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How do the same job demands and resources predict work engagement and workaholism?

A SEM analysis investigating the relation between job characteristics and heavy work investment

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Acknowledgements

The inspiration for this thesis came while I was studying for my bachelor degree, when I was introduced to positive psychology and the concept of work engagement. Work engagement immediately captured my attention and became the topic of my bachelor thesis. During my master's degree, I began to question how work engagement actually differs from workaholism, and, more specifically, how can work engagement be promoted and workaholism prevented. This became the starting point for my master thesis.

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Abstract

Work engagement and workaholism are considered as, respectively, positive and negative heavy work investment constructs, and predict opposite outcomes for job performance and well-being. Thus, work engagement should be promoted and workaholism should be prevented. Using the Job Demands-Resources (JD-R) model as a theoretical framework, this study aimed to investigate how job resources (i.e., autonomy and supervisor support) and job demands (i.e., workload and role conflict) related to work engagement and workaholism. The cross-sectional study comprised 5146 academics from the higher education sector in Norway. Partial Least Squares Structural Equation Modeling (PLS-SEM) was performed to test the hypotheses. The results indicated that job resources were positively related to work engagement, and job demands were positively related to workaholism. In addition, the job demand workload was positively related to work engagement, and job resource autonomy was positively related to the working excessively dimension of workaholism. More specifically, these findings indicate that workload can act as a challenging demand in relation to work engagement, and autonomy can act as a threatening resource in relation to workaholism. The findings challenge the JD-R model's current definitions of when to categorize a job characteristic as a job demand or resource.

Keywords: Job Demands-Resources model, ARK Research Platform, work engagement, workaholism, autonomy, supervisor support, workload, role conflict

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How do the same job demands and resources predict work engagement and workaholism? A SEM analysis investigating the relation between job characteristics and heavy work investment

During the last decades, working life has gone through major changes, characterized particularly by global competition, more mental and emotional demands, and technology that enables employees to be connected to work round the clock (Derks & Bakker, 2010; Schaufeli, 2013). This rapidly changing world of work both allows and stimulates employees to work harder than before (van Beek, Hu, Schaufeli, Taris, & Schreurs, 2012).

Work engagement and workaholism are two constructs of heavy work investment and are considered, respectively, as positive and negative ways of working hard (Salanova, Del Líbano, Llorens, & Schaufeli, 2014). Research shows that workaholism and work engagement are inversely related to well-being (Shimazu, Schaufeli, Kamiyama, & Kawakami, 2015). Whereas work engagement is positively related to job satisfaction (Del Libano, Llorens, Salanova, & Schaufeli, 2012; van Beek, Taris, Schaufeli, & Brenninkmeijer, 2013) and job performance and negatively related to intention to change jobs (van Beek et al., 2013), workaholism is negatively related to job satisfaction (Caesens, Stinglhamber, & Luypaert, 2014; van Beek et al., 2013) and job performance and positively related to intention to change jobs (2013). Furthermore, work-engaged employees are found to have a greater degree of life satisfaction (Schaufeli & Salanova, 2007) and experience work-to-family enrichment (Hakanen & Peeters, 2015), while workaholic employees are found to have less life satisfaction (Shimazu, Schaufeli, Kubota & Kawakami, 2012) and experience work-to-family conflict (Hakanen & Peeters, 2015). Hence, the two types of heavy work investment predict opposite outcomes for performance and well-being. Accordingly, work engagement should be promoted and workaholism should be prevented (Shimazu et al., 2015).

Equally, research has found that job resources are related to work engagement (e.g., Bakker & Demerouti, 2007), whereas job demands are related to workaholism (e.g., Schaufeli, Taris & Bakker, 2008; Molino, Bakker, & Ghislieri, 2016). Furthermore, job demands are reportedly both positively and negatively related to work engagement (e.g., Crawford, LePine, & Rich, 2010), whereas job resources are mainly negatively related to workaholism (e.g., Schaufeli et al., 2008). However, researchers have begun to question whether the job resource autonomy can promote workaholic tendencies (e.g., Hakanen & Peeters, 2015).

Academics play a vital role in the creation and development of knowledge and innovation (Gillespie, Walsh, Winefield, Dua, & Stough, 2001). However, in the pursuit of a

knowledge society, the workload of academics has increased (Houston, Meyer, & Paewai, 2006). In addition, academics experience the triple demands of research, teaching, and administration (Boyd et al., 2010), and are therefore stretching the time they spend working in order to meet the demands of the job (Houston et al., 2006). Simultaneously, job resources autonomy and flexibility are found to be the most important factors for becoming and remaining an academic (Watty, Bellamy & Morley, 2003). Such flexible work arrangements and autonomy may enhance work engagement, but they may also pave the way for extensive working and workaholic tendencies (Hakanen, Rodriguez-Sánchez, & Perhoniemi, 2012). Thus, the challenge is how to prevent workaholism while at the same time promoting work engagement among an occupational group like academics who experience both job demands and resources in high measure. To answer this question, it is important to know how the same job demands and resources relate to both constructs.

Schaufeli and colleagues (2008) argue that research should include both work engagement and workaholism to increase understanding of employee well-being. This study uses the Job Demands-Resources model (JD-R) as a theoretical framework to investigate how demands and resources are related to work engagement and workaholism among Norwegian academics. The research question is as follows:

How are the same job demands and resources related to both work engagement and workaholism?

By investigating this research question, the current study aims to make two contributions. First, greater empirical understanding of how the two heavy work investment constructs are affected by the same antecedents can contribute valuable knowledge to practitioners who are responsible for occupational health. Second, applying the JD-R model to investigate the antecedents to both work engagement and workaholism can challenge the applicability of the model, with its current definitions of job resources and demands.

This thesis starts with an examination of the theoretical framework, including the JD-R model, the concepts of work engagement and workaholism, and the study's hypothesis. Next, the methods used and results will be presented. Thereafter, the results will be discussed in light of earlier empirical findings and the JD-R model, followed by theoretical and practical implications, suggestions for future research, and the conclusion of this study.

Theoretical Framework

The Job Demands-Resources Model

The job demands-resources (JD-R) model is a theoretical model that focuses on negative and positive indicators of employee well-being (Bakker & Demerouti, 2007). The model states that every occupation has its own job characteristics, which can be classified into one of two categories—namely, job demands and job resources (Bakker & Demerouti, 2016). Job demands refer to the “physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort or skills and are therefore associated with certain physiological and/or psychological costs” (Bakker & Demerouti, 2007, p. 312). Examples of job demands are role overload, role conflict, and job insecurity. Job resources refer to the “physical, psychological, social, or organizational aspects of the job” (p. 312) that are (1) functional in achieving work goals, (2) reduce job demands and the associated physiological and psychological costs, and/or (3) stimulate personal growth, learning, and development (2007). Examples of job resources include job autonomy, social support, and performance feedback. The balance between positive (i.e., resources) and negative (i.e., demands) job characteristics are thought to affect employee health and well-being (Schaufeli & Taris, 2014).

The JD-R model describes how job demands and resources lead to two different psychological processes: a health-impairment process and a motivational process, respectively (Bakker & Demerouti, 2007; Bakker & Demerouti, 2016). Through the health-impairment process, job demands are suggested to exhaust employees’ mental and physical resources and therefore lead to energy depletion and health problems. In the motivational process, on the other hand, job resources are thought to have a motivational potential and foster positive organizational outcomes (Schaufeli & Taris, 2014). According to the JD-R model, job resources can play an intrinsic motivational role because they foster employees’ growth, learning, and development (Bakker & Demerouti, 2007) by fulfilling basic human needs (i.e., autonomy, competence, relatedness; Deci & Ryan, 1985). For instance, decision latitude can satisfy the need for autonomy, feedback can foster learning and thus increase job competence, and social support can satisfy the need to belong (Bakker & Demerouti, 2007). Job resources can also play an extrinsic motivational role insofar as resourceful working environments foster the willingness to dedicate one’s effort and abilities to the work task (Meijman & Mulder, 1998); job resources are, therefore, instrumental in achieving work goals (Bakker & Demerouti, 2007). For instance, social support from colleagues and feedback from superiors

can increase the chance of success in attaining one's work goals (Schaufeli & Bakker, 2004). In the health-impairment process, burnout is often regarded as a mediator between job demands and employee health and well-being, whereas work engagement is often regarded as a mediator between job resources and organizational outcomes in the motivational process (Schaufeli & Taris, 2014). Hence, these dual processes are thought to affect job performance in different ways (Bakker & Demerouti, 2016).

Furthermore, the interaction between job demands and job resources is thought to impact the development of job strain and motivation. More specifically, job resources can buffer the impact of job demands on job strain (Bakker & Demerouti, 2007, 2016). Characteristics of the work situation may also buffer the impact of job demands on job strain if the reasons for the presence of a stressor are predictable, understandable, or controllable (Kahn & Byosiere, 1992). Several studies have found that employees who have access to many job resources cope better with their job demands. For instance, a study among Finnish teachers found that the relationship between pupil misbehavior and work engagement was negatively moderated by the following job resources: supervisor support, organizational climate, and appreciation (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). Similarly, a study among employees working in higher education in the Netherlands found that the job resources job autonomy, social support from colleagues, and high-quality relationships with supervisors significantly buffered the impact of the job demand work overload on the burnout construct exhaustion (Bakker, Demerouti, & Euwema, 2005). How job resources act as buffers is thought to differ between resources (Bakker et al., 2007). For example, support from supervisors may ease the influence of job demands on strain because their appreciation and support might cast the demands in another, more positive fashion (2007).

Lastly, the JD-R model proposes that job resources particularly influence motivation when job demands are high (Bakker & Demerouti, 2016). This proposition is in accordance with Hobfoll's (2001) notion that all types of resources gain their motivational potential and are particularly useful when needed. To illustrate, Bakker and colleagues (2007) have found that job resources particularly boost work engagement when job demands are high, which lends support to what they call the "coping hypothesis." The coping hypothesis suggests that employees are more likely to use job resources as a coping mechanism under stressful conditions (Demerouti & Bakker, 2011).

An important elaboration of the JD-R model is the nature of job demands. More specifically, job demands are found to play a motivational role. A meta-study differentiated two categories of job demands—namely, challenging and hindrance demands (Crawford et

al., 2010). Challenging demands (e.g., time pressure, high workload, high levels of responsibility) can be described as having the potential to promote personal growth or gains, trigger positive emotions, and facilitate an active or problem-solving style of coping, which are all positively associated with work engagement (2010). Hindrance demands (e.g., role conflict, role ambiguity, organizational politics) can be described as having the potential to harm or block personal growth or gains, trigger negative emotions, and provoke a passive or emotional style of coping, and are thus negatively associated with work engagement. The meta-study found that both challenging and hindrance demands were positively related to burnout, whereas hindrance demands were negatively related and challenging demands were positively related to work engagement. Hence, job demands may relate differently to specific outcome variables (Schaufeli & Taris, 2014).

An unresolved issue of the JD-R model is the definition of job demands and resources. Schaufeli and Taris (2014) argued that the difference between job demands and resources may not be as distinct as they are by definition. The authors explained that job demands and resources usually constitute two different factors because they are *valued* negatively or positively. Thus, challenging demands that are positively related to work engagement, as found by Crawford et al. (2010), might be re-conceptualized as “resources” since they are valued positively (Schaufeli & Taris, 2014). Similarly, the job control resource can be experienced negatively for some employees and therefore be considered a threatening resource. A threatening resource might thus be conceptualized as a “demand” since it is valued negatively (2014). Schaufeli and Taris (2014) argued that as a guiding principle, demands are appraised negatively and resources are appraised positively, but future research should still focus on challenging demands (i.e., positively valued demands) and threatening resources (i.e., negatively valued resources).

In this thesis, the JD-R model will be used as a theoretical framework as it accounts for various types of well-being (Bakker & Demerouti, 2016). This thesis will investigate work engagement as a part of the motivational process, and workaholism as a part of the health-impairment process. Furthermore, this thesis will investigate whether the established definitions of job demands and resources are applicable when studying work engagement and workaholism simultaneously in the JD-R model.

Work Engagement

The concept of *work engagement* has emerged from the research on burnout, where the two concepts are viewed as each other's opposite (Maslach, Schaufeli, & Leiter, 2001; Schaufeli, Taris, & van Rhenen, 2009). In contrast to burned-out employees, engaged employees have a sense of energetic and effective connection with their work activities and regard themselves as able to deal with job demands (2009). The most used definition of work engagement (Hakanen & Peeters, 2015; Mäkikangas, Schaufeli, Tolvanen, & Feldt, 2013) defines the concept as a "positive, fulfilling, work-related state of mind that is characterized by vigor, dedication and absorption" (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p. 74). *Vigor* is characterized by high levels of energy and mental resilience while working, whereas *dedication* is characterized by strong involvement in one's work and the experience of a sense of significance. *Absorption* is characterized by full concentration and content engrossment in one's work, where time passes quickly and difficulty detaching from the work at hand might be experienced (Bakker & Demerouti, 2008). The three dimensions are thought to cover behavioral-energetic (vigor), emotional (dedication), and cognitive (absorption) components (Schaufeli, 2013). In other words, work-engaged employees have high levels of energy, are enthusiastic about their work, and are often so fully immersed in their work that time seems to pass more quickly (Bakker & Demerouti, 2008).

Antecedents. The majority of published empirical research on the antecedents of work engagement has been grounded in the job demands-resources model (Crawford et al., 2010). As the JD-R model states, job resources can lead to work engagement through the motivational process. Job resources can be energizing, encourage persistence, and focus one's effort, thereby fostering work engagement (Schaufeli, 2013). Previous studies have consistently found that the job autonomy resource is positively related to work engagement (Bakker & Demerouti, 2008; Salanova & Schaufeli, 2008). *Job autonomy* refers to employees' influence in decisions over important matters, such as the pacing and timing of their work (Bakker & Demerouti, 2007). It is considered a job resource as it is associated with opportunities to cope with stressful situations; therefore, autonomy is crucial for employee health and well-being (Karasek, 1998). A similar construct to job autonomy is job control, which refers to control over tasks and conduct during the work day (Karasek, 1979). Job control is regarded as a job resource that allows employees to deal with workplace demands (Bakker & Demerouti, 2007). A study among Finnish health care personnel tested the relationship of different job resources to work engagement over a period of two years. The results showed that job control had the most consistent positive relation to the dimensions of

work engagement, which implies that a sufficient level of job control is needed in order to increase one's work engagement (Mauno, Kinnunen, & Ruokolainen, 2007).

The job resource social support has also been found to be positively related to work engagement (Bakker & Demerouti, 2008; Hakanen, Bakker, & Schaufeli, 2006). *Social support* refers to a helpful social interaction involving coworkers and/or supervisors (Karasek & Theorell, 1990) and is considered a job resource since it promotes the achievement of work goals (Bakker & Demerouti, 2007). A positive social relationship with a supervisor can facilitate access to resources such as assistance and advice, and can therefore diminish stressful experiences caused by demanding tasks (Hobfoll, 2001). Social support is often divided into support from organizations, supervisors, and colleagues. One study found that coworker support had a positive relation to work engagement, whereas support from supervisors had no such relationship (Schaufeli et al., 2009). In contrast, a study by Caesens and colleagues (2014) found that perceived supervisor support was positively related to work engagement, and was an even more powerful source of support than perceived organizational and coworker support. Social support from supervisors has also been found to moderate the effect of job demands on work engagement (Bakker et al., 2007).

Scholars have generally concluded that job demands do not predict work engagement (Crawford et al., 2010). Still, job demands have been found to be related to work engagement, even though the relationship between job resources and work engagement was found to be stronger (Hakanen et al., 2006; Halbesleben, 2010; Mauno et al., 2007). A meta-analysis by Crawford and colleagues (2010) found that the relationship of job demands to work engagement is dependent of the nature of the demands. Their results showed that challenging demands such as job responsibility, time urgency, and workload were positively related to work engagement; whereas hindrance demands like emotional conflicts, organizational politics, and role conflicts were negatively related to work engagement. These researchers (2010) argued that challenging demands trigger positive emotions and an active, problem-focused coping style that increase one's willingness to invest energy in efforts to meet the demands, which in turn increases work engagement. Similarly, hindrance demands trigger negative emotions and a passive, emotion-focused coping style that lead to withdrawal from the situation, consequently reducing work engagement. Schaufeli and Taris (2014) have argued that to properly understand the motivational process of the JD-R model, future research should acknowledge the direct and indirect impact of job demands on work engagement.

Consequences. Work engagement has been found to have predominantly positive organizational and personal outcomes. Work engaged employees exhibit higher in-role and extra-role performance (Christian, Garza, & Slaughter, 2011), indicating that engaged employees perform well and are willing to go the extra mile (Bakker & Demerouti, 2008). Work engagement is further related to productivity, job satisfaction, job involvement and organizational commitment, proactive behavior, and lower turnover intention (Hakanen et al., 2012; Salanova & Schaufeli, 2008; Schaufeli, 2013); moreover, it has also been found to be negatively related to burnout (Halbesleben, 2010), presenteeism, and sleeping problems (Hakanen et al., 2012). Longitudinal research has also found that work engagement is related to a decrease in ill-health and depressive symptoms over time (Hakanen & Schaufeli, 2012; Shimazu et al., 2012). This indicates that even though work engagement is related to overwork, work-engaged employees do not overwork at the expense of their health (Hakanen et al., 2012). Research has further shown that work engagement is positively related to work–family enrichment and negatively related to work–family conflict (2012), also over time (Hakanen & Peeters, 2015).

Workaholism

The term *workaholism* was first introduced by Oates (1971), who described it as “the compulsion or the uncontrollable need to work incessantly” (p. 11). Several definitions of workaholism exist, with contemporary definitions commonly defining workaholism as a continual pattern of high work investment, long working hours, working beyond expectations, and an all-consuming obsession with work (Griffiths, 2011; Ng, Sorensen, & Feldman, 2007). In the literature, there are divergent opinions regarding the affective component of workaholism. For instance, Spence and Robbins (1992) regarded true workaholics as highly involved in work but low on work enjoyment, whereas others have regarded workaholics as those who greatly enjoy the act of working (e.g., Ng et al., 2007). Schaufeli et al. (2008) argued that work enjoyment should not be considered a defining feature of workaholism. Rather, the authors considered the affective dimension of work enjoyment to be part of work engagement, not workaholism.

In this thesis, workaholism is defined as “the tendency to work excessively hard and to being obsessed with work, which manifests itself in working compulsively” (Schaufeli, Shimazu, & Taris, 2009, p. 322). This definition corresponds with Oates’ (1971) original definition of workaholism (Schaufeli, Bakker, van der Heijden, & Prins, 2009a) and conceptualizes workaholism as a combination of two dimensions: *working excessively* and

working compulsively. Working excessively represents a behavioral dimension whereby employees dedicate an exceptional amount of their time and energy to work, and work beyond what is required (Mazzetti, Schaufeli, & Gugliemi, 2014). Working compulsively represents a cognitive dimension whereby employees are obsessed with their work and persistently think about it, even when they are not working (Mazzetti et al., 2014).

An important aspect of workaholism is its addictive nature. Whereas people might work long hours due to financial problems, marital difficulties, social pressure, or career advancement, workaholic employees work long hours due to an obsessive internal drive that cannot be resisted (Schaufeli et al., 2009a). Thus, workaholism should be considered beyond the number of working hours, as one cannot neglect its addictive nature (Schaufeli, Bakker, van der Heijden, & Prins, 2009b).

Antecedents. Research has used several different approaches when investigating the antecedents to workaholism. Some studies have indicated that personality characteristics like perfectionism, nondelegation, achievement motivation, and a Type A personality are related to workaholism (Clark, Michel, Zhdanova, Pui, & Baltes, 2016; Mazzetti et al., 2014). In addition, it seems like the interaction between work climate and personality affects the relation to workaholism. For instance, Mazzetti and colleagues (2014) found that conscientiousness and self-efficacy were only related to workaholism in interaction with an overwork climate.

In the context of the JD-R model, workaholism has usually been treated like a personal resource (Bakker & Demerouti, 2016). There is thus a lack of studies investigating the relationship between working conditions and workaholism (Molino et al., 2016). However, some studies have investigated the relationship between job demands and workaholism. For instance, role conflict, workload, cognitive demands, and emotional demands have been found to be positively related to workaholism (Molino et al., 2016; Schaufeli et al., 2008; Taris, Schaufeli, & Verhoeven, 2005). Role conflict is a demand that has frequently been reported as a source of stress among academics (Gillespie et al., 2001). This type of conflict can be defined as incompatible expectations among the roles one possesses (Idris, 2011). A study among Dutch junior doctors found that the two dimensions of workaholism were strongly related to intra-role conflict, i.e., conflict between different roles at work (Schaufeli et al., 2009b). Another prevalent demand among academics is workload (Winefield, 2000). Work pressure and time pressure involve the sense of having too much to do in the time available, and is often treated as an indicator of workload (Boyd et al., 2010). Workload is considered as a central component of job demands for most workers (Karasek & Theorell, 1990) and has

been found to have a positive relationship with workaholism (Schaufeli et al., 2008).

It seems that the type of demand relates differently to the two dimensions of workaholism. One study found that quantitative demands (e.g., work overload, mental and organizational demands) are more important for working excessively than working compulsively (Schaufeli et al., 2008). For instance, work overload was found to be the most important predictor for working excessively, whereas its relationship to working compulsively was relatively weak. On the other hand, qualitative demands (e.g., work–family conflict, mental and emotional demands) are important for both dimensions (2008).

The relationship between job resources and workaholism has not been studied often (Clark et al., 2016). Still, both dimensions of workaholism have been found to be related to a lack of resources (Schaufeli et al., 2008). Schaufeli and colleagues (2008) found in their study that workaholism was related to a lack of supervisory support, which they suggested might be because workaholics work in unfavorable psychological environments. In contrast, Caesens and colleagues (2014) found that coworker support was the only work-related social support that was negatively related to workaholism. Another study tested whether job resources could buffer the effect of job demands and workaholism. This study found that the job security and opportunities for development resources significantly moderated the relationship between job demands and resources, and is thus a starting point for expanding the buffer hypothesis to workaholism (Molino et al., 2016).

Job autonomy has traditionally been considered as a resource that can buffer the relationship between job demands and work-related outcomes (Karasek, 1979). However, several researches have begun to question whether job autonomy can in fact increase workaholic tendencies. For instance, one study found that employees with work latitude can use this latitude to increase, rather than decrease, their experience of overload (Laurence, Fried, & Raub, 2016). As workaholics are known to create self-imposed demands, and thus make their work more complicated than necessary (Hakanen et al., 2012), one can believe that job autonomy may increase employees' workaholic tendencies. This notion is supported by Hakanen and Peeters (2015), who emphasized that professional groups with high job autonomy can promote both engaged and workaholic tendencies. Similarly, Wrzesniewski and Dutton (2001) claimed that employees with control may use their high decision latitude to craft their work toward increased levels of duties and responsibilities.

There is some empirical evidence for the relationship between job autonomy and workaholism. A study of full-time employees from different occupational sectors compared four types of employee well-being—namely, relaxed, work-engaged, workaholic, and burned-

out. The results showed that work-engaged employees experienced the most job control compared to the other groups, whereas workaholic employees had a higher score on job control than relaxed employees (Salanova et al., 2014). Similarly, a study among Dutch medical residents found that workaholic employees did not differ from non-workaholic employees regarding the job control resource (Schaufeli et al., 2009a). On the contrary, Schaufeli et al. (2008) found a negative relationship between job control and the drive dimension (i.e., compulsivity) of workaholism.

In sum, workaholic employees were found to experience more job demands and less job resources than non-workaholic employees (Schaufeli et al., 2009a).

Consequences. Workaholism has been demonstrated to have mainly negative consequences for organizations and employees. Still, workaholism has also been found to be related to organizational commitment (Hakanen et al., 2012). Even though workaholic employees appear to feel committed to their organization, longitudinal research has not found a causal link between workaholism and job performance (Clark et al., 2016; Shimazu et al., 2012; Shimazu et al., 2015). This implies that despite workaholism being related to excessive working, workaholics do not appear to be more productive workers (Clark et al., 2016). Furthermore, it seems as workaholic employees work so hard and so compulsively that they do not have time to enjoy their job, and therefore feel less job satisfaction (Del Libano et al., 2012). Workaholism was further found to be related to sleeping problems (Hakanen et al., 2012; Schaufeli et al., 2008), absenteeism due to illness (Hakanen et al., 2012), and emotional/mental and physical psychosomatic complaints (Clark et al., 2016). Longitudinal research has also found that workaholism is related to a decrease in life satisfaction and an increase in ill-health (Shimazu, Schaufeli, & Taris, 2010; Shimazu et al., 2015). In addition, workaholism was found to be negatively related to work–family enrichment and positively related to work–family conflict (Falco et al., 2013), even over time (Hakanen & Peeters, 2015).

Comparing Workaholism and Work Engagement

Russell's circumplex model of affect (1980), which was later adapted to the workplace (Bakker & Oerlemans, 2011), can be used as a theoretical framework for distinguishing between different types of work-related subjective well-being (i.e., work engagement, workaholism, burnout, and job satisfaction). Work-related subjective well-being can be understood as a linear combination of two underlying orthogonal dimensions, which run from pleasure to displeasure, and activation to de-activation (Bakker & Oerlemans, 2011).

According to the framework, work engagement is characterized by high activation and high pleasure, while workaholism is also characterized by high activation, but also by displeasure. Furthermore, burnout is regarded as the opposite pole of work engagement and is characterized by low activation and displeasure. Job satisfaction is regarded as the opposite pole of workaholism, which is also characterized by low activation and pleasure. Salanova and colleagues (2014) have found empirical support for the theoretical framework. They found that the “pleasure” dimension had a central role in the taxonomy of work-related well-being. Whereas work engagement was characterized by high levels of pleasure, workaholism was characterized by low levels of pleasure. The results also showed that both work engagement and workaholism scored high on the energy dimension (similar to the activation dimension) and can be seen as positive and negative heavy work investors, respectively (Salanova et al., 2014).

As accounted for above, both work engagement and workaholism are characterized by heavy work investment (Schaufeli, Shimazu, et al., 2009). Several studies have supported the notion that workaholism and work engagement are related to working excessively hard (e.g., Salanova et al., 2014), which may be because the two constructs share the same behavioral component (Schaufeli, Shimazu, et al., 2009). Whereas workaholics are described as hard workers because of an obsessive inner drive they cannot resist, work-engaged employees work hard because they get pleasure from the work itself (2009). Hence, work-engaged employees lack the compulsive drive typical of workaholism (2009). In other words, engaged workers work hard because they like and enjoy work for its own sake, whereas workaholics work hard because they are driven by a strong inner obsession with their job (Bakker & Demerouti, 2008; Hakanen et al., 2012). This is supported by a study that investigated the underlying motivation of work engagement and workaholism. Anchored in self-determination theory, it was found that workaholic employees are mainly driven by controlled motivation, whereas work-engaged employees are mainly driven by autonomous motivation. More specifically, workaholic employees are driven by an external pressure to work, while engaged employees act with a sense of volition (van Beek, Taris, & Schaufeli, 2011).

Several researchers have investigated the relationship between work engagement and workaholism, and despite varying results, their research mainly agrees that the two constructs are distinct. Some research has found that the absorption of the work engagement dimension, in addition to load on work engagement, also has a weak loading on workaholism (Clark et al., 2014; Hakanen et al., 2012; Schaufeli et al., 2008). This suggests that workaholism and work engagement overlap with the feeling of being absorbed in one’s work (Schaufeli et al.,

2008), where a high level of absorption could be a sign of workaholic tendencies (Hakanen et al., 2012). However, van Beek et al. (2011) only found a weak correlation between work engagement and workaholism, indicating that the two constructs are relatively independent. These findings were supported by Shimazu and colleagues (2012), who found that work engagement and workaholism only had a weak correlation, implying that the two constructs only share little variance. Furthermore, work engagement and workaholism are mainly related to job characteristics in the opposite direction, and thus appear to be distinct constructs (Clark et al., 2014; Schaufeli et al., 2008)

Work engagement and workaholism also seem to be unrelated over time. A study by Mäkikangas and colleagues (2013) investigated the development of work engagement and workaholism among Finnish managers over a two-year period. The results showed that work engagement and workaholism do not typically co-occur within an individual and that the level of both constructs remains stable across time. Similarly, a study among Finnish dentists found that workaholism and work engagement were unrelated over a period of seven years (Hakanen & Peeters, 2015).

In sum, work engagement and workaholism share only a weak proportion of their variance, which indicates that the two constructs are relatively distinct and unrelated over time (Mäkikangas et al., 2013). Notably, one study revealed three different groups of hard workers—namely, workaholic employees, engaged employees, and engaged workaholics (van Beek et al., 2011). The results showed that workaholic employees and engaged employees work equally hard, whereas engaged workaholics work the hardest. The study also revealed that engaged workaholics experience less burnout than workaholic employees, which might suggest that work engagement buffers the adverse effects of high levels of workaholism (van Beek et al., 2011).

Hypotheses

This study aimed to investigate how the same job demands and resources affect both workaholism and work engagement. To investigate the research question, the job autonomy and supervisor support job resources and the workload and role conflict job demands were included as independent variables. Furthermore, the work engagement and workaholism well-being constructs were included as dependent variables.

The JD-R model proposes that job resources have a motivational potential and can lead to work engagement. This is supported by numerous studies (e.g., Bakker & Demerouti, 2008). Thus, the first hypothesis is:

Hypothesis 1: *Job resources (i.e., job autonomy and supervisor support) are positively related to work engagement.*

The JD-R model further describes how job demands can cause a health-impairment process and lead to negative outcomes. Job demands have been found to be related to workaholism (e.g., Schaufeli et al., 2008), and workaholism has been shown to lead to negative outcomes (e.g., Clark et al., 2014). Thus, I argue that workaholism can be tested as a part of the health-impairment process of the JD-R model. The study's next hypothesis is:

Hypothesis 2: *Job demands (i.e., workload and role conflict) are positively related to workaholism.*

Schaufeli and Taris (2014) demonstrated how job demands can be valued both positively and negatively; they also stated that future research should investigate the direct and indirect impact of job demands on work engagement. Work engagement has been shown to be affected differentially by the nature of the demand, whether it be a hindrance or challenging demand (Crawford et al., 2010). Since role conflict is considered to be a hindrance demand (e.g., 2010) and workload is considered to be a challenging demand (e.g., 2010), I hypothesize:

Hypothesis 3: *Role conflict is negatively related to work engagement, and workload is positively related to work engagement.*

The JD-R model proposes that job resources particularly influence work engagement when job demands are high (Bakker & Demerouti, 2007). I argue that the job demand workload will be considered a hindrance demand in the interaction with supervisor support and work engagement, and a challenging demand in the interaction with autonomy and work engagement. The next hypothesis is:

Hypothesis 4: *Workload negatively moderates the relationship between supervisor support and work engagement, and positively moderates the relationship between autonomy and work engagement.*

An unresolved issue in the JD-R model is how job resources can be valued differently (i.e., buffering or threatening; Schaufeli & Taris, 2014). Earlier research has found that supervisor support is negatively related to workaholism (e.g., Schaufeli et al., 2008), whereas job autonomy has been seen to be positively related to workaholism (e.g., Salanova et al.,

2013). Thus, I hypothesize that supervisor support will act as buffering resource, whereas job autonomy will act as a threatening resource:

Hypothesis 5: Supervisor support is negatively related to workaholism, and job autonomy is positively related to workaholism.

The JD-R model further proposes that job resources can buffer the effect of job demands on job strain. Some studies have shown that job resources might buffer the impact of job demands on workaholism (e.g., Molino et al., 2016). Thus, I argue that autonomy can act as a buffering resource in interaction with role conflict, and as a threatening resource in interaction with workload:

Hypothesis 6: Job autonomy negatively moderates the relationship between role conflict and workaholism, and positively moderates the relationship between workload and workaholism.

To my knowledge, this is the first study to investigate work engagement and workaholism simultaneously among Norwegian academics. Furthermore, to my knowledge, this is the first study to hypothesize how job resources can relate differently to workaholism (i.e., as buffering or threatening resources). The study’s hypotheses are displayed in Figure 1.

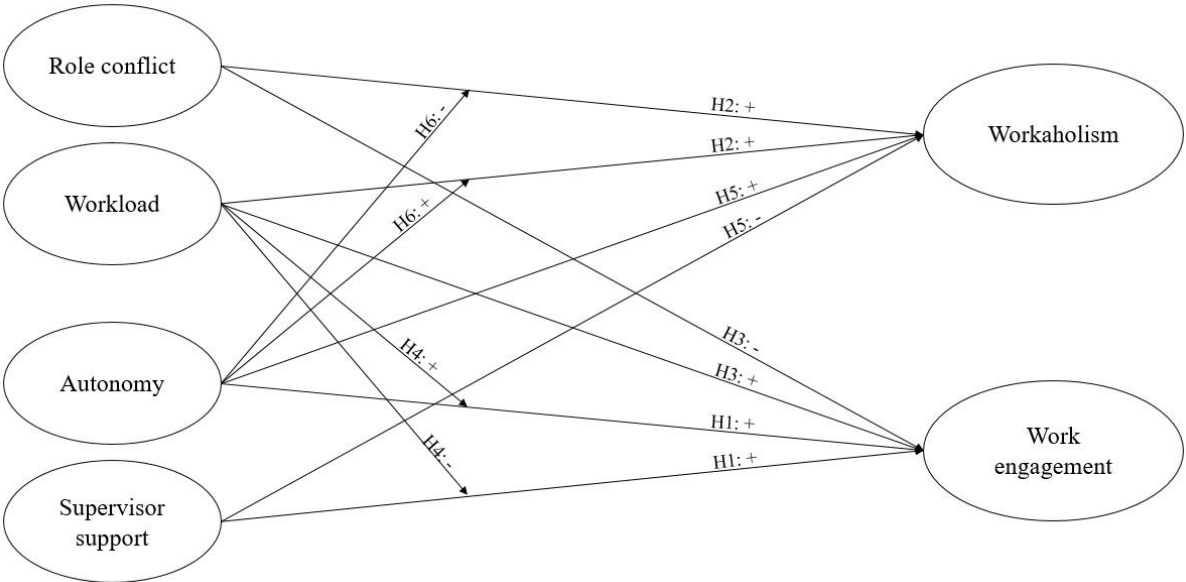


Figure 1. The study’s working model and its hypotheses (H) with corresponding numbers.

Methods

Study Design

The data in this thesis were collected through the ARK Intervention Programme, which is a research-based tool for working environment surveys and the implementation of interventions in knowledge-intensive organizations (Undebakke, Innstrand, Anthun, & Christensen, 2015). The implementation of the ARK Intervention Programme consists of five phases: (1) preparation of the organization and management, (2) screening with a questionnaire and the presentation of results, (3) development of action based on results, (4) implementation of actions, and (5) evaluation of the process and the results. During the second phase, the Knowledge Intensive Working Environment Survey Target (KIWEST) mapping tool was used. The KIWEST questionnaire's aim is to map important psychosocial working environment factors for universities and university colleges (Undebakke et al., 2015).

In this thesis, data collected with the KIWEST questionnaire between October 2013 and December 2015 were used. Employees at Norwegian universities and university colleges with regular payroll in a 20% position or more were invited to participate. Prior to the data collection, the survey was reported to the Data Protection Official for Research (Undebakke et al., 2015). All employees received an email with information regarding the rules of privacy protection and a private link to the online questionnaire. The survey was kept open for three weeks, and up to two reminders were sent to those who did not respond (2015). The data collected were cross-sectional.

The sample included a total of 5146 academics (i.e., professors, associate professors, lecturers, post-doctors, and doctoral research fellows) from the higher education sector in Norway. Among the respondents, 54.1% were men and 43.9% were women. Further, 13.1% were under 30 years old, 24.6% were in the 30–39-year-old age group, 23.9% were in the 40–49-year-old age group, 21.8% were in the 50–59-year-old age group, and 16.6% were over 60 years old.

Measures

The KIWEST questionnaire contains 29 validated scales to measure psychosocial working environment factors. The scales used in this study were job autonomy, supervisor support, role conflict, workload, work engagement, and workaholism.

Job autonomy. The extent to which the respondents felt they had autonomy and influence on how their work was carried out was measured by four items, as described by Näswall et al. (2010). An example item is “I have a sufficient degree of influence in my

work.” The responses were measured on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), where high scores indicate a strong sense of autonomy.

Supervisor support. The extent to which the respondents experienced support from their closest supervisor was measured by three items, adapted from Pejtersen, Kristensen, Borg, and Bjorner (2010). An example item is “My immediate superior gives me the help and support I need from her/him.” The responses were measured on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). High scores indicate that the respondents felt a high degree of support from their immediate superior.

Role conflict. The extent to which the respondents perceived conflict between their different roles was originally measured by four items, as described by Dallner and colleagues (2000, cited in Undebakke et al., 2015). In the KIWEST questionnaire, the role conflict scale included four items, where the fourth item was “My job involves tasks that are in conflict with my personal values.” To my knowledge, the original scale only included three items, with the fourth item regarded as a single item measuring general role expectations (Lindström et al., 2000). Thus, it was decided to remove the fourth item from the scale, and role conflict was thus measured by three items, as done by Lindström and colleagues (2000). An example item is “I frequently receive incompatible requests from two or more people.” The responses were recorded on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), where high scores indicate high conflict between one’s roles.

Workload. The extent to which the respondents experienced having too much to do in too little time was measured by three items adapted from Näswall et al. (2010). A typical item is “It happens quite often that I have to work under heavy time pressure.” The responses were measured on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). High scores indicate that the respondents experienced a heavy workload.

Due to conceptual confusion, I have chosen to rename the scale from its original name, *role overload*, to *workload*. Since the role overload scale is used to describe the experience of having too much to do in too little time as well as heavy workload (Näswell et al., 2010; Undebakke et al., 2015), I found it more accurate to rename the scale *workload*, as this term is more often treated as an indicator of having too much to do in too little time than role overload (Boyd et al., 2010). While role overload can be defined as conflict between several roles that require different, incompatible behaviors or changes in behavior (Rizzo, House, & Lirtzman, 1970), and for that reason it is usually considered a hindrance demand (Crawford et al., 2010), the term *role overload* is not compatible with how it is used in this thesis. Here, the scale is treated as a challenging demand, and thus renaming the scale was

considered appropriate.

Work engagement. The extent to which the respondents experienced a high degree of work engagement was measured by the nine-item Utrecht Work Engagement Scale (UWES; Schaufeli & Bakker, 2003). The three dimensions of work engagement (i.e., vigor, dedication, and absorption) were measured by three items each. Examples of items used are the following: “At my work, I feel bursting with energy” to measure vigor; “I am enthusiastic about my job” to measure dedication; and “I get carried away when I’m working” to measure absorption. The responses were measured on a seven-point Likert scale ranging from 1 (*never*) to 7 (*every day*). High scores indicate that the respondents experienced high engagement at work.

As the overall scores on work engagement are of interest in this thesis, work engagement was measured as a one-factor scale, indicating that all items load on one underlying dimension. Even though the three-factor scale (i.e., measuring all three dimensions) has been demonstrated to have a better fit than the one-factor scale, the one-factor scale is found to be satisfactory (Schaufeli & Bakker, 2003).

Workaholism. The extent to which respondents indicated an addiction to work was measured by the Dutch Workaholism Scale (DUWAS; Schaufeli, Shimazu, et al., 2009). The scale measures the two dimensions of workaholism (i.e., working excessively and working compulsively) with five items each. An example item for measuring working excessively is “I find myself continuing to work after my co-workers have called it quits;” and an example item for measuring working compulsively is “It is important to me to work hard even when I do not enjoy what I am doing.” The responses were measured on a four-point Likert scale ranging from 1 (*almost never*) to 4 (*almost always*), where high scores indicate a high degree of compulsory and exaggerated work effort.

As true workaholics have been found to score high on both dimensions, working excessively and working compulsively (Schaufeli et al., 2009), my aim was to investigate workaholism as one factor. Yet, since the two-factor scale for measuring workaholism has been demonstrated to be superior to the one-factor scale (Balducci et al., 2015; Schaufeli, Shimazu, et al., 2009), it was decided to measure workaholism with the two-factor scale. The two dimensions of workaholism are hereafter referred to as *working excessively* and *working compulsively*.

Control variables. To rule out alternative explanations for the findings (Schmitt & Klimoski, 1991, cited in Becker, 2005), the control variables age and gender were included in the first analysis, i.e., when investigating for main effects.

Missing Values

The original dataset included 5817 respondents. Gaskin (2017) argued that every respondent with more than 10% missing values should be excluded from the dataset. Thus, a total of 102 respondents were removed. I did not consider the removed respondents to reflect a common response issue, but rather a lack of response due to the long questionnaire. To elaborate, both scales on work engagement and workaholism were introduced late in the questionnaire and had equally missing data, even though they represented positive and negative work investment, respectively. In addition, the supervisor support scale in the KIWEST questionnaire included a response alternative, 6 (*not applicable*). Since this sixth response did not fit the continuous scale used in this analysis, a total of 569 respondents were removed from the dataset. After removal, the remaining respondents had less than 5% missing data. In the analysis, the remaining missing values were replaced with the mean value of their indicators. As recommended by Hair, Hult, Ringle, and Sarstedt (2014), mean value replacement should only be used when the data exhibit extremely low levels of missing data (i.e., < 5%), as in this data set. After the missing values were handled, the remaining sample included 5146 respondents.

Statistical Analysis

To investigate the hypothesis in this thesis, the statistical analysis Partial Least Squares Structural Equation Modeling (PLS-SEM) was chosen. SEM is a multivariate analysis that measures the relationship between latent variables and enables the analysis of all study variables simultaneously (Hair et al., 2014). Covariance-based structural equation modeling (CB-SEM) is a widely applied SEM approach based on the maximum likelihood estimation procedure. CB-SEM is favorable in theory testing and confirmation, while PLS-SEM is favorable in prediction and theory development (Hair, Ringle, & Sarstedt, 2011). In this thesis, the PLS-SEM was found to be appropriate since the study aimed to expand the JD-R model to account for workaholism as a part of the health-impairment process and the nature of job resources. In addition, PLS-SEM was chosen over CB-SEM due to the structural model's complexity (i.e., many constructs and indicators) and simplicity for testing interaction effects with latent variables (Hair et al., 2014; Lowry & Gaskin, 2014). The PLS-SEM analysis was conducted using SmartPLS (Ringle, Wende, Sven, & Becker, 2015).

Measurement model. In the measurement model, the PLS-SEM algorithm calculates the relationship between the reflective latent variables and its indicators, i.e., loadings (l). Here, the measurement model was evaluated by investigating the reliability and validity of the

construct measures. Reliability was investigated through indicator reliability and internal consistency reliability, while validity was investigated through convergent validity and discriminant validity. *Internal consistency reliability* assesses whether items measuring a construct are similar in their scores (Hair et al., 2014). Cronbach's alpha is the traditional criterion for internal consistency, but since the criterion tends to underestimate internal consistency reliability and can thus be considered as a conservative measure, the composite reliability was used instead (2014). The composite reliability for a construct varies between 0 and 1, where values around 0.60-0.70 are considered acceptable in exploratory research and values between 0.70 and 0.90 are considered satisfactory (Nunally & Bernstein, 1994, cited in Hair et al., 2014). Values above 0.95 are undesirable, as this may indicate that all the items measured the same phenomenon (2014). Furthermore, *indicator reliability* assesses how much of the variation in an item is explained by the latent construct. An item's outer loading should be above 0.70, as this indicates that the latent variable explains at least 50% of the variance in the item and thus shares a larger variance than the measurement error variance (2014). *Convergent validity* assesses to what extent items of a construct share a high proportion of variance. This can be established by investigating a construct's Average Variance Extracted (AVE), which is a measure of to what degree a latent variable explains the variance of its indicators (2014). The value of AVE should be 0.50 or above, as this indicates that the construct on average explains more than one-half of the variance of its indicators. *Discriminant validity* investigates whether a construct by empirical standards is truly distinct from other constructs. This can be assessed with the Fornell-Larcker criterion. The criterion postulates that the square root of each construct's AVE must be larger than its highest correlation with any other latent construct (2014). This criterion assesses whether a latent construct shares more variance with its assigned indicators than another latent variable (Hair et al., 2011).

Structural model. When the measurement model was evaluated as satisfactory, the relationships in the two structural models were assessed (Hair et al., 2014). In the structural model, the algorithm estimates the relationship between the latent variables, i.e., path coefficients (p), based on the estimated loadings. The PLS-SEM algorithm calculates the loadings and path coefficients as standardized coefficients, ranging from -1 to +1. The path coefficients can be interpreted as standardized beta coefficients (β) of ordinary least squares regressions (Hair et al., 2011). Since the PLS-SEM algorithm does not assume that data are normally distributed, a nonparametric bootstrap procedure is applied to assess the significance of the path coefficients (Hair et al., 2014). The path coefficients are calculated to maximize

the R^2 values of the endogenous variables. The R^2 values are standardized between 0 and +1, and represent the amount of explained variance in the endogenous variable (2014). A R^2 value of 0.25, 0.50, and 0.75 can be considered as weak, moderate, and substantial, respectively (Hair et al., 2011). The f^2 effect size can further be evaluated to examine specific exogenous constructs' impact on the endogenous variable's R^2 value. An exogenous variable's f^2 value of 0.02 is considered a small effect, 0.15 is considered a medium effect, and 0.35 is considered a large effect on the endogenous variable (2011).

Two PLS-SEM analyses were conducted: the first to test the direct effects (Hypothesis 1, 2, 3, and 5), and the second as a moderation analysis to test for interaction effects (Hypothesis 4 and 6). An interaction effect occurs when a moderator changes the strength or the direction of a relationship between two constructs in a model (Hair et al., 2014). The interaction term is created with the product indicator approach, where each indicator of the (mean-centered) exogenous latent variable is multiplied with each indicator of the moderator variable, thus creating an interaction term (2014).

Results

Descriptive Statistics

The descriptive statistics for the study variables are displayed in Table 1. The average responses to the items measuring job autonomy, supervisor support, and workload are slightly above the middle score of the scale. In contrast, the average responses to the items measuring role conflict are slightly below the middle score of the scale. The items measuring work engagement are on average well above the scale's middle score, indicating that the respondents on average experience work engagement *once a week* (4) or *a couple of times per week* (5). Lastly, the items that measured the two dimensions of workaholism, working excessively and working compulsively, are close to and slightly below the middle score of the scale, respectively. This indicates that the respondents on average experience workaholism between *sometimes* (2) and *often* (3).

Table 1
Descriptive Statistics of Study Variables

Variables	Min	Max	Mean	SD
<i>Job autonomy</i>	1	5		
Item 1			3.79	0.90
Item 2			4.06	0.77
Item 3			4.17	0.74
Item 4			3.64	0.83
<i>Supervisor support</i>	1	5		
Item 1			3.88	1.02
Item 2			3.75	1.06
Item 3			3.34	1.17
<i>Workload</i>	1	5		
Item 1			3.24	1.06
Item 2			3.60	0.99
Item 3			3.78	0.94
<i>Role conflict</i>	1	5		
Item 1			2.90	1.06
Item 2			2.78	1.06
Item 3			2.37	0.96
<i>Work engagement</i>	0	6		
Item 1			4.58	1.14
Item 2			4.56	1.16
Item 3			4.86	1.26
Item 4			4.93	1.15
Item 5			4.83	1.20
Item 6			4.86	1.25

Item 7			4.92	1.10
Item 8			4.66	1.19
Item 9			3.97	1.49
<i>Working excessively</i>	1	4		
Item 1			2.70	0.79
Item 2			2.49	0.85
Item 3			2.88	0.78
Item 4			2.27	0.91
Item 5			2.18	0.90
<i>Working compulsively</i>	1	4		
Item 1			2.13	0.84
Item 2			2.77	0.81
Item 3			2.12	0.86
Item 4			2.09	0.94
Item 5			1.82	0.85

Note. *SD* = standard deviation.

The correlations between the study variables are displayed in Table 2. The highest correlation was found between working excessively and working compulsively ($r = .68, p < .001$), followed by working excessively and workload ($r = .63, p < .001$). There was no significant correlation between working excessively and autonomy, work engagement and role conflict, or working compulsively and work engagement.

Table 2
Correlations of Study Variables

Variables	1	2	3	4	5	6	7
1. Job autonomy	1						
2. Supervisor support	.48**	1					
3. Workload	-.16**	-.18**	1				
4. Role conflict	-.47**	-.41**	.46**	1			
5. Work engagement	.38**	.32**	.01	-.28**	1		
6. Working excessively	-.01	-.08**	.63**	.30**	.18**	1	
7. Working compulsively	-.14**	-.15**	.45**	.33**	.01	.68**	1

Note. ** $p < .001$

PLS-SEM Analysis

Measurement model. Before evaluating the structural model, the reflective measurement models were evaluated.

Internal consistency reliability. The composite reliability of the study's constructs is displayed in Table 3. As shown, all variables exhibit values between 0.84 and 0.94, which

indicate good internal consistency reliability.

Indicator reliability. The indicators of the constructs job autonomy, supervisor support, workload, and role conflict all show loadings above the recommended value of 0.70 (see Table 3). Indicator 9 on the Work Engagement scale had an outer loading of 0.67 and was therefore below the recommended threshold. Since the value was close to 0.70, and the composite reliability and AVE (as accounted for below) were satisfactory, the item was not removed. Two of the indicators of the workaholism dimension working excessively (i.e., item 4 and 5), and one indicator of the workaholism dimension working compulsively (i.e., item 2), showed outer loadings below the recommended 0.70 value. Hair and colleagues (2014) only recommended removing items from a scale when it increases the composite reliability and the AVE value above the suggested threshold. As shown above, the composite reliability of both dimensions of workaholism were satisfactory and, as will be accounted for below, the AVE values for both workaholism dimensions were above the recommended threshold. Since the loadings were well above the critical value for elimination (i.e., below 0.40; Hair et al., 2011), they were not excluded from the scale. Thus, it was decided to keep all original items.

Convergent validity. As shown in Table 3, all constructs exhibit AVE values above the required minimum level of 0.50 and therefore display high levels of convergent validity.

Table 3
Measurement Model

Variables	Loading	Composite reliability	AVE
<i>Job autonomy</i>		0.86	0.62
Item 1	0.82		
Item 2	0.75		
Item 3	0.76		
Item 4	0.80		
<i>Supervisor support</i>		0.92	0.80
Item 1	0.90		
Item 2	0.92		
Item 3	0.86		
<i>Workload</i>		0.87	0.72
Item 1	0.83		
Item 2	0.85		
Item 3	0.88		
<i>Role conflict</i>		0.84	0.63
Item 1	0.80		
Item 2	0.82		
Item 3	0.76		

<i>Work engagement</i>		0.94	0.65
Item 1	0.78		
Item 2	0.81		
Item 3	0.80		
Item 4	0.90		
Item 5	0.89		
Item 6	0.81		
Item 7	0.85		
Item 8	0.73		
Item 9	0.67		
<i>Working excessively</i>		0.86	0.55
Item 1	0.83		
Item 2	0.78		
Item 3	0.74		
Item 4	0.69		
Item 5	0.66		
<i>Working compulsively</i>		0.85	0.53
Item 1	0.76		
Item 2	0.57		
Item 3	0.82		
Item 4	0.73		
Item 5	0.75		

Discriminant validity. As shown in Table 4, the square root of each construct's AVE is larger than its highest correlation with any other construct. This provides evidence for discriminant validity for each construct.

Table 4
Discriminant Validity Test of Study Variables

Variables	1	2	3	4	5	6	7
1. Job autonomy	1						
2. Supervisor support	0.48	1					
3. Workload	-0.16	-0.18	1				
4. Role conflict	-0.47	-0.41	0.46	1			
5. Work engagement	0.40	0.33	-0.00	-0.29	1		
6. Working excessively	-0.01	-0.08	0.65	0.31	0.15	1	
7. Working compulsively	-0.17	-0.17	0.46	0.35	-0.06	0.65	1
$\sqrt{\text{AVE}}$	0.78	0.89	0.85	0.79	0.81	0.74	0.73

Structural model. Four of the study's hypotheses were tested through the examination of the structural model, as displayed in Table 5. Hypothesis 1 predicted that the job autonomy and supervisor support resources were positively related to work engagement. The results gave strong support to the hypothesis, where job autonomy ($b = .28, p < .001$) had a stronger effect on work engagement than supervisor support ($b = .17, p < .001$). Further, the results supported Hypothesis 3, which predicted that role conflict ($b = -.14, p < .001$) was negatively, and workload ($b = .13, p < .001$) was positively, related to work engagement. In all, autonomy, supervisor support, conflict, workload, gender, and age accounted for 22% of the variance in work engagement. Job autonomy ($f^2 = .07$) had the largest effect on work engagement.

Hypothesis 2 predicted that the role conflict and workload job demands were positively related to workaholism. The results showed that workload was related to both working excessively ($b = .65, p < .001$) and working compulsively ($b = .40, p < .001$). Role conflict was found to be related to working excessively ($b = .07, p < .001$) and working compulsively ($b = .12, p < .001$). Thus, Hypothesis 2 was supported.

Hypothesis 5 predicted that supervisor support was negatively related to workaholism, whereas autonomy was positively related to workaholism. The hypothesis received partial support, as autonomy was positively related to working excessively ($b = .12, p < .001$) but had a weak negative relationship with working compulsively ($b = -.05, p < .001$). Moreover, supervisor support was not significantly related to working excessively ($b = .00, ns.$), but did show a weak negative relation to working compulsively ($b = -.05, p < .001$). In total, autonomy, supervisor support, conflict, workload, gender, and age explained 44% of the variance in working excessively and 26% of the variance in working compulsively. Workload had the largest effect on both working excessively ($f^2 = .58$) and working compulsively ($f^2 = .17$).

In the examination of the structural model, age and gender were controlled for. The results indicated that men ($b = -.03, p < .001$) experience less work engagement than women and that work engagement increases with age ($b = .12, p < .001$). Regarding workaholism, the results indicated that men display more excessive ($b = .05, p < .001$) and compulsive ($b = .03, p < .001$) working than women and that excessive ($b = -.05, p < .001$) and compulsive ($b = -.18, p < .001$) working decreases with age.

Table 5

Main Effects of Study Variables on Work Engagement and Workaholism

Variables	Path Coefficient	R^2	f^2	95% CI
<i>Work engagement</i>		.22		
Job autonomy (H1)	.28**		.07	[.26, .30]
Supervisor support (H1)	.17**		.03	[.15, .19]
Role conflict (H3)	-.14**		.02	[-.17, -.12]
Workload (H3)	.13**		.02	[.11, .15]
Gender	-.03**		.00	[-.05, -.02]
Age	.12**		.02	[.10, .14]
<i>Working excessively</i>		.44		
Job autonomy (H5)	.12**		.02	[.10, .14]
Supervisor support (H5)	.00		.00	[-.02, .02]
Role conflict (H2)	.07**		.01	[.05, .09]
Workload (H2)	.65**		.58	[.63, .66]
Gender	.05**		.00	[.04, .06]
Age	-.05**		.00	[-.06, -.03]
<i>Working compulsively</i>		.27		
Job autonomy (H5)	-.05**		.00	[-.07, -.03]
Supervisor support (H5)	-.05**		.00	[-.07, -.03]
Role conflict (H2)	.12**		.01	[.10, .14]
Workload (H2)	.40**		.17	[.38, .42]
Gender	.03**		.00	[.02, .05]
Age	-.18**		.04	[-.19, -.16]

Note. ** $p < .001$, two-tailed; CI = confidence interval.

Moderated PLS-SEM

In order to test the interaction hypotheses, a moderated PLS-SEM was conducted. The results are displayed in Table 6. Hypothesis 4 predicted that workload would negatively moderate the relationship between supervisor support and work engagement, and positively moderate the relationship between job autonomy and work engagement. The results did not show any significant moderation effect.

The last hypothesis, Hypothesis 6, predicted that job autonomy would negatively moderate the relationship between role conflict and workaholism, and positively moderate the relationship between workload and workaholism. The hypothesis was partially supported, as job autonomy negatively moderated the relationship between role conflict and both working excessively ($b = -.08, p < .001$) and working compulsively ($b = -.03, p < .01$). Furthermore, job autonomy was found to negatively moderate the relationship between workload and

working compulsively ($b = -.04, p < .001$), which thus contradicts the hypothesis prediction. Lastly, job autonomy did not significantly moderate the relationship between workload and working excessively.

Table 6
Interaction Effects of Study Variables on Work Engagement and Workaholism

Variables	Interaction Effect	95% CI
<i>Work engagement (H4)</i>		
Supervisor support × Workload	-.02	[-.07, .02]
Job autonomy × Workload	.01	[-.01, .05]
<i>Working excessively (H6)</i>		
Role conflict × Job autonomy	-.08**	[-.10, -.06]
Workload × Job autonomy	-.01	[-.03, .01]
<i>Working compulsively (H6)</i>		
Role conflict × Job autonomy	-.03*	[-.06, -.01]
Workload × Job autonomy	-.04**	[-.06, -.02]

Note. * $p < .01$, two-tailed; ** $p < .001$, two-tailed; CI = confidence interval.

Discussion

This study aimed to investigate how the same job demands and resources are related to both workaholism and work engagement. The results demonstrated that job resource autonomy was positively related to work engagement and positively related to working excessively. Furthermore, the job resource of supervisor support was found to be positively related to work engagement and negatively related to working compulsively. The job demand workload was positively related to work engagement and both dimensions of workaholism. Finally, job demand role conflict was positively related to both dimensions of workaholism and negatively related to work engagement.

In addition to the main effects, this study also investigated interaction effects. The results did not show any significant interaction effect of workload on the relationship between either job autonomy and work engagement, or supervisor support and work engagement. Furthermore, the results showed that autonomy negatively moderated the positive relationship between role conflict and both dimensions of workaholism, as well as the positive relationship between workload and working compulsively.

These results will be compared with earlier empirical findings and the JD-R model, followed by a discussion of the theoretical and practical implications, as well as the limitations of the study and suggestions for future research.

Heavy Work Investment as Two Dual Processes

Work engagement and workaholism are considered as two constructs of heavy work investment, the former being considered positive and the latter negative (Salanova et al., 2014). The study's first hypothesis predicted that job resources were positively related to work engagement. As predicted, job autonomy ($b = .28, p < .001$) and supervisor support ($b = .17, p < .001$) were positively related to work engagement, in accordance with earlier research (Crawford et al., 2010; Halbeslesen, 2010; Hakanen et al., 2006). These findings support the motivational process of the JD-R model, which suggests that job resources can have a motivational role and create work engagement. This was found to apply to Norwegian academics, among whom job autonomy had a considerably stronger effect on work engagement than supervisor support. These findings are in accordance with earlier research, which found that job control is the most important predictor of work engagement (Mauno et al., 2007). The relationship between supervisor support and work engagement was lower than found in earlier research (e.g., Caesens et al., 2014). Since the most important resources for employees are thought to depend on the work environment (Bakker & Demerouti, 2016), one

plausible explanation may be that social support was a less important resource in this context because of the particular characteristics of the sample. As academics are often highly qualified in their own field, supervisor support may not be able to provide the skills and experience (Ng & Sorensen, 2008) that are usually required to achieve work goals (Bakker & Demerouti, 2007). Supervisor support may thus not be able to foster an extrinsic motivational role, as described by the JD-R model (Bakker & Demerouti, 2007). Instead, it may play an intrinsic role, in terms of satisfying a need for belonging (Schaufeli & Bakker, 2004). Thus, one explanation for the weaker relationship in the present sample between supervisor support and work engagement compared to earlier studies may be that such support primarily plays an intrinsic motivational role.

The study's next hypothesis predicted that job demands were positively related to workaholism. The hypothesis was supported, as a positive relationship was found between workload and both dimensions of workaholism, as well as role conflict and both dimensions of workaholism. These findings are in accordance with earlier research that found that job demands are positively related to workaholism (e.g., Schaufeli, Taris & van Rhenen, 2008). The strong link between job demands and workaholism may be caused by workaholic employees' tendency to go so far as to actively create more work for themselves, making their work more complicated than necessary, and refusing to delegate work (Machlowitz, 1980, cited in Schaufeli et al., 2008).

The findings indicate that when employees experienced a heavy workload, they tended to work more excessively ($b = .65, p < .001$) and compulsively ($b = .40, p < .001$). Workload had a considerably stronger effect on working excessively than on working compulsively. As found by Schaufeli and colleagues (2008), the working excessively scale is more related to quantitative demands (e.g., work overload and overwork) than the working compulsively scale. This may explain why workload has a stronger relationship with working excessively (i.e., the behavioral dimension) than working compulsively (i.e., the cognitive dimension). The results also demonstrated that role conflict was positively related to working excessively ($b = .07, p < .001$) and working compulsively ($b = .12, p < .001$). These findings are in accordance with Schaufeli and colleagues (2008), who found that qualitative demands (i.e., mental and emotional demands) such as role conflict are important predictors for both scales.

Taken together, the job demands workload and role conflict were significantly related to workaholism. These findings suggest that the JD-R model can be applied to workaholism as a negative well-being construct, and thus be compatible with the health-impairment process. As workaholism is characterized by high levels of energy (Salanova et al., 2014), and

health impairment process leads to a depletion of energy (Bakker & Demerouti, 2016), it may at first glance seem a bad fit. However, workaholic employees tend to use up their energy reservoir (Schaufeli et al., 2009a), which leads to an increase in health problems (e.g., Shimazu et al., 2010) including burnout (e.g., Hakanen, Peeters & Schaufeli, 2017). Hence, although workaholism has usually been treated as a personal resource in the context of the JD-R model (Bakker & Demerouti, 2016), the model can be extended to include workaholism as a mediator between job characteristics and job performance.

As discussed above, the two constructs of heavy work investment seem to relate to the two dual processes in the JD-R model (i.e., the motivational and the health-impairment process). It would seem initially that work engagement and workaholism have different antecedents, job resources being related to work engagement and job demands being related to workaholism. However, investigation of the study's next hypotheses shows the distinction between the antecedents to be less clear.

Hindrance and Challenging Demands

The study's third hypothesis predicted that workload was positively related to work engagement and that role conflict was negatively related to work engagement. The results supported the hypothesis, and were in accordance with the study by Crawford et al. (2010), who found that hindrance demands (i.e., role conflict) were negatively related to work engagement, and challenging demands (i.e., workload) were positively related to work engagement. The results of the present study among Norwegian academics indicate that the two demands affect work engagement differently. To elaborate, role conflict may lead to a passive, emotion-focused coping style, as the employee may believe that no effort will be sufficient to cope with the role conflict. Therefore, he or she may devote energy to coping with frustration rather than the conflict, which may lead to decreased work engagement (Crawford et al., 2010). Hence, role conflict is in line with the definition of job demands, as role conflict requires "sustained physical and/or psychological effort" (Bakker & Demerouti, 2007). Furthermore, workload can have the potential to promote an active, problem-focused coping style that increases the employee's willingness to invest energy to cope with the workload, and thus lead to an increase in engagement. Accordingly, workload can be argued to function as a job resource, as, by definition, job resources can be "functional in achieving work goals" (Bakker & Demerouti, 2007). This supports Schaufeli and Taris's (2014) discussion, which states that job demands may be viewed as resources if they are valued positively.

The study's fourth hypothesis related to how workload moderated the relation between job resources and work engagement. The hypothesis predicted that workload would negatively moderate the relationship between social support and work engagement and thus act as a hindrance demand, whereas it would positively moderate the relationship between autonomy and work engagement and thus act as a challenging demand. The results did not show any significant interaction effects and thus did not support the JD-R model's assumption that job resources especially affect work engagement when job demands are high (i.e., the so-called coping hypothesis; Bakker & Demerouti, 2016). Several studies that have tested the interaction between job demand and resources have failed to find any significant interaction effects. This may imply that interaction effects are hard to detect (Hu, Schaufeli & Taris, 2011).

In sum, the results indicate that job demands can relate differently to work engagement, depending of the nature of the demand. If the demand is considered a challenge, it can increase engagement, and if it is considered a hindrance, it can decrease engagement. These findings are in accordance with the refinements of the JD-R model, which suggest that job demands can play a motivational role (Schaufeli & Taris, 2014). Interestingly, a similar distinction in the nature of demands seems to be the case for job resources as well, as found in the study's next hypotheses.

Buffering and Threatening Resources

The study's fifth hypothesis predicted that job autonomy was positively related to workaholism and that supervisor support was negatively related to workaholism. This was partially supported. Results showed that supervisor support had only a weak negative relationship with working compulsively ($b = -.05, p < .001$), and no statistical significant relationship with working excessively. This is in line with an earlier study that found that supervisor support was negatively related to working compulsively but had no significant relationship to working excessively (Schaufeli et al., 2008).

Furthermore, the findings indicated that job autonomy was positively related to working excessively ($b = .12, p < .001$), and weakly negatively related to working compulsively ($b = -.05, p < .001$). These results provide an interesting insight into the concept of workaholism. First, as job resources are thought to have the potential to energize (Schaufeli, 2013), the positive relationship between job autonomy and working excessively can be one reason why workaholism is characterized by high levels of energy. Furthermore, studies have suggested that workaholism is related to a lack of resources (Schaufeli, Taris &

Bakker, 2008). However, researchers have begun questioning whether job autonomy might promote workaholic tendencies (e.g., Hakanen & Peeters, 2015). This is supported by the findings in the present study, which indicate that job autonomy can increase excessive working. Since workaholic tendencies are due to an obsessive internal drive, and not to external factors (such as financial problems or career advancement; Schaufeli, Shimazu et al., 2009), some degree of autonomy may be necessary in order for the employee to be able to act out his or her drive toward excessive working. The positive relationship between autonomy and working excessively raises the question of whether autonomy should be considered a threatening resource or a demand. As argued by Schaufeli and Taris (2014), a negatively appraised resource (i.e., a threatening resource) could be conceptualized as a demand, as job demands are by definition “aspects of the job that require sustained physical or psychological effort.”

The study’s sixth hypothesis aimed to explore how job autonomy would moderate the relationship between job demands and workaholism. It was predicted that job autonomy would negatively moderate the relationship between role conflict and workaholism and thus act as a buffering resource, and positively moderate the relationship between overload and workaholism and thus act as a threatening resource. The results showed that autonomy negatively moderated the relationship between role conflict and both dimensions of workaholism. This indicates that having control over one’s work can make it easier to handle conflict between different roles at work and thus reduce excessive and compulsive working. Contrary to the hypothesis, job autonomy was found to negatively moderate the relationship between workload and working compulsively. This result supports the notion of job autonomy as a buffering resource. Here, job autonomy seems to buffer the effect of job demand on workaholism and thus provide support for the buffer hypothesis on workaholism, as found by Molino et al. (2016).

The findings raise some questions about the nature of job autonomy in relation to workaholism. Autonomy seemed to act both as a buffering and a threatening resource in relation to workaholism. Most noticeably, job autonomy had a positive relationship with working excessively and did not significantly buffer the relationship between workload and working excessively. This indicates that autonomy does not act as a buffering resource in relation to the experience of a heavy workload or the act of working excessively. Future research is needed to unravel the ambiguous results of the relationship between autonomy and these variables.

Theoretical Implications

The findings from this study challenge some of the propositions of the JD-R model. Schaufeli and Taris (2014) have argued that, in order to understand both the motivational and health-impairment process, these two factors should be studied jointly, as in this study. As discussed above, the results indicate that job demands predict workaholism and job resources predict work engagement, hence supporting the health-impairment and motivational process of the JD-R model, respectively. In addition, supervisor support and role conflict related differently to the two heavy work investment constructs, supervisor support being negatively related to working compulsively and role conflict being negatively related to work engagement. This implies that the two processes are instigated by different antecedents. Yet, considering how autonomy and workload were related to both heavy work investment constructs, it blurs the distinction between the antecedents for the two processes (Bakker & Demerouti, 2007). However, the apparently unclear distinction between the motivational process and the health-impairment process may be due to a lack of a coherent definition of job demands and resources, as discussed below.

The job demand workload, which was found to relate positively to workaholism, was also found to be positively related to work engagement. This raises the question of the nature of job demands and resources. Since workload is found to have a positive relation to work engagement, Crawford and colleagues (2010) define it as a challenging demand, since it triggers an active, problem-focused coping style and the employee's willingness to invest energy in efforts to meet this workload. This definition is in accordance with that of job resources as being "functional in achieving work goals" (Bakker & Demerouti, 2007); it can thus play an extrinsic motivational role, as it fosters the willingness to dedicate one's effort and abilities to the work task (Meijman & Mulder, 1998).

Similarly to how job demands can relate differently to work engagement, the job resource autonomy, which was found to be positively related to work engagement, was also positively related to the workaholism dimension of working excessively. This gives empirical support to Schaufeli and Taris's (2014) inquiry into whether job resources can be perceived as threatening. The authors propose that threatening resources are resources that are valued negatively and thus can be defined as a job demand, since they require "sustained physical and/or psychological effort or skills, and are therefore associated with certain physiological and/or psychological costs" (Bakker & Demerouti, 2007). The same applies to autonomy in relation to working excessively.

Crawford et al. (2010) argue that a shortcoming of the JD-R model is that it lacks

theory to account for the variation in the way in which job demands can affect work engagement differently. This argument can be expanded to job resources as well. The JD-R model does not account for the variation in the way in which job resources can affect workaholism. This is potentially a greater issue when studying well-being constructs that are similar, such as the two heavy work investment constructs. The JD-R model has traditionally been used to test work engagement as a mediator in the motivational process and burnout as a mediator in the health-impairment process (Bakker & Demerouti, 2016). Although work engagement and workaholism are found to be independent constructs, they are both characterized by high levels of energy (Salanova et al., 2014) and share the behavioral component of “working hard” (Schaufeli, Shimazu, et al., 2009). These similarities may explain why work engagement and workaholism could be predicted by the same job characteristics. Thus, when the JD-R model is expanded to more similar constructs, such as work engagement and workaholism, the model does not seem to be able to account for the different effects of job resources on the health-impairment process.

To my knowledge, this is the first empirical study to provide evidence that job resources can have variable effects on the health-impairment process. This challenges the current definitions of job demands and resources in the JD-R model, and raises the question of whether job characteristics should be categorized as job demands and resources according to how they are valued, and whether the JD-R model needs to account for the way in which resources can act as threatening.

Practical Implications

The findings of this study can have implications for practitioners who are responsible for occupational health. As argued by Shimazu and colleagues (2015), work engagement should be promoted and workaholism should be prevented, as the two constructs predict opposite outcomes for future well-being and performance. This study provides some insight into the antecedents of the two heavy work investment constructs.

First, role conflict was found to be positively related to workaholism and negatively related to work engagement. This implies that role conflict does not provide any functional role for occupational well-being and should therefore be prevented. The results of the study found that autonomy could buffer the impact of role conflict on workaholism. This indicates that increasing employees’ autonomy can be a means of reducing the influence of role conflicts on workaholic tendencies.

However, the results demonstrated that autonomy was a predictor not only of work

engagement but also of working excessively. Simultaneously, autonomy was found to buffer the impact of role conflict on workaholism. These findings raise the question whether autonomy is a resource that should be promoted by practitioners. A plausible approach to promote work engagement and prevent workaholic tendencies when job autonomy is present may be to increase other job resources. As work engagement and workaholism do not typically co-occur in individuals (Mäkikangas et al., 2013), an increase in job resources can promote work engagement. Since workaholism is mainly found to be related to a lack of resources (e.g., Schaufeli et al., 2008), an increase in other job resources can be a fruitful approach to reducing workaholic tendencies, even when job autonomy is present.

Finally, workload was found to be the strongest predictor for working excessively and working compulsively. Since workload among academics tends to increase (Houston et al., 2006), this highlights the importance of actively managing the workload. A recent study has found that work overload initiated by the organization has more unfavorable outcomes for the employee than work overload initiated by the employee (Laurence et al., 2012). Regarding the moderate correlation between role conflict and workload ($r = .46, p < .001$), one method of reducing the workload initiated by the organization may be to reduce role conflict due to the triple demands of research, education, and administration among academics (Boyd et al., 2010).

Methodological Limitations

Although the findings of this study have yielded an interesting insight into how the same antecedents relate to work engagement and workaholism, the study has some limitations.

Since the study used a cross-sectional design (i.e., data collected at a single time point) no conclusions regarding the cause–effect relationship between the variables can be drawn (Field, 2009). For instance, the results indicated that workload was positively related to workaholism. However, the possibility cannot be excluded that workaholic employees create more demands for themselves and therefore experience a higher workload, rather than that workload predicts workaholic tendencies. Thus, longitudinal research is required to reveal causal relationships between the variables.

Another limitation is data collection by self-reporting. Self-reporting can inflate the relationships between the study's variables, owing to a common method variance (i.e., variance because of the measurement method; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For instance, common method variance from self-reporting can occur due to a

consistency motif (respondents' tendency to maintain consistency in their response) or social desirability (respondents' tendency to present themselves in a favorable light; Podsakoff et al., 2003). However, a recent study found that ratings from self-reports and coworker reports on the overall scales of work engagement and workaholism were largely in agreement (Mazzetti, Schaufeli, & Guglielmi, 2016). Bakker and Demerouti (2016) emphasize that future research aimed at testing the JD-R model should use ratings by others to capture more objectively how job characteristics influence well-being.

Another limitation of this study is its homogeneous sample. The characteristics of the sample limit its generalizability beyond highly educated employees in knowledge-intensive sectors in Nordic countries. On the other hand, it can be considered a strength that the current sample captures a big proportion of the same population and can thus be argued to be representative for Norwegian academics.

Finally, since this study conducted PLS-SEM analysis, there is also a potential for PLS-SEM bias. The PLS-SEM algorithm uses all the variance from the indicators that can help explain the latent variables, which also involves some degree of measurement error (Hair et al., 2014). This error is thus present in the model estimates. The bias can cause the relationships in the measurement model to be overestimated and the relationships in the structural model to be underestimated. However, simulation studies have shown that PLS-SEM bias is usually very low (Reinartz, Haenlein, & Henseler, 2009). Although PLS-SEM estimates can be biased, PLS-SEM exhibits higher levels of statistical power than CB-SEM. Hence, PLS-SEM is better at identifying population relationships than CB-SEM (Hair et al., 2014).

Suggestions for Future Research

Several studies have highlighted the importance of promoting work engagement and preventing workaholism, as the two constructs have opposite relations with well-being (e.g., Shimazu et al., 2015). Future research should therefore explore further how the same job demands and resources can affect both work engagement and workaholism. It is of practical importance to unravel the antecedents of heavy work investment and how the same job characteristics (e.g., workload and autonomy) positively relate to both constructs. In theoretical terms, it is important to investigate how job demands and job resources are valued positively or negatively. Thereafter, researchers should investigate whether job characteristics should be defined as a job demand or resource according to how they are valued (positively or negatively) or how they appear to the employee (hindrance or challenging demand, buffering

or threatening resource).

A fruitful approach to investigating how job demands and resources are valued in relation to work engagement and workaholism may be to use the bottom-up approach of the JD-R. In recent years, the JD-R model has incorporated how employees actively affect the characteristics of their own job through job crafting and self-undermining behavior (Bakker & Demerouti, 2016). While job crafting refers to self-initiated changes that employees make to the levels of their job demands and job resources, in order to better align these with their own abilities and preferences (Tims & Bakker, 2010), self-undermining refers to behavior that creates obstacles that may undermine their performance (Bakker & Costa, 2014). These approaches may give a better insight into when job demands (e.g., workload) and resources (e.g., autonomy) are valued positively or negatively by the employee, and thus how it can affect work engagement and workaholism.

Conclusion

This study aimed to investigate how the same job demands and resources were related to both work engagement and workaholism. The results demonstrated that job resources (i.e., autonomy and supervisor support) were positively related to work engagement, and job demands (i.e., workload and role conflict) were positively related to workaholism. In addition, the job demand workload was also positively related to work engagement, and the job resource autonomy was positively related to the working excessively dimension of workaholism. The findings indicate that the motivational and health-impairment processes of the JD-R model are not purely affected by, respectively, job resources and demands, using the current definitions. To my knowledge, this is the first empirical study to challenge the JD-R model's categorizations of a job characteristic as a job demand or resource. Future research should investigate how the job characteristics job autonomy and workload are related to both work engagement and workaholism, as this can be important knowledge for practitioners who are responsible for occupational health.

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