16** (1.24–3.77)	0.68 (0.19–2.39)	0.80 (0.44–1.44)
High (vs. medium and low)	−3.92 (2.24)	0.54 (0.29–1.00)	1.02 (0.30–3.45)	−1.35 (1.00)	0.81 (0.52–1.26)	0.71 (0.32–1.55)	0.93 (0.64–1.34)
Model 2[a]							
Fatigue (continuous)	N/A	N/A	N/A	N/A	N/A	N/A	1.01** (1.01–1.02)
Prolonged fatigue (caseness)	N/A	N/A	N/A	N/A	N/A	N/A	2.04** (1.32–3.14)
Work enjoyment	N/A	N/A	N/A	N/A	N/A	N/A	0.67 (0.29–1.50)
Model 3[a]							
Psychological job demands	−0.22 (0.20)	1.00 (0.94 −1.05)	1.03 (0.92–1.14)	−0.22* (0.09)	1.00 (0.96–1.04)	1.00 (0.94–1.07)	0.99 (0.96–1.03)
X Skill discretion	−0.01 (0.04)	1.00 (0.99–1.01)	0.99 (0.97–1.01)	−0.01 (0.02)	1.00 (0.99–1.01)	1.00 (0.99–1.02)	1.00 (1.00–1.01)
X Decision authority	−0.04 (0.03)	1.00 (0.99–1.01)	1.00 (0.98–1.01)	0.01 (0.01)	1.00 (0.99–1.00)	1.01* (1.00–1.02)	1.00 (1.00–1.01)
X Co-worker social support	−0.10 (0.12)	1.00 (0.96–1.05)	0.95 (0.88–1.02)	−0.05 (0.05)	0.99 (0.97–1.01)	1.01 (0.97–1.06)	0.99 (0.97–1.01)
X Supervisor social support	−0.16 (0.08)	0.98 (0.97–1.00)	0.99 (0.94–1.05)	−0.01 (0.03)	1.00 (0.99–1.02)	1.01 (0.98–1.03)	1.00 (0.99–1.01)
X Perceived health	0.14 (0.24)	1.01 (0.94–1.09)	0.97 (0.85–1.11)	0.20* (0.10)	1.04 (0.99–1.10)	1.06 (0.97–1.16)	1.02 (0.98–1.06)
X Personal mastery	−0.03 (0.05)	1.00 (0.98–1.01)	0.98 (0.96–1.01)	−0.00 (0.02)	1.00 (0.99–1.01)	1.00 (0.99–1.02)	1.01 (1.00–1.02)
X Educational level							
Low (vs. medium and high)	−0.10 (0.83)	1.00 (0.80–1.26)	N/A	−0.18 (0.25)	1.00 (0.92–1.09)	0.89 (0.73–1.08)	1.01 (0.92–1.11)
High (vs. medium and low)	−0.52 (0.39)	0.97 (0.87–1.08)	0.86 (0.70–1.05)	0.14 (0.17)	1.02 (0.94–1.09)	1.10 (0.96–1.25)	1.04 (0.97–1.10)

Notes: N/A: Not Applicable, because either irrelevant or low sample size.
B = Unstandardized beta; SE = Standard Error; HR = Hazard Ratio; 95% CI = 95% Confidence interval.
Model 1: relationships of work-related and personal resources with (prolonged) fatigue, work enjoyment and retirement intentions, additionally controlled for psychological job demands.
Model 2: relationships of (prolonged) fatigue and work enjoyment with retirement intentions.
Model 3: model 1 with additional interaction terms between psychological job demands and the corresponding resource.
[a]Adjusted for gender, living alone, emotional demands and strenuous work, and additionally for baseline levels of the outcome (fatigue) or exclusion of cases at baseline (of prolonged fatigue, low work enjoyment and early retirement intentions, respectively).
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 4. Multivariable results on the longitudinal relationships of work-related and personal resources with (prolonged) fatigue, work enjoyment and retirement intentions across age groups over four years of follow-up.

	<45 years			≥45 years			
	Fatigue (continuous)	Prolonged fatigue (caseness)	Low work enjoyment	Fatigue (continuous)	Prolonged fatigue (caseness)	Low work enjoyment	Early retirement intentions
Age category	B (SE)	HR (95% CI)		B (SE)	HR (95% CI)		
Skill discretion	−0.76** (0.27)	0.92 (0.84–1.00)	0.87 (0.74–1.02)	−0.04 (0.13)	0.98 (0.93–1.04)	1.04 (0.95–1.14)	1.02 (0.98–1.07)
Decision authority	0.41 (0.24)	1.08* (1.00–1.17)	0.98 (0.87–1.11)	0.03 (0.10)	1.00 (0.96–1.04)	0.95 (0.88–1.02)	0.98 (0.95–1.02)
Co-worker social support	0.69 (0.87)	1.03 (0.79–1.34)	0.74 (0.46–1.20)	−0.25 (0.37)	0.94 (0.80–1.11)	0.95 (0.71–1.27)	1.01 (0.88–1.16)
Supervisor social support	0.07 (0.60)	1.00 (0.82–1.21)	0.99 (0.70–1.40)	0.06 (0.23)	1.02 (0.92–1.13)	0.95 (0.81–1.13)	0.96 (0.89–1.04)
Perceived health	−1.36 (1.51)	0.59* (0.37–0.92)	1.40 (0.61–3.20)	−1.64* (0.76)	0.45*** (0.31–0.64)	0.51* (0.29–0.91)	0.88 (0.68–1.14)
Personal mastery	−0.71 (0.46)	0.84** (0.75–0.94)	0.82 (0.65–1.03)	−0.41* (0.17)	0.90** (0.85–0.97)	0.94 (0.85–1.05)	0.97 (0.92–1.02)
Educational level							
Low	−1.30 (5.39)	0.58 (0.12–2.80)	N/A	2.07 (1.69)	1.62 (0.87–3.01)	0.54 (0.15–1.96)	0.75 (0.41–1.38)
Medium	1	1	1	1	1	1	1
High	−3.96 (2.41)	0.52 (0.26–1.02)	1.36 (0.34–5.40)	−0.13 (1.09)	1.18 (0.72–1.93)	0.80 (0.35–1.79)	0.96 (0.64–1.42)

Notes: N/A: Not Applicable, because low sample size;.
B = Unstandardized beta; SE = Standard Error; HR = Hazard Ratio; 95% CI = 95% Confidence interval.
Adjusted for gender, living alone, emotional demands, strenuous work, psychological job demands and additionally for baseline levels of the outcome (fatigue) or exclusion of cases at baseline (of prolonged fatigue, low work enjoyment and early retirement intentions, respectively).
$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

(Schreurs, De Cuyper et al. 2011) on the potential pathways from work-related and personal resources to retirement intentions. Whereas in earlier cross-sectional research on the pathways, the direction of the presumed relationships could not be established, our study renders more support for the directionality of the pathways as also assumed by the JD-R model. It is important to note that we found evidence for the health impairment process ((prolonged) fatigue but not for the motivational process (work enjoyment)). More personal mastery and better perceived health decreased the likelihood of low work enjoyment, but the latter was unrelated to retirement intentions. The importance of the role of health impairment in the retirement decision process has also been suggested by earlier research investigating the role of diminished work ability. Work ability encompasses health measures and diminished work ability was predicted by poorer work-related resources and was found to relate to having a higher interest in retirement (Bohle, Pitts, and Quinlan 2010; Tuomi et al. 2001).

Another aim of this study was to explore whether resources may buffer the adverse impact that psychological job demands have on the retirement decision process of older workers. As found in the cross-sectional analysis, some resources like higher educational level and better perceived health might act as a buffer, in the sense they seem to mitigate the positive association of psychological job demands with (prolonged) fatigue or its negative association with high work enjoyment. Yet, these interaction effects remained overall relatively weak. Moreover, the few borderline significant longitudinal interactions could not be interpreted as typical buffering effects. It appeared that older workers with better perceived health or more decision authority were less likely to develop (prolonged) fatigue or low work enjoyment, respectively, when they were also exposed to lower levels of psychological job demands. The combination of low resources with low psychological job demands appeared most detrimental for either (prolonged) fatigue or work enjoyment.

All in all these findings suggest that of all resources, personal resources like better perceived health and personal mastery foster older workers' resilience and may facilitate prolonging working careers. This is also demonstrated in the multivariable analysis in which the impact of all resources was estimated simultaneously. The importance of personal mastery is in line with research on the quality of personal mastery as a coping resource. More specifically, it has been shown that workers with high personal mastery are less likely to experience elevated physiological responses to stress, and are therefore less prone to strains like (prolonged) fatigue (e.g. Roepke and Grant 2011). In addition, because these workers may be better equipped to personally cope with demands at work, the desirability of an early exit from the workplace may not come about. Also one work-related resource, namely decision authority, stands out. Decision authority involves the ability to influence and make decisions about one's own job. The importance of this work-related resource also fits with insights from lifespan theory, like SOC theory, suggesting that work-related resources functional for job crafting and choosing work roles that better match with one's strengths and weaknesses have particular importance at older age (Truxillo et al. 2012). Also, the importance of personal mastery can be seen in this light. At the same time, demanding work conditions like higher psychological job demands were not related to the development over time of prolonged fatigue, low work enjoyment or retirement intentions amongst older workers.

The group of younger workers was also analysed in this study to have a point of reference. In general, the pattern of cross-sectional associations is very similar compared to the group of older workers, with a few exceptions. More specifically, accommodative support showed no associations with (prolonged) fatigue or work enjoyment amongst younger workers. The impact of accommodative support throughout the lifespan needs to be explored in further research. Over time also the resources of perceived health, personal mastery and decision authority were of importance in preventing the development of (prolonged) fatigue and/or low work enjoyment. In addition, also higher levels of skill discretion prevented low work enjoyment over time. The latter finding also aligns with SOC theory suggesting that skill discretion – which involves performing a variety of tasks, lower levels of repetitiveness and opportunities to learn new things – may be of particular value for younger workers because it fosters the accumulation of job skills that are necessary for advancing their careers (Truxillo et al. 2012).

4.1. Strengths and limitations

The primary outcome of this study was the forming of early retirement intentions – a central aspect of older workers' retirement decision process – often preceding actual transitions into retirement. Although retirement intentions are not identical to actual retirement they can be regarded as an important proxy for whether or not older workers will extend their working careers. Retirement intentions are however likely to be determined by factors that fall outside the scope of this article, like national legislation and pension schemes, workers' savings, country-specific demographic factors and differences in labour market structures (European Commission 2012). This implies that our findings should be interpreted in the light of the Dutch labour market and pension system. In this context, the statutory retirement age was 65 years throughout the entire follow-up of our study (October 2008–October 2012), and hence affirmative answers on the item to assess retirement intentions reflect workers' intentions to retire before that age. Yet, a limitation is that we only relied on a single question, whereas reliability may increase with more items (van Dam, van der Vorst, and van der Heijden 2009).

Despite the prospective nature of our study, some additional limitations can be identified. First, although developmental and accommodative support showed important cross-sectional associations with (prolonged) fatigue and work enjoyment, we were unable to investigate their influence longitudinally. Second, our follow-up of four years is sufficient to investigate the impact of personal and work-related resources on the forming of retirement intentions and to study the pathways in between. This long follow-up period delineated cross-sectional associations from longitudinal relationships. Yet, because we have no measurements in between baseline and follow-up measurement, both psychological job demands and resources, as well as the outcomes may have been subject to changes. Therefore, in future research changes in job demands deserve more attention, even more so because work-related resources like accommodative support may also impact these job demands (Kooij 2010).

A strength of this study is that we studied relationships in a relatively homogenous sample of full-time day workers. We preferred this approach since the prevalence and relevance of particular resources may differ across different work settings and because also pathways may work differently across different occupational groups (Schreurs, van Emmerik et al. 2011). This implies however that we cannot generalise our findings to other specific groups of workers like shift workers in manufacturing or health care. Future research needs to study these relationships across various occupational settings including shift workers and part-time workers. Also, as we only included full-time working respondents for the purpose of internal validity, our sample has become predominantly male. Although men are also overrepresented amongst the group of older workers on the Dutch labour market, it is plausible that the hypothesised relationships amongst women may be (partly) different. Women may be exposed to other work- and non-work-related demands (Silverstein, Fine, and Armstrong 1986; Statistics Netherlands 2012), and differ in their report of health outcomes (Niedhammer et al. 2000), warranting research that focuses specifically on their situation.

We also need to consider other personal resources too. More specifically, in this study the impact of educational level in earlier life was investigated and assessed as the highest educational degree workers had obtained in May 1998. Although educational attainment earlier in life (e.g. at labour market entry) remains an important determinant of work participation and opportunities (like training) in later life (Edgerton, Roberts, and von Below 2012; Fouarge, Schils, and de Grip 2013), future research may however also want to focus on the impact of educational attainment in later life as the latter has been linked with sustainable employment amongst older workers (Caniëls, van Vuuren, and Semeijn 2011). In addition to educational level, future research in this area may also consider the role of relevant career-related competencies like adaptability (Fugate, Kinicki, and Ashforth 2004).

Another particular strength of our study is that we also focused on the pathways that may theoretically explain relationships between resources and retirement intentions. We relied on (prolonged) fatigue and work enjoyment. Concerning fatigue we investigated both

continuous scores (fatigue levels) and caseness (prolonged fatigue caseness). Like many health conditions, fatigue can be best viewed as a continuum (Lewis and Wessely 1992). Yet, a cut-off score to define cases of prolonged fatigue is helpful in determining which workers are at risk for early retirement, and can thereby be useful to direct interventions. However, other ways of operationalising these processes remain possible. For instance, instead of prolonged fatigue which may be chronic and less reversible, one may also consider short-term health consequences like need for recovery or the degree to which individuals experience the need to recuperate from work-induced fatigue, primarily experienced after a day of work (Jansen, Kant, and van den Brandt 2002). Although work enjoyment can be considered as an operationalisation of work motivation, the vast majority of workers consider their work as pleasant based on our single-item measure. As a consequence, we excluded cases of low work enjoyment at baseline to study in a group of workers who enjoy their work at baseline, whether work-related and personal resources had impact on becoming a case of low work enjoyment at the follow-up wave in 2012. The alternative would have been to study the impact of work-related and personal resources on becoming a case of high work enjoyment in a relative small group of workers with low work enjoyment at baseline. Although the definition of our endpoint shifts from high work enjoyment in the cross-sectional analyses to low work enjoyment in the longitudinal analysis, we regard our approach more appropriate for understanding the relationship between resources and work enjoyment. Yet, perhaps the concept of 'work engagement', which can be viewed on a continuum (Demerouti and Bakker 2011) may better capture feelings of pleasure at work compared to our dichotomous measure. Others have also considered the role of related concepts like job satisfaction, but could not empirically link it to retirement (Beehr et al. 2000). More research is needed to identify the motivational process in older workers' retirement decision-making.

In addition, future research needs to incorporate at least three waves to examine the pathways linking resources with fatigue and work enjoyment and these in turn with retirement intentions over time, as suggested by the JD-R model.

The primary focus of this study concerned the older workers. Although labelling individuals as 'young' or 'old' by means of calendar age is always arbitrary, the threshold of 45 years is within the acceptable ranges as suggested by others (e.g. Kooij et al. 2008; Loeppke et al. 2013) and has also been adopted by the WHO (1993). Above 45 years still large heterogeneity may exist regarding one's psychological proximity to retirement. When investigating the impact of resources on older workers, we analysed relationships amongst younger workers as a point of reference. The aim of this study was not to test for age-related differences but to better understand relationships amongst older workers by also involving a different age group in the analyses. In addition, age differences can only be formally tested adding additional age interactions. Given that we were also interested in the interactions of resources with psychological job demands, adding these three-way interactions would make our model needlessly complex and results difficult to interpret. Therefore, we chose to stratify results based on workers' age.

Finally, selective dropout was rather limited as there were only few significant differences at baseline between responders and dropouts at the follow-up wave in 2012. Differences were mainly noted in background characteristics and not in study outcomes.

4.2. Conclusions and implications

Overall, this study points out that personal resources (better perceived health, more personal mastery) and work-related resources (more decision authority) can affect the retirement decision process of older workers. For practice, this implies that organisations concerned with the participation of their older workers may want to monitor and evaluate the health of these workers, and also specifically resources that enable older workers to immediate influence and deal with work demands like personal mastery and decision authority. In addition, one may consider fostering these resources. It has been suggested that Human Resource (HR) practices targeted at older workers' development and career management may also enhance feelings of control of over one's work and life (Snape and Redman 2010). Yet, more research is needed on the impact of HR practices on these outcomes. Finally, health surveillance seems invaluable, and in this context, a measure like prolonged fatigue may also have additional merit. Older workers with prolonged fatigue were more than two times as likely to develop early retirement intentions compared to workers free of prolonged fatigue. Overall, results point to the relevance of resources in older workers retirement decision-making which complements the more traditional perspective of focusing on the importance of demanding working conditions in late career management (Buyens et al. 2009; van Dalen, Henkens, and Wang 2015; Schreurs, De Cuyper et al. 2011).

Because our set of resources is not exhaustive future research may consider other personal resources like competencies and work-related resources like task variety and task significance, and consider shorter time intervals between work-related and personal resources on the one hand and (prolonged) fatigue, work enjoyment and retirement intentions on the other hand.

Acknowledgements

The authors thank Jos Slangen for his support in the data management.

Disclosure statement

The authors declare to have no conflict of interest.

Funding

This study was supported by Instituut Gak [grant number 2011-089 WR] and by School CAPHRI (School for Public Health and Primary Care), Maastricht, the Netherlands.

References

Aaronson, N. K., M. Muller, P. D. A. Cohen, M. L. Essink-Bot, M. Fekkes, R. Sanderman, M. A. G. Sprangers, A. T. te Velde, and E. Verrips. 1998. "Translation, Validation, and Norming of the Dutch Language Version of the SF-36 Health Survey in Community and Chronic Disease Populations." *Journal of Clinical Epidemiology* 51: 1055–1068.

Aiken, L. S., and S. G. West. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage.

Armstrong-Stassen, M., and N. D. Ursel. 2009. "Perceived Organizational Support, Career Satisfaction, and the Retention of Older Workers." *Journal of Occupational and Organizational Psychology* 82: 210–220.

Bakker, A. B., and E. Demerouti. 2007. "The Job Demands-resources Model: State of the Art." *Journal of Managerial Psychology* 22: 309–328.

Bal, P. M., S. De Jong, P. G. W. Jansen, and A. B. Bakker. 2012. "Motivating Employees to Work beyond Retirement: A Multi-level Study of the Role of I-Deals and Unit Climate." *Journal of Management Studies* 49: 306–331.

Baltes, P. B., U. M. Staudinger, and U. Lindenberger. 1999. "LIFESPAN PSYCHOLOGY: Theory and Application to Intellectual Functioning." *Annual Review of Psychology* 50: 471–507.

Beehr, T. A., S. Glazer, N. L. Nielson, and S. J. Farmer. 2000. "Work and Nonwork Predictors of Employees' Retirement Ages." *Journal of Vocational Behavior* 57: 206–225.

Beurskens, A., U. Bültmann, I. J. Kant, J. Vercoulen, G. Blijenberg, and G. Swaen. 2000. "Fatigue among Working People: Validity of a Questionnaire Measure." *Occupational and Environmental Medicine* 57: 353–357.

Blekesaune, M., and P. E. Solem. 2005. "Working Conditions and Early Retirement: A Prospective Study of Retirement Behavior." *Research on Aging* 27: 3–30.

Bohle, P., C. Pitts, and M. Quinlan. 2010. "Time to Call It Quits? The Safety and Health of Older Workers." *International Journal of Health Services* 40: 23–41.

Boone-James, J., S. McKechnie, and J. Swanberg. 2010. "Predicting Employee Engagement in an Age-diverse Retail Workforce." *Journal of Organizational Behavior* 32: 173–196.

Bültmann, U., I. J. Kant, P. van den Brandt, and S. V. Kasl. 2002. "Psychosocial Work Characteristics as Risk Factors for the Onset of Fatigue and Psychological Distress: Prospective Results from the Maastricht Cohort Study." *Psychological Medicine* 32: 333–345.

Bültmann, U., M. de Vries, A. J. Beurskens, G. Bleijenberg, J. H. Vercoulen, and I. J. Kant. 2000. "Measurement of Prolonged Fatigue in the Working Population: Determination of a Cutoff Point for the Checklist Individual Strength." *Journal of Occupational Health Psychology* 5: 411–416.

Buyens, D., H. Van Dijk, T. Dewilde, and A. De Vos. 2009. "The Aging Workforce: Perceptions of Career Ending." *Journal of Managerial Psychology* 24: 102–117.

Caniëls, M. C. J., T. van Vuuren, and J. Semeijn. 2011. "Lifelong Learning and Sustainable Employment." Paper Presented at the 15th Conference of the European Association of Work and Organizational Psychology, Maastricht.

Cloostermans, L., M. B. Bekkers, E. Uiters, and K. I. Proper. 2015. "The Effectiveness of Interventions for Ageing Workers on (Early) Retirement, Work Ability and Productivity: A Systematic Review." *International Archives of Occupational and Environmental Health* 88: 521–532.

van Dalen, H. P., K. Henkens, and M. Wang. 2015. "Recharging or Retiring Older Workers? Uncovering the Age-Based Strategies of European Employers." *The Gerontologist* 55: 814–824.

van Dam, K., J. D. M. van der Vorst, and B. I. J. M. van der Heijden. 2009. "Employees' Intentions to Retire Early: A Case of Planned Behavior and Anticipated Work Conditions." *Journal of Career Development* 35: 265–289.

Demerouti, E., A. B. Bakker, F. Nachreiner, and W. B. Schaufeli. 2001. "The Job Demands-resources Model of Burnout." *Journal of Applied Psychology* 86: 499–512.

Demerouti, E., and A. B. Bakker. 2011. "The Job Demands-resources Model: Challenges for Future Research." *SA Journal of Industrial Psychology* 37: 1–9.

Edgerton, J. D., L. W. Roberts, and S. von Below. 2012. "Education and Quality of Life." In *Handbook of Social Indicators and Quality of Life Research*, edited by K. C. Land, Alex C. Michalos, and M. Joseph Sirgy, 265–296. London: Springer.

Ekmann, A., I. Petersen, M. Manty, K. Christensen, and K. Avlund. 2013. "Fatigue, General Health, and Ischemic Heart Disease in Older Adults." *The Journals of Gerontology Series a: Biological Sciences and Medical Sciences* 68: 279–285.

Elovainio, M., P. Forma, M. Kivimäki, T. Sinervo, R. Sutinen, and M. Laine. 2005. "Job Demands and Job Control as Correlates of Early Retirement Thoughts in Finnish Social and Health Care Employees." *Work & Stress* 19: 84–92.

European Commission. 2012. *Employment and Social Developments in Europe 2012*. Luxembourg: Publications Office of the European Union.

Fouarge, D., T. Schils, and A. de Grip. 2013. "Why Do Low-educated Workers Invest Less in Further Training?" *Applied Economics* 45: 2587–2601.

Friis, K., O. Ekholm, Y. A. Hundrup, E. B. Obel, and M. Grønbaek. 2007. "Influence of Health, Lifestyle, Working Conditions, and Sociodemography on Early Retirement among Nurses: The Danish Nurse Cohort Study." *Scandinavian Journal of Public Health* 35: 23–30.

Fugate, M., A. J. Kinicki, and B. E. Ashforth. 2004. "Employability: A Psycho-social Construct, Its Dimensions, and Applications." *Journal of Vocational Behavior* 65: 14–38.

Gommans, F. G., N. W. H. Jansen, M. Mackey, D. Stynen, A. de Grip, and I. J. Kant. 2016. "The Impact of Physical Work Demands on Need for Recovery, Employment Status, Retirement Intentions, and Ability to Extend Working Careers." *Journal of Occupational and Environmental Medicine* 58: e140–e151.

Gründemann, R. W. M., P. W. G. Smulders, and C. R. de Winter. 1993. *Handleiding Vragenlijst Arbeid en Gezondheid* [Manual, Questionnaire on Work and Health]. Lisse: Swets & Zeitlinger.

Harkonmaki, K., O. Rahkonen, P. Martikainen, K. Silventoinen, and E. Lahelma. 2006. "Associations of SF-36 Mental Health Functioning and Work and Family Related Factors with Intentions to Retire Early among Employees." *Occupational and Environmental Medicine* 63: 558–563.

Henkens, K. 1999. "Retirement Intentions and Spousal Support: A Multi-actor Approach." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 54B: S63–S73.

Henkens, K., and M. Leenders. 2010. "Burnout and Older Workers' Intentions to Retire." *International Journal of Manpower* 31: 306–321.

Herrbach, O., K. Mignonac, C. Vandenberghe, and A. Negrini. 2009. "Perceived HRM Practices, Organizational Commitment, and Voluntary Early Retirement among Late-career Managers." *Human Resource Management* 48: 895–915.

Houtman, I. 1995. "Reliability and Validity of the Dutch Version of the Karasek Job Content Questionnaire." Paper Presented at the NIOSH/APA Conference on Stress, Work, and Health, Washington, DC.

Huibers, M. J., S. S. Leone, I. J. Kant, and J. A. Knottnerus. 2006. "Chronic Fatigue Syndrome-like Caseness as a Predictor of Work Status in Fatigued Employees on Sick Leave: Four Year Follow up Study." *Occupational and Environmental Medicine* 63: 570–572.

Ilmarinen, J. 2006. *Towards a Longer Worklife! Ageing and the Quality of Worklife in the European Union*. Helsinki: National Institute for Occupational Health.

Jansen, N. W. H., I. J. Kant, and P. van den Brandt. 2002. "Need for Recovery in the Working Population: Description and Associations with Fatigue and Psychological Distress." *International Journal of Behavioral Medicine* 9: 322–340.

Janssen, N., I. J. Kant, G. M. Swaen, P. P. Janssen, and C. A. Schroër. 2003. "Fatigue as a Predictor of Sickness Absence: Results from the Maastricht Cohort Study on Fatigue at Work." *Occupational and Environmental Medicine* 60 (90001): 71i–76.

Kant, I. J., U. Bültmann, C. A. P. Schröer, A. J. H. M. Beurskens, L. P. G. M. van Amelsvoort, and G. M. H. Swaen. 2003. "An Epidemiological Approach to Study Fatigue in the Working Population: The Maastricht Cohort Study." *Occupational and Environmental Medicine* 60: 32i–39.

Karasek, R. A. 1979. "Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign." *Administrative Science Quarterly* 24: 285–308.

Karasek, R. A. 1985. *The Job Content Questionnaire and User's Guide (version 1.1)*. Los Angeles: Department of Industrial and Systems Engineering, University of Southern California.

Kooij, D. T. A. M. 2010. "Motivating Older Workers: A Lifespan Perspective on the Role of Perceived HR Practices." PhD diss., University Amsterdam.

Kooij, D. T. A. M., A. H. de Lange, P. G. W. Jansen, and J. S. E. Dikkers. 2008. "Older Workers' Motivation to Continue to Work: Five Meanings of Age." *Journal of Managerial Psychology* 23: 364–394.

Kooij, D. T. A. M., and K. van de Voorde. 2015. "Strategic HRM for Older Workers." In *Aging Workers and the Employee-Employer Relationship*, edited by P. M. Bal, D. T. A. M. Kooij, and D. M. R. Rousseau, 57–72. Dordrecht: Springer International Publishing.

Lewis, G., and S. Wessely. 1992. "The Epidemiology of Fatigue: More Questions than Answers." *Journal of Epidemiology and Community Health* 46: 92–97.

Loeppke, R. R., A. L. Schill, L. C. Chosewood, J. W. Grosch, P. Allweiss, W. N. Burton, J. L. Barnes-Farrell, R. Z. Goetzel, L. Heinen, T. W. Hudson, and P. Hymel. 2013. "Advancing Workplace Health Protection and Promotion for an Aging Workforce." *Journal of Occupational and Environmental Medicine* 55: 500–506.

Mein, G., P. Martikainen, S. A. Stansfeld, E. J. Brunner, R. Fuhrer, and M. Marmot. 2000. "Predictors of Early Retirement in British Civil Servants." *Age and Ageing* 29: 529–536.

Mohren, D. C. L., N. W. H. Jansen, L. P. G. M. van Amelsvoort, and I. J. Kant. 2007. *An Epidemiological Approach of Fatigue and Work. Experiences from the Maastricht Cohort Study*. Maastricht: Programma Epidemiologie van Arbeid en Gezondheid, Maastricht University.

Niedhammer, I., M. J. Saurel-Cubizolles, M. Piciotti, and S. Bonenfant. 2000. "How is Sex Considered in Recent Epidemiological Publications on Occupational Risks?" *Occupational and Environmental Medicine* 57: 521–527.

Ng, T. W. H., and D. C. Feldman. 2013. "Employee Age and Health." *Journal of Vocational Behavior* 83: 336–345.

van Oorschot, W., and P. H. Jensen. 2009. "Early Retirement Differences between Denmark and the Netherlands." *Journal of Aging Studies* 23: 267–278.

Oude Hengel, K. M., B. M. Blatter, G. A. Geuskens, L. L. J. Koppes, and P. M. Bongers. 2012. "Factors Associated with the Ability and Willingness to Continue Working until the Age of 65 in Construction Workers." *International Archives of Occupational and Environmental Health* 85: 783–790.

Pearlin, L. J., and C. Schooler. 1978. "The Structure of Coping." *Journal of Health and Social Behavior* 19: 2–21.

Robroek, S. J., M. Schuring, S. Croezen, M. Statti, and A. Burdorf. 2013. "Poor Health, Unhealthy Behaviors, and Unfavorable Work Characteristics Influence Pathways of Exit from Paid Employment among Older Workers in Europe: A Four Year Follow-up Study." *Scandinavian Journal of Work and Environmental Health* 39: 125–133.

Roepke, S. K., and I. Grant. 2011. "Toward a More Complete Understanding of the Effects of Personal Mastery on Cardiometabolic Health." *Health Psychology* 30: 615–632.

Schreurs, B., N. De Cuyper, I. J. H. van Emmerik, G. Notelaers, and H. De Witte. 2011. "Job Demands and Resources and Their Associations with Early Retirement Intentions through Recovery Need and Work Enjoyment." *SA Journal of Industrial Psychology* 37: 1–11.

Schreurs, B., Hetty van Emmerik, N. De Cuyper, G. Notelaers, and H. De Witte. 2011. "Job Demands-Resources and Early Retirement Intention: Differences between Blue-and White-Collar Workers." *Economic and Industrial Democracy* 32: 47–68.

Sejbaek, C. S., M. A. Nexo, and V. Borg. 2013. "Workrelated Factors and Early Retirement Intention: A Study of the Danish Eldercare Sector." *The European Journal of Public Health* 23: 611–616.

Silverstein, B. A., L. J. Fine, and T. J. Armstrong. 1986. "Hand Wrist Cumulative Trauma Disorders in Industry." *British Journal of Industrial Medicine* 43: 779–784.

Sluiter, J. K., and M. H. W. Frings-Dresen. 2007. "What Do We Know about Ageing at Work? Evidence-based Fitness for Duty and Health in Fire Fighters." *Ergonomics* 50: 1897–1913.

Snape, E., and T. Redman. 2010. "HRM Practices, Organizational Citizenship Behaviour and Performance: A Multi-level Analysis." *Journal of Management Studies* 47: 1219–1247.

van Solinge, H., and K. Henkens. 2014. "Work-related Factors as Predictors in the Retirement Decision-making Process of Older Workers in the Netherlands." *Ageing & Society* 34: 1551–1574.

Spence, J. T., and A. S. Robbins. 1992. "Workaholism: Definition, Measurement, and Preliminary Results." *Journal of Personality Assessment* 58: 160–178.

Statistics Netherlands. 2012. *Emancipatiemonitor 2012* [Emancipation Monitor 2012]. http://www.cbs.nl/NR/rdonlyres/F5DF2565-1721-40A4-BF16-FF7852AAC53D/0/emancipatiemonitor2012.pdf.

Stynen, D. 2013. "The Retention of an Aging Workforce: Essays on Work-related Barriers and Affordances." PhD diss., KU Leuven.

Szerencsi, K., L. van Amelsvoort, J. Serroyen, M. Prins, N. Jansen, and I. J. Kant. 2013. "The Impact of Personal Attributes on the Association between Cumulative Exposure to Work Stressors and Cardiovascular Disease." *Journal of Psychosomatic Research* 75: 23–31.

Thorsen, S., R. Rugulies, K. Løngaard, V. Borg, K. Thielen, and J. B. Bjorner. 2012. "The Association between Psychosocial Work Environment, Attitudes towards Older Workers (Ageism) and Planned Retirement." *International Archives of Occupational and Environmental Health* 85: 437–445.

Truxillo, D. M., D. M. Cadiz, J. R. Rineer, S. Zaniboni, and F. Fraccaroli. 2012. "A Lifespan Perspective on Job Design: Fitting the Job and the Worker to Promote Job Satisfaction, Engagement, and Performance." *Organizational Psychology Review* 2: 340–360.

Tuomi, K., P. Huuhtanen, E. Nykyri, and J. Ilmarinen. 2001. "Promotion of Work Ability, the Quality of Work and Retirement." *Occupational Medicine* 51: 318–324.

van Veldhoven, M., and S. Broersen. 2003. "Measurement Quality and Validity of the 'Need for Recovery Scale'." *Occupational and Environmental Medicine* 60: 3i–9.

Vercoulen, J. H. M. M., M. Alberts, and G. Bleijenberg. 1999. "De Checklist Individual Strength (CIS)." *Gedragstherapie* 32: 31–36.

Vermeer, N., M. Mastrogiacomo, and A. Soest. 2014. *Demanding Occupations and the Retirement Age in the Netherlands*. Amsterdam: De Nederlandsche Bank.

Wang, M., and J. Shi. 2014. "Psychological Research on Retirement." *Annual Review of Psychology* 65: 209–233.

Wang, M., and K. Shultz. 2010. "Employee Retirement: A Review and Recommendations for Future Investigation." *Journal of Management* 36: 172–206.

de Wind, A., S. van der Pas, B. M. Blatter, and A. J. van der Beek. 2016. "A Life Course Perspective on Working beyond Retirement, Results from a Longitudinal Study in the Netherlands." *BMC Public Health* 16: 617.

WHO (World Health Organization). 1993. *Aging and Working Capacity: Report of a WHO Study Group*. Geneva: World Health Organization.

Xanthopoulou, D., A. B. Bakker, E. Demerouti, and W. B. Schaufeli. 2007. "The Role of Personal Resources in the Job Demands-resources Model." *International Journal of Stress Management* 14: 121–141.

Zoer, I., M. M. Ruitenburg, D. Botje, M. H. W. Frings-Dresen, and J. K. Sluiter. 2011. "The Associations between Psychosocial Workload and Mental Health Complaints in Different Age Groups." *Ergonomics* 54: 943–952.