UiT The Arctic University of Norway

The Faculty of Health

Come Together: Promoting Work and Well-being

A study in the framework of the JD-R model

Benedicte Langseth-Eide

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Abstract

By global standards, Norway has a high education level, low inequality a healthy population, high employment, low unemployment and has been ranked as number 1 at the UNs Human Development Index for more than a decade. Yet, compared to other countries, the levels of sickness absenteeism are extraordinarily high, and one of three employees reports that work is partly or fully the reason why they are absent. At the same time, working life has undergone dramatic and continuously changes over the past decades due to globalization. These changes have impacted every line of business and employees now need to work harder and learn new things faster than before. In the pursuit of increased employee contributions, it is important for organizations and policymakers to know how they can create working conditions that enable employees to work hard and be well.

In this dissertation we have identified factors that can contribute to the improvement and enhancement of employee well-being and health. In Paper I we showed that job resources and job demands were associated with work engagement and workaholism, respectively. Both engaged employees and workaholics worked extra hours. However, work engagement was positively related to work-related health, whilst workaholism was negatively related to work-related health. In Paper II we revealed that job resources predict work engagement, that work engagement leads to reduced sickness absenteeism and that this relationship is mediated by health. In Paper III we found that organizational contexts (i.e., nature of work and occupation) and individual dispositions (i.e., positive trait emotions) influence the degree to which individuals appraise job demands positively and negatively.

Our results have refined the JD-R model. Specifically, we argue that workaholism could be included in the health-impairment process and that health-related indicators could be included as possible outcomes of the motivational process. Further, we suggest that job demands may play a role in the motivational process and that a more nuanced approach to measuring job demands should be applied in future research.

The findings presented in this dissertation challenge the policies and reforms currently applied to reduce sickness absenteeism in Norway. Today, attention is focused on removing or reducing aspects of work that may cause ill-being, which is important but not sufficient. Rather, our research suggests that the promotion of positive working conditions may lead to hard working *and* healthy employees. This can prove profitable for organizations, add societal value through a healthy work force, and contribute to solve parts of the absence puzzle. Authorities and employers are encouraged to utilize this perspective in the future.

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Table of Contents

List of Tables

List of Figures

1 Chapter: Introduction

Work is life, you know

- John Lennon

We spend a large proportion of our lives at work. That is, if we are healthy enough. As reported by the OECD, the levels of sickness absenteeism in Norway are extraordinarily high (Hemmings & Prinz, 2020) and approximately one in three employees on sick leave reports that aspects of their work is partly or fully the reason why they are absent (Bakke et al., 2021). Also sickness presenteeism in Norway is relatively high compared to other European countries (Aagestad et al., 2017).

According to Aagestad et al. (2017), active employees in the European economy spend approximately 1850 hours per year at work. Hence, the workplace is an arena in which there are great opportunities to impact people positively if we have knowledge on how to facilitate and enhance employee well-being, well-functioning and health. However, in work and organizational psychology, the main focus in research and practice has been on stress and preventive work aiming to remove and reduce factors that can cause harm, thereby neglecting the potentially positive effects of work (e.g., Shimazu & Schaufeli, 2008). Thus, the focus should not be merely on ill-being and ill-health with the purpose to reduce absenteeism, but also on the factors and processes that lead to well-being and positive work-related health, in order to increase attendance.

The broad goals of this dissertation is to explore and identify processes that strengthens employee well-being and work-related health, as well as to add to the refinement of the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Bakker & Demerouti, 2017). This dissertation consists of three separate articles aimed at investigating different parts of these overarching goals. In introducing this dissertation, I will outline the research context, discuss the role of work and development of occupational health, and give an overview of the development of the JD-R model.

1.1 Research context

1.1.1 General context

Over the past decades, working life has undergone dramatic and continuously changes due to globalization, advancements in automatization, robotization and digitalization, new information strategies as well as increased global competition. These changes have impacted every line of business, have given rise towards increased knowledge work, and has shortened the life cycle of job content (Bakke et al., 2021; Aagestad et al.,

2017). For example, the proportion of routine jobs are decreasing and there is now high Information and Technology Communications (ICT) intensity present in both service and manufacturing industries (Norwegian Ministry of Finance, 2021). Technology has, and will continue to, replace tasks that has been done by human labor while simultaneously give rise to new products and services (Norwegian Ministry of Finance, 2021). Consequently, employees need to learn new things faster and more frequently than before (Bakker & Demerouti, 2017). In the pursuit of increased employee contributions, it is important for organizations and policymakers to know how they can create working conditions that enable employees to perform well and be well (Christensen, 2017a; Rongen et al., 2014). One way to achieve this is to identify and implement factors that can contribute to the improvement and enhancement of employee well-being and health. Although well-functioning organizations and engaged employees in general promote work attendance, work performance and positive employee health, the details of these processes are not fully understood.

1.1.2 Key features in the Norwegian labor market and welfare system

By global standards, Norway has a high education level, low inequality, a healthy population, high employment, low unemployment and has been ranked as number 1 at the United Nations Human Development Index ranking for more than a decade (Hemmings & Prinz, 2020). In addition, the working hours in Norway are less than in many other countries due to a reduced standard working day, there are a larger proportion of part-time jobs, longer holidays and generous parental leave (Hemmings & Prinz, 2020). Yet, compared to other countries, the sickness absenteeism is extraordinarily high, and topping the list of OECD countries (Hemmings & Prinz, 2020). Moreover, approximately 10% of the Norwegian working age population is receiving disability benefits in which long-term sick leave is recognized as a significant predictor (Bakke et al., 2021). Musculoskeletal and mental health problems are the cause of 63 per cent of the sickness absenteeism in Norway and in the latter group almost half of those on sick leave reports that their job is fully or partly the reason why they are absent (Bakke et al., 2021). At the same time, in a comparison of sickness presenteeism (i.e., being at work despite being ill) between European countries, Norway was ranked 7th (Aagestad et al., 2017).

Sickness absence is a complex phenomenon that is influenced by a host of social, organizational, and personal factors and there exists no simple causal model to explain the phenomenon. Rather, it is considered a multifaceted phenomenon which can be understood and explained from many different perspectives and research fields. However, in the medical and social sciences, there is now a broad agreement that there is no clear relation between illness in the traditional sense and sickness absence (Bakke et al., 2021; Dorrington et al.,

2018). Moreover, it has been shown that what promotes work attendance and work ability are other factors than merely good medical health (Tynes et al., 2018). This is in line with Tetrick (2002) who argued that it is very unlikely that the same mechanisms that underlie employee ill-health and malfunctioning constitute employee health and optimal functioning. Hence, Tetrick (2002) argued that the traditional medical model needed to be supplemented by a distinct wellness model that focuses on positive occupational health and well-being.

Regardless of a clear and explicit political goal to reduce sickness absence in Norway, previous reforms have not had much success and the absence rates have remained unchanged for several years (Hemmings & Prinz, 2020). The main focus of previous reforms has been more on how to get people *into* work (Bakke et al., 2021; Hemmings & Prinz, 2020), and less on how to promote positive working experiences when people are *at* work. Furthermore, previous and current efforts at workplaces to prevent and reduce absenteeism have mainly been about removing or reducing risk factors that may lead to strain and ill-health (Bakke et al., 2021) and far less on the facilitation of positive working conditions. Thus, providing research that is not merely investigating how sickness absence can be prevented, but that emphasizes facilitation of employees' well-being that may promote work attendance with the workplace as the research arena seems to be of necessity.

1.1.2.1 Governmental policies

The governmental legislations and policies that are regulating working life in Norway includes components highly relevant for the research presented in this dissertation. First, in 2006, the Ministry of Labor and Social Affaires presented a new Work Environment Act (WEA-2006) which was a major revision of its predecessor dated 1977. The WEA-2006 has since its conception been updated regularly to reflect societal and work-related changes. The purpose of the WEA-2006, as written in § 1-1, is to provide (*i*) a basis for health-promoting and meaningful work situations, (*ii*) a basis for employers and employees to develop their work environment, and (*iii*) to foster inclusive workplaces. Second, in line with the WEA-2006, the government has developed the IA agreement for a more inclusive working life in Norway, which is a tripartite cooperation between the government, the employee's unions, and the traders unions. The IA agreement was introduced in 2001 as a response to the high and increased levels of sickness absenteeism and disability benefits and has since then been revised regularly. The objective of every version of the IA agreement has been to ensure that as many people as possible can work as long as possible as well as to reduce sickness absenteeism. Although there has been a marginal decrease in sickness absenteeism in Norway since 2001, the effects on sickness absenteeism have been minimal, particularly when taking into account the NOK 21 billion (approximately EUR 2 million) spent on different IA measures, projects and means in the years 2001-2018. In 2019, the latest version

of the IA agreement was released, with substantial changes from the former ones. First, in the new agreement all workplaces are entitled to receive support, resources, and competence from NAV (i.e., the Norwegian Labor and Welfare Administration). This is different from former IA-agreements in which only those workplaces who had signed a local agreement had access to this support. Second, in comparison to previous versions, in the new IA agreement the workplace is recognized as the most important arena for promoting work attendance and reduce absenteeism. This is different from former IA-agreements in which a substantial amount of the measures and funding were targeting support services outside of the workplaces.

In this respect, conducting research that not only investigates how sickness absence can be reduced, but that also emphasizes promotion of well-being and work-related health seems to be in accordance with the nation's policy.

1.2 Work, Health, and Well-being

To understand contemporary research on working life, it is valuable to draw up some historical lines of how is has been understood and studied in the past. Not only does it refrain us from reinventing the wheel, but it also provides us with a deeper understanding of the phenomena we are studying. In this section, I will give a brief overview over how work has changed and evolved. I will also discuss the development of the concept of health. Knowledge about this can enhance our understanding on how to create a working environment that promotes and strengthens well-functioning and healthy employees.

1.2.1 The History of Work

The role of work has always been important for humankind, although the role has played different parts during history. Labor was viewed at with disgust in the preindustrial societies, as a necessity for survival driven by needs, which several of the ancient Greek philosophers claimed did not distinguish us from animals (Kildal, 2005). With the emergence of the industrial societies and the development of paid labor the role of work changed. For the first time work and leisure were separated. Adam Smith, known as the father of capitalism, introduced in his political-economical writings during the 1700s for the first time the idea that work as an activity for something else than fulfilling momentary needs (such as food, housing, clothing) and argued that work was a means for building economical wealth (Kildal, 2005). 100 years later, Marx agreed that work did have a meaning in itself but was opposed to the idea of capitalism. He argued that the purpose of work was self-actualization and viewed work as the most important human activity. Smith's and Marx's views are still impacting how we view the role of work today, as we understand work

activities not only from an economical point of view, but also as an intellectual and moral activity that involves learning and development. Two of the pioneers in research on working life in Norway, Emery and Thorsrud, similarly emphasized that work was about more than creating economic wealth. In the 60s and 70s they argued that work entailed psychological aspects, such as meaning, learning and acknowledgement (Emery & Thorsrud, 1969). Hence, the role of work has changed from being mainly industrially founded to entail knowledge, culture, art, service and much more. Nowadays, work still plays an important role in securing an income, but it also holds social, collective, and individual meanings. As a consequence, work has become a more fluid concept. For many, work is now more than a restricted activity and plays an important role in their life. This is in line with the research of Rath and Harter (2010). They collected data in more than 150 countries and identified five dimensions of well-being. They concluded with that, for most people, career well-being is probably the most important out of the five dimensions. The notion that the role of work has changed identity and meaning is of importance when talking about work and organizational psychology and when studying working life. The idea that work play an important role for people's well-being naturally also influences how we understand employee well-being and work-related health.

1.2.2 The History of Health

It is almost impossible to unveil, wholly understand and fully explain the construct of health. It is a multifaceted, complex, context- and culture-dependent construct that changes throughout life and one can easily be overwhelmed when diving into the health literature. Nevertheless, despite the challenges that lies in approaching health as a phenomenon, I have applied health-related measures in the research presented in this dissertation with the aim of providing valuable insight into the understanding of work-related health. Health and well-being are of great interest to policymakers and employers, as it is linked to productivity, sickness absenteeism, presenteeism, and performance. In trying to understand and gain insight into health and well-being at work, as well as its antecedents and consequences, it is useful to look at health through a historical lens. Similarly, to how the role of work has changed (which I elaborated on above), the concept of health has also undergone substantial developments over time that reflects the beliefs and scientific understanding of that time.

People have always sought to understand what it means to be healthy. In ancient times, health was closely tied to religion. One's health was viewed as a result of the sacrifices and offerings one had to make to the gods, given by deities of healing and medicine (Magner & Kim, 2017). Health was belonging to the supernatural world, both in disease and healing (Badash et al., 2017). The first to reject the supernatural concept of health was Hippocrates (ca. 460-377 B.C.), known as the father of modern medicine. Hippocrates postulated that

illness was not a result of the god's wrath or of magic forces, but rather a result of environmental and behavioral factors (Yapijakis, 2009). To this day, modern medicine remains influenced by Hippocrates thinking. Galen (ca. 130-210 C.E.) contributed to further transform the understanding of health as a more holistic idea as he included mental and emotional states (i.e. personality and temperament) in his concept of health (Flaskerud, 2012). During the scientific revolution chemical and molecular entities were discovered, which further developed the concept of health and related it to biological science (Cilliers & Retief, 2006; Gest, 2004). In this period, Descartes (1596-1650) introduced the mind-body dualism and claimed that humans consisted of two separate substances, that is the body (material) and mind (immaterial). It was only the body (materialism) that could become sick. Thus, the approach when facing illness was to examine body parts (reductionism) applying principles from anatomy, physics, biochemistry, and physiology. Disease was viewed as an anomality from the biological norm caused by a chemical or physical event, and consequently, health was defined as the absence of disease (Mehta, 2011). The biomedical model that emerged in the mid-nineteenth century is based on this foundation and its basic notion is that all illness, physical and mental, is caused by biological factors. In other workds, if the underpinning biological cause for illness is removed, health will be restored (Engel, 1977; Strickland & Patrick, 2015). This viewpoint is understandable given that many of the challenges at the time were related to infectious diseases that were successfully treated with penicillin or vaccines programs that were carried out (Engel, 1977). Due to effective treatment, from the 1950s, infectious diseases were no longer the main cause of death in the Western world but was replaced by lifestyle diseases such as cardiovascular diseases, diabetes and lifestyle related cancer. These diseases could not be successfully treated by a biomedical reductionistic approach that focused on physical causes alone. Therefore, Engel (1977) introduced the biopsychosocial (BPS) model of health and argued that in order to understand and respond to illness, it is essential to consider both biological, psychological, and social dimensions. The BPS model encompasses a more holistic understanding of health and challenged the reductionistic view that dominated at the time (Borrell-Carrió et al., 2004). According to the BPS model, psychological factors (e.g., anxiety, negative thought patterns and health behavior) and social components (e.g., religion, technology, socio-economic relations and social relations) are important in order to understand and treat illness (Christensen, 2017b). Moreover, it is the interaction of these factors (i.e., biological, psychological, and social) that causes disease. Although the biomedical model still dominate medical practice and research to this day, the BPS model is being increasingly applied in research and practice, both among medical researchers and in the social sciences (Havelka et al., 2009; Wade & Halligan, 2017).

As can be seen, the understanding of health throughout history has mainly been about the absence of disease. However, a broader understanding of health started to evolve and include a wider perspective, as can be seen in one of the most popular definitions of health, presented in 1948 by the WHO: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2006). This definition is also consistent with the BPS model and also links health directly to well-being. Although the BPS model was primarily concerned with understanding illness, it also includes health promotion because it focuses on how to maintain and promote health. Thus, there has been a change from treating and protecting people from disease toward also promoting well-being and health. Nonetheless, the historical perspective of health being about (the absence of) disease is still visible in science and practice in the field of psychology. For instance, in the psychological scientific literature from 1887-2000, the ratio of publication on negative states exceeded those of positive states by a ratio of 14:1 (Myers, 2000). In addition, Shimazu and Schaufeli (2008) showed that approximately 95% of all articles published in the leading Journal of Occupational Health Psychology have been about ill health, such as cardiovascular disease, strain injury and burnout, while only about 5% of the published articles addressed positive aspects of well-being, such as job satisfaction, engagement and motivation.

The development of the understanding of health is highly relevant when addressing well-being and health-related issues in work- and organizational research. The focus in both research and practice has been on removing risk factors for ill-being and treating disease is understandable as the historical understanding of health has mostly been focused on treatment and prevention. This perspective seems to have also influenced Norwegian policies that have to a large degree focused on getting people "healthy" enough for entering working life. Thus, the potential for increasing positive health through work has been neglected. In this dissertation, I aim to include positive aspects of work and shed light on the potential positive work experiences can have on promoting health and work-attendance.

1.2.3 From ill-being to well-being

Following the health definition by the WHO from 1948 and the introduction of the BPS in the late 70s, the WHO arranged the first international conference on health promotion in 1986. This was a significant point in history where the promotion of health was being set in focus and has impacted health-related work research and practices. Two very important events happened at the first international health promotion conference in 1986. First, the definition of health from 1948 was expanded by adding that health is "a resource for everyday life, not the objective of living" (WHO, 1986). Second, the international agreement of health promotion was signed in which health promotion was defined as the

"process of enabling people to increase control over, and to improve, their health" (WHO, 1986). This was the first document that conceptualized health and included political and practical strategies in a way that made it more applicable for health-related work and research. It was emphasized that health-promotional work is closely tied with the local environment, at all levels of society and politics. In Norway, a direct consequence of this agreement is seen in §1-1 in the Work Environmental Act which states that the purpose of the law is to ensure a work environment that provides a healthy and meaningful working situation.

The first models of occupational health focused mainly on the physical work environment and the safety of employees. When the interest for other aspects of individual health increased, the models expanded to include psychosocial aspects. Nevertheless, virtually all models on occupational health and well-being focused exclusively on job stress and the resulting strain, thereby neglecting the potentially positive effects of work (Kelloway & Day, 2005a, 2005b). This is in line with the psychological scientific literature in general, which in the second half of the 20th century first and foremost focused on curing disease and repairing damage. However, there is now a growing body of research on well-being, well-functioning and development of positive qualities (e.g., Boniwell & Tunariu, 2019; Korunka et al., 2009). This shift in psychologists' interest from pathology to nurture what is best has been attributed to when Martin Seligman, former president of the American Psychologist Association, introduced the term positive psychology in 1998. Two years later, Seligman and Csikszentmihalyi (2000) outlined the foundations of this renewed approach in their highly cited paper and stated that positive psychology is "a science of positive subjective experiences, positive individual traits and positive institutions" (p. 5). Since then, positive psychology has influenced the science of psychology, including the field of work and organizational psychology. From initially being concerned about negative work-related aspects such as stress and ill-being, nowadays the focus in research and practice is also on positive individual and organizational qualities and outcomes (Day & Randell, 2014; Schaufeli, Leiter, et al., 2009).

A healthy workplace is defined as a workplace that not only works to reduce negative stressors and demands, but also promotes the integration and coexistence between the employees' well-being (work engagement, health and performance) and the organization's well-being (profit and productivity) (Christensen et al., 2019; Kelloway & Day, 2005a, 2005b). Similarly, Salanova et al. (2012) developed a model for healthy and resilient organizations (HERO) and defined it as "those organizations that make systematic, planned, and proactive efforts to improve the processes and results of their employees organization" (p. 788). According to the HERO-model, investments in organizational resources and practices promotes higher well-being levels in employees, which in turn, generate better

organizational results (Gil-Beltrán et al., 2020; Salanova et al., 2012). This is in line with a growing body of research showing that predictors of positive psychological and physical functioning (e.g., social resources, task resources, engagement, and positive affect) are also important predictors of both performance and positive subjective health (e.g., Brauchli et al., 2015; Gil-Beltrán et al., 2020; Salanova et al., 2012; Shimazu et al., 2015).

1.2.4 Individuals at work

Organizations consist of multiple levels, such as divisions, departments, teams, and individuals, that are interacting with and influencing each other (Landy & Conte, 2016). Thus, there are several levels for measurements and analysis available and the levels chosen in research must be in concordance with the topic being investigated (Costa et al., 2013). The research presented in this dissertation investigates stress- and motivation processes to identify factors that may improve employee well-being and health, in which the individual level have been recognized as suitable (Costa et al., 2013). Understanding individuals is one of the basic components in work and organizational psychology (Landy & Conte, 2016) and is the most applied level for research within this field most research in this field. Moreover, I have applied the JD-R model as a theoretical framework which represents an individual-level approach and integrates stress- and motivation processes (Schaufeli & Taris, 2014).

1.3 Theoretical Framework

The theoretical framework guiding this dissertation is the JD-R model (Bakker & Demerouti, 2014; Bakker & Demerouti, 2017). To place the empirical findings and theoretical refinements presented in this dissertation in a contemporary light I will outline the main developments of the JD-R model, from the earlier models until the latest revised JD-R theory, as well as shed light on some of the critique that the JD-R model has received.

The JD-R model (Bakker & Demerouti, 2014; Bakker & Demerouti, 2017) incorporates principles from two lines of research literatures that to a large degree seem to have neglected each other, namely the literatures on work motivation and job stress. Four models from these respective literatures have in particular influenced the development of the JD-R theory: the two-factor theory (Herzberg, 1966), the demand-control model (Karasek, 1979), the job characteristics theory (JCT) (Hackman & Oldham, 1980), and the effort-reward imbalance model (Siegrist, 1996) (for a brief overview, see Bakker & Demerouti, 2014). As such, the JD-R theory has a holistic approach to the study of work.

1.3.1 The development of the JD-R model

1.3.1.1 The JD-R model of burnout

In 2001, the first JD-R Model of burnout was presented (Demerouti, Bakker, Nachreiner, et al., 2001). The model was inspired by the increasing acknowledgement that burnout was something some employees suffered from and the empirical research on burnout grew. At that time, however, there was no comprehensive theoretical framework to explain burnout (Bakker & Demerouti, 2017). Recognizing the need, Demerouti, Bakker, Nachreiner, et al. (2001) thus aimed to provide a theoretical model that explained the antecedents of burnout and based the model on the meta-analysis of Lee and Ashforth (1996), in which specific job demands and job resources were identified as possible antecedents of burnout, combined with the "structural model of burnout" presented in the Maslach Burnout Inventory test manual (Maslach et al., 1996).

Demerouti, Bakker, Nachreiner, et al. (2001) proposed that all job characteristics could be categorized as either job demands or job resources. Job demands are defined as "those physical, psychological, social or organizational aspects of the job that require sustained physical and/or psychological (i.e., cognitive or emotional) effort and are therefore associated with certain physiological and/or psychological costs" (Schaufeli & Bakker, 2004, p. 296). Examples of job demands are role conflict, workload, interpersonal conflicts, and illegitimate tasks. Not all job demands are negative, but they may turn into stressors when the level of job demands are high and/or the effort required to deal with the demands are high, which again can lead to burnout. Demerouti, Bakker, Nachreiner, et al. (2001) argued that the process that connects job demands to health problems via burnout are in line with Hockey (1993, 1997) compensatory control model of demand management, which suggests that additional effort is exerted when work stressors (i.e., job demands) are high, in order to prevent decrease in performance and to achieve work goals. The higher the work stress the more effort is needed, which comes with greater physical and psychological costs for the individual. Job resources are defined as "those physical, psychological, social or organizational aspects of the job that either/or (1) reduce job demands and the associated physiological and psychological costs; (2) are functional in achieving work goals; (3) stimulate personal growth, learning and development" (Schaufeli & Bakker, 2004, p. 296). Examples of job resources are goal clarity, social support, and job control. The JD-R model of burnout proposed that job demands and job resources initiated two underlying processes that could lead to burnout. First, high levels of job demands could result in physiological and/or psychological exhaustion, which is the energetic component of burnout. Second, lack of sufficient resources to deal with the demands could lead to withdrawal (i.e., reduced motivation and disengagement), which is the is the motivational component of burnout

(Demerouti, Bakker, Nachreiner, et al., 2001). Based on this, Demerouti, Bakker, Nachreiner, et al. (2001) modeled job demands, job resources and burnout in one overall structural equation model so that it was possible to test all the hypothesized relationships simultaneously (Bakker & Demerouti, 2017).

1.3.2 The revised JD-R model

1.3.2.1 Work engagement and dual processes

In 2004, the revised JD-R model was presented (Schaufeli & Bakker, 2004) which included work engagement in addition to burnout. Work engagement is defined as "a positive, fulfilling, work-related state of mind that is characterized by vigor (that is, high levels of energy and mental resilience while working), dedication (referring to a sense of significance, enthusiasm and challenge), and absorption (being focused an happily engrossed in one's work)" (Schaufeli & Taris, 2014, p. 46). Work engagement and burnout were considered as mediators between job resources and low turnover intention and between job demands and health problems, respectively. As such, the underlying processes presented in the first JD-R model of burnout (Demerouti, Bakker, Nachreiner, et al., 2001) were extended and refined. First, the energetic process (nowadays referred to as the health-impairment process) proposed that job demands may lead to burnout, which in turn, could result in health problems and a decrease in performance. On the other hand, job resources can initiate a motivational process that may lead to work engagement and positive organizational outcomes (i.e., low turnover intention). Job resources can be intrinsically motivating by facilitating learning, development and personal growth, or extrinsically motivation by being instrumental in achieving work goals (Schaufeli & Bakker, 2004). The relationships between various job resources and work engagement are in accordance with the job characteristics theory (Hackman & Oldham, 1980). This theory proposes that particular core job characteristics, such as skill variety, task identity, task significance, autonomy and feedback, generate positive work-related outcomes, of which intrinsic motivation resembles the concept of work engagement. In a similar line, Bakker and Demerouti (2007) argue that job resources may fulfill basic human needs for autonomy, competence and relatedness, and when those needs are met they will, according to the Self-determination theory (Ryan & Deci, 2000, 2017), lead to increased intrinsic motivation and optimal functioning. Furthermore, these needs are essential for psychological health and well-being. The dual processes (i.e., the motivational process and the health impairment process) are at the core of the JD-R model and one of its central tenets. These dual processes were also included in the first JD-R model where high levels of job demands were proposed to lead to burnout and lack of job resources decreased motivation and could also lead to burnout. However, in the revised model the dual processes were elaborated and refined; from job characteristics (i.e., job demands and job

resources) leading to well-being (i.e., burnout and work engagement) to outcomes (i.e., ill-health and low turnover intention). Hence, the revised JD-R model aimed at understanding antecedents and consequences of both a positive and negative state (i.e., work engagement and burnout), which may be seen as a reflection of the proposal of positive psychology offered by Seligman and Csikszentmihalyi (2000) a few years earlier.

In chapter 2 of this dissertation, I am testing the two processes. However, as I have outlined earlier, today's working life require employees to be able to work fast, hard and constantly develop, meaning that modern organizations are in need of heavy work investment. Thus, my aspiration in Chapter 2 is to investigate if it is possible to work hard and be well and instead of burnout, I study the role of workaholism in the JD-R model. This is in line with the study of Molino et al. (2015), in which they argue that workaholism can vary depending on the work context (i.e., exposure to job demands and job resources) and where they applied the JD-R to investigate the antecedents and consequences of workaholism.

1.3.3 Elaborations of the JD-R model

1.3.3.1 The buffer hypothesis

Bakker et al. (2003) and Bakker et al. (2004) presented studies that addressed whether job resources can mitigate the impact of job demands on burnout, also known as the buffer hypothesis in the JD-R model. Nevertheless, in 2005 Bakker et al. (2005) highlighted that the buffer hypothesis of the JD-R model had received little attention and made an effort to investigate this process in a greater detail. In their study they revealed that several job resources (i.e., high-quality with the supervisor, performance feedback and autonomy) moderated the impact of work overload, physical demands and work-home interference on burnout. Bakker et al. (2005) argued that the buffering effect of resources on burnout is in line with the demand-control model which proposes that autonomy can mitigate the impact of work overload on job stress (Karasek, 1979). However, in the JD-R model the DCM (Karasek, 1979) was expanded because several job resources could buffer the impact of several job demands on burnout. Two years later this possible interaction between job resources and job demands (i.e., the buffer hypothesis) was formally included in the JD-R model (Bakker & Demerouti, 2007) and several studies have since then reported mitigating effects of job resources on job demands and the following strain (e.g., Bakker et al., 2007; Dicke et al., 2018; Tadić et al., 2015; Xanthopoulou, Bakker, Dollard, et al., 2007).

In Chapter 2 I am testing the proposed buffering effect that high levels of job resources will decrease the impact of job demands on strain. Specifically, I am investigating whether the buffer hypothesis that has been receiving empirical evidence on the relationship

between job demands, job resources and burnout also is eligible for the relationship between job demands, job resources and workaholism.

1.3.3.2 Personal resources, gain and loss cycles

Several studies proposed to expand the JD-R model to also include personal resources (e.g., Xanthopoulou, Bakker, Demerouti, et al., 2007; Xanthopoulou et al., 2009a; Xanthopoulou, Bakker, Dollard, et al., 2007). Personal resources are defined as "positive self-evaluations that are linked to resiliency and refer to individuals' sense of their ability to control and impact upon their environment successfully" (Xanthopoulou et al., 2009a, p. 236) The first studies suggested that personal resources functioned as mediators between job resources and work engagement and between job resources and exhaustion, respectively (e.g., Xanthopoulou, Bakker, Demerouti, et al., 2007). However, personal resources have been integrated in several ways in the JD-R model. It has been shown that personal resources directly can impact well-being (e.g., Lorente Prieto et al., 2008), that personal resources may act as moderators between job characteristics and well-being (e.g., Van den Broeck et al., 2010) and that personal resources may influence the appraisal of job characteristics (e.g., Xanthopoulou, Bakker, Demerouti, et al., 2007), and that personal resources can strengthen the positive impact of challenge job demands on motivation (Bakker & Demerouti, 2017). In addition, because personal resources have been shown to impact both employee well-being and appraisal of job characteristics, it has been suggested that they may act as a third variable that can explain the relationship between both (Schaufeli & Taris, 2014). Personal resources has thus been included in the JD-R model in several ways and although there has been a lack of consensus with regards to where personal resources should be positioned in the JD-R model, Bakker and Demerouti (2014) formally included it in the JD-R theory.

As I have illustrated above, the JD-R model has been expanded and refined multiple times and a large body of research have tested the proposed processes. For example, Tims et al. (2013) integrated job crafting in the motivational process, which is defined as "the self-initiated changed that employees make in their own job demands and job resources to attain and/or optimize their personal (work) goals" (Tims et al., 2012, p. 173) in the motivational process of the JD-R model. This widened the model so that from previously having a top-down perspective in which it is the management who are responsible for creating the working conditions and employees are reacting to it, the model now also included proactive employees that are active in forming their own working environment. This is also in line with another important proposal in the JD-R model, that is, the gain cycles in which engaged employees positively influence their own work environment that ignites a gain cycle of job resources, well-being and outcomes. Several longitudinal studies have confirmed that job resources predicted work engagement and that work engagement predicted job resources

(e.g., Hakanen et al., 2008; Reis et al., 2015) and that personal resources predicted work engagement and reversed causal effects from personal resources and work engagement to job resources (e.g., Weigl et al., 2010; Xanthopoulou et al., 2009a). Gain cycles in the JD-R model are founded on the conservation of resources theory (Hobfoll & Shirom, 2001), a motivational theory that describes how people strive to gain, accumulate and protect different resources and build resource pools, including job resources.

The JD-R model also proposes a loss cycle in the health-impairment process, in which job demands causes strain and where employees who experience job strain perceive and create more job demands over time. Longitudinal evidence for these reversed causal and reciprocal effects has been presented (e.g., Demerouti et al., 2009; ten Brummelhuis et al., 2011). Based on this, Bakker and Costa (2014) theoretically conceptualized that this was a result of self-undermining behavior, which is defined as "behavior that creates obstacles that may undermine performance" (p. 511). Thus, self-undermining was integrated as a mediator in the health-impairment process.

In chapter 3 in this dissertation, I present a study where we tested the gain cycles of job resources and work engagement in a two-wave study. Moreover, in chapter 4 I am investigating individual appraisals of job demands and how positive trait emotions (i.e., a personal resource) may influence those appraisals.

1.3.3.3 Hindrance and challenge demands

In the JD-R model, job demands are proposed to be a part of the health-impairment process but have no role in the motivational process. Nevertheless, Bakker and Demerouti (2017) recognized in the, until now, last state-of-the-art paper on the JD-R model, that several authors have suggested that job demands can hold a motivational potential and that two types of job demands exists, that is, hindering demands that belongs to the health-impairment process and challenge demands that may play a role in the motivational process. Moreover, that the same job demands may be perceived as hindrance demands by some and challenge demands by others. They called for new research to unveil under which circumstances these demands acts as challenges and hindrances (Bakker & Demerouti, 2017).

In chapter 4 in this dissertation, we are taking a closer look at the hindrance-challenge framework and are investigating the differentiation of job demands with a vignette study.

1.3.3.4 Organizational and health outcomes

The outcomes of the motivational process and the health-impairment process in the JD-R model have also changed as the model evolved. After the first presentation proposed that health problems were the outcome of the health-impairment process and low turnover

intention was the outcome of the motivational process and (Schaufeli & Bakker, 2004), later studies suggested that other organizational outcomes (e.g., performance, productivity) also were relevant for both processes. Hence, Bakker and Demerouti formally presented organizational outcomes as an overarching construct as the outcome for both processes in their state-of-the art overviews of the JD-R model in 2007 and 2011 (Bakker & Demerouti, 2007; Demerouti & Bakker, 2011). In 2014 and 2017, Bakker and Demerouti argued that the JD-R model had developed into the JD-R theory due to the magnitude of studies and meta-analysis that had applied the JD-R model (Bakker & Demerouti, 2014; Bakker & Demerouti, 2017). In the visual presentation in these papers, they label the outcome of the motivational- and health-impairment process as job performance. However, this should not be understood as performance being the one construct applied as the outcome of the two processes. Rather, it is an overarching label representing that the outcome of the motivational and health-impairment process will, in different ways, affect employee job performance. As such, the current model holds that the motivational process is leading to positive organizational outcomes, especially performance, but other measures have also been applied (e.g., productivity, low turnover intention). Further, the health-impairment process is leading to negative outcomes, especially health-related ones, although other measures have been included (e.g., low performance) (Taris et al., 2017).

Research has revealed that engaged workers report better health compared to their less engaged colleagues (e.g., Bakker & Demerouti, 2008; Schaufeli, 2012). However, health-related indicators have not been included as potential outcomes of the motivational process in the JD-R model, although this has been suggested by some authors (e.g., Airila et al., 2014; Hakanen & Roodt, 2010). In line this and the above-mentioned point of whether it is possible to work hard and be well, in Chapter 2 and 3 I test health-related constructs as outcomes of the motivational process.

1.3.4 The current JD-R model

To sum up, the current JD-R model proposes that job resources and job demands trigger two fairly independent but interacting processes, namely the motivational process and the health-impairment process, respectively, which in turn may lead to motivation (e.g., work engagement, commitment, flourishing) and strain (e.g., burnout, job-related anxiety, health-complaints). Job demands may also play a role in the motivational process when they are experienced as challenge demands. The outcomes of the motivational process are positive organizational outcomes, especially performance, whilst the health-impairment process is leading to negative outcomes, especially health-related ones. Personal resources may influence to which degree employees perceive their work environment positively or

negatively, which have the potential to ignite job crafting behavior or self-undermining behavior (Bakker & Demerouti, 2017).

1.3.5 Critiques of the JD-R model

Several critiques of the JD-R model have been raised by researchers (e.g., Rattrie & Kittler, 2014; Schaufeli & Taris, 2014; Van den Broeck et al., 2013). Below, I will briefly outline the critiques that are of particularly relevance for this dissertation.

One of the peculiarities of the JD-R model is its flexibility and heuristic nature, meaning that the model can be applied to every work environment and that all types of job characteristics can be included. This is one of the strengths of the model but also a weakness. This flexibility makes the model applicable across many different contexts and conditions and has opened for an extensive variation in the variables that constitute job resources, job demands, the mediators, and outcome variables. It also implies that although two studies have no overlap in their study concepts, they can still test the same assumptions in the JD-R model (Schaufeli & Taris, 2014). In addition, this flexibility allows for studies that include for example additional moderators or applies simplified versions of the model (Schaufeli & Taris, 2014). Many of the studies that have applied the JD-R model only examine part of it, for example only the health-impairment process or the motivational process, or only the relationship between job resources, job demands and work engagement, without including burnout or other outcome variables (e.g., Hakanen et al., 2005). However, as Schaufeli and Taris (2014) argue, although there is a large body of research that supports the assumptions in the JD-R model, there are nonetheless unresolved issues and room for improvements, some of which are addressed in this dissertation.

Another critical point of the JD-R model is the categorization of job resources and job demands, including the differentiation between challenge- and hindrance demands. This categorization is often built on assumptions and not objective facts (Webster et al., 2010). The benefit that the JD-R model can include all types of resources and demands comes at the cost of limited specificity, which can result in that the same job characteristic can be both a demand and a resource (Bakker & Demerouti, 2017). According to Bakker and Demerouti (2017) this distinction may depend on the work context which again implies that there are some limitations regarding generalizability. Relevant to this issue is the inclusion of personal resources in the JD-R model. One aspect is that personal resources are integrated into the JD-R model in various ways, as mediators, moderators, antecedents of job demands and job resources, as "third variables" or a combination of these (Schaufeli & Taris, 2014). Thus, personal resources may or may not play a role in the perception of job demands as hindering or challenging.

A further issue of the JD-R model is postulated by Schaufeli and Taris (2014) who argue that there is not sufficient evidence for the underlying mechanisms in the JD-R model as they are building on other theories. This is seen in my outlining of the development of the JD-R model, it is not drawing upon one theory, but many. Bakker and Demerouti (2017) responds to the critique postulated by Schaufeli and Taris (2014) and disagree that the JD-R model falls short in explaining the underlying mechanisms because it is built on several other theories. Rather, they argue that it is a common scientifical practice to build theories on other theories.

1.4 The Present research

The research reported in this dissertation was conducted in Norway, a country that ranks high on many so-called success factors, such as equality, education, employment, gross national product, trust, and population health. In the popular media Norway is often referred to the place with the highest living standards. Still, Norway is struggling with extraordinarily high levels of sickness absenteeism and one of three reports work to be partly or fully the reason why they are absent. Explicitly stated policies and effort to reduce sickness absenteeism has not been successful. Most effort has been on getting people into work, and while there, on preventive work to reduce or remove harm that may cause strain. Hence, it seems that the potential to add positive work experiences and promote health at work has been neglected. This dissertation aims to explore processes that strengthens employee well-being and work-related health and through this, adding to the refinement of the JD-R model. Specifically, I focus on how job characteristics (i.e., job resources and job demands) impact employee well-being (i.e., work engagement and workaholism) and work-related health (i.e., subjective health and sickness absenteeism). I also seek to explore the degree to which the nature of work (i.e., belonging to an occupational group) and positive trait emotions influence individual appraisals of job demands.

To achieve these aims this, I have included three papers that each test and investigate factors that may contribute to employee well-being and health. Each investigation is discussed in a separate chapter, which I have outlined below.

To investigate whether it is possible to work hard and be well, Chapter 2 explored the antecedents and consequences of work engagement and workaholism within the framework of the JD-R model. The results indicate that although both engaged workers and workaholics put in more hours at work than what is expected from them, engaged employees experience positive work-related health, whereas the opposite was found for workaholics. These findings support the expansion of including workaholism in the health-impairment process of the JD-R model.

In a further exploration examining the potential of work engagement on health-related outcomes, Chapter 3 includes a longitudinal conceptual replication of the motivational process presented in the previous chapter. The results affirm previous findings that job resources cause work engagement. Work engagement was in turn negatively related to sick leave via subjective health. By showing that health-related outcomes could be outcomes of the motivational process in the JD-R model, we have strengthened the model.

Finally, we wanted to address the two types of job demands (i.e., challenging and hindering) in the JD-R model. In Chapter 4, I present a vignette study that investigated the impact of organizational context (i.e., nature of work and occupation) and individual dispositions (i.e., positive trait emotions) on individual appraisals of job demands. The results indicate that job demands that are a typical core task for an occupational group mostly were appraised as more challenging than hindering, but that they can be appraised as challenging and hindering simultaneously. In addition, we found that positive trait emotions predicted challenging appraisals. The data reported in Chapter 4 thus support the notion that challenge-like demands may play a role in the motivational process in the JD-R model.

Together, the studies presented in this dissertation provide insights into how working conditions may ignite and influence employee well-being and health.

2 Chapter: Is it Possible to Work Hard and be Well?

2.1 Overview of Study

As outlined in the previous chapter, due to nature of the current working life, today's organizations need employees that can work hard, that is, be productive and perform well. Moreover, organizations need employees that are healthy enough to be able to work hard over time. This is at the core of the present chapter: is it possible to work hard and be well? In the present chapter I am taking a closer look on two forms of working hard, a negative (i.e., workaholism) and a positive (i.e., work engagement) and study some of the antecedents (i.e., job demands and job resources) and consequences (i.e., working extra hours and work-related health) of these forms of heavy work investments. I also investigate and discuss if workaholism could be included in the health-impairment process of the JD-R model. Below I present a shortened version of the published manuscript. See Appendix A for the full manuscript.

2.1.1 The JD-R model

In the well-established job-demands resources (JD-R) model (Bakker & Demerouti, 2007) working conditions are positioned as predictors for well-being and ill-being at work. Recent research shows that the JD-R model could, in addition to burnout, also embrace workaholism in its health-impairment process (e.g., Molino et al., 2015). However, even though proposals have been made in favor of expanding the JD-R model, further investigations are needed to validate this expansion, particularly with regard to the antecedents and consequences of workaholism. Hence, in the present study, we will contribute to the literature on this emerging topic by identifying salient predictors of workaholism and work engagement and their relationship with overtime work and work-related health within the framework of the JD-R model.

2.1.2 Workaholism

Although heavy work investment has long been a topic of interest in the scientific literature (e.g., Machlowitz, 1980; Oates, 1971; Schaufeli, Taris, et al., 2006), there are vastly diverging ideas of the value and consequences of working hard. Previous research has established inconsistent associations between working hard and individual and organizational outcomes, which may be due to the notion that heavy work investment has been assessed differently (Burke & Cooper, 2008). Scholars have distinguished between two types of working hard, namely work engagement and workaholism, which may be two constructs that can contribute to achieving construct specificity. Work engagement is

typically described as a positive form of working hard, while workaholism historically has been described as both a positive and negative form of working hard (Schaufeli et al., 2008).

Oates (1971) coined the term workaholism and defined it as "addiction to work, the compulsion or the uncontrollable need to work incessantly" (p. 1), and he argued that workaholism has a negative impact on health, happiness, and social relationships. Since then, the definitions, opinions, observations, and conclusions regarding workaholism have differed in the scientific literature. Hitherto, there is still little consensus about the conceptualization and definition of the construct other than its core feature of heavy work investment (Harpaz & Snir, 2003; Spence & Robbins, 1992).

Some authors have viewed workaholism primarily as a positive quality or behavior that involved high work motivation (Korn et al., 1987; Sprankle & Ebel, 1987). Others have included both positive and negative aspects in their conceptualization of workaholism. Spence and Robbins (1992) proposed a workaholic triad that contained three concepts of workaholism, namely work involvement, feeling driven to work because of inner pressure and enjoyment of work. Based on this, the authors distinguished among three types of workaholics: work addicts (high on involvement and feeling driven, low on work enjoyment), work enthusiasts (high on work involvement and work enjoyment, low on feeling driven) and enthusiastic addicts (high on all three concepts). In contrast, other scholars have excluded positive components from their conceptualization of workaholism and view it as a primarily negative construct (Andreassen et al., 2012; Schaufeli, Shimazu, et al., 2009). Hence, when assessed empirically, workaholism may or may not include both negative and positive components, which might explain the discrepancies in the findings and the conceptual confusion that still exists about the nature or workaholism. Porter (1996) argued that the lack of a definition hinders the effort to research workaholism. She suggests that to overcome this problem, investigators should return to the starting point and consider workaholism as an addiction that is excessive and has harmful consequences, which would make it possible to find constructive responses. In our work, we adopt the view of Schaufeli and colleagues who defines workaholism as "the tendency to work excessively hard and being obsessed with work, which manifests itself in working compulsively" (Schaufeli, Shimazu, et al., 2009, p. 3). This definition includes both a behavioral component (excessive work) and a cognitive component (being obsessed with work). Hence, the definition includes the core constructs that have been identified across various definitions, namely working excessively and being obsessed with work.

Some authors argue that workaholism is linked to stable individual characteristics and claim that personality traits and values play a major role in stimulating obsession with work (e.g., Liang & Chu, 2009; McMillan & O'Driscoll, 2006). Others view workaholism as a

behavioral addiction and have argued that working conditions play a role in stimulating it (e.g., Fry & Cohen, 2009; Molino et al., 2015). And some suggest that a combination of individual characteristics and working conditions may generate workaholism (e.g., Mazzetti et al., 2014). Hence, in the literature it is acknowledged that workaholism may be associated with individual characteristics as well as environmental factors.

2.1.3 Work Engagement

Work engagement is defined as a "positive, fulfilling, work-related state of mind that is characterized by vigor, dedication and absorption (Schaufeli et al., 2002, p. 74). Vigor refers to mental resilience and high levels of energy while working, persistence even in difficult phases and willingness to invest effort into one's work. Dedication is characterized by enthusiasm about and involvement in one's work. Absorption refers to fully concentrating on and being happily engrossed in work such that time passes quickly and one has difficulties detaching (Bakker et al., 2008). May et al. (2004) operationalize work engagement in a similar three-dimensional concept (physical, emotional, and cognitive components). Although the labels differ slightly, the physical component (i.e., "I exert a lot of energy performing my job"), emotional component (i.e., "My own feelings are affected by how well I perform my job") and cognitive component (i.e., "I am rarely distanced when performing my job) correspond to Schaufeli et al. (2002) emphasis on vigor, dedication and absorption. According to Harter et al. (2002), work engagement assumes both cognitive and emotional antecedents to improve work-related affective and performance outcomes. These authors conceptualize work engagement as individual's involvement in, satisfaction with and enthusiasm for work, which closely resembles other authors definitions and operationalizations of the construct. Thus, for work engagement, there seems to be general agreement among scholars.

2.1.4 The Role of Job Demands for Workaholism

An abundance of research has revealed a positive relationship between job demands and burnout (e.g., Demerouti, Bakker, De Jonge, et al., 2001; Hakanen et al., 2008; Schaufeli & Bakker, 2004). Although there have been far fewer studies on the relationship between job demands and workaholism, the results point in a similar direction (e.g., Mazzetti et al., 2016; Molino et al., 2015). Several studies have revealed that work-related factors can generate or boost workaholism, such as leaders who set the example of working hard (Van Wijhe et al., 2010), workload and time pressure (Schaufeli et al., 2008) as well as career barriers, career commitment, and career insecurity (Spurk et al., 2016).

In the present study, our hypothesis on the relationship between job demands and workaholism will be tested by combining three job demands, namely illegitimate tasks, role conflicts, and interpersonal conflicts.

Illegitimate tasks are tasks that are perceived by the employee to exceed his or her responsibilities and that break the norm of what can be reasonably expected from a person (Semmer et al., 2010). Illegitimacy may result from being asked to do a task that typically would be carried out by others or from being asked to do a task perceived as irrelevant or unnecessary. Previous research has revealed that illegitimate tasks cause employee strain, such as anger, indignation, and threat to the self (Semmer et al., 2015). In addition, the perceived illegitimacy of one's workload may contribute to strain that exceeds the workload levels alone (Ford & Jin, 2015). Previous studies have shown that workaholics may perceive job tasks as more frustrating and even as a punishment given to them (Clark, Michel, Stevens, et al., 2014) and that workaholism may develop in response to low self-worth (Mudrack, 2006).

Interpersonal conflicts refer to negative interactions with others in the workplace and have been associated with employee's' perceived divergence of interests or goals (De Dreu & Weingart, 2003) and occur in work environments where employees compete for resources (Jaramillo et al., 2011; Kippist & Fitzgerald, 2009). Previous research has revealed that a work culture that encourages peer competition (Liang & Chu, 2009) and "winner-takes-all" reward systems (Ng et al., 2007) are positively associated with workaholism.

Role conflicts occur when employees receive inconsistent or conflicting information concerning their job tasks. Such information could come from multiple individuals or a single person within the organization (Nixon et al., 2011). Role conflict involves a sense that things at work should be done "properly" and in a different manner. Previous research has revealed that workaholics may have a desire to do things "differently" and that they often believe that the ideal person to be in charge is one self and may even actively intrude in the works of others in order to fulfill this desire (Mudrack & Naughton, 2001).

2.1.5 The Role of Job Resources for Work Engagement

Previous studies have consistently shown that job resources, such as support from coworkers and supervisors, job control, autonomy, performance feedback, skill variety and learning opportunities, are positively associated with work engagement (Albrecht, 2010; Bakker, 2011; Schaufeli & Salanova, 2008). Moreover, a longitudinal study revealed a reciprocal relationship between job resources and work engagement in which engaged employees are successful in mobilizing their own job resources over time (Llorens et al., 2007).

In the present study, our hypothesis on the relationship between job resources and work engagement will be tested by combining three job resources, namely, independence in task completion, social community at work and goal clarity.

Independence in task completion involves a sense of knowing that the job tasks entails and when the tasks can be considered completed. As such, it provides employees with control over their own work tasks (Näswall et al., 2010). Control over one's work has been recognized as an important resource among most influential models in the literature on occupational stress and health (e.g., job demands-control model, Karasek, 1979; self-determination theory, Ryan and Deci, 2001; and the JD-R model, Bakker and Demerouti, 2007) that fosters motivation and promotes work engagement.

Social community at work may provide employees with social support, by feeling cared for and appreciated and by having access to direct or indirect help, which may provide additional resources provided by colleagues and supervisors (Kossek et al., 2011; Taipale et al., 2011). Numerous studies have revealed that social community may start a motivational process that generates work environment (e.g., Bakker & Demerouti, 2008).

Goal clarity provides employee with a clear purpose and goal for his or her work (Arnetz, 2005; Näswall et al., 2010). Several studies have revealed that goal clarity promotes a sense of meaningful work and increases work motivation and engagement (De Vreede et al., 2013; Hansson & Anderzén, 2009; Wright, 2001).

2.1.6 Consequences of Working Hard

One of the most obvious characteristics of workaholics is that they spend a great deal of their time working, beyond what is required from them (Schaufeli, Bakker, et al., 2009; van Beek et al., 2011). Employees who report high work engagement also put in more hours at work than what is expected from them (Schaufeli et al., 2008). Several studies have shown that working long hours may have a negative impact on employees' health and well-being (e.g., Sparks et al., 1997). Interestingly, research has also found positive relationships between working overtime and health and well-being (e.g., Beckers et al., 2004; Schaufeli et al., 2008). These seemingly contradictory findings might be explained by several factors. Several studies on extremely long working hours (i.e., working 61 hours or more a week) have reported that overtime work can severely affect health (Amagasa et al., 2005; Kawakami & Haratani, 1999; Uehata, 1991). The associations between moderate overtime work and well-being are more complex and seem to depend on other factors. For example, Beckers et al. (2004) found that moderate overtime hours were related to fatigue when employees reported relatively adverse work characteristics, while non-fatigue employees reported relatively favorable work characteristics and high work motivation. Along a similar line, Van der Hulst

et al. (2006) found that moderate overtime work only related to ill-being when employees reported high job demands in combination with low job autonomy. Thus, it seems that it is more than merely working long hours that account for the differences between individuals who work hard but are health and those who work hard and are in distress.

Work is recognized as an important health determinant (Waddell & Burton, 2006) and it is recognized that good health is fostered where people are gainfully employees (i.e., where the impact of work and the work environment is positive) (Buijs et al., 2012). Several authors have linked workaholism with detrimental consequences for the employee, such as a higher level of job stress (Spence & Robbins, 1992), conflicting relationships with colleagues (Schaufeli, Taris, et al., 2006), work-home conflicts (Clark, Michel, Stevens, et al., 2014) and impaired social relationships outside of work (Burke & Cooper, 2008). In addition, workaholics reports higher levels of ill-being, such as burnout (Taris et al., 2005), poor subjective well-being (Schaufeli, Taris, et al., 2006) and decreased physical and mental health (Clark, Michel, Zhdanova, et al., 2014).

On the other hand, previous studies have suggested that employees who are engaged perform better (Bakker & Bal, 2010; Christian et al., 2011; Salanova et al., 2005), show more positive extra role behaviors such as citizenship behavior (Babcock-Roberson & Strickland, 2010), are more committed to their organization (Hakanen et al., 2005), and have increased innovativeness and lower turnover intention (Bhatnagar, 2012). Moreover, engaged workers report fewer psychosomatic complaints (Demerouti, Bakker, Nachreiner, et al., 2001) and better self-reported health (Hakanen et al., 2006). In other words, engaged employees seem to enjoy good mental and psychosomatic health (Schaufeli & Salanova, 2008).

2.1.7 The Buffer Hypothesis

When testing the buffer (moderation) hypothesis of the JD-R model, that job resources may reduce the impact of job demands on workaholism, we combine one job resource and one job demand and their interaction effect on the relationship between job demands and workaholism.

Some scholars have proposed that specific job resources should match the job demands in the workplace to reduce the impact of the demands, also known as the matching hypothesis (De Jonge & Dormann, 2006; Frese, 1999). The matching hypothesis claims that only cognitive resources will reduce the negative impact of cognitive demands, whereas emotional and physical resources are beneficial in reducing the strain due to emotional and physical demands, respectively. However, several studies applying the JD-R model have found that job resources can buffer the impact of largely independent job demands (i.e., they share little overlap) (Bakker et al., 2005; Bakker et al., 2011). It has been argued that it is

difficult to label specific job demands and job resources into clear categories and that employees can perceive and experience the same job demands and job resources in different ways (Bakker et al., 2011). For example, it is possible that being given illegitimate tasks can be experiences as an increased workload (i.e., physical and or cognitive) by some employees and as unfair (i.e., emotional) by others. This notion supports the role of job resources in the JD-R model, which claims that, by definition, any job resource can buffer the impact of any demand on any type of outcome.

2.2 Aims of Study and Hypotheses

The first goal of the present research was to identify salient predictors of workaholism and work engagement and their relationship with overtime work and work-related health. The second, and integrated, goal was to examine whether the JD-R model could be expanded by including workaholism in its health-impairment process.

In line with research on the associations between working conditions and employee well-being, we hypothesize that job demands (i.e., illegitimate tasks, interpersonal conflicts, and role conflicts) are positively related to workaholism **(H1)** and that job resources (i.e., independence in task completion, social community and goal clarity) are positively related to work engagement **(H2)**. To test the health impairment process and the motivational process of the JD-R model we hypothesize that workaholism and work engagement mediates the relationship between job demands and overtime work **(H3a)** and between job resources and overtime work **(H3b)**, respectively. Further, that workaholism and work engagement mediates the relationship between job demands and work-related health **(H4a)** and between job resources and work-related health **(H4b)**, respectively. Finally, to test the buffer hypothesis, we hypothesize that job resources moderate the relationship between job demands and workaholism. Specifically, the relationship between job demands and workaholism will be stronger for employees who report low job resources than for employees who report high job recourses, particularly under conditions of high job demands **(H5)**.

2.3 Method

2.3.1 Procedure and participants

A total of 12170 employees at Norwegian universities and university colleges participated in the study as a part of a working environment and work climate survey. Of the participants 46.4 % were men (n = 5642) and 53.6 were women (n = 6527). The ages were subdivided into five groups: < 30 years old (9.8%, n = 1178), 30–39 years old (23.2%, n = 2794), 40–49 years old (27.2%, n = 3271), 50–59 years old (24.3%, n = 2925) and > 60

years old (15.5%, *n* = 1859). Seventy-five percent of the sample consisted of permanent employees (*n* = 8979). The years of employment ranged from 0 to 50 years (*M* = 10.18, *SD* = 9.12); 45.2% of the participants were technical and administrative personnel (*n* = 5519), 37.5% were scientific and teaching staff (*n* = 4562), 11.9% were research fellows (*n* = 1452), and 5.3% were unit leaders (*n* = 637).

2.3.2 Measures

All measures are drawn from the second version of the Knowledge Intensive Working Environment Survey Target (KIWEST 2.0; Innstrand et al., 2015). KIWEST examines employees' individual experiences of psychosocial working environment factors (including demands and resources). It is based on standardized and validated measures from Nordic and European research.

Job demands were measured using three scales: illegitimate tasks, interpersonal conflicts and role conflicts. The illegitimate task scale (Semmer et al., 2010) investigated the degree to which respondents experienced being given tasks outside their arena of responsibility with four items; a sample item was: "I must carry out work which I feel demands more of me than is reasonable." Responses were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was 0.77.

The interpersonal conflict scale (Näswall et al., 2010) measured the extent to which work was negatively affected by conflicts between employees. The scale consisted of three items, and a sample item was "In my unit, there is a great deal of tension due to prestige and conflicts." Responses were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was 0.87.

The role conflict scale (Elo et al., 2000) assessed the degree to which participants perceived conflicts between their different roles with four items; a sample item was "I am often given assignments without adequate resources to complete them." Responses were measures on a five-point Likert scale (1 = to a very small extent, 5 = to a very large extent). The Cronbach's alpha was 0.73.

Job resources were measured using three scales: task completion, social community at work, and goal clarity. All job resources were measured on a Likert scale ranging from 1 (= strongly disagree) to 5 (= strongly agree). The task completion scale (Näswall et al., 2010) measured the extent to which employees could, or had to, determine when their tasks were completed. An example item was "I determine when my work assignments are completed." The Cronbach's alpha was 0.64.

The social community at work scale (Pejtersen et al., 2010) measured respondents' degree of social community with colleagues in their own unit using three items. A sample item was "There is a good sense of fellowship between the colleagues in my unit." The Cronbach's alpha was 0.83.

The goal clarity scale (Näswall et al., 2010) measured to what degree the respondents had a clear picture of the purpose of his or her own work with four items. A sample item was "What is expected of me at work is clearly expressed". The Cronbach's alpha was 0.78.

Workaholism was measured using the Dutch Workaholism Scale (DUWAS, Schaufeli, Shimazu, et al., 2009), which consists of 10 items. The scale covers two aspects of workaholism: working compulsively (sample item: "I often feel that there's something inside me that drives me to work hard) and working excessively (sample item: "It is hard for me to relax when I'm not working"). The response alternatives were 1 (almost never), 2 (sometimes), 3 (often) and 4 (always). The Cronbach's alpha was 0.93. Schaufeli, Shimazu, et al. (2009) suggested that working compulsively and having an exaggerated inner drive to work represent two distinct dimensions of workaholism. An exploratory factor analysis with maximum likelihood conducted on the data from the present study did not reveal a clear two-factor solution, nor did a subsequent conformity maximum likelihood analysis. Therefore, a one-dimensional mean score variable based on all 10 items was computed and used for the subsequent analyses.

Work engagement was measured using the nine-item version of the Utrecht Work Engagement Scale (UWES, Schaufeli, Bakker, et al., 2006). These items covered three aspects of the work engagement concept: vigor (sample item: "At my job, I feel strong and vigorous"), dedication (sample item: "Mu job inspires me") and absorption (sample item: "I get carried away when I'm working"). The response alternatives ranged from 0 (= never) to 6 (= every day). The Cronbach's alpha was 0.82. Schaufeli et al. (2002) suggested that vigor, dedication, and absorption represent three distinct dimensions of work engagement. An exploratory factor analysis with maximum likelihood conducted with the data from the present study did not find a clear three-dimensional model, nor did a subsequent confirmatory maximum likelihood analysis. Therefore, a one-dimensional mean score variable based on all nine items was computed and used in the subsequent analyses.

Overtime work was assessed by asking the participants "How many hours over and beyond your agreed working hours do you normally work per week?" The response alternatives were 1 (0 h), 2 (1-5 h), 3 (6-10 h), and 4 (more than 10 h).

The perceived work-related health was measured using to items about the respondents' experience with how their work situation impacted their health. The items were "My work has a positive influence on my health" and "My work has a negative influence on

my health." The two items correlated negatively (r = 0.66, p < 0.001). The Cronbach's alpha was 0.80. For further statistical analyses, we reserved the item measuring negative health and computed the two items into a variable assessing the total perceived work-related health. The response alternatives ranged from 1 (to a very small extent) to 5 (to a very large extent).

2.4 Results

As self-reports collected at one point in time were used in this study, Harman's single-factor test was conducted for examining whether or not the common method bias was serious (Podsakoff et al., 2003). The results revealed that no factor explained more than 50% of the variance. This outcome suggest that common method did not improperly impact the model.

2.4.1 Descriptive Statistics

Workaholism corresponded positively with job demands and overtime work and negatively with work-related health. On the other hand, work engagement correlated positively with job resources, overtime work and work-related health. This is in line with hypotheses 1 and 2. (see Table 2.1 for the means, standard deviations, intercorrelations and coefficient alphas for all the included variables).

2.4.2 Analytical Strategy

To test the study hypotheses, we applied structural equation modeling (SEM) using the Mplus 8.0 software package (Muthén & Muthén, 1998-2018). Several goodness-of-fit criteria were considered: the root mean square of approximation (RMSEA), the comparative fit index (CFI), the Tucker-Lewis index (TLI) and the standardized root mean square residual (SRMR). RMSEA values below 0.07, SRMR values below 0.08, and CFO and TLI values greater than 0.95 indicate a good fit (Hooper et al., 2008).

For the moderation analyses, we applied Hayes PROCESS macro for PAWS 25.0 (Hayes, 2017). For each hypothesized interaction effect, we tested a model that include one job demand, one job resource and their interaction, i.e., three exogenous variables. Each of the exogeneous variables had only one indicator, which was the centered score of the variable. The indicator of the interaction effect was the multiplication of the interacting variables. Workaholism was included as the endogenous variable.

2.4.3 Mediation Analyses

Table 2.2 includes the results of the SEM model estimated to test the study hypothesis. First, we conducted CFAs in which the job characteristics were loaded on one

factor and two factors (i.e., job demands and job resources). The results revealed that only the model with two factors had a good fit. Hence, for the subsequent analyses the six job characteristics were modeled into two latent factors representing job demands (illegitimate tasks, interpersonal conflicts, and role conflicts) and job resources (independence in task completion, social community, and goal clarity), which were treated as exogeneous variables.

The hypothesized mediation model (M1), in which workaholism was a full mediator between job demands and overtime work and between job demands and work-related health, and work engagement was a full mediator between job resources and overtime work and between job resources and work-related health showed a good fit to the data for two of the four criteria, namely the CFI and SRMR. However, the TLI was slightly below the criterion value of 0.95, and the RMSEA value had a *p*-value of > 0.001, indicating that the data did not fit the model. Thus, we tested a new model (M2) in which workaholism was a partial, not full, mediator between job demands and work-related health. The new model showed a good fit to the data for all four criteria. In conclusion, the results support hypotheses 1, 2, 3a, 3b, 4a and 4b. The final model is presented in Figure 2.1.

2.4.4 Moderation Analysis

Finally, we tested hypothesis 5, that job resources would mitigate the positive relationship between job demands and workaholism. Eight of the nine interaction effects of job demand and job resources were statistically significant; only goal clarity did not interact significantly with interpersonal conflicts on workaholism. The positive relationship between job demands and workaholism was stronger under conditions of low versus high job resources when job demands were high. The directions of the interactions were as expected. Figure 2.2 shows the directions of the eight significant moderation effects. (For additional linear regression analyses, see Table 4 in appendix A).

2.5 Discussion

The aim of the current study was to identify salient predictors of workaholism and work engagement and investigate their relationship with overtime work and work-related health. The second, and integrated, goal was to examine whether the JD-R model could be expanded by including workaholism in its health-impairment process. We assumed that different working conditions would have a negative or positive effect on employee well-being and hypothesized that job demands and job resources would be positively related to workaholism and work engagement, respectively (**H1, H2**).

As expected, our results revealed that job demands predicted workaholism and job resources predicted work engagement. Our findings support the main assumption of the JD-

R model, namely, that different working conditions may have a negative or positive effect on employee well-being. Our final model also supports the notion that environmental factors may play a role in generating or boosting workaholism. Thus, it is likely that a work environment that promotes workaholic behavior increases the chances of producing workaholics, while a work environment rich in resources enhances the chances of generating engaged workers.

Further, we examined the consequences of work engagement. We hypothesized that workaholism and work engagement would mediate the relationship between job demands and overtime work (**H3a**) and between job resources and overtime work (**H3b**), respectively. In line with previous research, we found that both workaholic and engaged employees put in more hours at work than was expected from them. More specifically, the results suggest that workaholism was a stronger predictor for overtime work than work engagement. We also hypothesized that workaholism would mediate the relationship between job demands and work-related health (**H4a**). This hypothesis was not confirmed completely, as only a partial mediation of workaholism was observed rather than the hypothesized full mediation. Our results suggest that workaholism has a negative impact on work-related health. The observed additional direct effect of job demands on work-related health is in line with literature indicating that negative working conditions has a depleting effect on employee health (e.g., Rugulies, 2012; Westgaard & Winkel, 2011).

Furthermore, we hypothesized that work engagement would mediate the relationship between job resources and work-related health (**H4b**). Indeed, our results confirmed that work engagement had a positive impact on work-related health. These results reveal that working hard does not necessarily have detrimental consequences. If overtime work is performed by engaged employees with access to a work environment rich in resources, work can influence one's work-related health positively. In contrast, when working extra hours is fueled by workaholic behavior by employees in adverse working conditions, work may influence work-related health negatively. Our findings also support the distinction between workaholism and work engagement as a negative and positive form of working hard, respectively.

Lastly, we tested the buffer (moderation) hypothesis of the JD-R model and hypothesized that job resources would lessen the effect of job demands on workaholism (**H5**). In line with studies applying the JD-R model that found that job resources can mitigate the impact of largely independent job demands, we tested all nine interaction effects. Our results confirmed the hypotheses in eight of nine combinations between job demands and job resources. Additionally, all significant effects were in the expected directions. However, the expectation that under highly stressful working conditions the risk of workaholism should be

lower if sufficient job resources are available was weaker than anticipated. There might be several reasons for this result. Previous research has revealed that in their attempt to continue working, workaholics may even go as far as actively creating more work for themselves, for instance, by making their work more complicated than necessary or by refusing to delegate job tasks (Kanai & Wakabayashi, 2001; Schaufeli, Bakker, et al., 2009). In addition, it has been revealed that workaholics may perceive their workplace environment as being more demanding and stressful than others do (Bakker et al., 2009). Moreover, it has been reported that workaholics are inflexible, rigid and perfectionists (Schaufeli, Taris, et al., 2006). Taken together, this may imply that workaholics either cannot or do not want to use job resources, even though these resources are available to them.

In summary, our results suggest that different working conditions (i.e., job demands and job resources) can have a negative or positive impact on employee well-being through two different processes. Both workaholics and engaged workers put in more hours at work than what was required of them, but workaholism and job demand predicted negative work-related health, whereas work engagement predicted positive work-related health. Job resources buffered the impact of demands on workaholism in eight of the nine combinations in the expected directions, although the effect was smaller than expected. Our findings also emphasize the importance for construct specificity, i.e., that it is suitable to distinguish between a positive and a negative form of working hard (i.e., work engagement and workaholism).

2.5.1 Limitations and Perspectives for Future Research

The findings come from a study with a cross-sectional design; thus, it is not possible to make causal inferences about the relations between study variables. Future studies could employ a longitudinal design to examine the causal effects of the proposed processes.

Second, all data were obtained from questionnaires, with the limitations inherent to this method. The results are also based solely on single-source data, namely, self-ratings. Future studies could add objective indicators to rule out the potential effects of common method variance. For instance, observer ratings have previously been used to study working conditions (Demerouti, Bakker, Nachreiner, et al., 2001) and could be used in future studies.

There are also limitations rooted in the measurement of subjective work-related health. First, the instrument applied measures the subjective perception of how work is influencing individual health. Other measures on health could provide better information regarding the participants general health and could provide a stronger understanding of the relationship between working hard and overall health. Second, there is some sort of norm built into questions of self-reported health. For instance, respondents may answer questions

relative to similar others (e.g., my health compared with others at my age) or with respect to time (e.g., my health now compared to last year). Objective measures could overcome these methodological challenges. Finally, the study might reflect a selection bias known as the "healthy worker effect"; only those who are healthy and "survive" remain in their jobs, whereas unhealthy employees drop out. However, empirical studies suggest that problems with non-response are more severe for estimations of population means than for estimation of associations (Van Loon et al., 2003).

Additionally, the buffer hypothesis of the JD-R model was not as clear for workaholism as was previously revealed for burnout. This ambiguity should be investigated in a greater detail to determine whether the relationships between job demands, job resources and workaholism are the same as those previously revealed for the relationship between job demands, job resources and burnout. Future studies could investigate whether job resources have a stronger buffer effect on burnout compared to workaholism.

2.5.2 Conclusion

The present study supports the expansion of including workaholism in the health impairment process in the JD-R model. Our results offer further support for the notion that it is suitable to distinguish between workaholism and work engagement as two different types of working hard (i.e., negative and positive). Finally, our study suggests that it is possible to create working conditions which support engaged workers.

TABLE 2.1

Descriptive statistics, Pearson's product-moment correlations and Cronbach's alphas (in the diagonal) for task completion, social community, goal clarity, illegitimate tasks, interpersonal conflicts, role conflicts, work engagement, workaholism, perceived work-related health, and overtime work.

Variables	1	2	3	4	5	6	7	8	9	10
(1) Task completion	*(0.64)*									
(2) Social community	0.22	*(0.83)*								
(3) Goal clarity	0.35	0.43	*(0.78)*							
(4) Illegitimate tasks	– 0.27	– 0.38	– 0.49	*(0.77)*						
(5) Interpersonal conflicts	– 0.20	– 0.62	– 0.42	0.50	*(0.87)*					
(6) Role conflict	– 0.33	– 0.43	– 0.55	0.70	0.55	*(0.73)*				
(7) Work engagement	0.23	0.35	0.36	– 0.25	– 0.23	– 0.29	*(0.82)*			
(8) Workaholism	0.11	– 0.17	– 0.19	0.37	0.24	0.33	0.10	*(0.93)*		
(9) Perceived work-related health	0.21	0.41	0.39	– 0.48	– 0.41	– 0.47	0.40	– 0.37	*(0.80)*	
(10) Overtime work	– 0.03	– 0.09	– 0.05	0.18	0.12	0.14	0.18	0.56	– 0.16	*
N	12023	11966	12034	11926	11958	11950	11643	11273	12034	11900
Mean	3.72	3.99	3.55	2.39	2.31	2.49	4.60	2.17	4.90	2.28
SD	0.64	0.76	0.77	0.76	1.02	0.72	1.04	0.56	1.41	0.90

*All correlations are significant at the 0.01 level (p). * single item question.*

TABLE 2. 2

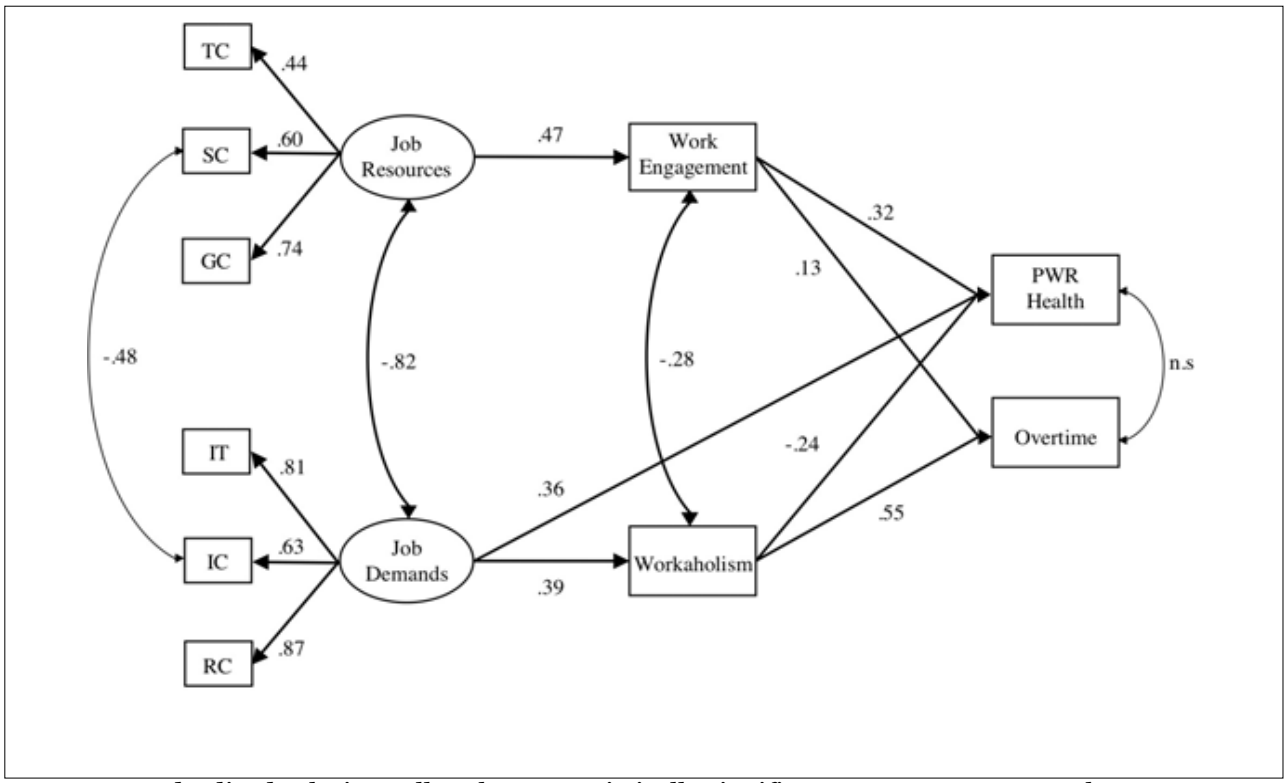
Fit indices of the model

	CFI	TLI	RMSEA	SRMR
CFA1 factor	0.89	0.82	0.16	0.05
CFA2 factor	0.99	0.99	0.03	0.01
M1 hypothesized	0.95	0.92	0.08*	0.06
M2 final	0.98	0.97	0.05	0.03

Note. N = 12169. * The RMSEA had a p-value of <0.001, indicating that the hypothesized model does not have a good fit.

Figure 2.1

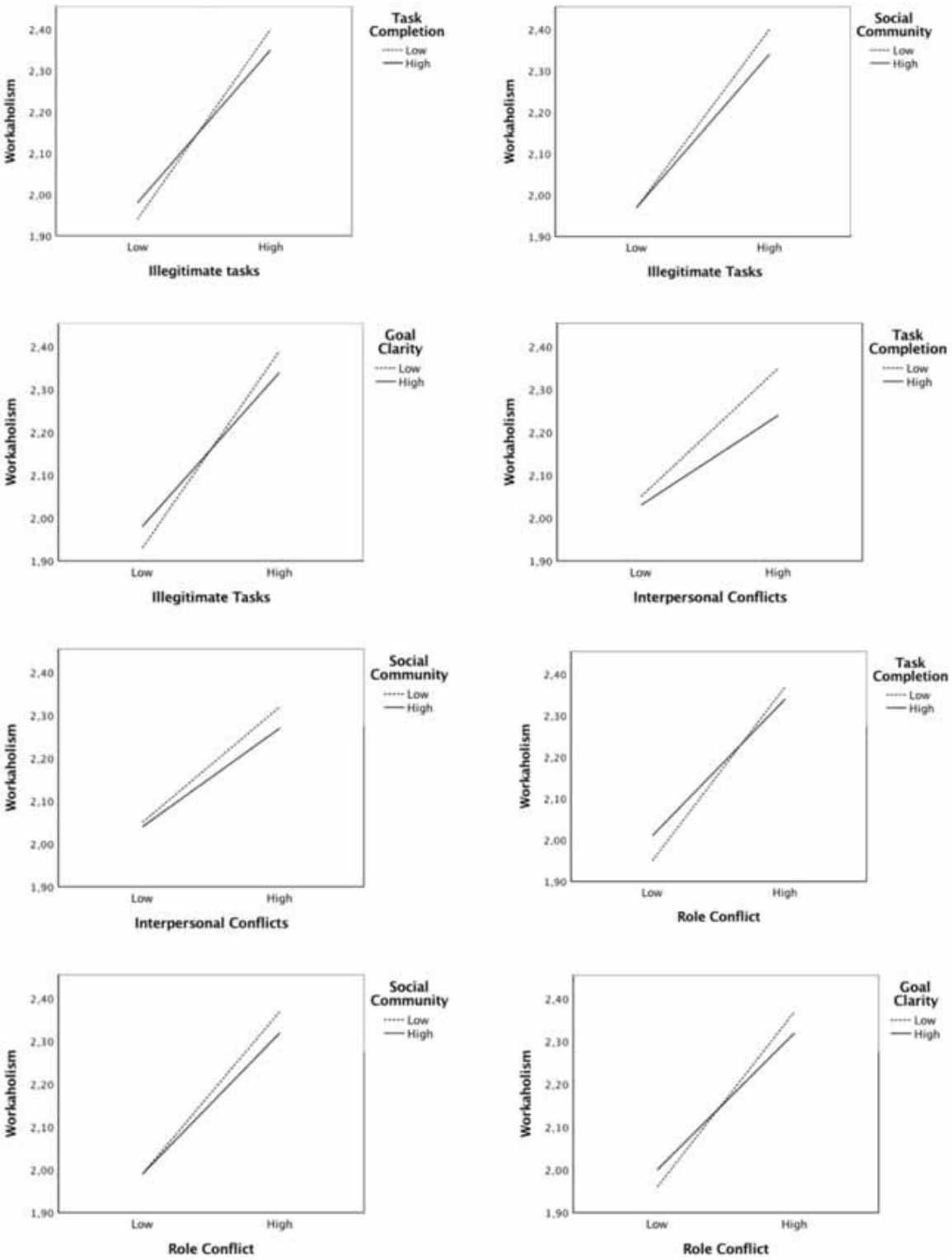
SEM model



Note. Standardized solution. All paths are statistically significant at p <.001. TC = task completion; SC = social community; GC = goal clarity; IT = illegitimate tasks; IC = interpersonal conflicts; RC = role conflicts, PWR Health = perceived work-related health.

Figure 2.2

The Interaction Effects



3 Chapter: Work Engagement and Health

3.1 Overview of Study

In the previous chapter, I presented results supporting the notion that work engagement and workaholism are two different types of heavy work investment that are related to positive and negative work-related health, respectively. Thus, we applied work-related indicators as outcomes of the motivational process. However, the study in Chapter 2 was cross-sectional, which limits the possibility to draw causal inferences. In the current chapter I present a longitudinal conceptual replication of the motivational process studied in the former chapter. That is, we examined the impact of job resources (i.e., social support and feedback) on work engagement and their relationship with self-reported health and sickness absenteeism. Further, I discuss the inclusion of health-related indicators as outcomes of the motivational process in the JD-R model. Below I present a shortened version of the published manuscript. See Appendix B for the full manuscript.

3.1.1 Health-related Outcomes in the JD-R model

In the well-established JD-R model, health-related indicators have most often been measured as outcomes of the health-impairment process, whereas organizational outcomes have been linked to the motivational process. It has been argued that one of the limitations of the JD-R model is the lack of investigations of the relations among job resources, work engagement and health-related outcomes (Airila et al., 2014). Even though it has been suggested to expand the motivational process in the JD-R model with regard to health-related outcomes, it is necessary to perform studies that can validate this expansion.

3.1.2 Job Resources Leads to Work Engagement

Job resources may be intrinsically motivating by facilitating growth, development and learning (Bakker & Demerouti, 2014) and thus function to satisfy basic needs, such as the needs for autonomy, relatedness and competence (Fernet et al., 2012; Ryan & Deci, 2017). For example, social support may fulfill the need to belong (Van Wingerden et al., 2017a), and suitable feedback may foster learning, which increases job competence (Bakker, 2011). The same job resources may also be extrinsically motivating by providing tools or concrete information that contribute to goal attainment. For instance, social support may function as hands-on assistance to handle momentary work overload (i.e., reduce job demands) to reach work goals (Salanova et al., 2010), while feedback can provide concrete information that may contribute to goal achievement. Hence, both social support and feedback enhances the possibility that an employee successfully will achieve his or her goals at work (Schaufeli &

Bakker, 2004). In addition, being in a resourceful work environment may stimulate the desire to dedicate one's capabilities and effort to the job task (Bakker et al., 2014), which increased the likelihood that the tasks will be completed and that work goals will be achieved. Whether these resources satisfy basic needs or contribute to achieving work goals, the outcome is positive, and it is likely that work engagement will emerge (Schaufeli & Bakker, 2004; Schaufeli & Salanova, 2007).

The relationship between job resources and work engagement is compatible with the job characteristics theory (Hackman & Oldham, 1980). The job characteristics theory emphasizes that certain core job characteristic (i.e., skill variety, task identity, task significance, autonomy and feedback) will lead to different work-related outcomes, of which intrinsic motivation corresponds with work engagement. Also, self-determination theory (Ryan & Deci, 2000) suggests that job resources satisfy the basic human needs for autonomy, competence and relatedness. The fulfillment of these needs leads to increased intrinsic motivation and optimal functioning, which is essential for psychological health and well-being. Conservation of resources (COR) theory (Hobfoll, 1989; Hobfoll et al., 2018) is also compatible with the notion that job resources are associated with work engagement. COR theory suggests that resources evolve n cycles, meaning that various types of resources are likely to accumulate over time because the existence of resources may bring additional resources (Xanthopoulou et al., 2009a). As stated in the COR theory, people strive to obtain, retain, and protect their resources, including job resources. Individuals with strong resource pools invest resources for future gains and thus experience a gain cycle. On the other hand, those who do not have access to strong resource pools have an increased likelihood of experiencing resource loss (i.e., loss cycle). Hence, gaining resources increases the likelihood that additional resources will be acquired, which in turn increases work engagement.

3.1.3 Work Engagement Leads to Better Self-Reported Health and Reduces Sick Leave

In well-being research, there is a growing interest in the associations between positive work-related conditions and states, and health outcomes. Work is identified as an important health determinant (Waddell & Burton, 2006), and gainful employment is considered to foster good health. For example, Keyes (2007) showed that flourishing employees had a lower risk of cardiovascular disease and reported fewer days of sick leave than their less-flourishing colleagues.

Convincing empirical support has been provided for the motivational process of the JD-R model, which moves from job resources through engagement to positive organizational outcomes (Bakker, 2017; Halbesleben, 2010; Schaufeli & Salanova, 2007). It has been shown,

for example, that work engagement is positively associated with positive work-related attitudes, commitment to the job and organization, and better performance at work. However, the link between job resources and health-related outcomes, such as subjective health and sick absence, via work engagement has rarely been investigated (Airila et al., 2014). However, there is some empirical evidence of a positive association between job resources and work engagement and health-related outcomes. Hakanen and Schaufeli (2012) showed that engagement was positively related to life satisfaction. Airila et al. (2014) revealed that engagement mediated the relationship between job and personal resources and workability, in which the latter includes being healthy enough to perform the job. Moreover, and as presented in the previous chapter, we revealed that workaholism was negatively related to work-related health but that work engagement was positively related to work-related health, although both workaholics and engaged employees worked overtime hours (Langseth-Eide, 2019). Additionally, previous studies have revealed that engaged employees report fewer psychosomatic complaints (Demerouti, Bakker, Nachreiner, et al., 2001), suffer less from head pain, cardiovascular problems and abdominal pain (Schaufeli & Bakker, 2004) and report better self-reported health (Hakanen & Schaufeli, 2012).

This is in line with COR theory (Hobfoll, 1989; Hobfoll et al., 2018) that describes pathways from job resources via work engagement to health in long term gains. People employ their resources not only to deal with stress, but also to have a pool of resources for future needs. These resources are salient in creating well-being (i.e., work engagement) and in enhancing health. In the long term, individuals that have access to greater resources will experience future resource gains, and this will contribute to protect against stress and as a consequence they will be better protected against illness and ill-being. To summarize, COR theory presumes that increased levels of resources will be beneficial for ill-being and health in the long term. Healthy employees are less absent from work, and there is empirical evidence that health mediates the relationship between job-related states (such as work engagement) and sick leave. For example, Schalk and Schouten (2000) showed in a longitudinal study that work place attitudes (i.e., job satisfaction and organizational commitment) were negatively related to sick leave and that this relationship was mediated by employee health. Further, based on their summarization of previous studies, Pousette and Hanse (2002) proposed that the relationship between particular work attitudes and sick leave was mediated by health. Thus, there is some empirical evidence to suggest that engagement can predict reduced sick absence and that this relationship is mediated by subjective perceptions of health.

3.2 Study Goals and Hypotheses

With the present study we aim to show that the motivational process in the JD-R model, which starts with job resources that give rise to work engagement, may, in turn, lead to positive health-related outcomes. Although the proposed processes in the JD-R model have been replicated numerous times, a great majority of these studies have been performed with cross-sectional data. Our contribution includes both concurrent and longitudinal (panel) data.

To test the motivational process in the JD-R model, we examined antecedents and consequences of work engagement. In line with previous research, we hypothesize that job resources (i.e., social support and feedback) predict work engagement (**H1a**). Further, in line with literature on gain cycles, we hypothesize that work engagement at a given point of time (T1) directly affects levels of job resources in a subsequent time point (T2) (**H1b**).

For theory development, we included health-related measures as outcomes and hypothesize that work engagement is negatively related to sick leave (**H2a**) and that the relationship between work engagement and sick leave is mediated by employees self-reported health levels (**H2b**).

3.3 Method

3.3.1 Sample and procedure

The data for the present study were collected as a part of a work environment survey among public employees with a variety of professions (e.g., teachers at elementary schools and art school, lawyers, cleaners, public health nurses, nurses, physiotherapists, librarians, bureaucrats, social workers, engineers, firemen, IT advisors, translators, janitors, and administrative personnel) in a municipality in Norway. The broad variety of professions and workplaces is favorable regarding external validity. Participants were invited by e-mail with a link to an electronic questionnaire at both T1 and T2 two years later. A total of 1544 and 1503 employees participated in the survey at T1 and T2, respectively. The participants could make their T1 and T2 information identifiable on a voluntary basis. A total of 185 participants completed both questionnaires and made themselves identifiable and could therefore be included in the longitudinal analysis; 27% (N = 50) of the participants were men, and 73% (N = 135) were women. The mean age at T1 was 33.4 (SD = 10.05).

3.3.2 Measures

To measure feedback, a five-item scale developed by Kuvaas (2007) was employed. An example item is "I receive frequent and continuous feedback on how I do my job". The Cronbach's alpha coefficients were 0.87 and 0.85 at T1 and T2, respectively. Colleague support was measured using a four-item subscale from the Survey of Perceived Organizational Support (Rhoades et al., 2001). An example item is "My colleagues really care about my well-being". The Cronbach's alphas were 0.94 and 0.89 at T1 and T2, respectively. The responses for feedback and colleague support were provided on a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree).

Work engagement was measured with the nine-item version of the Utrecht Work Engagement Scale (Schaufeli, Bakker, et al., 2006), as presented in the previous chapter. Also, and like the analyses presented in chapter two, neither the exploratory factor analysis nor the confirmatory maximum likelihood analysis indicated a clear three-dimensional model. For this reason, a one-dimensional mean score variable based on the nine items was computed and used in the subsequent analyses. The Cronbach's alpha were 0.94 at T1 and 0.95 at T2.

A single item was used to measure the participants' subjective health: "How would you describe your present health?" (Aronsson & Gustafsson, 2002). The response alternatives were Very poor, Poor, Average, Good and Very Good. This single-item measure of self-reported health has previously been used in numerous studies (e.g., Fylkesnes & Førde, 1991; Heistaro et al., 2001). Self-reported health has been closely related to somatic and psychological complaints in several previous studies and has also proven to be a predictor of objective health measures (Idler & Benyamini, 1997; Manderbacka, 1998). It has been argued that this single-item measure of subjective health is correlated strongly with other direct or indirect measures of health and has good test-retest reliability, demonstrating a high degree of construct validity (Mackenbach et al., 1994).

To assess the participants' sick absence, we asked participants how many times (spells/episode, not days) they had been absent from work due to sickness during the past 12 months. Sick absence can be assessed as spell-, person-, or time-based measures. Sick absence spells, often referred to as sick leave episodes, are common events in the general population. Sick absence spells have a skewed distribution, in which short-term spells are common, whilst long-term spells take place to a smaller extent. In previous reviews of measurements of sickness absence, Hensing et al. (1998) and (Hensing, 2009) suggested the following five measures for sick absence: frequency, length, cumulative incidence, incidence rate and duration. Frequency was suggested as a basic measure. They argue that it is suitable

to apply frequency as a measurement when studying workplaces as it can provide an overview of the burden of sickness absence within a limited study population.

3.3.3 Analyses

We computed the internal consistencies, descriptive statistics, and intercorrelations of the study variables using the PAWS 25.0 program (IBM, Armonk, NY, USA).

To test our hypotheses, we conducted SEM analyses using the Mplus 8.0 software package (Muthén & Muthén, 1998-2018). The fit of the models were assessed with the chi-square test, root mean square of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI) and standardized root mean square residual (SRMR). It is suggested that RMSEA values below 0.07, SRMR values below 0.08, and CFI and TLI values greater than 0.95 indicate a good fit (Hooper et al., 2008).

3.4 Results

The descriptive statistics, Pearson's correlations and Cronbach's alpha of the study variables are presented in Table 3.1. All variables were normally distributed within the limits of a skewness less than | 2 | (West et al., 1995). None of the mean scores differed significantly across time points (all p values from paired-sampled t-tests > 0.270). As expected, the cross-sectional correlations between the two job resources variables and the work engagement variable were moderately high, ranking between r = 0.24 and r = 0.43 (p's < 0.01). The associations between these variables and the sick leave variables were negative and much smaller, in the range of r = –0.06 to r = –0.16, all p's > 0.05, except for the association between feedback and sick leave at T1, (i.e., r = –0.16) which was significant at p = 0.037. Self-reported health and sick leave correlated negatively and significantly, r = –0.20, p = 0.008, and r = –0.33, p < 0.001, at T1 and T2, respectively. Self-reported health at T1 also correlated negatively with sick leave at T2, r = –0.27, p = 0.001.

The variables were fitted to the path model depicted in Figure 3.1. All models received acceptable goodness of fit (Table 3.2). The standardized regression coefficients (betas) were all significantly different from zero (p < 0.01) and were in the range from β = –0.14 (p < 0.001) for path E (cf. Figure 3.1 and Table 3.3) in the complete sample at T1 to β = 0.41 (p < 0.001) for path A in the longitudinal subsample at T1.

To determine whether the associations in the full samples at T1 (N = 1544) differed from those in the subsample of participants who completed the questionnaires at both time points and made themselves identifiable (N = 185), we constrained all coefficients in the full sample T1 model to be equal to those in a model with the longitudinal data (i.e., the N = 185

sample at T1). We repeated the procedure for two models at T2 (i.e., compared results based on the full $N = 15003$ sample, with data from the $N = 185$ sample).

Using a multigroup strategy, we first inspected the differences in chi-squares for the two T1 models, and next for the two T2 models. The chi-square difference at T1 was not significant $\Delta X^2(5) = 3.09$, $p = 0.686$. Similarly, the chi-square difference at T2 was not significant either, $\Delta X^2(5) = 3.03$, $p = 0.695$.

Hence, with regard to the associations between the present study variables, we assumed that they were the same for those of the participants who completed both questionnaires as compared to those who only completed either the T1 or the T2 questionnaire.

Regarding the size of regression weights, the results from the models were consistent with the results from the zero-order correlations. No direct effect from job resources to health and sick leave were included in the model, and we did not observe any direct effect from work engagement to sick leave.

Figure 3.2 shows our final model, which integrated information from both data waves. The model adequately fit data with $X^2(25)$, $N = 184) = 34.92$, $p = 0.089$, CFI = 0.98, RMSEA = 0.05 [0.00 0.08], SRMS = 0.05. The model showed the cross-sectional stability between variables and crossover effects within variables. For example, the cross-sectional paths from health to sick leave were $\beta = -0.21$ and $\beta = -0.22$ at T1 and T2, respectively (both ps < 0.01). A direct path from health at T1 to sick leave at T2 was nonsignificant, $\beta = -0.09$, $p = 0.259$.

Our first hypothesis (H1a) stated that job resources predict work engagement, which is confirmed in the path from feedback to work engagement ($\beta = 0.23$, $p = 0.001$) and from social support to work engagement ($\beta = 0.34$, $p = 0.001$) in Figure 3.2. Our second hypothesis (H1b) was partly supported. It suggests that work engagement at T1 predicts job resources at T2, which it does for social support ($\beta = 0.14$, $p = 0.021$), but not for feedback ($\beta = 0.03$, $p = 0.617$).

Our final hypotheses are that work engagement is negatively related to sick leave (H2a), and that this relationship is mediated by self-reported health (H2b). Hypothesis 2a was not supported since no significant paths between work engagement and sick leave were found ($ps > 0.073$). Hypothesis 2b was supported, however, since the indirect effects at both T1 ($\beta = -0.07$, $p = 0.044$) and T2 ($\beta = -0.06$, $p = 0.034$) were significant and in the expected direction. Longitudinally, a small but significant indirect effect was found from work engagement at T1 through general health at T1 on sick leave at T2 ($\beta = -0.02$, $p = 0.047$).

3.5 Discussion

The aim of this paper was to show that the JD-R model could be expanded by including health-related indicators as outcomes in the motivational process. Hence, we examined antecedents (i.e., job resources) and consequences (i.e., health and sick leave) of work engagement within the framework of the JD-R model.

As expected, we found longitudinal evidence that social support and feedback predicted work engagement (H1a). Our findings support the main notion of the motivational process of the JD-R model, namely, that job resources have a positive effect on employee well-being (Bakker & Demerouti, 2017). Hence, it is likely that a resourceful job environment enhances the chances of having engaged workers. These findings are in line with the assumption in the COR theory of an accumulation process resulting in resource gains. When employees hold resources they value, they are more likely to continue to invest resources, which in turn increases work engagement. Our final model also supports previous studies that have revealed a positive association between job resources and work engagement (Bakker & Bal, 2010; Hakanen et al., 2006).

Drawing on the reciprocal process described in the COR theory, we also hypothesized that work engagement at T1 would predict job resources at T2 (H1b). This hypothesis was only partially confirmed. We found a significant relationship between work engagement at T1 and social support at T2, but a nonsignificant relationship between work engagement and feedback at T1 and T2, respectively. There might be several reasons for this finding. One issue is to consider the relatively high stability of work engagement (Ângelo & Chambel, 2015). Due to the relatively stable nature of many psychological constructs, the predictors will fail to account for any additional variance in the outcome variable. Time lags that are too long may also lead to the underestimation of the true causal impact (Dormann & Griffin, 2015). The two-year follow-up period may have been suitable to investigate the association between work engagement and social support among colleagues. Often, employees are colleagues for several years, and social support, which also has a relational aspect, may therefore not be very vulnerable to longer time lags between measurement points. On the other hand, it is possible that the two-year time lag is unsuitable to investigate the association between feedback and work engagement. Feedback, as measured in the present study, is a transaction between the leader and the employee and is often tied to job tasks and performance (Kuvaas, 2007). It may be that levels of feedback change more during a two-year period than the social relations among colleagues, and feedback may therefore be more vulnerable to long time lags between measurements. Future studies should investigate the longitudinal relationship between feedback and work engagement in more detail. However, the overall results were meaningful and support the motivational process in the JD-R model.

Finally, we wanted to investigate the inclusion of health-related indicators as outcomes of the motivational process in the JD-R model. The results did not provide longitudinal evidence that work engagement directly led to reduced sick leave (H2a), but a significant mediating effect was found via self-reported health (H2b). Thus, it seems that engaged workers experience better subjective health than less engaged workers and that they are less absent from work. Hence, our findings support the pathway described in the COR theory in which job resources are positively related to health-related outcomes via engagement through long-term gains.

There might be several reasons why engaged workers report better health and are less absent from work. Previous studies have revealed that compared to less-engaged workers, engaged workers recover from their workdays better (Sonnentag et al., 2012) and more often experience positive emotions (Ouweneel et al., 2012). Engaged workers also report that they more often participate in leisure-time activities that help them relax and detach from work, such as sports and exercise, social activities and hobbies (Brummelhuis & Bakker, 2012). Additionally, Schaufeli and Bakker (2004) found that engaged workers suffered less from self-reported headaches, stomach aches and cardiovascular problems. Hence, work engagement may lead to something else beyond positive organizational outcomes. Our results provide evidence that the JD-R model could also be used more broadly to predict positive health, as well as the (negative) health outcomes that often follow the health-impairment pathway.

3.5.1 Limitations and future research

The current study has some limitations that should be mentioned. We used questionnaires to collect data, and there are some limitations to this method. First, the results are based on single-source self-ratings, which may imply that the relationships among the variables are due to common method variance. However, applying a longitudinal design has been shown to reduce the problem with unmeasured third variables and common method variance (Menard, 2007). We also conducted Harman's single-factor test, and the results showed that common method variance did not pose a problem in this data set (Podsakoff et al., 2003). Still, future studies could enhance the explanatory power of the model by including other measures. For example, observer ratings have previously been used successfully to study working conditions (Hakanen et al., 2006) and could be applied.

There are also limitations inherent in the measurement of subjective health. In questions about self-reported health, there is often a norm or benchmark attached to it. Participants may, for example, compare themselves to similar others (e.g., how my health is compared to others at my age) or take time into account (e.g., my current health status

compared with one year ago). In order to overcome these challenges, objective measures could be applied. In addition, our study may display a selection bias called “the healthy worker effect”, that is, only the strongest and healthiest employees stay in the work force while those who are unhealthy leave working life. However, empirical studies suggest that problems with nonresponse are more severe for estimation of population means than for estimations of associations (Van Loon et al., 2003). There are also limitations in the measurement of sick leave. The reliability of the measure of sick leave in this study may have been reduces due to memory bias since what we measured was the employees’ recalled sick leave. Again, objective measures, such as absence registers may be employed in future studies.

Finally, there are some limitations regarding the sample in our study. Although the participants represent a large variety of professions and workplaces within the municipality, they are all from the same geographical area and have the same overall employer. Thus, there might be that our findings cannot be generalized to other communities. Future studies should attempt to investigate the associations between job resources, work engagement, health, and sick leave in both the private and public sector, in different occupations and workplaces and in different areas of the world.

Table 3.1

Descriptive Statistics, Pearson's Product-Moment Correlations and Cronbach's Alphas (in the diagonal) for Feedback, Social Support Work engagement, Self-reported health, and Sick absence spells

	Range	*M*	*SD*	*Sk*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Time 1														
1. Feedback	1 to 7	3.57	1.46	0.22	(.87)									
2. Social support	1 to 7	5.68	1.31	-1.28	.41***	(.94)								
3. Work engagement	1 to 7	5.67	1.22	-1.26	.37***	.43***	(.94)							
4. Self-reported health	1 to 5	3.94	.76	-0.35	.06	.13	.24**	†						
5. Sick absence spells	1 to 13	3.05	1.83	1.83	-.16*	-.06	-.12	-.20**	†					
Time 2														
6. Feedback	1 to 7	3.63	1.39	1.39	.53***	.24**	.22**	.03	-.16*	(.85)				
7. Social support	1 to 7	5.62	1.22	1.22	.31***	.64***	.39***	.14	-.16*	.30***	(.89)			
8. Work engagement	1 to 7	5.57	1.25	1.25	.24**	.40***	.55***	.19**	-.18*	.31***	.40***	(.95)		
9. Self-reported health	1 to 5	3.88	.79	0.79	.05	.13	.15*	.56***	-.22**	.05	. 09	.31***	†	
10. Sick absence spells	1 to 13	3.08	2.08	2.08	-.02	-.08	-.08	-.27***	-.54***	-.14	-.04	-.26***	-.33***	†

Note. *M* = Mean, *SD* = Standard Deviation, *Sk* = Skewness,

*p <.05, **p < .01, ***p <.001 (two-tailed tests).

Figure 3.1

The study model.

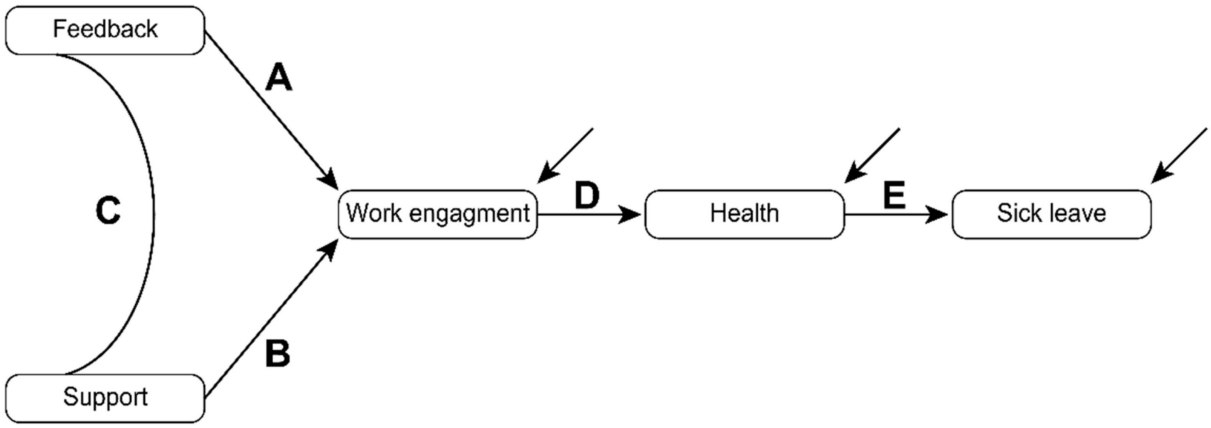


Table 3.2

Goodness-of-fit measures for the model depicted in Figure 3.1, fitted to the full samples at T1 and T2 and to the longitudinal samples at T1 and T2.

Model	$\chi^2(5)$	*N*	*p*	CFI	RMSEA (90% CI)	SRMR
Model 1 (T1)	15.04	1544	0.010	0.96	0.04 [0.02–0.06]	0.03
Model 2 (T1)	4.67	185	0.457	1.00	0.00 [0.00–0.10]	0.04
Model 3 (T2)	18.11	1501	0.003	0.97	0.04 [0.02–0.06]	0.02
Model 4 (T2)	8.88	185	0.114	0.95	0.07 [0.00–0.13]	0.05

Note. χ^2(df) = Chi-square (degrees of freedom), CFI = Comparative Fit Index, RMSEA = Root Mean Square of Approximation, SRMR = Standardized Root Mean Square Residual.

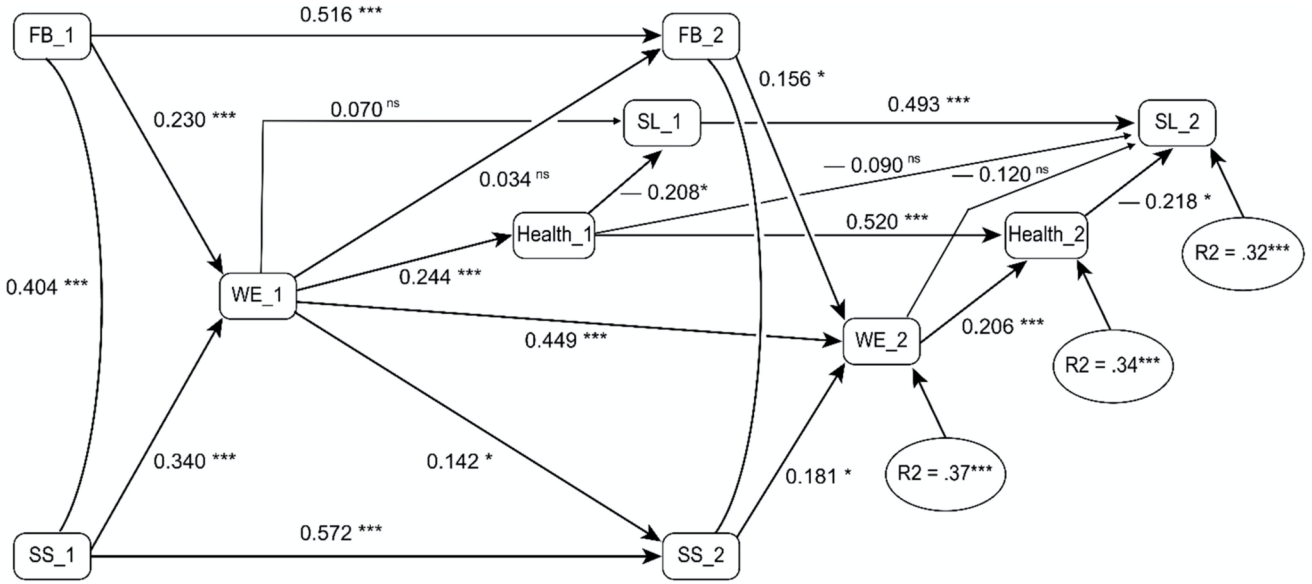
Table 3.3

Standardized regression coefficients (β's) and 95% confidence intervals (CIs).

	T1			T1 Longitudinal			T2			T2 Longitudinal		
Path	β	LL-CI	UL-CI	β	LL-CI	UL-CI	β	LL-CI	UL-CI	β	LL-CI	UL-CI
a	0.37	0.30	0.43	0.34	0.21	0.47	0.28	0.23	0.33	0.34	0.21	0.47
b	0.22	0.15	0.28	0.23	0.10	0.37	0.27	0.22	0.31	0.21	0.08	0.34
c	0.30	0.23	0.35	0.41	0.28	0.53	0.30	0.26	0.34	0.30	0.12	0.43
d	0.29	0.23	0.25	0.24	0.11	0.38	0.25	0.20	0.29	0.31	0.13	0.44
e	-0.14	-0.20	-0.10	-0.20	-0.35	-0.06	-0.19	-0.25	-0.14	-0.33	-0.51	-0.20

Figure 3.2

Longitudinal model.



FB = feedback, SS = social support, WE = work engagement, SL = sick leave episodes, 1 = T1, 2 = T2.

* $p < 0.05$, *** $p < 0.001$, ns = non-significant.

4 Chapter: Individual Appraisals of Job Demands

4.1 Overview of Study

The results presented in Chapter 2 and 3 suggest that it is possible to work hard and be healthy. My data specifically speaks to that work environments rich in resources are likely to generate engaged employees and promote positive health. In Chapter 2 I also investigated the negative impact of job demands on workaholism and health. Taken together, both studies show that working conditions (i.e., job resources and job demands) may lead to well-being and ill-being, which is in line with the proposals of the JD-R model. However, it has been suggested that job demands, commonly categorized as negative stressors, may have the potential to have a more positive valence. If, and under which conditions, job demands may hold a positive potential remains as one of the unresolved issues in the JD-R model. In the current chapter I am investigating how organizational contexts and individual dispositions may influence the appraisal of job demands. Below I present a shortened version of the published manuscript. See Appendix C for the full manuscript.

4.1.1 Job Demands in the JD-R model

The JD-R model (Bakker & Demerouti, 2014; Bakker & Demerouti, 2017) proposes that working conditions initiate two distinct processes that lead to well-being and ill-being at work. Specifically, job resources start a motivational process that leads to engagement and positive outcomes, whereas job demands start a health impairment process that leads to burnout (Bakker et al., 2014), workaholism (Langseth-Eide, 2019; Molino et al., 2015) and negative outcomes. Thus, job demands are positioned as predictors in the health impairment process but have no roles in the motivational process. However, it has been argued that job demands can also be motivating. For example, LePine, Podsakoff and LePine (2005) as well as Podsakoff, LePine and LePine (2007) made a distinction between hindrance and challenging demands, in which hindrance demands have a negative impact and challenge demands have a positive impact on employee well-being, respectively. In their paper, in which they summarize the development of the JD-R theory and address issues that need to be solved, Bakker and Demerouti (2017) specifically raise the concern about the two types of job demands (i.e., with a positive or negative impact on well-being) and suggest that new research may try to uncover the conditions under which job demands act as challenges versus hindrances.

The JD-R model states that several job resources and job demands should be grouped into general higher-order factors of resources or demands. However, some studies have suggested that job demands may not always belong to one overarching construct. For

example, Luchman and González-Morales (2013) found that a model, in which several job demands were included as individual factors, fit the data better. It is possible that this finding is due to the notion that demands can be differentiated into demands that have a positive or negative impact (i.e., challenge or hindrance) on employee well-being. Additionally, the confirmatory factor analyses reported in the study of Van den Broeck et al. (2010) supported the differentiation between job hindrances and job challenges. Additionally, structural equation modeling revealed that job challenges were positively associated with vigor and unrelated to exhaustion, while job hindrances were positively related to exhaustion and negatively related to vigor. Furthermore, Searle and Auton (2015) found that even when the effects of demands were accounted for, it was the individual differences in the appraisal of the demands that consistently explained the unique variance in the outcomes (i.e., affective states). Webster et al. (2011) revealed that although a demand was primarily perceived as either challenging or hindering, it could also be perceived as both challenging and hindering at the same time. Taken together, this suggests that more research is necessary to clarify the role and denomination of job demands by investigating them in various jobs, work situations and how individual characteristics influence appraisals of job demands.

4.1.2 Differentiation of Job Demands

LePine, Podsakoff and LePine (2005), as well as Podsakoff, LePine and LePine (2007) introduced the differentiation of job stressors into challenge stressors and hindrance stressors. Hindrance job stressors have been defined as "job demands or work circumstances that involve excessive or undesirable constraints that interfere with or inhibit an individual's ability to achieve valued goals" (Cavanaugh et al., 2000, p. 67). This description corresponds with the definition of job demands described in the JD-R model. Examples of hindrance job demands reported in previous studies include role ambiguity (e.g., Kawai & Mohr, 2015; Lin & Ling, 2018) and illegitimate work tasks (e.g., Semmer et al., 2015). These job stressors are considered negative. On the other hand, stressors that have the potential to promote personal growth as well as goal achievement are defined as challenge stressors (Podsakoff et al., 2007). Examples of challenge stressors reported in the literature include high workload levels (e.g., Van Laethem et al., 2019) and responsibility (e.g., Kim & Beehr, 2020). These demands, although they require effort, may lead to beneficial individual and organizational outcomes and are therefore considered stressors with positive potential.

It is not yet known whether the differentiation between job demands as challenging and hindering is valid due to the lack of evidence regarding this issue. Moreover, it is still unclear whether such a differentiation between job demands is valid for every occupation (Bakker & Sanz-Vergel, 2013). For example, some studies have classified role conflict as a

hindrance demand (Antwi et al., 2019), while others have considered it a challenge demand (Wincent & Örtqvist, 2011). Similarly, emotional demands have been considered a hindrance demand by some (Ahmed et al., 2017; Albrecht, 2015) and a challenge demand by others (Donoso et al., 2015). Hence, regarding job demands, the observations, opinions, categorization, and conclusions are not always the same in the scientific literature, and the same job demands are not consistently classified as either hindrances or challenges. Furthermore, it has been shown that employees will not always experience job demand as either a hindrance or a challenge; indeed, several researchers have argued that the categorization of job demands into having either a hindrance or challenge demand is too simplistic (e.g., Li et al., 2020; Parker, 2014). For example, Bakker and Sanz-Vergel (2013) showed that nurses perceived work pressure *more* as a hindrance than as a challenge demand. This approach in which employees report the degree to which they experience each job demand as hindering and challenging may provide more nuanced insight into the differentiation and role of job demands.

4.1.3 Appraisal of Job Demands

Whether or not the same job demand is appraised similarly by individuals has seldom been tested (Li et al., 2020) but some studies have reported that individual subjective appraisal accounts for the differences regarding whether a job demand is classified as hindering or challenging (e.g., Li et al., 2020; Searle & Auton, 2015). Appraisal, in the context of the present study, can be defined as an individual's perception and interpretation of specific job characteristics, and how these job characteristics hold potential for personal growth, gain and goal achievement (i.e., challenging) or whether they are appraised as constraints that are hindering (Li et al., 2020, September 20). Research by Lazarus (1991a, 1991b) and Bagozzi (1992) has contributed to the literature on occupational stress models and appraisals, and they argue that employees make continuous appraisals of their work environments. Based on these appraisals, they form mental representations of which behavior they may apply to cope with these appraisals. Specifically, the Lazarus (1991b) transactional model of stress and coping (TMSC) suggests that individuals first make primary appraisals, that is, evaluating the significance and importance of a stressful episode, followed by secondary appraisals, which is an evaluation of the available options and resources to handle stressful events (Folkman et al., 1986). The TMSC suggests that not all stressful episodes will lead to negative stress reactions, which will happen only when the stressors are appraised as exceeding the available resources, and that they will impact well-being negatively. Thus, individuals will appraise stressors or stress episodes differently, and the same stressor may therefore be appraised negatively by one and not by another (Lazarus, 1991a). Hence, according to the TMSC, appraisals can function as mediators between job

demands, well-being and work outcomes. Research has also revealed that appraisals of job demands may function as moderators on the relationship between job demands and work outcomes (Li et al., 2020, September 20; Li et al., 2020). In line with the person-context interaction theory (Magnusson & Stattin, 1998), which states that individual functioning is a result of the interaction between the individual and the environment, Li et al. (2020) as well as Li et al. (2020, September 20) argue that individuals may appraise a stressor (i.e., job demand) as potentially impacting them positively (i.e., challenging), negatively (i.e., hindering) or both. This may, in turn, moderate the relationship between job demands, well-being, and other work outcomes. Although a body of research has revealed a link between job demands, employee strain and well-being (e.g., Ângelo & Chambel, 2015; Dicke et al., 2018; Vander Elst et al., 2016), this relationship is not fully understood. Job demands may be perceived and experienced in several ways. Investigations of appraisals of job demands are needed to gain knowledge and validate the hindrance-challenge framework of job demands.

4.1.4 Organizational Context

One of the reasons why a given job demand has been classified as hindering or challenging may be due to the nature of work that they are related to. For example, Bakker and Sanz-Vergel (2013) found that nurses perceived workload and time pressure as hindering rather than challenging. These hindering demands were experienced as inhibitory and destructive for both personal growth and achieving work goals. Specifically, high levels of time pressure reduced the quality of patient care. In the same study, the authors describe how a different occupational group, namely journalists, appraised time pressure as a challenging job demand. The nature of many journalists' jobs is to work under a strict time regime. Time pressure may be a job demand that does not hinder journalists from achieving their work goals and rather is a challenge demand they often and successfully overcome, which leads to goal achievement.

Emotional demands at work have been perceived as positive indicators for better performance by some occupational groups. Bakker and Sanz-Vergel (2013) reported that emotional demands were experienced as more challenging than hindering among nurses. Nurses experienced interactions with patients and the need to confront emotional demands as a part of their everyday work lives and as a part of their job. Conversely, it might be that other occupational groups find emotional demands hindering and not a natural part of their jobs. For instance, it might be that real estate agents can experience emotional demands as something outside their core job tasks and as something that will hinder them from achieving their work goals.

Although there are individual differences among employees in occupational groups, there are some characteristics belonging to the job performed by certain occupational groups that may influence the appraisal of job demands. Hence, the role of a given job demand may vary by occupation and may therefore be appraised differently (i.e., as hindering or challenging) not only individually but also based on the nature of the work belonging to that occupational group.

4.1.5 Individual Dispositions

In addition to the context in which job demands occur (i.e., occupation), individual traits and differences may also impact appraisals of job demands, of which positive trait emotions may play a role. Over the last decade, positive emotions related to work have received increased attention in the literature (Diener et al., 2020). For example, evidence has revealed that positive emotions are associated with beneficial job attitudes (Judge et al., 2017), productivity (Oswald et al., 2015), creativity (Langley, 2018), job crafting (Costantini & Sartori, 2018), organizational citizen behavior, and cooperation with others (Van Doorn et al., 2012). However, the majority of the research on the relationship between positive emotions and work outcomes has focused on general positive emotions and thus suggested that all positive emotions are equally related to other work variables (Hu & Kaplan, 2015). By applying the functional wellbeing approach (FWA, Vittersø, 2013, 2016), we aim to bring nuance to this topic. According to the FWA, two distinct categories of positive emotions are particularly important for well-being: hedonic feelings, such as pleasure and happiness, and eudaimonic feelings, such as interest and immersion. Hedonic feelings are important because they help sustain homeostatic stability, whereas the major function of eudaimonic feelings is to facilitate change. Hedonic feelings are typically experienced when goals are achieved or needs are fulfilled, i.e., when an equilibrium has been reestablished. Hence, hedonic feelings signal to our minds that our current actions appear to succeed in maintaining our well-being. Relatedly, hedonic feelings also facilitate a kind of mental flexibility, including broadened attention, thus preparing the organism for a change of goals and plans. In contrast, eudaimonic feelings narrow attention to help us stay focused in the process of reaching a difficult goal. Eudaimonic feelings commit us to put in extra effort and to value the striving toward goals—even when the going is rough. Thus, eudaimonic positivity feels different and functions different than hedonic positivity.

Previous research on emotions in the workplace corroborated the association between hedonic feelings and goal achievement, on the one hand, and that between eudaimonic feelings and the process of overcoming a challenging work task, on the other. For example, Stone et al. (2006) found that happiness increased when the workday ended, while building

competence had the highest levels during midmorning when demands were dealt with. Similarly, Straume and Vittersø (2012) found that hedonic feelings decreased during challenging work tasks, whereas eudaimonic feelings increased. Additionally, research on goal pursuit and goal achievement has revealed similar findings. Thorsteinsen and Vittersø (2018) reported in their longitudinal study that eudaimonic well-being initiated and sustained goal pursuit processes, while hedonic well-being was more related to goal achievement.

FWA encompasses both momentary state feelings and more stable and trait-like feelings. According to the FWA, high levels of hedonic feelings predict well-functioning stability, while high levels of eudaimonic feelings predict well-functioning change processes. The orientation to life in hedonic feelings is typically the tendency to evaluate the environment and oneself as good rather than bad, while for eudaimonic feelings, it is the proneness to develop and attain personal growth. Thus, when facing demanding job situations, it is likely that individuals with higher levels of hedonic and eudaimonic feelings will more often evaluate those demands positively and possible to overcome (i.e., good rather than bad) as well as see them as opportunities for utilizing and developing abilities to experience personal growth. This is also in line with (Rogala & Cieslak, 2019), who reported that positive emotions at work did not decrease hindering demands but increased challenging demands.

4.1.6 Applying Vignettes

Vignettes are usually short stories portraying a made-up person and/or a made-up scenario, and vignette studies can be very powerful. For example, Kahneman and Tversky's contributions to economics and psychology was to a large extend due to their observations of responses people provided to small vignettes (Kahneman & Tversky, 2000). By identifying salient characteristics in a specific context, a vignette approach makes is possible to elicit critical patterns in human thinking and emotions (Atzmüller & Steiner, 2010; Wilks, 2004). One of the advantages of the methodology for the current study concerns how it makes standardization of a demanding job situation possible, thus allowing for all participants to respond to the same stimuli (Hughes & Huby, 2002). The imaginary nature of vignettes poses a limitation to the design. Hence, a probable association between imagined and real-life response must be established to generalize the results.

In the present study we have chosen to investigate appraisals of time pressure and emotional demands for two occupational groups, namely nurses and real estate agents. There are several reasons for choosing these occupational groups. Firstly, we have made an effort to choose occupational groups that differ regarding core work tasks. In line with this we aimed

to investigate job demands (i.e., emotional demands and time pressure) that could have different positive and negative denominations (i.e., hindering or challenging) based on the demands in relation to core tasks within those occupational groups. This includes that one of the core tasks for nurses is to care and comfort their patients (i.e., emotional demands), whilst this is not the case for real estate agents. On the other hand, time pressure is related to core tasks for real estate agents, particularly during bidding rounds, a process that is commonly known to be hectic. On the other hand, time pressure is not recognized as a built-in part of nurses work tasks but may rather be understood as a consequence of too high workload and/or understaffing. Finally, both occupations are well-known in Norway and the general population have at least basic knowledge about their core work tasks. Hence, it is reasonable to assume that it is possible for the participants to read vignettes about nurses and real estate agents and appraise the job situations described.

4.2 Aims of Study and Hypotheses

With the present study, we aim to contribute to the job characteristic literature by applying vignettes to investigate the degree to which participants will appraise two job demands (i.e., time pressure and emotionally demanding situation) for two occupational groups (i.e., nurses and real estate agents) as hindering and/or challenging. Additionally, we aim to reveal how the participants' positive trait emotions are related to their appraisals. A vignette study applied on a convenience sample of Norwegian students provides empirical data for the study.

We hypothesize that job demands (i.e., time pressure and emotionally demanding situations) are appraised as both hindering *and* challenging (**H1**). To test if job demands are appraised differently for each occupational group (within) the following hypotheses are tested: for nurses time pressure is appraised as more hindering than emotionally demanding situations (**H2**) and emotionally demanding situations are appraised as more challenging than time pressure (**H3**); for real estate agents emotionally demanding situations are appraised as more hindering than time pressure (**H4**) and time pressure is appraised as more challenging than emotionally demanding situations (**H5**). To test if job demands are appraised differently for the occupational groups (between) the following hypotheses are tested: time pressure is appraised as more hindering for nurses than for real estate agents (**H6**), emotionally demanding situations are appraised as more hindering for real estate agents than for nurses (**H7**), time pressure is appraised as more challenging for real estate agents than for nurses (**H8**) and emotionally demanding situations are appraised as more challenging for nurses than for real estate agents (**H9**). To verify the basic assumption in the FWA, we hypothesize that hedonic and eudaimonic feelings are different concepts and will be accounted for by separate factors (**H10**). Following this, to investigate the influence of

individual dispositions (i.e., positive trait emotions) on appraisals of job demands, we hypothesize that hedonic and eudaimonic are differently related to hindering and challenging appraisals (**H11**).

4.3 Method

4.3.1 Design

To investigate the circumstances under which time pressure and emotional demands are perceived as hindering or challenging, we developed a quasi-experimental study with vignettes. Specifically, we provided two vignettes to the participants, three times each. For each subsequent time the vignette was presented, additional information about the occupation of the person in the vignette was provided. The first time the vignettes were presented, only the employee's name (Hans or Hanna) and demand category (time pressure or emotionally demanding situation) were included. The second and third times the vignettes were presented, we included the occupation of the fictional person in the vignette, who was either a nurse or a real estate agent.

The first vignette described a job situation with high time pressure: "Hanna/Hans has been at work for a few hours. She or he has not been able to take a break yet. It is not certain that she or he will have time to sit down during the rest of the workday. There are many job tasks to be done, and the tempo is high. It is often like this at Hanna's/Hans's job. She or he must often choose which job tasks should be prioritized and which job tasks must wait. A hectic day at work often means that Hanna/Hans are not able to perform all the tasks of the day before she or he goes home, and it is not unusual that she or he must work extra hours and at unfavorable times of the day. To what degree do you think Hanna/Hans is experiencing her or his job as…". Then, six appraisal items were presented as detailed in the Measure section below.

The second vignette described an emotionally demanding job situation: "Hans/Hanna has been at work a few hours when he or she gets into a situation with a woman who is having a very hard time. The woman cries a lot. Hans/Hanna feels like the woman is overwhelmed with emotions and that she is seeking help from him or her to handle the situation she is currently in. It is hard for Hans/Hanna to understand what the woman is trying to tell him or her; she cries so much that it is hard to have a conversation. The woman takes a long time to be able to find the words to describe what she wants and appears somewhat chaotic when meeting Hans/Hanna. To what degree do you think Hans/Hanna is experiencing his or her job as…". Again, the six appraisal items were presented.

The participants were randomly selected to one of two conditions in which the persons' gender and profession in the vignettes varied. See Figure 4.1 for the flow diagram.

4.3.2 Participants

Of 1453 students, 851 in the age range from 16 to 56 (M = 25.22, SD = 5.25) completed the survey and were included in the analyses, of which 77.6% were women (N = 664) and 21.8% were men (N = 187). The students came from a broad variety of study fields: 191 (22.3%) psychology, 221 (25.8%) nursing, 30 (3.5%) real estate, 84 (9.8%) economics, 111 (13%) law and 213 (24.9%) "other study fields". The students were invited to participate in an electronic survey through various social media platforms and by e-mail.

4.3.3 Measures

4.3.3.1 Appraisal of Job Demands

To measure the participants' appraisal of job demands as hindering or challenging, we applied six items previously used by Bakker and Sanz-Vergel (2013). Responses were given on endpoint-labeled scales, ranging from 1 (to a small degree) to 5 (to a large degree). A principal axis exploratory factor analysis with promax rotation suggested that two factors may account for the correlations between the demand variables. Two eigenvalues were higher than 1, and a parallel analysis (Horn, 1965) also supported the choice of a two-factor solution. Since the correlation between the two factors was trivial (r = -.05), we reran the final model with varimax rotation. Different from Bakker and Sanz-Vergel (2013), who conceptualized hindrance demands as consisting of the three items of "hindering", "stressful" and "demanding", our analysis also revealed that the item "challenge" belonged to this factor. Furthermore, our results revealed that the second factor consisted of the items "interesting" and "motivating." We believe this result is due to the Norwegian language, in which the term "challenge" has a more negative connotation than in English and even more so when reading about demanding situations (i.e., vignette stories). Hence, "challenge" is therefore associated with negative appraisals, while "interesting" and "motivating" represent positive appraisals. Accordingly, we believe that our factor structure does correspond to the hindrance-challenge framework reported in previous studies. Nevertheless, to make visible that our factor structure is different, we chose to apply the terms "hindrance-like" for hindering (i.e., negative) appraisals and "challenge-like" for challenging (i.e., positive) appraisals when reporting our findings. Two mean-score demand variables were computed, with Cronbach's α = .82 for the hindrance-like subscale and α = .83 for the challenge-like subscale.

4.3.3.2 Emotions

Trait-level emotions were measured with the Basic Emotions Trait Test (BETT, Vittersø et al., 2009). A short version of the scale comprises nine items, reflecting five basic emotions (happiness, interest, fear, anger, and sadness). The two positive emotions represent hedonic (i.e., happiness) and eudaimonic feelings (i.e., interest), respectively, whereas the three negative emotions may be summarized as a single negative composite score (Vittersø, 2016). The participants were asked to report the overall frequency of the five basic emotions in their lives overall. The introduction reads "In general, how often do you feel …" followed by nine adjectives or adjective phrases. For example, "happy" or "scared" (adjectives) or "completely absorbed in what I am doing" (adjective phrase). The response options ranged from 0 = never to 6 = all the time. To check the three-dimensional structure of the test, we ran a principal axis exploratory factor analysis with promax rotation. Three eigenvalues were higher than 1, and a parallel analysis (Horn, 1965) also supported the choice of a three-factor solution. Negative emotions were not used in the present study; hence, two mean-score emotion variables were computed for subsequent analyses, with Cronbach's alphas α = .86 for the hedonic feelings subscale and α = .79 for the eudaimonic feelings subscale. We take this result as evidence for H10.

4.4 Results

Data were analyzed using IBM SPSS 25 (IBM, Armonk, NY, USA) and Mplus version 8 (Muthén & Muthén, 1998-2018). Age and gender were controlled for.

Table 4.1 presents the means, standard deviations, skewness, and varimax rotated factor loadings for the demand items.

The participants' gender (man = 0, woman =1) was significantly related to hindrance-like appraisals (B = 0.18, p < .001), whereas age was not (p = .485). Similarly, the participants' gender (B = 0.20, p < .001), but not age (p = .720), was related to challenge-like appraisals. Hence, age was excluded from subsequent analysis. A multilevel (mixed model) regression analysis with grand-mean centered variables showed that the intraclass correlations (ICC) were .29 for hindrance-like demands and ICC = .19 for challenge-like demands. Overall, no mean differences were found between time pressure and emotional demands, neither for hindrance-like (p = .401) nor challenge-like (p = .061) appraisals. Looking more closely at the different vignettes, however, provides a more differentiated picture. A factorial repeated measures (GLM) was conducted with gender as the between-participant covariate. Separate models were run for hindrance-like demands and challenge-like demands, and the results are summarized in Figures 4.2 and 4.3, respectively, showing means and standard errors for the six vignettes for men and women separately. For

hindrance-like demands, the Huynh-Feldt sphericity was ε = 0.81. The main effect was significant, $F(4.02, 3400) = 68.64$, $p < .001$, as was the interaction with gender, $F(4.02, 3400) = 4.79$, $p = .001$. Although the overall interaction test was significant, the 95% CI for men and women did not overlap in the no-job emotional and the two nurse vignettes. For challenge-like demands, the Huynh-Feldt sphericity was ε = 0.92. The main effect was significant, $F(4.62, 3891) = 186$, $p < .001$, but the interaction with gender was not, $F(4.02, 3400) = 1.81$, $p = .113$. Although the overall interaction test was non-significant, the 95% CI for men and women did not overlap in the no-job emotion, nurse time pressure and real estate time pressure vignettes, indicating a post hoc interaction effect for these three conditions.

To further test the hypotheses, we conducted post hoc paired sample *t*-tests. As hypothesized in H1, time pressure and emotional demands were appraised hindrance-like and challenge-like. Specifically, the overall mean hindrance-like score, $M = 3.89$, $SD = 0.50$, was higher than that of challenge-like $M = 3.02$, $SD = .62$. A paired sample *t*-test showed that this difference was significant $t(850) = 34.61$, $p < .001$ (two-tailed). We further divided the two variables into time pressure hindrance-like and time pressure challenge-like and observed that the former ($M = 4.01$, $SD = 0.54$) was significantly higher than the latter ($M = 3.2$, $SD = 0.73$), $t(850) = 24.6$, $p < .001$ (two-tailed). For emotional demands, the hindrance-like scores ($M = 3.77$, $SD = 0.59$) were also higher than the challenge-like scores ($M = 2.77$, $SD = 0.75$), $t(850) = 32.61$, $p < .001$.

The hindrance-like scores for nurses during time pressure ($M = 4.07$, $SD = 0.66$) were higher than those during emotional demands ($M = 3.56$, $SD = 0.85$), and a paired-samples *t*-test showed that the difference was significant, $t(846) = 18.75$, $p < .001$ (two-tailed), supporting H2. The challenge-like scores for nurses during emotional demands ($M = 3.25$, $SD = 1.00$) were lower than those during time pressure ($M = 3.47$, $SD = 1.03$), and a paired-samples t-test showed that the difference was significant, $t(846) = 5.98$, $p < .001$ (two-tailed). H3 was not supported.

In line with H4, the hindrance-like scores for real estate agents during emotionally demanding situations ($M = 4.01$, $SD = 0.87$) were higher than those during time pressure situations ($M = 3.80$, $SD = 0.76$), and a paired-samples t-test showed that the difference was significant, $t(846) = -7.02$, $p < .001$ (two-tailed). The challenge-like scores for real estate agents during time pressure ($M = 3.36$, $SD = 0.98$) were higher than those during emotional demands ($M = 2.01$, $SD = 0.98$), and a paired-samples t-test showed that the difference was significant, $t(845) = 30.28$, $p < .001$ (two-tailed). H5 was supported.

The hindrance-like scores for time pressure were higher for nurses ($M = 4.07$, $SD = 0.66$) than for real estate agents ($M = 3.79$, $SD = 0.75$), and a paired-samples t-test showed

that the difference was significant, $t(848) = 10.66$, $p = .001$ (two-tailed). H6 was supported. The hindrance-like scores for emotional demands were lower for nurses ($M = 3.56$, $SD = 0.85$) than for real estate agents ($M = 4.01$, $SD = 0.87$), and a paired-samples t-test showed that the difference was significant, $t(846) = -11.72$, $p < .001$ (two-tailed), confirming H7.

The challenge-like scores for time pressure were higher for nurses ($M = 3.47$, $SD = 1.03$) than for real estate agents ($M = 3.35$, $SD = 0.98$), and a paired-samples t-test showed that the difference was significant, $t(848) = 2.76$, $p = .006$ (two-tailed). H5a was not supported. The challenge-like scores for emotional demands were also higher for nurses ($M = 3.25$, $SD = 1.00$) than for real estate agents ($M = 2.10$, $SD = 0.98$), and a paired-samples t-test showed that the difference was significant, $t(845) = 28.53$, $p < .001$ (two-tailed), confirming H9.

The only effect of gender of the employee in the vignette was seen for hindrance-like among nurses: Hanna was assigned higher scores for the emotional vignette, $M = 3.64$, $SD = 0.81$, than Hans, $M = 3.46$, $SD = 0.89$, $t(846) = 3.04$, $p = .002$ (two-tailed).

In line with H10, our results revealed that hedonic and eudaimonic feelings are different concepts accounted for by different factors. Table 4.2 presents the means, standard deviations, skewness, pattern matrix and factor correlations for the trait-level emotions.

Finally, we fitted a multilevel path model to the data (Figure 4.4). The model included hindrance-like and challenge-like appraisals as dependent variables and hedonic feelings, eudaimonic feelings and gender as the independent variables. The model depicted in Figure 4 was saturated, with zero degrees of freedom (hence, no goodness-of-fit estimates were available). Gender predicted both hindrance-like appraisals ($\beta = .18$, $p < .001$) and challenge-like appraisals ($\beta = .18$, $p < .001$). Hindrance-like appraisals were not significantly associated with emotions ($ps > .239$), whereas challenge-like appraisals were predicted by both hedonic feelings ($\beta = .12$, $p = .008$) and eudaimonic feelings ($\beta = .12$, $p = .014$). This result is not consistent with H11.

4.5 Discussion

When differentiating job demands, the scientific literature has presented this in a hindrance-challenge framework (e.g., Albrecht, 2015; Podsakoff et al., 2007; Tadić et al., 2015; Van Laethem et al., 2019). In previous research, the items that have been used to measure challenge and hindrance demands were most often decided a priori; that is, researchers have decided which items (i.e., adjectives) measure hindrance demands and challenge demands before the measures are done. In our study, we wanted to explore to what degree the appraisals could have both a positive and negative denomination at the same time. Thus, we chose to apply the six adjectives previously applied to measure hindrance and

challenge demands (Bakker & Sanz-Vergel, 2013) but applied a data-driven approach that grouped the items in accordance with the result from the factor analysis. Our results revealed a similar division between "good" and "bad" job demands as did the Bakker and Sanz-Vergel (2013) study, but differed from those of previous studies in that the item "challenge" was loaded with items belonging to the previously reported subscale of hindrance demands (i.e., "hindering", "stressful" and "difficult") and not with the more positive appraisal items "motivating" and "interesting". Several reasons may account for these results. First, it might be due to language. Although the Norwegian word for challenging (i.e., utfordring) holds both positive and negative connotations, depending on the context, the term has more negative connotations than the English term. It is not unreasonable to assume that this difference in meaning contributes to the different factor structures. Second, when applying vignettes, the reader might underestimate the engagement of the person in the vignette in demanding situations. When a person is engaged, the term challenge is often positively charged. When a person is disengaged or stressed, the term challenge is often negatively laden. In connection with our previous argument regarding the Norwegian term for challenge, when evaluating the fictional persons' experience (i.e., how do you think Hanna/Hans experienced this situation), it might be that underestimation of engagement led to challenge having mostly negative connotations in our study. Taken together, we believe that our factor structure does correspond with the previously reported labels of hindrance and challenge demands. Nonetheless, since our results did have a different factor structure than previous studies, instead of using the labels hindrance and challenge, we apply the labels hindrance-like and challenge-like, respectively. However, when we use the terms hindrance-like and challenge-like, our intention is merely to make visible that our results revealed that one item (i.e., challenge) loaded differently from previous studies. Hence, the new labels (i.e., hindrance-like and challenge-like) are in our opinion representing the same meaning as the previously used labels (i.e., hindrance and challenge).

In line with H1, when no job was specified, both job demands (i.e., time pressure and emotionally demanding situation) were appraised as hindrance-like and challenge-like to different degrees, specifically more hindrance-like than challenge-like. This is in line with the literature reporting that all job demands require sustained effort and even if some job demands have motivational potential, all job demands have costs (Searle & Tuckey, 2017). It is also in line with the literature reporting that the same job demands can be appraised as hindering and challenging at the same time (Bakker & Sanz-Vergel, 2013; Li et al., 2020, September 20). Thus, it seems that imagined and real-life job demands share some basic characteristics, although the results from the two approaches are not identical.

We argued that the nature of work belonging to an occupational group could impact the degree to which job demands were appraised as hindering or challenging and that this

was related to whether the job demand typically hindered the occupational group from achieving their work goals. As expected, time pressure for nurses was appraised as more hindrance-like than emotional demands (H2), in line with the literature that has revealed how time pressure prevents nurses from achieving their work goals and attending to patient care (Broetje et al., 2020). In addition, emotional demands in which a nurse is offering care and comfort are viewed as one of the core work characteristics for nurses and therefore as less preventive of goal achievement, although these situations require effort. Moreover, among the appraisals of hindrance-like demands, the vignette with nurses facing emotional demands received the lowest score.

We also hypothesized that emotional demands would be appraised as more challenging than time pressure (H3). This hypothesis was not supported, as we unexpectedly found that time pressure was appraised as more challenge-like than emotional demands. One of the reasons for this finding may be that when the participants, who were not nurses, read the vignettes, they interpreted emotional demands as a very clear part of the nurses' daily job tasks. Thus, their appraisal may reflect that they believe the nurse will solve these situations (i.e., they are little hindering) and that emotional demands are such an integrated part of their daily jobs that they weren't appraised as challenging as expected.

Furthermore, and in line with H4, we found that for real estate agents, the participants appraised emotional demands to be more hindrance-like than time pressure. Moreover, and in line with H5, time pressure was appraised as more challenge-like than emotional demands. This may be explained by the nature of work belonging to this occupational group, in which emotional demands may not be considered a core work experience, while time pressure is a part of real estate agents' daily activities (e.g., bidding rounds). Additionally, emotional demands were appraised to be less challenge-like for real estate agents than the other six job situations described in the vignettes. These findings are also in line with the literature that describes how short-term time pressure (e.g., during a workday with deadlines), which is something real estate agents regularly face during their workday, can be motivational (Baethge et al., 2018).

When comparing appraisals of the job demands for the two occupational groups, we found, as hypothesized in H6, that time pressure was appraised as more hindrance-like for nurses than for real estate agents and, in line with H7, that emotional demands were appraised more hindrance-like for real estate agents than for nurses. These results align with the literature that has revealed that job demands that are typically a part of the nature of work in an occupation are appraised as less hindering than job demands that are faced less frequently as part of the work (e.g., Bakker & Sanz-Vergel, 2013; Tadić et al., 2015). Although nurses are struggling with time pressure on a frequent level, it is not considered a part of

their work in a way that helps them achieve their work goals. Thus, time pressure is appraised as hindering them to a greater degree than time pressure is hindering real estate agents, who frequently deal with time pressure as a part of their work tasks. Conversely, real estate agents are not as experienced in facing emotional demands as part of their job; therefore, and real estate agents may appraise emotional demands as more hindering compared to nurses who are expected to handle emotional demands as an integrated part of their work.

We hypothesized that time pressure would be appraised as more challenging for real estate agents than for nurses (H8). However, and unexpectedly, time pressure was appraised as more challenge-like for nurses than for real estate agents. This result may be related to the finding that time pressure unexpectedly was appraised as more challenge-like than emotional demands for nurses (H3). Thus, overall, time pressure for nurses was appraised as more challenge-like than we expected, both when we measured this only for nurses (i.e., comparing challenge-like between time pressure and emotional demands for nurses) and between occupational groups (i.e., comparing challenge-like of time pressure between nurses and real estate agents). These findings may also reflect what the participants, who are not nurses, believe about nurses' jobs. For example, in the Norwegian media, nurses are often portrayed to work under intense time pressure. This portrayal of nurses working under constant time pressure may lead others (i.e., participants) to interpret time pressure as a core job characteristic that nurses must overcome, different from nurses themselves who report time pressure as preventing them from doing their job in the way they want to. Hence, the appraisals of time pressure for nurses may therefore be appraised as more challenge-like than we expected. On the other hand, emotional demands were, as expected and in line with H9, appraised as more challenge-like for nurses than for real estate agents. This result is in line with how we expect nurses to handle emotionally demanding situations as a part of their daily work, while the same is not expected for real estate agents. Additionally, it is in line with the literature reporting how some demands do have motivational potential, although they require sustained effort (e.g., Van den Broeck et al., 2010).

Altogether, our findings from H1-H9 revealed that the same job demands can be appraised as hindrance-like and challenge-like to different degrees within an occupational group and that when two occupational groups are compared, the same pattern follows. Thus, categorizing job demands a priori as having either a negative or positive impact on employee well-being does not seem to bring enough nuance to the understanding of job demands. Rather, it seems that the degree to which job demands are appraised hindrance-like or challenge-like is not only due to the job demand itself but is also connected to the organizational context within the job demand occurs (i.e., occupation). Even though H3 and H8 were not supported, the overall results were meaningful and supportive of our suggestion

that job demands are better understood when approached more nuanced, not categorizing them a priori. Moreover, our findings support our proposal that each job demand should be measured in such a way that the degree of positive (i.e., challenge-like) and negative (i.e., hindrance-like) appraisals may be captured when they occur simultaneously. Additionally, our results support the notion that some job demands (i.e., challenge-like) may also play a role in the motivational process of the JD-R model and not only in the health-impairment process.

We wanted to investigate how the participants' positive trait emotions were related to their appraisals of job demands. Specifically, we hypothesized that hedonic and eudaimonic feelings would be differently related to hindrance and challenging demands (H11). Our hypothesis was, however, not confirmed. This result was surprising, given the large number of previous studies showing how hedonic feelings are unrelated, or even negatively related, to challenging tasks, whereas eudaimonic feelings are positively associated with such tasks (see Vittersø, 2016, for an overview). Again, a possible reason might be that our data are from participants *imagining* how other people might be feeling in challenging situations and not from real feelings in such situations. Some studies indicate that people underestimate the positivity evoked in the process of being immersed in overcoming a challenging task (e.g., Ariely et al., 2008), and we speculate that an underestimation of eudaimonic feelings in challenge-like demand appraisals may account for the current results.

Finally, some gender effects were found. We observed gender differences among the participants in which women reported higher scores on all appraisals of job demands, both in the hindrance-like and challenge-like conditions. This finding may be explained by a relatively consistent finding in the literature, namely, that women are expected to display stronger emotional expressivity than men. These differences are observed both for negative and positive emotions (Brody & Hall, 2008). The underlying reason for these differences may stem from role development, by which women are socialized to be emotionally expressive and men are socialized to express fewer emotions (Eagly, 1987). According to poststructuralist feminist theories, different emotional roles for women and men have also been found in workplaces integrated as part of organizational norms and practices (Weedon, 1997). Thus, when responding to the questionnaires used in our study, women may tend to score higher than men. Nonetheless, although women reported higher scores than men on all 12 appraisal conditions, the responses followed the same patterns, as depicted in Figures 4.2 and 4.3.

We also found one effect of the gender of the employee in the vignette, namely, that when reading about nurses, the emotional demands were rated as more hindering for Hanna than for Hans. This one-employee gender effect may be explained by the shifting standards

model (Biernat, 2003), which suggests that when we make judgments about members of a social category (e.g., men) based on stereotype-relevant dimensions, these judgments are based on comparing standards for the within-group (e.g., judging a man relative to a male standard). Society still views nursing as a gender-specific occupation, and the public perspective is that nursing consists of female-associated qualities, such as compassion and caring (Cheng et al., 2018). Additionally, women are overrepresented as nurses; for example, in Norway, only 11.4% of nurses were men in 2020 (Statistisk sentralbyrå, 2021b). Thus, when the participants evaluated Hans's experience in the emotionally demanding situation they may have attributed female-associated traits of nursing (i.e., care and compassion) to him and with that, according to the shifting standards model, compared him to other men, which again led to lower hindrance-like scores for Hans's in the emotionally demanding situations. These findings were not obtained when the participants appraised the job demands faced by the real estate agents. One reason may be that this is a profession with more gender equality, as almost 40% of this profession in 2020 in Norway were women (Statistisk sentralbyrå, 2021a). Moreover, for the other vignettes, there were no effects of the gender of the employee in the vignette.

4.5.1 Limitations and Future Research

There are some limitations to this study that need to be acknowledged. First, when applying vignettes, it is possible that the assessments of the hypothetical job demands are less externally valid than if they were obtained by actual nurses and real estate agents. Moreover, the external validity could also be stronger if the situations were experiences in the field and not in fictional stories with fictional characters. Nevertheless, previous studies have found that hypothetical situations can evoke similar reactions to those obtained in the field (McDougall & Levesque, 2000) even if it cannot be guaranteed that the same reactions and appraisals would have found place in real-life settings (Wilks, 2004). Another limitation that must be recognized is that we do not know if the participants based their appraisal on occupational stereotypes and how this may have influenced the results. Moreover, all participants were students, and it is unknown whether they had previous work experiences. Thus, our findings cannot be generalized to other populations. Clearly, a replication study with nurses and real-estate agents reporting from their actual work experiences will strengthen the generalizability and the external validity of the presented results.

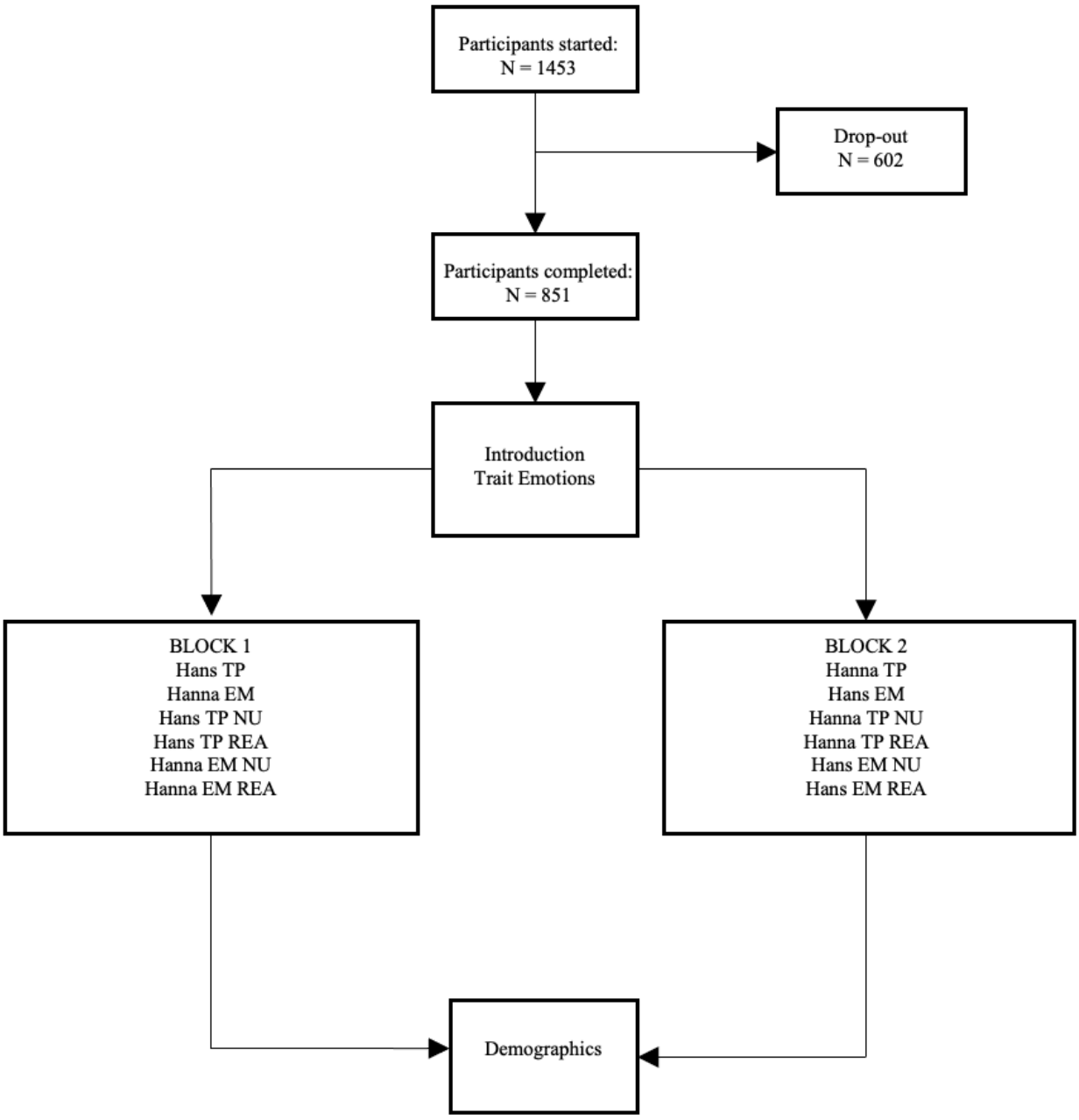
Although our factor analyses resulted in similar differentiation of job demands as previous studies, that is, positive and negative, our study differed in that the items "hindrance" and "challenge" belonged to the same factor (i.e., hindrance-like demands).

Future studies should attempt to validate the differentiation of challenge-like and hindrance-like demands, particularly in Norway but also in other areas of the world.

Finally, we focused only on job demands (i.e., time pressure and emotionally demanding situations) and how knowledge of an occupational group and individual trait emotions affected the appraisals of these demands. We did not investigate how these demands were related to, for example, work engagement and burnout, or other outcome variables. To validate that challenge-like job demands have motivational potential, it would be fruitful to design studies that also measure these relationships.

Figure 4.1

Flow diagram.



Note. TP = time pressure, EM = emotionally demanding situation, NU = nurse, REA = real estate agent.

Table 4.1.

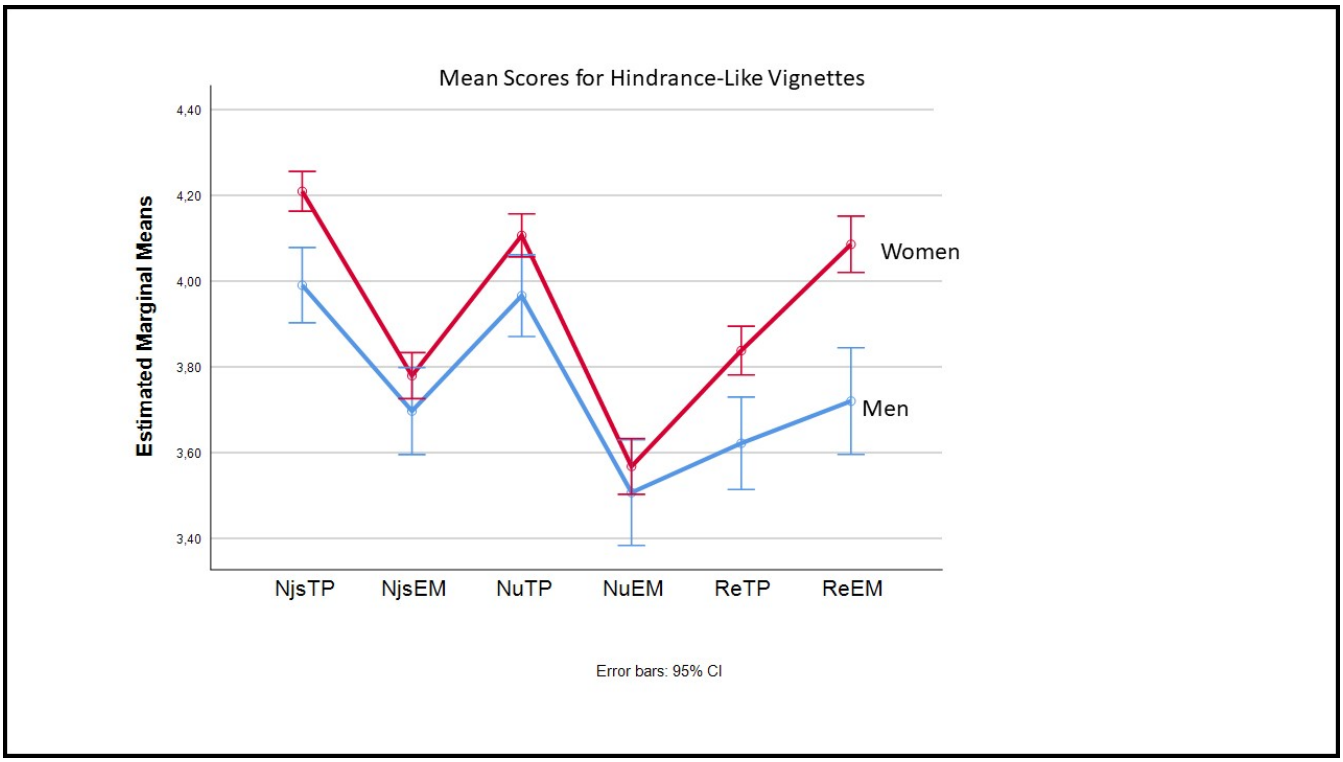
Means, Standard Deviations, Skewness, Varimax Rotated Factor Loadings, Eigenvalues, Explained Covariance for the Demands items.

	Mean	SD	Sk	F1	F2
Demanding	4.04	0.89	-0.84	**.88**	.00
Difficult	3.64	0.99	-0.34	**.83**	-.17
Challenging	4.00	0.87	-0.76	**.80**	.19
Stressful	3.88	1.08	-0.77	**.74**	-.10
Interesting	3.14	1.16	-0.20	.02	**.92**
Motivating	2.90	1.19	0.02	-.08	**.92**
Eigenvalues				2.67	1.75
Explained covariance (%)				44.54	29.22

Note. *N* = 5081. Factor loadings > .30 in bold. F1 = hindrance-like. F2 = challenge-like.

Figure 4.2.

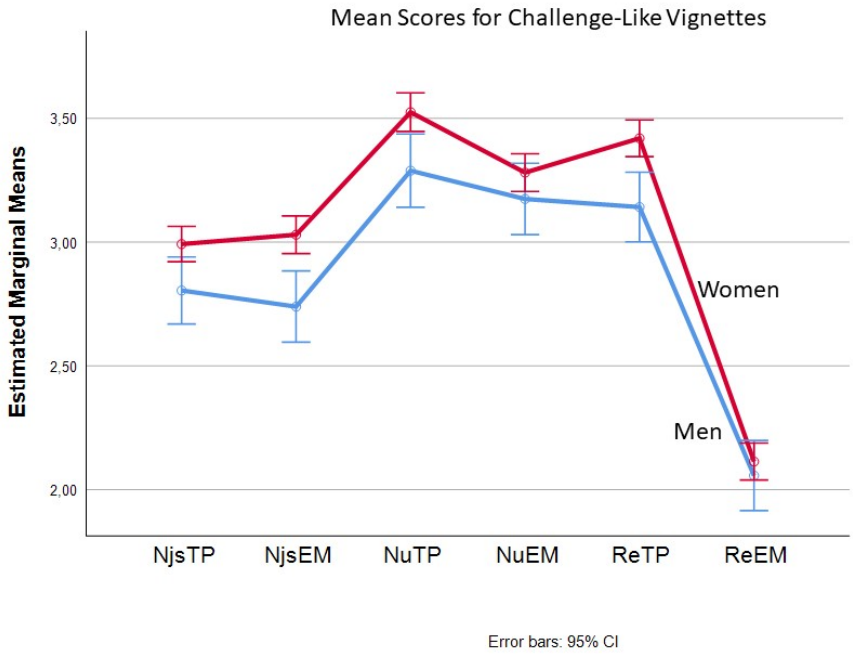
Means and Error Bars for hindrance-like appraisals across six vignettes.



Note. NjsTP = no jobs specified in time pressure condition, NjsEM = no jobs specified in the emotionally demanding condition, NuTP = nurse in the time pressure condition, NuEM = nurse in the emotional condition, ReTP = real estate agent in the time pressure condition, ReEM = real estate agent in the emotionally demanding condition.

Figure 4.3.

Means and Error Bars for challenge-like appraisals across six vignettes.



Note. NjsTP = no jobs specified in time pressure condition, NjsEM = no jobs specified in the emotionally demanding condition, NuTP = nurse in the time pressure condition, NuEM = nurse in the emotional condition, ReTP = real estate agent in the time pressure condition, ReEM = real estate agent in the emotionally demanding condition.

Table 4.2.

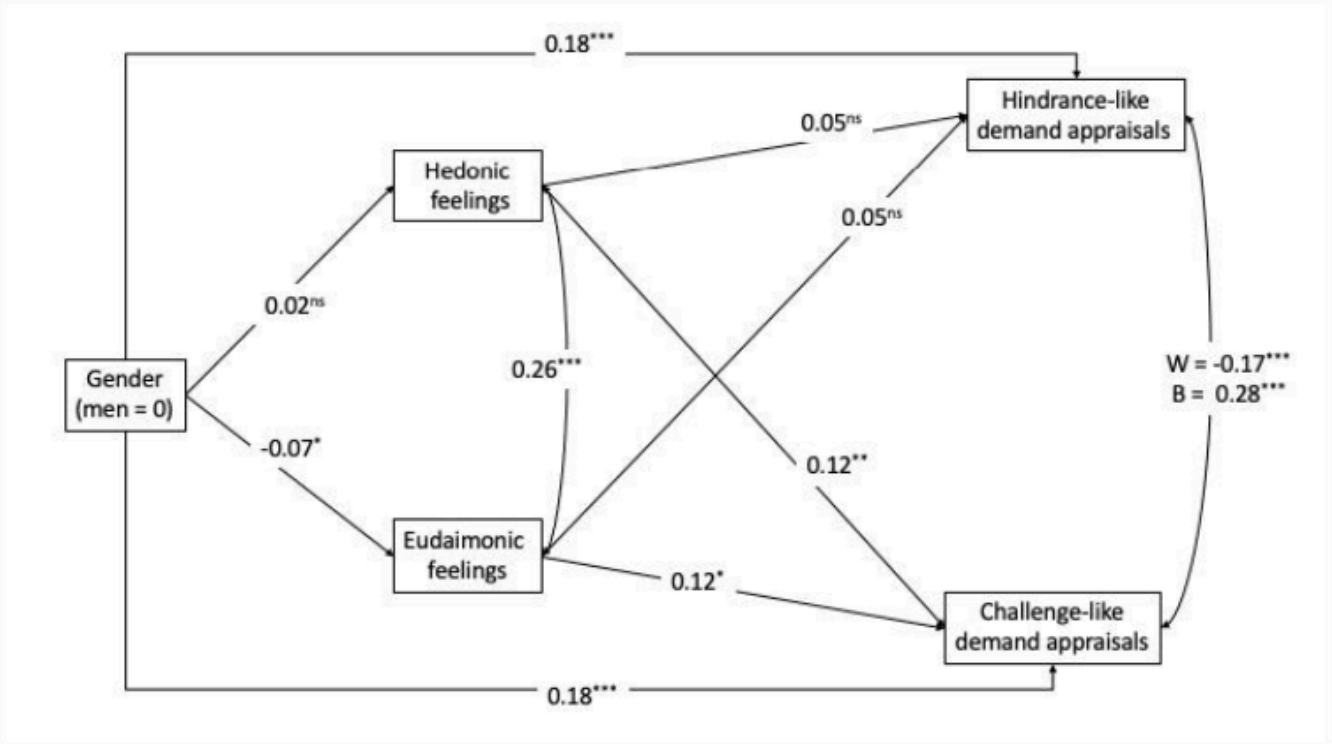
Means, Standard Deviations, Skewness, Pattern Matrix, Eigenvalues, Explained Covariance and Factor Correlations for the Basic Emotions Trait Test (BETT).

	Mean	*SD*	*Sk*	F1	F2	F3
Pleased	4.76	1.09	-0.59	**.94**	-.02	.09
Satisfied	5.18	1.01	-0.98	**.79**	.03	-.05
Happy	4.91	1.20	-0.83	**.75**	-.02	-.02
Immersed	4.35	1.30	-0.19	-.05	**.83**	.03
Engaged	4.88	1.23	-0.43	.10	**.77**	-.02
Absorbed	4.16	1.34	-0.28	-.05	**.68**	.00
Sad	3.20	1.27	0.48	-.09	-.04	**.76**
Scared	2.54	1.25	1.01	.02	.06	**.62**
Angry	2.97	1.19	0.63	.08	.00	**.51**
Eigenvalues				3.32	1.87	1.15
Explained covariance (%)				32.80	15.99	7.37
Factor correlations F1				1.00	.33	-.55
Factor correlations F2					1.00	-.15
Factor correlations F3						1.00

Note. *N* = 828, Promax rotation, Factor loadings >.30 in bold, F1 = hedonic emotions, F2 = eudaimonic emotions, F3 = negative emotions.

Figure 4.4.

Between participants standardized regression paths.



Note. The correlation between hindrance-like and challenge-like between participants (B) and within participants (W).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, *ns* = non-significant.

5 Chapter: Discussion and Concluding Remarks

The aims of this dissertation were to identify factors and investigate processes that strengthen employee well-being and work-related health, as well as add to the refinement of the JD-R model (Bakker & Demerouti, 2014; Bakker & Demerouti, 2017). I have presented three studies that, altogether, contributes to these overarching aims. In this chapter I present a summary of the key findings, discuss the implications of the presented research, and suggest directions for future research.

5.1 Summary of Key Findings

As I outlined in the first chapter of this dissertation, modern organizations are in need of employees who are able to work hard and be well. This was the focus in Chapter 2, where I identified job demands and job resources as antecedents of workaholism and work engagement, respectively. The results revealed that both workaholics and work-engaged employees put in more hours at work than was expected of them. Further, I found that workaholism was negatively related to work-related health, whereas work engagement was positively related to work-related health. These findings support the notion that it is applicable to differentiate workaholism and work engagement as a negative and positive form of working hard. I also tested the buffer hypothesis, that is, if job resources would mitigate the effects of job demands on workaholism. This was only partly supported. The moderations were in the expected direction, but effect sizes were weaker than those typically reported in previous studies applying the buffer hypothesis on burnout. Altogether, the results support the expansion of including workaholism in the JD-R model, although further studies are needed to confirm this.

The cross-sectional findings reported in Chapter 2 also addressed one of the limitations in the JD-R model, namely that analyses of the outcomes of the motivational process to a large degree have focused on organizational outcomes and neglected to investigate the associations between job resources, work engagement and health-related outcomes. In Chapter 3, we made a conceptual replication of the motivational process studied in Chapter 2 and performed a two-wave panel study. The results provided evidence that two well-established job resources (i.e., social support and feedback) predicted work engagement, that work engagement was negatively related to sick leave and that this relation was mediated by subjective health. Our findings highlight the important role working conditions may play to predict employee well-being. By showing that health-related indicators could be outcomes of the motivational process in the JD-R model, we strengthened the model.

After having investigated the antecedents and consequences of heavy work investment in Chapter 2 and 3, we wanted to address a recently presented unresolved issue in the JD-R model regarding job demands, that is, under which circumstances and conditions job demands may have a positive (i.e., challenging) or negative (i.e., hindering) effect on employee well-being (Bakker & Demerouti, 2017). Thus, in Chapter 4, we applied a vignette methodology to investigate appraisals of two job demands (i.e., time pressure and emotionally demanding situations) and to what degree they are appraised as challenging and hindering for two occupational groups (i.e., nurses and real estate agents). We also investigated the impact of individual dispositions (i.e., positive trait emotions) on demand appraisals. The results revealed that challenge-like and hindrance-like appraisals are different, but related concepts. Job demands related to core tasks within an occupational group were typically appraised as more challenge-like than hindrance-like and positive trait emotions predicted challenge-like appraisals. Hence, both the organizational context and individual dispositions played a role in appraisals of job demands.

Altogether, Chapter 2-4 addressed different aspects of employee well-being and health. My research on factors and processes that may strengthens employee well-being speaks to how the work environment can contribute to well-functioning (i.e., engaged workers) employees and, at the same time, shows a health promotion potential in work environments that are rich in resources. This work also contributes to a better understanding of individual appraisals of the work environment, specifically job demands, and emphasizes the importance of considering the role of the organizational context (i.e., occupation and core work tasks) as well as individual dispositions (i.e., positive trait emotions) when we are trying to understand how individuals are perceiving their work environment. This dissertation contains valuable perspectives relevant for the challenges Norway is facing regarding developments in the future of work and the high levels of sickness absenteeism. The implications of the results will be discussed in greater detail below.

5.2 Implications

As mentioned earlier, the recent developments in the world of work in which employee competitiveness has increased, where employees are asked to do more in less time and learn new things continuously, work has become more demanding and has led to stimulation of heavy work investment in terms of effort and time (Bakke et al., 2021; Aagestad et al., 2017). Employee contribution becomes a critical business issue because in trying to produce more output with less employee input, companies have no choice but to try to engage not only the body, but the soul and mind of every employee. Obviously, this objective is not achieved with a workforce that is “healthy” in the traditional sense only, meaning that employees do not suffer from job stress and are not absent because of sickness.

Being "healthy" must be supplemented with a focus on positive occupational health and well-functioning. I chose to apply the JD-R model as an overarching theoretical framework in this dissertation because the wholistic features of the model (i.e., integration of stress and motivational processes) are fitting this objective.

5.2.1 The Kinder Egg in the Workplace

The research presented in this dissertation shows the potential that lies in the workplaces to fulfill individual, organizational, and societal needs. Specifically, my data speak to the importance of creating working environments rich in resources in which employees can function well (i.e., be work engaged) and be well (i.e., gain positive health). Thus, the presented findings hold a promising revenue for both research and practice.

On the individual level we know that gainful employment as such is important for individual well-being and health (Waddell & Burton, 2006). Through work many employees have financial security, opportunities to develop skills and competencies, experience social belonging and acknowledgement, which all may be considered to fulfil some basic human needs that, in addition, has shown to contribute to good health (e.g., Bakke et al., 2021). However, work may also have adverse consequences if employees are experiencing harmful exposures and if the demands are high and resources are low (Bakke et al., 2021; Tynes et al., 2018). The research presented in Chapter 2 is supportive of this by showing that employees who report high levels of job demands and where job resources does not moderate the effect of job demands on workaholism to a sufficient degree, are more likely to develop workaholic behavior, which have a negative impact on their work-related health. On the other hand, as reported in Chapter 2 and 3, employees who experience a resourceful work environment are more likely to be engaged at work, which in turn may lead to increased work-related health and reduced sickness absenteeism.

On the organizational level, it is crucial to have productive employees that are able to perform well and reach their work goals in order to achieve organizational success and be a sustainable organization. A substantial amount of research has revealed how engaged employees perform better compared to less engaged employees and this has shown to be an organizational advantage that plays an important role in the success of organizations (e.g., Breevaart et al., 2015; Demerouti & Cropanzano, 2010; Halbesleben & Wheeler, 2008; Kartal, 2018; Salanova et al., 2005; Xanthopoulou et al., 2009b). As I showed in Chapter 2, engaged workers worked longer hours, but still reported that work had a positive effect on their health, alas, they were able to work hard and be healthy. This was different from the workaholics who also put extra hours into work but reported that their work had a negative effect on their health. In addition, previous research has revealed associations between

workaholism and poor job performance (e.g., Schaufeli et al., 2008; Shimazu & Schaufeli, 2009; Shimazu et al., 2015; Shimazu et al., 2012; Taris et al., 2010). Thus, the findings in this dissertation responds to the need of modern organizations and confirms that it is possible to facilitate working conditions in which it is possible to encourage a positive form of heavy work investment (i.e., work engagement) and still be healthy. Chapter 3 confirmed the motivational process of the JD-R model studied in Chapter 2, and also revealed that work engagement was negatively related to sick-leave and that this relationship was mediated by health. Hence, focusing on creating a resourceful work environment may not only produce engaged workers, which is beneficial for reaching organizational goals, but it may also contribute to promote employee health.

The findings in Chapter 2 and 3 relates to the ongoing societal challenges in Norway regarding the high levels of sickness absenteeism, where a lot of effort has been focused on getting people *into* the workforce and less on the potential of health promotion *at* work. Moreover, when measures have been taken to improve the work environment, the main focus has been on removing and reducing risk factors that may lead to stress and ill-being (Bakke et al., 2021; Tynes et al., 2018). This is portrayed in the latest report on the status of the Norwegian working environments published by the National Institute of Occupational Health (Bakke et al., 2021), in which a whole chapter is dedicated to health preventive work. Moreover, throughout the report, the word "prevention" shows up 84 times while the term "health promotion" is found two times. While prevention work is important, it is not sufficient. By removing or reducing something negative nothing positive is added. This is simplistically, but nevertheless brilliantly shown in the JD-R model, in which the reduction or removal of a job demand does not create a job resource. It just removes or reduces the demand. Moreover, as job demands and job resources initiate the two related, but different processes (i.e., the health impairment process and the motivational process), the JD-R model portrays that while preventive work may reduce work stress, it does not evoke motivation. Therefore, by focusing too narrowly on prevention, legislators and employers may be able to reduce the risk for stress and burnout but are also neglecting the potential for igniting motivation and health promotion. The strong focus on prevention may be seen as having roots in older historical understandings of health, as outlined in Chapter 1, and speaks to how the biomedical model, in which health is defined as the absence of disease, still is standing strong. Although the health promotional perspective entered the scene a few decades ago, it appears as like promotional work is lacking in action, both from the authorities and among employers. Thus, it looks like there is a potential for promoting employee well-being and work-related health that has not been taken advantage of yet. If the promotional initiatives were to be put into actions by legislators, policy makers and employers, it is reasonable to assume that the Norwegian working life would gain from this by providing the society with

sustainable organizations and a healthier work force, which again could lead to a reduction in sickness absenteeism.

Taken together, a good and resourceful working environment seems to be like a kinder egg with three perks; it may fulfill individual needs in that the individual is able to perform well and be well; prove profitable for organizations in that they have engaged employers that are able to work hard, reach their goals, gain positive work-related health, and thus contribute to sustainable and competitive businesses; and finally, add societal value by contributing to a healthy work force that are willing and able to work hard, that are less absent from work and that are contributing to the overall national productivity. With this backdrop, I would like to take a closer look at the predictors that initiate the processes that lead to these potential outcomes and discuss how research and practice may investigate and apply this in the future.

5.2.2 The Impact of Working Conditions

As outlined earlier, the basic assumption of the JD-R model is that every job has working conditions that can be categorized into either job resources or job demands that initiate two independent but related processes, namely the motivational process and the health-impairment process. In Chapter 2 and 3, I applied well-established job resources and job demands which have been shown to be associated with the proposed processes by a substantial amount of research (e.g., Albrecht et al., 2018; Schaufeli, Bakker, et al., 2009; Semmer et al., 2015; Taipale et al., 2011; Weigl et al., 2010). Further, I investigated the impact of these resources and demands on employee well-being (i.e., work engagement and workaholism) and the following outcomes (i.e., work-related health and sickness absenteeism). Hence, we expanded the mediators and outcomes constructs applied in previous JD-R research, specifically by including workaholism in the health-impairment process as well as health-related indicators as outcomes of the motivational process. The results in Chapter 2 and 3 confirmed the important role of working conditions as they initiate processes that may lead to employee well-being and health. The findings that job demands may elicit workaholism, in addition to burnout, and that job resources may start a process that leads to better work-related health, in addition to organizational outcomes, implies that how workplaces are rigged may have far reaching consequences for individuals, organizations, and the society.

Even though we have a large body of knowledge on the impact and effects of job resources and job demands, there are still some unresolved issues with respect to these job characteristics in the JD-R model, both regarding their role in the model as well as their impact on employee well-being and health. In the JD-R model job resources and job

demands are viewed as having a positive and negative impact on employee well-being, respectively. However, this categorization might not always be that straight forward, as shown in Chapter 4, in which the same job demands (i.e., time pressure and emotional labor) were appraised as both having a positive and negative potential. Schaufeli and Taris (2014) addressed the role of job demands and job resources in the JD-R model and argued that negatively appraised resources should be reconceptualized as demands while positively appraised demands should be reconceptualized as resources. In a similar line, Bakker and Demerouti (2017) addressed the unresolved issue of two types of job demands and called for future research on under which circumstances and conditions they acted as hindrances and challenges. Taken together, Schaufeli and Taris (2014) and Bakker and Demerouti (2017) addresses one of the limitations in the JD-R model, namely that job characteristics are often categorized a priori as either job demands or job resources, whilst in reality it may be more complex. As I showed in chapter 4, both organizational contexts (i.e., core work tasks in an occupational group) and individual dispositions (i.e., positive trait emotions) may affect to which degree a job characteristic is appraised either positively or negatively. The interesting suggestion by Schaufeli and Taris (2014) to redefine job resources and job demands based on if they are positively or negatively valued, could also contribute to the unresolved issue of challenge and hindrance demands as studied in Chapter 4. Moreover, my suggestion that when measuring job characteristics, appraisals should be included and based on these, categorizations could be made post hoc, are in line with the proposal of Schaufeli and Taris (2014) to include validations of job characteristics. Better knowledge about when and for whom different working conditions lead to well-being and ill-being would increase the likelihood of successfully implementing measures to improve working environments and would improve the research on this topic.

Another claim in the JD-R model is that any job resource may buffer the impact of any job demand on burnout, which has been shown in several studies (Bakker et al., 2010; Xanthopoulou, Bakker, Dollard, et al., 2007). As shown in Chapter 2, the job resources (i.e., goal clarity, social community, and independence in task completion) did not moderate the effect of job demands on workaholism to the degree we expected. It might be that job resources do have the potential to attenuate the burden of job demands on workaholism and other studies have indeed reported such mitigating effects (e.g., Molino et al., 2015). However, it might be that there are not as many job resources that are able to buffer the impact of job demands on workaholism, compared to burnout (i.e., where various job resources may buffer the impact of various job demands). Another possibility is that job resources don't have the same moderating power on workaholism, as compared to on burnout. Yet, another prospect could be that there are only some specific types of job resources that have a mitigating effect on workaholism. In a review on workaholism,

Sussman (2012) suggests that enforced vacations, development opportunities for increased engagement and flexible roles, as well as leader training to promote enjoyment in the job, may be of assistance to treat and prevent workaholism, all of which could be tested in studies. New studies on the buffer hypothesis in relation to workaholism are needed to gain more insight and to possible establish associations. Another interesting avenue to explore is whether personal resources could be effective as buffers on workaholism. Research has shown that workaholism is related to neuroticism, personal insecurity, and discrepancy perfectionism (i.e., viewing colleagues as not measuring up to one own's standards of performance and/or not measuring up to one's own standards) (e.g., Sussman, 2012; van Beek et al., 2014). Interventions targeted at improving these aspects, may be helpful (Sussman, 2012) and could be a future avenue for research. However, if one is to implement interventions aimed at increasing personal resources, it should be noted that it could also have an adverse effect. For example, Del Líbano et al. (2012) showed that self-efficacy was positively related to both work engagement and workaholism, and thus, interventions to increase employee self-efficacy can potentially lead to more workaholic behavior for some employee. This illustrates the importance of applying evidence-based methods and carefully consider which measures are appropriate.

The notion that working conditions are the starting point of the motivational process and a health-impairment process (in the JD-R model) and that organizational contexts and individual traits and states impacts these relations, calls for research that includes a broader range of aspects than what I have presented in this dissertation. Importantly though, the potential that lies in facilitating and promoting good working conditions seems to be highly valuable, both humanly and economically, and should be of interest for employers, decision-makers and authorities as they work towards a sustainable workforce and reduced sickness absenteeism in Norway. Moreover, the framework of the JD-R model could be of assistance in increasing the understanding of why a preventive approach, although important, is not sufficient. Rather, policies, reforms and practices targeted at increasing employee well-being and health must also include measures with a promotional approach in line with the motivational process of the JD-R model.

5.3 Future Directions

This dissertation has my no means revolutionized the JD-R model but has contributed to expand the understanding and applicability of constructs within its framework and opened some interesting avenues for future research which will be discussed below. One of the aims of this dissertation was to add to the refinement of the JD-R model. Specifically, I showed that workaholism could be included in the health-impairment process of the JD-R model (Chapter 2), that health-related indicators could be outcomes of the motivational

process (Chapter 2 and 3) and showed that the same job demands may be appraised as having a positive and negative impact at the same time but to a different degree, related to organizational contexts and individual dispositions (Chapter 4). The results presented in this dissertation holds many opportunities for replication and refinement, of which some are mentioned in Chapter 2-4. Taken together, it is necessary to conduct studies to validate the refinements of the JD-R model suggested in this dissertation. This should preferably be conducted through longitudinal studies in which the associations presented in Chapter 2-4 could be validated. For example, it would be appropriate to apply both the same but also other job resources and job demands and investigate their associations to work-engagement, health-related outcomes and workaholism. It would also be advantageous to perform studies outside of Norway to be able to generalize the results to a broader population. Also, the differentiation of job demands needs more investigation. In line with the suggestion from Schaufeli and Taris (2014) this could be expanded to also include job resources. Future studies could explore to which degree other occupational groups and organizational contexts, in combination with individual dispositions, influences employees' appraisals and validations of their working environment and how this impacts their well-being and health. The notion that the JD-R model strongly emphasizes the impact job characteristics have on employee well-being and health underlines the importance of conducting studies aiming at solving the issues of how and when job resources and job demands are categorized as having a positive and/or negative impact. Increased knowledge about job resources and job demands could also improve the applicability of the JD-R framework in practice as this could lead to more precise implementations of measures aimed at improving the working environment on individual-, team-, and organizational levels.

5.3.1 Systematic Intervention Studies

Following the studies to validate the findings presented in this dissertation as described above, the research path outlined below would, if I had the means and the measures, be at the top of my list.

In JD-R research it has been shown a clear relation between job demands and burnout (Bakker & Demerouti, 2017; Bakker et al., 2014). Research has also revealed that several organizational and psychosocial working conditions can lead to health problems, such as musculoskeletal problems (Lang et al., 2012) and mental health problems (Harvey et al., 2017). In Norway, these two types of health problems are the cause of more than 60 per cent of the sickness absenteeism (Bakke et al., 2021). The notion that working conditions may play a role on causing health problems is well-known and may be one of the reasons why preventive work has been emphasized with the aim to reduce harm and detrimental effects.

We know that a substantial effort has been made to reduce sickness absenteeism in Norway, on political and organizational levels, but with marginal to no success (Hemmings & Prinz, 2020). However, and in line with the discussion earlier in this chapter, health promotional work seems to have been neglected in this effort. The research presented in this dissertation suggests that work may hold a potential to promote engagement and health and it is reasonable to assume that workplaces may have a substantial potential to reduce sickness absenteeism through promotional measures. This is in line with other JD-R research that has revealed a clear association between job resources and employee well-being (Albrecht et al., 2018; Dicke et al., 2018; Weigl et al., 2010). However, almost all of the JD-R research has investigated the relations between different working conditions and their positive and negative impact on employee well-being, while far fewer studies have implemented interventions to improve the working environments and investigated the effects of those. This is confirmed by Van Wingerden (2016) who wrote in her thesis that she had not found any empirical interventions studies that tested the propositions of the JD-R model in practice. It was therefore delightful that the interventions studies reported in her thesis showed promising results. For example, van Wingerden et al. (2017b) showed that a job crafting intervention had a significant impact on employee job crafting behaviors, increased performance feedback, self-efficacy, opportunities for professional development and job performance one year after the intervention. In a similar line, the same authors also showed that an intervention aimed at increasing the psychological capital (PsyCap) among health care professionals increased their work engagement, self-reported performance, and job crafting. These findings are in consonance with a literature review reporting that the effects of positive psychology interventions in organizations enhanced employee well-being and performance (Meyers et al., 2013). Moreover, it has also been shown that job crafting interventions, in which employees proactively work to fit their job characteristics to their needs and preferences by actively seeking resources and challenges and reduce their demands, has proven to improve employee well-being and performance (Demerouti et al., 2019). Thus, it seems that positive psychology interventions may hold the potential to improve employee well-being and could also contribute significantly to theoretical advancement by investigating if the propositions in the JD-R model are functional in organizational contexts. Based on the above, it would be highly interesting to conduct intervention studies focusing on optimizing job resources and job demands, as employee functioning have proven to be best when the demands *and* resources are high (Bakker et al., 2007). Moreover, it would be necessary to investigate to which degree different types of interventions increase employee well-being and work-related health and if that, in turn, decreases sickness absenteeism. Further, I would like to compare micro interventions (i.e., short-term intervention) and comprehensive interventions studies applying several training

sessions and their short- and long-term effects on organization-, team and individual levels to investigate the cost-benefit of the two different approaches. It could also be valuable to compare standardized intervention training with interventions tailored to the specific contexts. In prevention intervention research, the International Social Security Association (ISSA) showed that 337 companies from 19 countries who invested in occupational safety and health had a return on prevention of 2.2, that is, for each 1 NOK they invested in measures to reduce harm and increase safety they had 2.2 NOK in return on the company's bottom line (Bräunig & Kohstall, 2011). As far as I have been able to assess, there has not been conducted similar research on return on promotion (i.e., cost-effectiveness) and thus, including economic analyses could give further incentives for authorities and employers to invest in such work if proven profitable. Conducting intervention studies in line with what is described above is of course a time-consuming and costly effort. However, the potential this could have to improve individual well-being, organizational functioning, and reduce sickness absenteeism seems to be promising and could prove to be an important piece to solve parts of the Norwegian absenteeism-puzzle.

5.4 Limitations and Methodological Considerations

The work presented in this dissertation clearly has limitations of which several are addressed in Chapter 2-4. I will take the opportunity to further discuss some of the already mentioned limitations, as well as some overall methodological considerations.

One of the central tenets in scientific research is to search for causal explanations of the relationships between variables. The cross-sectional nature of the studies presented in Chapter 2 and 4 does not provide a basis to decide upon cause-and-effect relationships. Although it is possible to find support for certain associations in a cross-sectional sample in which assumed inferences can be made relying on theoretical frameworks, face-validity, and empirical results from other studies, it is difficult to establish the direction of these relationships and it is not possible to rule out third variables which is necessary to draw causal inferences. Therefore, the results in Chapter 2 and 4 should be interpreted with some caution. Nonetheless, the cross-sectional studies are still relevant because they investigate important questions that can be investigated further with longitudinal studies and intervention studies. Along this vein, in Chapter 3, I present results from a two-wave study and claim to present longitudinal evidence. Although the two-wave design is the most frequently used approach within longitudinal research (Taris & Kompier, 2014), several authors claim that the minimum number of repeated measures should be three, and preferably even more (e.g., Chan, 1998; Ployhart & Vandenberg, 2010). For example, Ployhart and Vandenberg (2010) argue that the observed changes between Time1 and Time2 measures in follow-up studies are linear and are not able to capture to which degree the

observed changes have plateaued, been steady, been delayed or that changes have increased and decreased over time. Also, by only applying two repeated measures, it is possible that there are other confounding variables accounting for the observed changes, either on both measurement times or at one point (Ployhart & Vandenberg, 2010). Additional repeated measures would have overcome this challenge and increased the generalizability of the results and is a revenue for future research.

Another limitation and methodological consideration are that we applied self-report questionnaires in all the studies presented in this dissertation. This is somewhat problematic because the results may be inflated by common method variance (CMV) (Podsakoff et al., 2003) However, we controlled for CMW and conducted the Harman's single-factor test, as reported in Chapter 2, and the size of the problem should not be overestimated (Spector & Brannick, 2009). Further, self-reports implicitly rely on the respondents' interpretation of the questions (i.e., work situation) which determines their responses, and one could argue that this could result in imprecise interpretations of the actual working conditions per se. This is particularly relevant for this dissertation, and it is important to attempt to untangle these concepts. The question is whether the results could be applied as a foundation to implement organizational (e.g., job characteristics such as increased goal clarity etc.) or individual procedures (e.g., interventions to increase self-efficacy, self-esteem etc.) or a combination of these, with the aim to improve employee well-being. When studying real world phenomena, objective measures are useful, but they do not automatically start a stress- or motivational response and the evaluation that follows with self-reports provides valuable information. Nonetheless, it could have strengthened the results presented in this dissertation if we supplemented the self-reports with other measures, for example observational data of working conditions, register data for sickness absenteeism and objective measures for health-related measures.

The levels of analyses in this dissertation are based solely on individual levels, which is the essential approach when applying the JD-R model (Schaufeli & Taris, 2014). However, applying multilevel analyses is possible and called for (Bakker & Demerouti, 2017). For example, it is possible to measure perceptions of job characteristics at, for example, team and department levels (Bakker & Demerouti, 2017; Schaufeli & Taris, 2014). If team- or department members share the same perceptions, that is, there is a consensus among the members, it could better reflect the common quality of job demands and job resources in that context (Bakker & Demerouti, 2017). Moreover, as suggested by Schaufeli and Taris (2014), it would be fruitful to go beyond aggregation of individual scores and apply collective measures and consider the influence of shared perceptions and shared experiences. Further, and as mentioned in Chapter 2 and 3, it could have strengthened the studies if I could apply objective health-related measures and register-data on sickness absenteeism.

Finally, it is worth discussing some methodological considerations connected to the JD-R model. Previously, and as outlined in the first Chapter, the JD-R model has been applied to understand, explain, and make predictions mainly about burnout, work engagement and organizational outcomes (Bakker & Demerouti, 2017). The heuristic and non-limitative nature of the JD-R model makes the model relevant across an extensive variety of settings but also implies that the items of job demands and job resources should be treated cautiously (Van den Broeck et al., 2013). Whether a job characteristic is conceptualized as a job resource or job demand is based on empirical investigations of the evaluation of the job characteristic in specific contexts (Schaufeli & Taris, 2014). Moreover, according to Schaufeli and Taris (2014), the JD-R model can be tailored to fit specific organizations and by applying more specific measures of job resources and job demands the likelihood of finding interactions between the variables increases. The notion that different concepts may represent job demands and job resources adds to the flexibility of the JD-R model but also makes it more difficult to generalize the results, and if tailored to a specific context generalizability might not even be preferable.

5.5 Concluding Remarks

For the successful promotion of healthy workplaces, it is necessary to identify factors that contribute to the improvement of organizational and employee well-being and to facilitate and strengthen the impact of those factors that are conductive to the health of all staff. Individuals are viewed as responsible for their own health. However, the creation of conditions that enable people to influence their health is also an overriding societal responsibility. Hence, the workplace is an arena in which legislators, policy makers and employers should strive to facilitate conditions that enable individuals to act in ways that promotes and strengthens their well-being and health.

Despite Norway's high standards in legislations and authorial regulations aiming to provide the workforce with meaningful and healthy workplaces, work-related sickness absenteeism is still high. The efforts made to improve working experiences and reduce sickness absence has to a large degree been preventive, that is, focused at removing factors that may cause ill-being, thus neglecting the potential that lies in promoting positive experiences at work. The issues described and discussed in this dissertation may provide decision makers with an evidence-based foundation to deal with upcoming challenges and contribute to raise awareness of how the work environment is central in promoting a healthy and sustainable workforce. More knowledge about the effects of different measures aimed at improving employee well-being and health is needed to help authorities and employers prioritize those that are documented as effective.

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Appendices

Appendix A Chapter 2 Published Article

frontiers in Psychology

ORIGINAL RESEARCH
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It's Been a Hard Day's Night and I've Been Working Like a Dog: Workaholism and Work Engagement in the JD-R Model

*Benedicte Langseth-Eide**

Department of Psychology, UiT The Arctic University of Norway, Tromsø, Norway

The study investigates if the job-demands resources (JD-R) model could be improved by including workaholism in its health impairment process. Salient predictors and antecedents of workaholism and work engagement are identified in a sample of 12170 employees at Norwegian universities and university colleges. Structural equation modeling suggested that job demands and job resources relate to workaholism and work engagement, respectively. The results also revealed that both workaholics and work-engaged employees put in more hours at work than was expected of them. We found that workaholism was negatively related to work-related health, whereas work engagement was positively related to work-related health. These findings support the notion of workaholism and work engagement as two different forms of working hard. Finally, we tested the buffer hypothesis that job resources would moderate the effect of job demands on workaholism. The moderations were in the expected direction, but effect sizes were weaker than those typically reported in previous investigations. In conclusion, the present study supports the expansion of including workaholism in the JD-R model.

Keywords: JD-R model, workaholism, work engagement, working hard, work-related health, employee well-being, KIWEST, ARK

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Reviewed by:
Maura Ignazia Cascio,
Centro per la Formazione Permanente e l'Aggiornamento del Servizio Sanitario (CEFPAS), Italy
Paula Benevene,
Libera Università Maria SS. Assunta, Italy

***Correspondence:**
Benedicte Langseth-Eide
benedicte.langseth-eide@uit.no

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INTRODUCTION

The unprecedented advancements in digitalization, automatization, robotization, and globalization over the past decades have impacted every line of businesses and shortened the life cycle of job content. Hence, employees need to learn and develop new skills faster than ever before. As a consequence, organizations seem to increasingly push their employees to work harder and longer (Fry and Cohen, 2009). In the pursuit of increased employee contributions, it is crucial that organizations create working conditions that enable employees to work hard and be well (Cohen and Black, 2013).

In the well-established job-demands resources (JD-R) model (Bakker and Demerouti, 2007) working conditions are positioned as predictors of well-being and ill-being at work. Recent research shows that the JD-R model could, in addition to burnout, also embrace workaholism in its account of the health impairment process (e.g., Molino et al., 2015). However, even though proposals have been made in favor of expanding the JD-R model, further investigations are needed to validate this expansion, particularly with regard to the antecedents and consequences of workaholism. Hence,

in the present study, we aim to contribute to the literature on this emerging topic by identifying salient predictors of workaholism and work engagement and their relationship with overtime work and work-related health within the framework of the JD-R model.

The JD-R Model

The main assumption in the JD-R model is that different working conditions (i.e., job demands and job resources) have a negative or positive effect on employee well-being and organizational outcomes. These effects are believed to operate via two different psychological processes. First, job demands—which are "physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (i.e., cognitive or emotional) effort"—lead to burnout, employee ill-being and negative organizational outcomes through the health impairment process (Schaufeli and Bakker, 2004, p. 296). Job demands may be quantitative (e.g., workload) or qualitative (e.g., emotional demands). Second, job resources—which are the "physical, psychological, social, or organizational aspects of the job that (1) reduce job demands and the associated physiological and psychological costs; (2) are functional in achieving work goals; and/or (3) stimulate personal growth, learning and development"—lead to work engagement, employee well-being and positive organizational outcomes through the motivational process (Schaufeli and Bakker, 2004, p. 296). As such, job resources may be both extrinsically motivating by providing tools or concrete information for goal achievement and intrinsically motivating by facilitating learning, growth, and development (Bakker, 2009). Previous research has revealed that a work environment with high levels of job demands and limited job resources has the highest risk of job strain (Bakker et al., 2014). In addition, the buffer hypothesis of the JD-R model states that job resources may mitigate the negative impact of job demands on employee well-being (Xanthopoulou et al., 2007).

Working Hard

Although heavy work investment has long been a topic of interest in the scientific literature (e.g., Oates, 1971; Machlowitz, 1980; Schaufeli et al., 2006), there are vastly diverging ideas of the value and consequences of working hard. Previous research has established inconsistent associations between working hard and individual and organizational outcomes, which may be due to the notion that heavy work investment has been assessed differently (Burke and Cooper, 2008). Scholars have distinguished between two types of working hard, namely, work engagement and workaholism, which may be two constructs that can contribute to achieving construct specificity. Work engagement is typically described as a positive form of working hard, while workaholism historically has been described as both a positive and a negative form of working hard (e.g., Schaufeli et al., 2008).

Workaholism

Oates (1971) coined the term workaholism and defined it as "addiction to work, the compulsion or the uncontrollable need to work incessantly" (p. 1), and he argued that workaholism has a negative impact on health, happiness and social relationships. Since Oates (1971), the definitions, opinions, observations, and conclusions regarding workaholism have differed in the scientific literature. Hitherto, there is still little consensus about the conceptualization and definition of the construct other than its core feature of heavy work investment (Spence and Robbins, 1992; Harpaz and Snir, 2003).

Some authors have viewed workaholism primarily as a positive quality or behavior that involves high work motivation (Korn et al., 1987; Sprankle and Ebel, 1987). Others have included both positive and negative aspects in their conceptualization of workaholism. Spence and Robbins (1992) proposed a workaholic triad that contained three concepts of workaholism, namely, work involvement, feeling driven to work because of inner pressures and enjoyment of work. Based on this, the authors distinguished among three types of workaholics: work addicts (high on involvement and feeling driven, low on work enjoyment), work enthusiasts (high on work involvement and work enjoyment, low on feeling driven) and enthusiastic addicts (high on all three concepts). In contrast, other scholars have excluded positive components from their conceptualization of workaholism and view it as a primarily negative construct (e.g., Schaufeli et al., 2009; Andreassen et al., 2012). Hence, when assessed empirically, workaholism may or may not include both negative and positive components, which might explain the discrepancies in the findings and the conceptual confusion that still exists about the nature of workaholism. Porter (1996) argued that the lack of a definition hinders the effort to research workaholism. She suggests that to overcome this problem, investigators should return to the starting point and consider workaholism as an addiction that is excessive and has harmful consequences, which would make it possible to find constructive responses. In our work, we adopt the view of Schaufeli and colleagues who defined workaholism as "the tendency to work excessively hard and being obsessed with work, which manifests itself in working compulsively" (Schaufeli et al., 2009, p. 3). This definition includes both a behavioral component (excessive work) and a cognitive component (being obsessed with work). Hence, the definition includes the core constructs that have been identified across various definitions, namely, working excessively and being obsessed with work.

Some authors argue that workaholism is linked to stable individual characteristic and claim that personality traits and values play a major role in stimulating obsession with work (e.g., McMillan and O'Driscoll, 2006; Liang and Chu, 2009). Others view workaholism as a behavioral addiction and have argued that working conditions play a role in stimulating it (e.g., Fry and Cohen, 2009; Molino et al., 2015). And some suggests that a combination of individual characteristics and working conditions may generate workaholism (Mazzetti et al., 2014). Hence, in the literature it is acknowledged that workaholism may be associated with individual characteristics as well as environmental factors. In our investigation of the role of workaholism in the JD-R model we examine the relationship between job demands (i.e., working conditions), workaholism and its consequences.

Work Engagement

Work engagement is defined as a "positive, fulfilling, work-related state of mind that is characterized by vigor, dedication

and absorption" (Schaufeli et al., 2002, p. 74). Vigor refers to mental resilience and high levels of energy while working, persistence even in difficult phases and willingness to invest effort into one's work. Dedication is characterized by enthusiasm about and involvement in one's work. Absorption refers to fully concentrating on and being happily engrossed in work such that time passes quickly and one has difficulties detaching (Bakker et al., 2008). May et al. (2004) operationalize work engagement in a similar three-dimensional concept (physical, emotional, and cognitive components). Although the labels differ slightly, the physical component (e.g., "I exert a lot of energy performing my job"), emotional component (e.g., "My own feelings are affected by how well I perform my job") and cognitive component (e.g., "I am rarely distanced when performing my job") correspond to Schaufeli et al. (2002) emphasis on vigor, dedication and absorption. According to Harter et al. (2002), work engagement assumes both cognitive and emotional antecedents to improve work-related affective and performance outcomes. These authors conceptualize work engagement as individuals' involvement in, satisfaction with and enthusiasm for work, which closely resembles other authors' definitions and operationalizations of the construct. Thus, for work engagement, there seems to be general agreement among scholars.

The Role of Job Demands for Workaholism

An abundance of research has revealed a positive relationship between job demands and burnout (e.g., Demerouti et al., 2001a; Schaufeli and Bakker, 2004; Hakanen et al., 2008). Although there have been far fewer studies on the relationship between job demands and workaholism, the results point in a similar direction (e.g., Molino et al., 2015; Mazzetti et al., 2016). Several studies have revealed that work-related factors can generate or boost workaholism, such as leaders who set the example of working hard, rewards for working hard (Van Wijhe et al., 2010), work load and time pressure (Schaufeli et al., 2008) as well as career barriers, career commitment, and career insecurity (Spurk et al., 2016).

In the present study, our hypothesis on the relationship between job demands and workaholism will be tested by combining three job demands, namely, illegitimate tasks, role conflicts, and interpersonal conflicts.

Illegitimate tasks are tasks that are perceived by the employee to exceed his or her responsibilities and that break the norm of what can be reasonably expected from a person (Semmer et al., 2010). Illegitimacy may result from being asked to do a task that typically would be carried out by others or from being asked to do a task perceived as irrelevant or unnecessary. Previous research has revealed that illegitimate tasks cause employee strain, such as anger, indignation, and a threat to the self (Semmer et al., 2015). In addition, the perceived illegitimacy of one's workload may contribute to strain that exceeds the workload levels alone (Ford and Jin, 2015). Previous studies have shown that workaholics may perceive job tasks as more frustrating and even as a punishment given to them (Clark et al., 2014a) and that workaholism may develop in response to low self-worth (Mudrack, 2006).

Interpersonal conflicts refer to negative interactions with others in the workplace and have been associated with employees' perceived divergence of interests or goals (De Dreu and Weingart, 2003) and occur in work environments where employees compete for resources (Kippist and Fitzgerald, 2009; Jaramillo et al., 2011). Previous research has revealed that a work culture that encourages peer competition (Liang and Chu, 2009) and "winner-takes-all" reward systems (Ng et al., 2007) are positively associated with workaholism.

Role conflicts occur when employees receive inconsistent or conflicting information concerning their job tasks. Such information could come from multiple individuals or a single person within the organization (Nixon et al., 2011). Role conflict involves a sense that things at work should be done "properly" and in a different manner. Previous research has revealed that workaholics may have a desire to do things "differently" and that they often believe that the ideal person to be in charge is one self and may even actively intrude in the work of others in order to fulfill this desire (Mudrack and Naughton, 2001).

Taken together, this leads us to propose the following hypothesis:

H1: Job demands (illegitimate tasks, interpersonal conflicts and role conflicts) are positively related to workaholism.

The Role of Job Resources for Work Engagement

Previous studies have consistently shown that job resources, such as support from coworkers and supervisors, job control, autonomy, performance feedback, skill variety and learning opportunities, are positively associated with work engagement (e.g., Schaufeli and Salanova, 2008; Albrecht, 2011; Bakker, 2011). Moreover, a longitudinal study revealed a reciprocal relationship between job resources and work engagement in which engaged employees are successful in mobilizing their own job resources over time (Llorens et al., 2007).

The relationships between various job resources and work engagement are in accordance with the job characteristics theory (Hackman and Oldham, 1980). This theory proposes that particular core job characteristics, such as skill variety, task identity, task significance, autonomy and feedback, generate positive work-related outcomes, of which intrinsic motivation resembles the concept of work engagement. In a similar vein, self-determination theory (Ryan and Deci, 2000) posits that job resources fulfill the basic human needs of autonomy, competence, and relatedness. If these needs are satisfied, they will lead to increased intrinsic motivation and optimal functioning. Furthermore, these needs are essential for psychological health and well-being.

In the present study, our hypothesis on the relationship between job resources and work engagement will be tested by combining three job resources, namely, independence in task completion, social community at work and goal clarity.

Independence in task completion involves a sense of knowing what the job tasks entails and when the tasks can be considered completed. As such, it provides employees with control over their own work tasks (Näswall et al., 2010). Control over ones

work has been recognized as an important resource among most influential models in the literature on occupational stress and health (e.g., job demands-control model, Karasek, 1979; self-determination theory, Ryan and Deci, 2000; and the JD-R model, Bakker and Demerouti, 2007) that fosters motivation and promotes work engagement.

Social community at work may provide employees with social support, by feeling cared for and appreciated and by having access to direct or indirect help, which may provide additional resources provided by colleagues and supervisors (Kossek et al., 2011; Taipale et al., 2011). Numerous studies have revealed that social community may start a motivational process that generates work engagement (e.g., Bakker and Demerouti, 2008).

Goal clarity provides the employee with a clear purpose and goal for his or her work (Arnetz, 2005; Näswall et al., 2010). Several studies have revealed that goal clarity promotes a sense of meaningful work and increases work motivation and engagement (e.g., Wright, 2001; Hansson and Anderzén, 2009; De Vreede et al., 2013).

Taken together, this leads us to propose the following hypothesis:

H2: Job resources (i.e., independence in task completion, social community and goal clarity) are positively related to work engagement.

Consequences of Working Hard

One of the most obvious characteristics of workaholics is that they spend a great deal of their time working, beyond what is required of them (Schaufeli et al., 2009; van Beek et al., 2011). Employees who report high work engagement also put in more hours at work than what is expected of them (Schaufeli et al., 2008). Several studies have shown that working long hours may have a negative impact on employees' health and well-being (e.g., Sparks et al., 1997). Interestingly, research has also found positive relationships between working overtime and health and well-being (e.g., Beckers et al., 2004; Schaufeli et al., 2008). These seemingly contradictory findings might be explained by several factors. Several studies on extremely long working hours (i.e., working 61 h or more a week) have reported that overtime work can severely affect health (e.g., Uehata, 1991; Kawakami and Haratani, 1999; Amagasa et al., 2005). The associations between moderate overtime work and well-being are more complex and seem to depend on other factors. For example, Beckers et al. (2004) found that moderate overtime hours were related to fatigue when employees reported relatively adverse work characteristics, while non-fatigued employees reported relatively favorable work characteristics and high work motivation. Along a similar line, Van der Hulst et al. (2006) found that moderate overtime work only related to ill-being when employees reported high job demands in combination with low job autonomy. Thus, it seems that it is more than merely working long hours that account for the differences between individuals who work hard but are healthy and those who work hard and are in distress.

Work is recognized as an important health determinant (Waddell and Burton, 2006) and it is recognized that good health is fostered where people are gainfully employed (i.e., where the impact of work and the work environment are positive) (Buijs et al., 2012). Several authors have linked workaholism with detrimental consequences for the employee, such as a higher level of job stress (Spence and Robbins, 1992), conflicting relationships with colleagues (Schaufeli et al., 2006), work-home conflicts (Clark et al., 2014a) and impaired social relationships outside of work (Burke and Cooper, 2008). In addition, workaholics reports higher levels of ill-being, such as burnout (Taris et al., 2005), poor subjective well-being (Schaufeli et al., 2006) and decreased physical and mental health (Clark et al., 2014b). On the other hand, previous studies have suggested that employees who are highly engaged perform better (Salanova et al., 2005; Bakker and Bal, 2010; Christian et al., 2011), show more positive extra role behaviors such as citizenship behavior (Babcock-Roberson and Strickland, 2010), are more committed to their organization (Hakanen et al., 2008), and have increased innovativeness and lower turnover intention (Bhatnagar, 2012). Moreover, engaged workers report fewer psychosomatic complaints (Demerouti et al., 2001b) and better self-reported health (Hakanen et al., 2006) and suffer less from self-reported headaches, cardiovascular problems and stomach aches (Schaufeli and Bakker, 2004). In other words, engaged employees seem to enjoy good mental and psychosomatic health (Schaufeli and Salanova, 2008).

These assumptions can be empirically tested:

H3a: Workaholism mediates the relationship between job demands and overtime work.
H3b: Work engagement mediates the relationship between job resources and overtime work.

H4a: Workaholism mediates the relationship between job demands and perceived work-related health.
H4b: Work engagement mediates the relationship between job resources and perceived work-related health.

The Buffer Hypothesis

When testing the buffer (moderation) hypothesis of the JD-R model, that job resources may reduce the impact of job demands on workaholism, we combine one job resource and one job demand and their interaction effect on the relationship between job demands and workaholism.

Some scholars have proposed that specific job resources should match the job demands in the workplace to reduce the impact of the demands, also known as the matching hypothesis (Frese, 1999; De Jonge and Dormann, 2006). The matching hypothesis claims that only cognitive resources will reduce the negative impact of cognitive demands, whereas emotional and physical resources are beneficial in reducing the strain due to emotional and physical demands, respectively. However, several studies applying the JD-R model have found that job resources can buffer the impact of largely independent job demands (i.e., they share little overlap) (e.g., Bakker et al., 2005, 2011; Xanthopoulou et al., 2007). It has been argued that it is difficult to label specific job demands and job resources into clear categories and that employees can perceive and experience the same job demands and job resources in different ways (Bakker et al., 2011).

For example, it is possible that being given illegitimate tasks can be experienced as an increased work load (i.e., physical and/or cognitive) by some employees and as unfair (i.e., emotional) by others. This notion supports the role of job resources in the JD-R model, which claims that by definition, any job resource can buffer the impact of any demand on any type of outcome.

Hence, the following hypotheses can be articulated:

H5: Job resources moderate the relationship between job demands and workaholism. Specifically, the relationship between job demands and workaholism will be stronger for employees who report low job resources than for employees who report high job resources, particularly under conditions of high job demands.

The study model is presented in **Figure 1**.

MATERIALS AND METHODS

Participants and Procedure

Data were collected by ARK, a commissioned project from the Centre for Health Promotion Research at the Norwegian University of Science and Technology. The questionnaire was sent in a link via e-mail to be answered electronically. A page-long cover letter that explained the purpose of the questionnaire and ensured employee confidentiality was also included. The questionnaire could be answered over a 3-week period, in which two reminders were sent out to invitees that failed to respond.

A total of 12170 employees at Norwegian universities and university colleges participated in the study as a part of a working environment and work climate survey. Of the participants, 46.4% were men ($n = 5642$), and 53.6% were women ($n = 6527$). The ages were subdivided into five groups: < 30 years old (9.8%, $n = 1178$), 30–39 years old (23.2%, $n = 2794$), 40–49 years old (27.2%, $n = 3271$), 50–59 years old (24.3%, $n = 2925$) and > 60 years old (15.5%, $n = 1859$). Seventy-five percent of the sample consisted of permanent employees ($n = 8979$). The years of employment ranged from 0 to 50 years ($M = 10.18$, $SD = 9.12$); 45.2% of the participants were technical and administrative personnel ($n = 5519$), 37.5% were scientific and teaching staff ($n = 4562$), 11.9% were research fellows ($n = 1452$), and 5.3% were unit leaders ($n = 637$).

Measures

All measures are drawn from the second version of the Knowledge Intensive Working Environment Survey Target (KIWEST 2.0), developed by ARK (Innstrand et al., 2015; Undebakke et al., 2015). KIWEST examines employees' individual experiences of psychosocial working environment factors (including demands and resources). It is based on standardized and validated measures from Nordic and European research.

Job Demands

Job demands were measured using three scales: illegitimate tasks, interpersonal conflicts, and role conflicts.

The illegitimate tasks scale (Semmer et al., 2010) investigated the degree to which respondents experienced being given tasks outside their arena of responsibility with four items; a sample item was "I must carry out work which I feel demands more of me than is reasonable." Responses were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Cronbach's alpha was 0.77.

The interpersonal conflict scale (Näswall et al., 2010) measured the extent to which work was negatively affected by conflicts between employees. The scale consisted of three items, and a sample item was "In my unit, there is a great deal of tension due to prestige and conflicts." Responses were measured on a

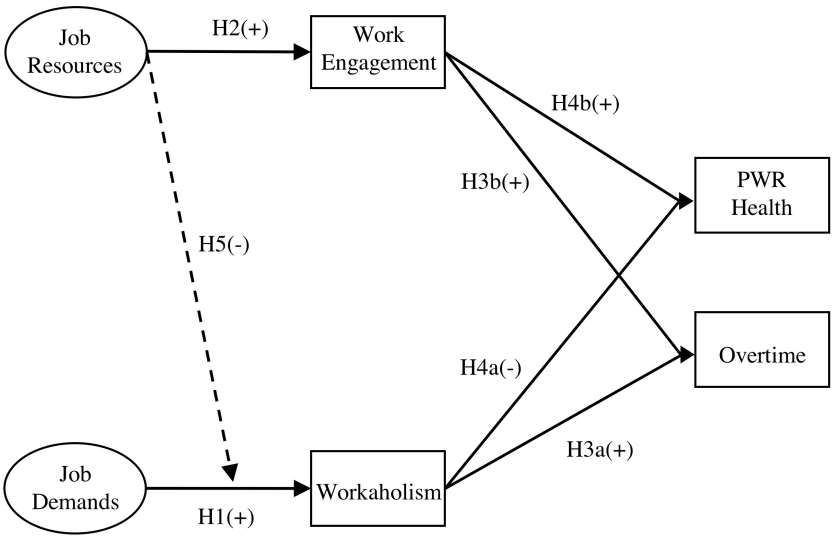

FIGURE 1 | The study model including the hypotheses (H1 to H5) and direction of effect. PWR Health, perceived work-related health.

five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Cronbach's alpha was 0.87.

The role conflict scale (Dallner, 2000) assessed the degree to which the participants perceived conflicts between their different roles with four items; a sample item was "I am often given assignments without adequate resources to complete them." Responses were measured on a five-point Likert scale (1 = to a very small extent, 5 = to a very large extent). Cronbach's alpha was 0.73.

Job Resources

Job resources were measured using three scales: task completion, social community at work, and goal clarity.

The task completion scale (Näswall et al., 2010) measured the extent to which employees could, or had to, determine when their tasks were completed. Due to statistical analyses that documented an overlap between two items, the four-item scale was reduced to three items (Innstrand et al., 2015). An example item was "I determine when my work assignments are completed." Responses were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was 0.64.

The social community at work scale was adapted from the Copenhagen Psychosocial Questionnaire II (COPSOQ II) (Pejtersen et al., 2010) and measured respondents' degree of social community with colleagues in their own unit using three items. A sample item was "There is a good sense of fellowship between the colleagues in my unit." Responses were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was 0.83.

The goal clarity scale (Näswall et al., 2010) measured to what degree the respondents had a clear picture of the purpose of his or her own work with four items. One item was removed after statistical analyses revealed an overlap, leaving three items (Innstrand et al., 2015). A sample item was "What is expected of me at work is clearly expressed." Responses were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was 0.78.

Working Hard

Workaholism was measured using the Dutch Workaholism Scale (DUWAS, Schaufeli et al., 2009), which consists of 10 items. The scale covers two aspects of workaholism: working compulsively (sample item: "I often feel that there's something inside me that drives me to work hard") and working excessively (sample item: "It is hard for me to relax when I'm not working"). The response alternatives were 1 (almost never), 2 (sometimes), 3 (often), and 4 (always). The Cronbach's alpha was 0.93. Schaufeli et al. (2009) suggested that working compulsively and having an exaggerated inner drive to work represent two distinct dimensions of workaholism. An exploratory factor analysis with maximum likelihood conducted on the data from the present study did not reveal a clear two-factor solution, nor did a subsequent confirmatory maximum likelihood analysis. Therefore, a one-dimensional mean score variable based on all 10 items was computed and used for the subsequent analyses.

Work engagement was measured using the nine-item version of the Utrecht Work Engagement Scale (UWES, Schaufeli and Bakker, 2003). These items covered three aspects of the work engagement concept: vigor (sample item: "At my job, I feel strong and vigorous"), dedication (sample item: "My job inspires me") and absorption (sample item: "I get carried away when I'm working"). The response alternatives were 0 (never), 1 (a few times a year), 2 (once a month or less), 3 (a few times a month), 4 (once a week), 5 (a few times a week), and 6 (every day). The Cronbach's alpha was 0.82. Schaufeli et al. (2002) suggested that vigor, dedication, and absorption represent three distinct dimensions of work engagement. An exploratory factor analysis with maximum likelihood conducted with data from the present study did not find a clear three-dimensional model, nor did a subsequent confirmatory maximum likelihood factor analysis. Therefore, a one-dimensional mean score variable based on all nine items was computed and used in the subsequent analyses.

Work Outcomes

Overtime work was assessed by asking the participants "How many hours over and beyond your agreed working hours do you normally work per week?" The response alternatives were 1 (0 h), 2 (1–5 h), 3 (6–10 h), and 4 (more than 10 h).

The perceived work-related health was measured using two items about the respondents' experience with how their work situation impacted their health. The items were "My work has a positive influence on my health" and "My work has a negative influence on my health." The two items correlated negatively ($r = -0.66$, $p < 0.001$). The Cronbach's alpha was 0.80. For further statistical analyses, we reversed the item measuring negative health and computed the two items into a variable assessing the total perceived work-related health. The response alternatives ranged from 1 (to a very small extent) to 5 (to a very large extent).

Statistical Analyses

We computed the internal consistencies (Cronbach's α), descriptive analyses and intercorrelations among the study variables using the PASW 25.0 program.

To test the study hypotheses, we applied structural equation modeling (SEM) using the Mplus 8.0 software package (Muthén and Muthén, 1998–2017). Several goodness-of-fit criteria were considered: the root mean square of approximation (RMSEA), the comparative fit index (CFI), the Tucker-Lewis index (TLI) and the standardized root mean square residual (SRMR). RMSEA values below 0.07, SRMR values below 0.08, and CFI and TLI values greater than 0.95 indicate a good fit (Hooper et al., 2008).

For the moderation analyses, we applied the Hayes PROCESS macro for PAWS 25.0 (Hayes, 2017). For each hypothesized interaction effect, we tested a model that included one job demand, one job resource and their interaction, i.e., three exogenous variables. Each of the exogenous variables had only one indicator, which was the centered score of the variable. The indicator of the interaction effect was the multiplication of the interacting variables. Workaholism was included as the endogenous variable. **Figure 2** represents the model used to test the interaction hypotheses.

RESULTS

As self-reports collected at one point in time were used in this study, Harman's single-factor test was conducted for examining whether or not the common method bias was serious (Podsakoff et al., 2003). The results revealed that no factor explained more than 50% of the variance. This outcome suggests that common method bias did not improperly impact the model.[1]

Descriptive Statistics

The means, standard deviations, intercorrelations, and coefficient alphas of all the included variables are presented in **Table 1**. As expected, workaholism correlated positively with job demands (i.e., illegitimate tasks, interpersonal conflicts, and role conflicts) and overtime work and negatively with work-related health. On the other hand, work engagement, as expected, correlated positively with job resources, overtime work and work-related health. This result is in line with hypotheses 1 and 2.

Mediation Analyses

Table 2 includes the results of the SEM model estimated to test the study hypothesis. First, we conducted CFAs in which the job characteristics were loaded on one factor and two factors (i.e., job demands and job resources). The results revealed that only the model with two factors had a good fit. Hence, for the subsequent analyses the six job characteristics were modeled into two latent factors representing job demands (illegitimate tasks, interpersonal conflicts, and role conflicts) and job resources (independence in task completion, social community, and goal clarity), which were treated as exogenous variables.

The hypothesized mediation model (M1), in which workaholism was a full mediator between job demands and overtime work and between job demands and work-related health and work engagement was a full mediator between job resources and overtime work and between job resources and work-related health, showed a good fit to the data for two of the four criteria, namely, the CFI and SRMR. However, the TLI was slightly below the criterion value of 0.95, and the RMSEA had a p-value of > 0.001, indicating that the data did not fit the model.

[1]Detailed results are available upon request.

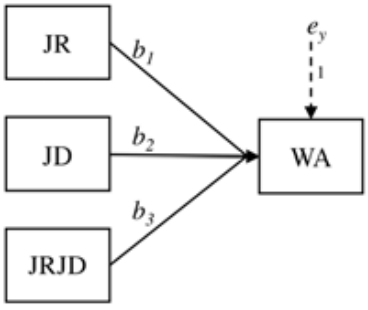

FIGURE 2 | The study model for testing the interaction hypotheses. JRs, job resources; JDs, job demands; WA, workaholism.

Thus, we tested a new model (M2) in which workaholism was a partial, not full, mediator between job demands and work-related health. The new model showed a good fit to the data for all four criteria. In conclusion, the results support hypotheses 1, 2a, 3a, 3b, 4a, and 4b. The final model is graphically represented in **Figure 3**.

Testing Mediations

Next, the hypothesized mediating paths in the model were evaluated and are presented in **Table 3**. The results showed that the indirect effect of job demands on overtime work and work-related health through workaholism was statistically significant at $p < 0.001$, as was the indirect effect of job resources on overtime work and work-related health through work engagement. These results offer additional support for hypotheses 3a, 3b, 4a, and 4b.

Moderation Analysis

Table 4 shows the result of the nine interaction effects used to test hypothesis 5, that job resources would mitigate the positive relationship between job demands and workaholism. Eight of the nine interaction effects of job demands and job resources were statistically significant; only goal clarity did not interact significantly with interpersonal conflicts on workaholism. The positive relationship between job demands and workaholism was higher under conditions of low versus high job resources when job demands were high.

The directions of the interactions were as expected. **Figure 4** shows the directions of the eight significant moderation effects.

DISCUSSION

The aim of the current study was to investigate whether workaholism could be included in the JD-R model. Hence, we examined antecedents and consequences of workaholism and work engagement within the framework of the JD-R model.

We assumed that different working conditions would have a negative or positive effect on employee well-being and hypothesized that job demands and job resources would be positively related to workaholism and work engagement, respectively (H1, H2). As expected, our results revealed that job demands predicted workaholism and that job resources predicted work engagement. Our findings support the main assumption of the JD-R model, namely, that different working conditions (i.e., job demands and job resources) may have a negative or positive effect on employee well-being. Our final model also supports the notion that environmental factors may play a role in generating or boosting workaholism. Thus, it is likely that a work environment that promotes workaholic behavior increases the chances of producing workaholics, while a work environment rich in resources enhances the chances of generating engaged workers.

Further, we examined the consequences of workaholism and work engagement. We hypothesized that workaholism and work engagement would mediate the relationship between job demands and overtime work (H3a) and between job resources and overtime work (H3b), respectively. In line with

TABLE 1 | Descriptive statistics, Pearson's product-moment correlations and Cronbach's alphas (in the diagonal) for task completion, social community, goal clarity, illegitimate tasks, interpersonal conflicts, role conflicts, work engagement, workaholism, perceived work-related health, and overtime work.

Variables	1	2	3	4	5	6	7	8	9	10
(1) Task completion	(0.64)									
(2) Social community	0.22	(0.83)								
(3) Goal clarity	0.35	0.43	(0.78)							
(4) Illegitimate tasks	−0.27	−0.38	−0.49	(0.77)						
(5) Interpersonal conflicts	−0.20	−0.62	−0.42	0.50	(0.87)					
(6) Role conflict	−0.33	−0.43	−0.55	0.70	0.55	(0.73)				
(7) Work engagement	0.23	0.35	0.36	−0.25	−0.23	−0.29	(0.82)			
(8) Workaholism	0.11	−0.17	−0.19	0.37	0.24	0.33	0.10	(0.93)		
(9) Perceived work-related health	0.21	0.41	0.39	−0.48	−0.41	−0.47	0.40	−0.37	(0.80)	
(10) Overtime work	−0.03	−0.09	−0.05	0.18	0.12	0.14	0.18	0.56	−0.16	*
N	12023	11966	12034	11926	11958	11950	11643	11273	12034	11900
Mean	3.72	3.99	3.55	2.39	2.31	2.49	4.60	2.17	4.90	2.28
SD	0.64	0.76	0.77	0.76	1.02	0.72	1.04	0.56	1.41	0.90

*All correlations are significant at the 0.01 level (p). * single item question.*

previous research, we found that both workaholic and engaged employees put in more hours at work than was expected of them. More specifically, the results suggest that workaholism was a stronger predictor for overtime than work engagement. We also hypothesized that workaholism would mediate the relationship between job demands and work-related health (H4a). This hypothesis was not confirmed completely, as only a partial mediation of workaholism was observed rather than the hypothesized full mediation. Our results suggest that workaholism has a negative impact on work-related health. The observed additional direct effect of job demands on work-related health is in line with literature indicating that negative working conditions have a depleting effect on employee health (e.g., Westgaard and Winkel, 2011; Rugulies, 2012). Furthermore, we hypothesized that work engagement would mediate the relationship between job resources and work-related health (H4b). Indeed, our results confirmed that work engagement had a positive impact on work-related health. These results reveal that working hard does not necessarily have detrimental consequences. If overtime work is performed by engaged employees with access to a work environment rich in resources, work can influence one's work-related health positively. In contrast, when working extra hours is fueled by workaholic behavior by employees in adverse working conditions, work may influence work-related health negatively.

TABLE 2 | Fit indices of the model (*N* = 12169).

	CFI	TLI	RMSA	SRMR
CFA1 factor	0.89	0.82	0.16	0.05
CFA2 factor	0.99	0.99	0.03	0.01
M1 hypothesized	0.95	0.92	0.08*	0.06
M2 final	0.98	0.97	0.05	0.03

**The RMSEA had a p-value of <0.001, indicating that the hypothesized model does not have a good fit.*

Our findings also support the distinction between workaholism and work engagement as a negative and positive form of working hard, respectively.

Lastly, we tested the buffer (moderation) hypothesis of the JD-R model and hypothesized that job resources would lessen the effect of job demands on workaholism (H5). In line with studies applying the JD-R model that found that job resources can mitigate the impact of largely independent job demands (i.e., they share little overlap), we tested all nine interaction effects. Our results confirmed the hypotheses in eight of the nine combinations between job demands and job resources. Additionally, all significant effects were in the expected directions. However, the expectation that under highly stressful working conditions the risk of workaholism should be lower if sufficient job resources are available was weaker than anticipated. There might be several reasons for this result. Previous research has revealed that in their attempt to continue working, workaholics may even go as far as actively creating more work for themselves, for instance, by making their work more complicated than necessary or by refusing to delegate job tasks (Kanai and Wakabayashi, 2001; Schaufeli et al., 2009). In addition, it has been revealed that workaholics may perceive their workplace environment as being more demanding and stressful than others do (Bakker et al., 2009). Moreover, it has been reported that workaholics are inflexible, rigid, and perfectionists (Schaufeli et al., 2006). Taken together, this may imply that workaholics either cannot or do not want to use job resources, even though these resources are available to them. Furthermore, the buffer hypothesis has received an abundance of support regarding the relationship of the effects of resources and demands on burnout. However, burnout, which is a state of exhaustion and disengagement (Bakker et al., 2014), and workaholism are two different constructs. It might be that job resources are more effective to moderate the impact of job demands on burnout compared to that on workaholism.

In summary, our results suggest that different working conditions (i.e., job demands and job resources) can have a

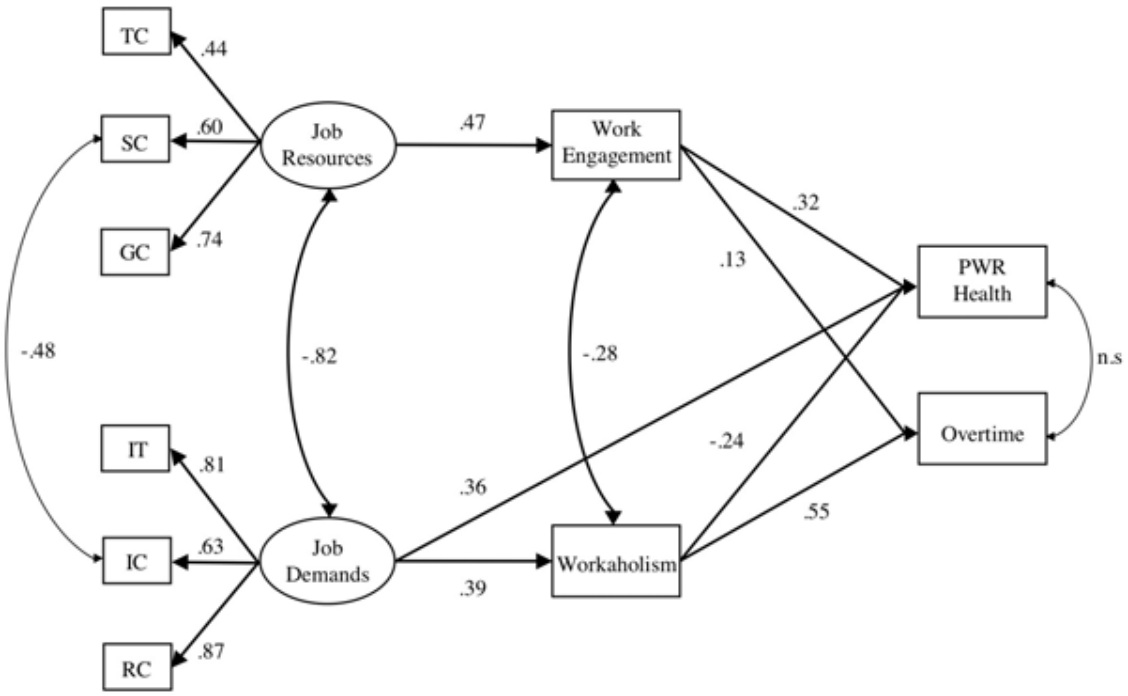

FIGURE 3 | SEM model. Standardized solution. All paths are statistically significant at $p < 0.001$. TC, task completion; SC, social community; GC, goal clarity; ITs, illegitimate tasks; ICs, interpersonal conflicts; RCs, role conflicts; PWR Health, perceived work-related health.

negative or positive impact on employee well-being through two different processes. Both workaholics and engaged workers put in more hours at work than what was required of them, but workaholism and job demands predicted negative work-related health, whereas work engagement predicted positive work-related health. Job resources buffered the impact of demands on workaholism in eight of the nine combinations in the expected directions, although the effect was smaller than expected. Our findings also emphasize the importance for construct specificity, i.e., that it is suitable to distinguish between a positive and a negative form of working hard (i.e., work engagement and workaholism).

Note that we use causal langue in describing and reporting the results from the mediating and moderating models. The reason is that causality is an intrinsic part of such models (e.g., Hayes, 2017). However, the causality implied by claiming that an independent variable has an effect on a mediating variable, and that both the independent and the mediating variables have causal effects on a dependent variable refers to a theoretical assumption inherent in regression models, even if the causality is not tested empirically (e.g., Davis and Weber, 1985). Despite the framing of the results in terms such as cause and effect, the results should not be interpreted as if a causal direction between these variables has been proven.

TABLE 3 | Estimates (Est.), standard errors (SE), *p*-values (p), and confidence intervals (CI) for the mediated effects ($N = 12168$).

	Est.	*SE*	*p*	CI 95%
JD → WA → PWR Health	−0.09	0.01	< 0.001	[−0.10, −0.08]
JD → WA → OT	0.21	0.01	< 0.001	[0.20, 0.22]
JR → WE → PWR Health	0.15	0.01	< 0.001	[0.14, 0.16]
JR → WE → OT	0.06	0.01	< 0.001	[0.05, 0.07]

Parameter estimates are standardized coefficients. JDs, job demands; JRs, job resources; WA, workaholism; WE, work engagement; PWR Health, perceived work-related health; OT, overtime work.

Limitations and Future Research

Although this study has made significant contributions to the literature, some limitations need to be acknowledged. The findings come from a study with a cross-sectional design; thus, it is not possible to make causal inferences about the relations between study variables. Future studies could employ a longitudinal design to examine the causal effects of the proposed processes.

Second, all data were obtained from questionnaires, with the limitations inherent to this method. The results are also based solely on single-source data, namely, self-ratings. Future studies could add objective indicators to rule out the potential effects of common method variance. For instance, observer ratings have previously been used to study working conditions (Demerouti et al., 2001b) and could be used in future studies.

There are also limitations rooted in the measurement of subjective work-related health. First, the instrument

TABLE 4 | Regression weights (b), confidence intervals (CI), standard errors (*SE*), *t*-values, *p*-values, and squared multiple correlations (R^2) from a set of linear regression analyses with workaholism as the dependent variable, job demands as the independent variable and job resources as the moderator variable.

Predictor	*b*	CI	*SE*	*t*	*p*	R^2
Constant	2.17	[2.16, 2.18]	0.005	441.02	<0.001	0.14
Task completion	−0.00	[−0.20, 0.01]	0.008	−0.26	0.797	
Illegitimate tasks	0.27	[0.26, 0.29]	0.007	39.13	<0.001	
Task completion × Illegitimate tasks	−0.045	[−0.06, −0.03]	0.009	−5.06	<0.001	
Constant	2.17	[2.16, 2.18]	0.005	428.34	<0.001	0.14
Social community	−0.02	[−0.03, −0.005]	0.007	−2.59	0.010	
Illegitimate tasks	0.27	[0.25, 0.28]	0.007	36.83	<0.001	
Social community × Illegitimate tasks	−0.021	[−0.04, −0.01]	0.008	−2.74	0.006	
Constant	2.16	[2.15, 2.17]	0.005	416.82	<0.001	0.14
Goal clarity	−0.01	[−0.02, 0.01]	0.008	−0.14	0.886	
Illegitimate tasks	0.27	[0.25, 0.28]	0.008	35.01	<0.001	
Goal clarity × Illegitimate tasks	−0.044	[−0.06, −0.03]	0.007	−6.09	<0.001	
Constant	2.17	[2.16, 2.18]	0.005	430.15	<0.001	0.06
Task completion	−0.05	[−0.06, −0.03]	0.009	−5.65	<0.001	
Interpersonal conflicts	0.13	[0.12, 0.14]	0.005	23.98	<0.001	
Task completion × Interpersonal conflicts	−0.035	[−0.05, −0.02]	0.008	−4.45	<0.001	
Constant	2.17	[2.16, 2.18]	0.006	375.80	<0.001	0.06
Social community	−0.02	[−0.04, 0.00]	0.009	−1.88	0.060	
Interpersonal conflicts	0.12	[0.11, 0.14]	0.007	18.38	<0.001	
Social community × Interpersonal conflicts	−0.013	[−0.02, −0.01]	0.006	−2.02	0.043	
Constant	2.17	[2.16, 2.18]	0.005	406.44	<0.001	0.07
Goal clarity	−0.08	[−0.09, −0.06]	0.008	−10.03	<0.001	
Interpersonal conflicts	0.11	[0.10, 0.12]	0.005	19.34	<0.001	
Goal clarity × interpersonal conflicts	−0.009	[−0.02, −0.00]	0.007	−1.39	0.165	
Constant	2.17	[2.16, 2.18]	0.005	431.70	<0.001	0.11
Task completion	0.01	[−0.01, 0.03]	0.009	1.14	0.254	
Role conflicts	0.26	[0.24, 0.27]	0.008	34.43	<0.001	
Task completion × Role conflicts	−0.048	[−0.07, −0.03]	0.100	−5.00	<0.001	
Constant	2.17	[2.16, 2.18]	0.005	414.91	<0.001	0.11
Social community	−0.02	[−0.03, −0.002]	0.008	−2.18	0.029	
Role conflicts	0.25	[0.23, 0.26]	0.008	31.63	<0.001	
Social community × Role conflicts	−0.021	[−0.04, −0.004]	0.008	−2.46	0.014	
Constant	2.16	[2.15, 2.17]	0.005	400.92	<0.001	0.11
Goal clarity	−0.001	[−0.02, 0.01]	0.008	−0.16	0.871	
Role conflicts	0.25	[0.23, 0.27]	0.009	29.52	<0.001	
Goal clarity × Role conflicts	−0.039	[−0.06, −0.02]	0.008	−4.88	<0.001	

n = 12030–12051. $p < 0.001$ for all overall models.

applied measures the subjective perception of how work is influencing individual health. Other measures on health could provide better information regarding the participants general health and could provide a stronger understanding of the relationship between working hard and overall health. Second, there is some sort of norm built into questions of self-reported health. For instance, respondents may answer questions relative to similar others (e.g., my health compared with others at my age) or with respect to time (e.g., my health now compared to last year). Objective measures could overcome these methodological challenges. Finally, the study might reflect a selection bias known as "the healthy worker effect"; only those who are healthy and "survive" remain in their jobs, whereas unhealthy employees drop out. However, empirical studies suggest that problems with non-response are more severe for estimations of population means than for estimations of associations (Van Loon et al., 2003).

Additionally, the buffer hypothesis of the JD-R model was not as clear for workaholism as was previously revealed for burnout. This ambiguity should be investigated in greater detail to determine whether the relationships between job demands, job resources and workaholism are the same as those previously revealed for the relationship between job demands, job resources and burnout. Future studies could investigate whether job resources have a stronger buffer effect on burnout compared to workaholism.

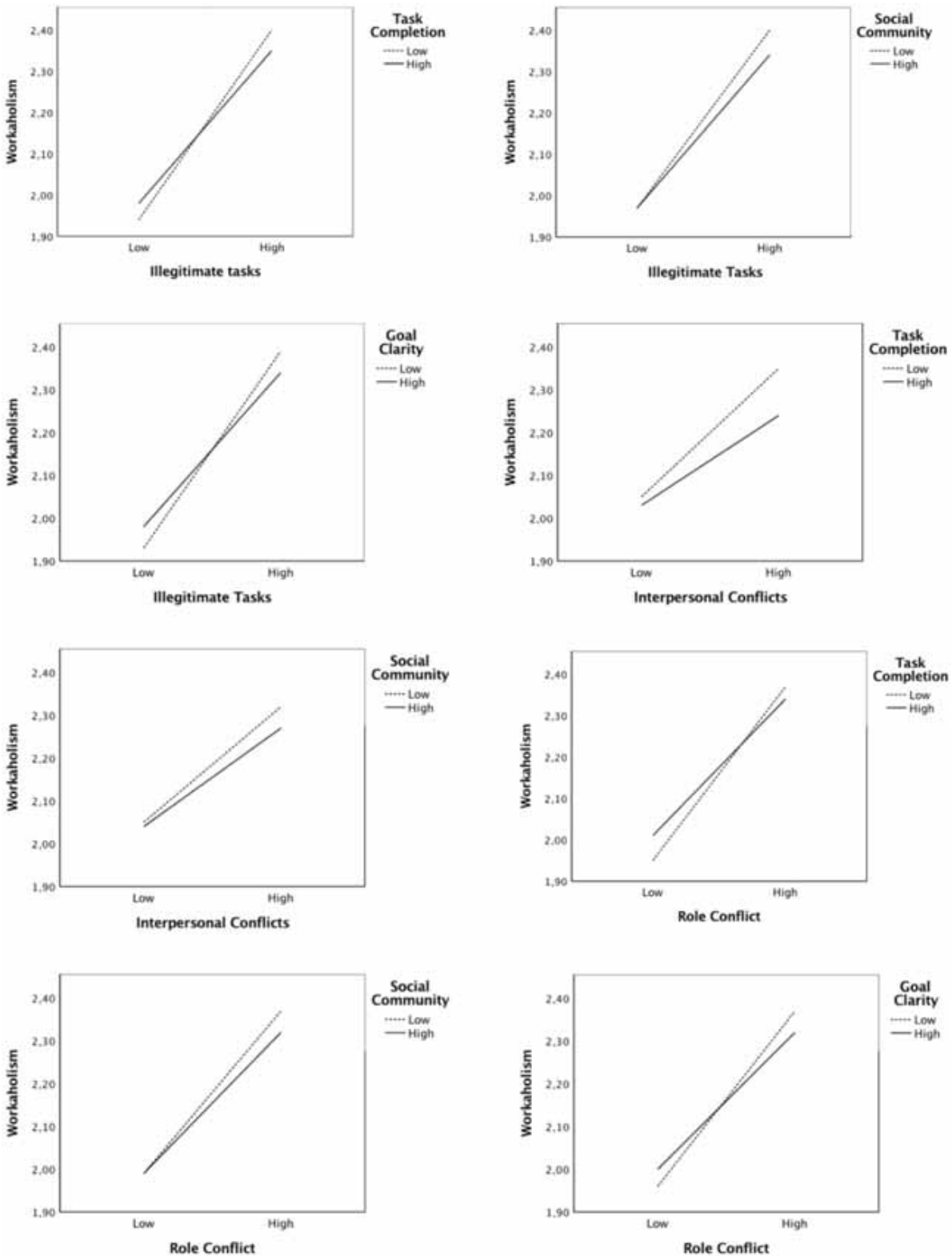

FIGURE 4 | The interaction effects.

CONCLUSION

The present study supports the expansion of including workaholism in the health impairment process in the JD-R model. Our results offer further support for the notion that it is suitable to distinguish between workaholism and work engagement as two different types of working hard (i.e., negative and positive). Finally, our study suggests that it is possible to create working conditions which support engaged workers. This may prove to be a business advantage, providing organizations with employees who are able and willing to walk the extra mile.

ETHICS STATEMENT

This study's protocol was approved by the Norwegian Centre for Research Data (NSD); further approval by an Ethics Committee was not required as per applicable institutional and national guidelines and regulations. All participants gave written informed consent in accordance with the Declaration of Helsinki.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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Appendix B Chapter 3 Published Article

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Article

Ticket to Ride: A Longitudinal Journey to Health and Work-Attendance in the JD-R Model

Benedicte Langseth-Eide * and Joar Vittersø

Department of Psychology, UiT The Arctic University of Norway, 9019 Tromsø, Norway; joar.vitterso@uit.no
* Correspondence: benedicte.langseth-eide@uit.no

Abstract: The present study addresses one of the limitations of the JD-R model, namely, that analyses of the outcomes of the motivational process have largely focused on organizational outcomes and have neglected to investigate the associations between job resources, work engagement and health-related outcomes. Specifically, the aim of this paper is to show that health-related indicators may be outcomes of the motivational process in the job demands-resources (JD-R) model. We achieve this through a two-wave panel study with a two-year time lag. The results provide longitudinal evidence that two well-established job resources (i.e., social support and feedback) predicted work engagement, that work engagement was negatively related to sick leave and that this relation was mediated by subjective health. By showing that health-related indicators could also be outcomes of the motivational process in the JD-R model, we have strengthened the model.

Keywords: work engagement; JD-R model; sick absence; employee well-being

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1. Introduction

The identification and implementation of factors that can contribute to improving and enhancing employee health and well-being is needed in order to create and provide healthy workplaces [1]. However, although flourishing organizations and engaged employees in general promote work attendance and positive employee health, these processes are not fully understood.

In the well-established job demands-resources (JD-R) model [2], health-related indicators have most often been measured as outcomes of the health-impairment process, whereas organizational outcomes have been linked to the motivational process. It has been argued that one of the limitations of the JD-R model is the lack of investigation of the relations among job resources, work engagement and health-related outcomes [3]. Recent research has shown that the JD-R model could, in addition to organizational outcomes, include health-related outcomes in its motivational process [3]. Even though it has been suggested to expand the motivational process in the JD-R model with regard to health-related outcomes, it is necessary to perform studies that can validate this expansion.

1.1. The Motivational Process in the JD-R Model

The JD-R model assumes that job demands and job resources (i.e., working conditions) will negatively or positively impact organizational outcomes and employee well-being. This happens through two distinct psychological processes: either the health-impairment process or the motivational process [2]. The health impairment process posits that job demands lead to burnout [4] or workaholism [5,6], which in turn leads to ill health. On the other hand, the motivational process posits that job resources first lead to work engagement and thereafter to positive organizational outcomes [7,8].

1.1.1. Job Resources Leads to Work Engagement

Job resources are those physical, psychological, social or organizational aspects of a job that may stimulate personal growth, development and learning; that may assist in

achieving work goals; and that may reduce job demands and the associated psychological and physiological costs [9]. Job resources may be intrinsically motivating by facilitating growth, development and learning [2] and thus function to satisfy basic needs, such as the needs for autonomy, relatedness and competence [10,11]. For example, social support may fulfill the need to belong [12], and suitable feedback may foster learning, which increases job competence [8]. The same job resources may also be extrinsically motivating by providing tools or concrete information that contribute to goal attainment. Further, social support may function as hands-on assistance to handle momentary work overload (i.e., reduce job demands) to reach work goals [13], while feedback can provide concrete information that may contribute to goal achievement. Hence, both social support and feedback enhances the possibility that an employee successfully will achieve his or her goals at work [9]. In addition, being in a resourceful work environment may stimulate a desire to dedicate one's capabilities and effort to the job task [4], which increases the likelihood that the tasks will be completed and that work goals will be achieved. Whether these resources (i.e., social support and feedback) satisfy basic needs or contribute to achieving work goals, the outcome is positive, and it is likely that work engagement will emerge [9,14]. Work engagement is defined as a "positive, fulfilling work-related state of mind that is characterized by vigor (that is, high levels of energy and mental resilience while working), dedication (referring to a sense of significance, enthusiasm and challenge), and absorption (being focused and happily engrossed in one's work)" [15] (p. 46).

Empirical studies have consistently shown a positive relationship between several job resources, such as job control, autonomy, skill variety and learning opportunities and work engagement [8,16–18]. Additionally, Schaufeli and Bakker [9] used structural equation modeling (SEM) to reveal that three job resources, namely, performance feedback, social support and supervisory coaching, predicted work engagement. The relationship between job resources and work engagement is compatible with the job characteristic theory [19]. The job characteristic theory emphasizes that certain core job characteristics (i.e., skill variety, task identity, task significance, autonomy and feedback) will lead to different positive work-related outcomes, of which intrinsic motivation corresponds with work engagement. Also, self-determination theory [20] suggests that job resources satisfy the basic human needs for autonomy, competence and relatedness. The fulfillment of these needs leads to increased intrinsic motivation and optimal functioning, which is essential for psychological health and well-being. Conservation of resources (COR) theory [21,22] is also compatible with the notion that job resources are associated with work engagement. COR theory suggests that resources evolve in cycles, meaning that various types of resources are likely to accumulate over time because the existence of resources may bring additional resources [23]. As stated in the COR theory, people strive to obtain, retain and protect their resources, including job resources. Individuals with strong resource pools invest resources for future gains and thus experience a gain cycle. On the other hand, those who do not have access to strong resource pools have an increased likelihood of experiencing resource loss (i.e., loss cycle). Hence, gaining resources increases the likelihood that additional resources will be acquired, which in turn increases work engagement. Empirical evidence for an upward spiral of resources and work engagement has been presented. For example, Dicke et al. [24] showed that resources had positive long-term effects on work engagement two years later among German teachers. Simultaneously, work engagement led to higher levels of resources over time. In a similar vein, Reis, Hoppe and Schröder [25] found a reciprocal relationship between work engagement and mental health among psychotherapists. In addition, they found that work engagement was both a predictor and outcome for autonomy, learning opportunities and task variety (i.e., job resources). Furthermore, Schaufeli and Salanova's [15] study with managers revealed that engagement predicted higher levels of job resources, such as social support, autonomy, learning and performance feedback the following year. Together, these findings suggest that engaged employees are capable of mobilizing their own personal resources and job resources, which in turn nourish forthcoming engagement, and onward.

1.1.2. Work Engagement Leads to Better Self-Reported Health and Reduced Sick Leave

In well-being research, there is a growing interest in the associations between positive work-related conditions and states, and health outcomes. Work is identified as an important health determinant [26], and gainful employment is considered to foster good health. For example, Keyes [27] showed that flourishing employees had a lower risk of cardiovascular disease and reported fewer days of sick leave than their less-flourishing colleagues.

Convincing empirical support has been provided for the motivational process of the JD-R model, which moves from job resources through engagement to positive organizational outcomes [7,14,28]. It has been shown, for example, that work engagement is positively associated with positive work-related attitudes, commitment to the job and organization, and better performance at work. However, the link between job resources and health-related outcomes, such as subjective health and sick absence, via work engagement has rarely been investigated [3]. However, there is some empirical evidence of a positive association between job resources and work engagement and health-related outcomes. Hakanen and Schaufeli [29] showed that engagement was positively related to life satisfaction. Airila et al. [3] revealed that engagement mediated the relationship between job and personal resources and work ability, in which the latter includes being healthy enough to perform the job. Moreover, Langseth-Eide [5] revealed that workaholism was negatively related to work-related health but that work engagement was positively related to work-related health, although both workaholics and engaged employees worked overtime hours. Additionally, previous studies have revealed that engaged employees report fewer psychosomatic complaints [30]; suffer less from head pain, cardiovascular problems and abdominal pain [9]; and report better self-reported health [31].

This is in line with COR theory [21,22] that describes pathways from job resources via work engagement to health in long term gains. People employ their resources not only to deal with stress, but also to have a pool of resources for future needs. These resources are salient in creating well-being (i.e., work engagement) and in enhancing health. In the long term, individuals that have access to greater resources will experience future resource gains, and this will contribute to protect against stress and as a consequence they will be better protected against illness and ill-being. To summarize, COR theory presumes that increased levels of resources will be beneficial for well-being and health in the long term.

Healthy employees are less absent from work, and there is empirical evidence that health mediates the relationship between job-related states (such as work engagement) and sick leave. For example, Schalk [32] showed in a longitudinal study that workplace attitudes (i.e., job satisfaction and organizational commitment) were negatively related to sick leave and that this relationship was mediated by employee health. Further, based on their summarization of previous studies, Pousette and Hanse [33] proposed that the relationship between particular work attitudes and sick leave was mediated by health. Thus, there is some empirical evidence to suggest that engagement can predict reduced sick absence and that this relationship is mediated by subjective perceptions of health.

1.1.3. Aim of the Study

With the present study we aim to show that the motivational process in the JD-R model, which starts with job resources that give rise to work engagement, may, in turn, lead to positive health-related outcomes. Although the proposed processes in the JD-R model have been replicated numerous times, a great majority of these studies have been performed with cross-sectional data. Our contribution includes both concurrent and longitudinal (panel) data.

Accordingly, we hypothesize:

Hypothesis 1a: *Employees' job resources (i.e., social support and feedback) predict their level of work engagement.*

Hypothesis 1b: *Employees' level of work engagement in a given point in time (T1), directly affects their level in job resources (i.e., social support and feedback) in a subsequent time point (T2).*

Hypothesis 2a: *Work engagement is negatively related to sick leave.*

Hypothesis 2b: *The relationship between work engagement and sick leave is mediated by employees' self-reported health levels.*

2. Materials and Methods

2.1. Sample and Procedure

The data for the present study were collected as part of a work environment survey among public employees from many workplaces and a wide variety of professions in a municipality in Norway (e.g., teachers at elementary schools and art schools, lawyers, cleaners, public health nurses, nurses, physiotherapists, librarians, bureaucrats, social workers, engineers, firemen, librarians, IT advisors, translators, janitors and administrative personnel). The broad variety of professions and workplaces is favorable regarding external validity. Participants were invited by e-mail with a link to an electronic questionnaire at both T1 and T2 two years later. A total of 1544 and 1503 employees participated in the survey at T1 and T2, respectively. The participants could make their T1 and T2 information identifiable on a voluntary basis. A total of 185 participants completed both questionnaires and made themselves identifiable and could therefore be included in the longitudinal analyses; 27% (N = 50) of the participants were men, and 73% (N = 135) were women. The mean age at T1 was 33.4 (SD = 10.05).

2.2. Measures

2.2.1. Feedback

To measure feedback, a five-item scale developed by Kuvaas [34] was employed. An example item is "I receive frequent and continuous feedback on how I do my job". The Cronbach's alpha coefficients were 0.87 and 0.85 at T1 and T2, respectively. The responses were provided on a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree).

2.2.2. Colleague Support

Colleague support was measured using a four-item subscale from the Survey of Perceived Organizational Support [35]. An example item is "My colleagues really care about my well-being". The Cronbach's alphas were 0.94 and 0.89 at T1 and T2, respectively. The responses were provided on a Likert scale ranging from 1 (=Strongly disagree) to 7 (=Strongly agree).

2.2.3. Work Engagement

Work engagement was measured with the nine-item version of the Utrecht Work Engagement Scale [36]. The items cover three aspects of work engagement: vigor, dedication, and absorption. Sample items are "At my work, I feel bursting with energy" (vigor), "I am enthusiastic about my job" (dedication) and "I am immersed in my work" (absorption). The response alternatives ranged from 0 (Never) to 6 (Every day). Exploratory factor analysis with maximum likelihood conducted with the data from the present study did not indicate a clear three-dimensional model, and neither did following confirmatory maximum likelihood factor analysis. For this reason, a one-dimensional mean score variable based on the nine items was computed and used in the subsequent analyses. The Cronbach's alphas were 0.94 at T1 and 0.95 at T2.

2.2.4. Self-Reported Health

A single item was used to measure the participants' subjective health: "How would you describe your present health?" [37]. The response alternatives were Very poor, Poor, Average, Good or Very good. This single-item measure of self-reported health has previously been used in numerous studies [38,39]. Self-reported health has been closely related to somatic and psychological complaints in several previous studies and has also proven to be a predictor of objective health measures and mortality [40,41]. It has been argued that this single-item measure of subjective health is correlated strongly with other direct

or indirect measures of health and has good test-retest reliability, demonstrating a high degree of construct validity [42].

2.2.5. Sick Absence

To assess the participants' sick absence, we asked participants how many times (spells/episodes, not days) they had been absent from work due to sickness during the past 12 months. Sick absence can be assessed as spell-, person-, or time-based measures. Sick absence spells, often referred to as sick leave episodes, are common events in the general population. Sick absence spells have a skewed distribution, in which short-term spells are common, whilst long-term spells take place to a smaller extent. In previous reviews of measurements of sickness absence, Hensing [43] and Hensing et al. [44] suggested the following five measures for sick absence: frequency, length, cumulative incidence, incidence rate and duration. Frequency was suggested as a basic measure. They argue that it is suitable to apply frequency as a measurement when studying workplaces as it can provide an overview of the burden of sickness absence within a limited study population.

2.3. Analyses

We computed the internal consistencies, descriptive statistics, and intercorrelations of the study variables using the PASW 25.0 program (IBM, Armonk, NY, USA).

To test our hypotheses, we conducted SEM analyses using the Mplus 8.0 software package (Muthén & Muthen, Los Angeles, CA, USA) [45]. The fit of the models were assessed with the chi-square test, root mean square of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI) and standardized root mean square residual (SRMR). It is suggested that RMSEA values below 0.07, SRMR values below 0.08, and CFI and TLI values greater than 0.95 indicate good fit [46].

3. Results

The descriptive statistics, Pearson's correlations and Chronbach's alpha of the study variables are presented in Table 1. All variables were normally distributed within the limits of a skewness less than |2| [47]. None of the mean scores differed significantly across time points (all p values from paired-sample t-tests > 0.270). As expected, the cross-sectional correlations between the two job resource variables and the work engagement variable were moderately high, ranging between $r = 0.24$ and $r = 0.43$ (p's < 0.01). The associations between these variables and the sick leave variables were negative and much smaller, in the range of $r = -0.06$ to $r = -0.16$, all p's > 0.05, except for the association between feedback and sick leave at T1, (i.e., $r = -0.16$) which was significant at $p = 0.037$. Self-reported health and sick leave correlated negatively and significantly, $r = -0.20$, $p = 0.008$, and $r = -0.33$, $p < 0.001$, at T1 and T2, respectively. Self-reported health at T1 also correlated negatively with sick leave at T2, $r = -0.27$, $p = 0.001$.

Table 1. Descriptive statistics, Pearson's product-moment correlations and Cronbach's alphas (diagonally presented) for feedback, social support work engagement, self-reported health, and sick absence spells.

Time 1	Range	*M*	*SD*	Sk	T1(1)	T1(2)	T1(3)	T1(4)	T1(5)	T2(1)	T2(2)	T2(3)	T2(4)	T2(5)
T1(1). Feedback	1 to 7	3.57	1.46	0.22	(0.87)									
T1(2). Social support	1 to 7	5.68	1.31	−1.28	0.41 ***	(0.94)								
T1(3). Work engagment	1 to 7	5.67	1.22	−1.26	0.37 ***	0.43 ***	(0.94)							
T1(4). Self-reported health	1 to 5	3.94	0.76	−0.35	0.06	0.13	0.24 **	N.A.						
T1(5). Sick absence spells	1 to 13	3.05	1.83	1.83	−0.16 *	−0.06	−0.12	−0.20 **						
Time 2														
T2(1). Feedback	1 to 7	3.63	1.39	1.39	0.53 ***	0.24 **	0.22 **	0.03	−0.16 *	(0.85)				
T2(2). Social support	1 to 7	5.62	1.22	1.22	0.31 ***	0.64 ***	0.39 ***	0.14	−0.16 *	0.30 ***	(0.89)			
T2(3). Work engagement	1 to 7	5.57	1.25	1.25	0.24 **	0.40 ***	0.55 ***	0.19 **	−0.18 *	0.31 ***	0.40 ***	(0.95)		
T2(4). Self-reported health	1 to 5	3.88	0.79	0.79	0.05	0.13	0.15 *	0.56 ***	−0.22 **	0.05	0.09	0.31 ***	N.A.	
T2(5). Sick absence spells	1 to 13	3.08	2.08	2.08	−0.02	−0.08	−0.08	−0.27 ***	−0.54 ***	−0.14	−0.04	−0.26 ***	−0.33 ***	N.A.

Note. *M* = Mean, *SD* = Standard Deviation, Sk = Skewness, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests).

The variables were fitted to the path model depicted in Figure 1. All models received acceptable goodness of fit (Table 2). The standardized regression coefficients (betas) were all significantly different from zero ($p < 0.01$) and were in the range from $\beta = -0.14$ ($p < 0.001$) for path E (cf. Figure 1 and Table 3) in the complete sample at T1 to $\beta = 0.41$ ($p < 0.001$) for path A in the longitudinal subsample at T1.

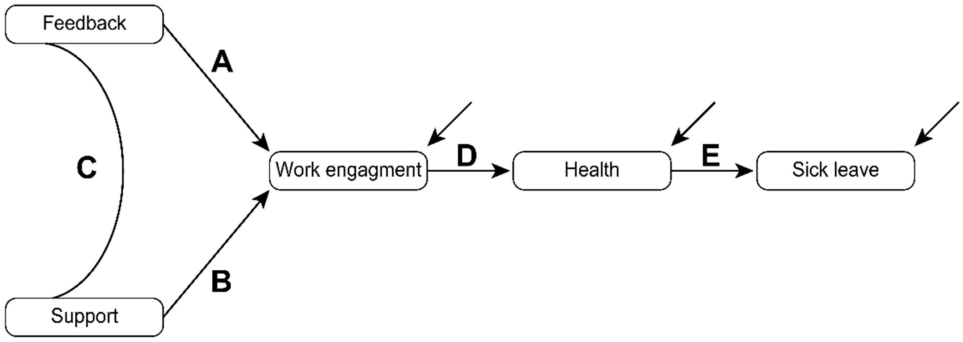

Figure 1. Cross-sectional path model.

Table 2. Goodness-of-fit measures for the model depicted in Figure 1, fitted to the full samples at T1 and T2 and to the longitudinal samples at T1 and T2.

Model	$\chi^2(5)$	*N*	*p*	CFI	RMSEA (90% CI)	SRMR
Model 1 (T1)	15.04	1544	0.010	0.96	0.04 [0.02–0.06]	0.03
Model 2 (T1)	4.67	185	0.457	1.00	0.00 [0.00−0.10]	0.04
Model 3 (T2)	18.11	1501	0.003	0.97	0.04 [0.02−0.06]	0.02
Model 4 (T2)	8.88	185	0.114	0.95	0.07 [0.00−0.13]	0.05

χ^2(df) = Chi-square (degrees of freedom), CFI = Comparative Fit Index, RMSEA = Root Mean Square of Approximation, SRMR = Standardized Root Mean Square Residual.

Table 3. Standardized regression coefficients (β's) and 95% confidence intervals (CIs).

Path	T1			T1 Longitudinal			T2			T2 Longitudinal		
	β	LL-CI	UL-CI	β	LL-CI	UL-CI	β	LL-CI	UL-CI	β	LL-CI	UL-CI
a	0.37	0.30	0.43	0.34	0.21	0.47	0.28	0.23	0.33	0.34	0.21	0.47
b	0.22	0.15	0.28	0.23	0.10	0.37	0.27	0.22	0.31	0.21	0.08	0.34
c	0.30	0.23	0.35	0.41	0.28	0.53	0.30	0.26	0.34	0.30	0.12	0.43
d	0.29	0.23	0.25	0.24	0.11	0.38	0.25	0.20	0.29	0.31	0.13	0.44
e	−0.14	−0.20	−0.10	−0.20	−0.35	−0.06	−0.19	−0.25	−0.14	−0.33	−0.51	−0.20

To determine whether the associations in the full samples at T1 ($N = 1544$) differed from those in the subsample of participants who completed the questionnaires at both time points ($N = 185$), we constrained all coefficients in the full sample T1 model to be equal to those in a model with the longitudinal data (i.e., the $N = 185$ sample at T1). We repeated the procedure for two models at T2 (i.e., compared results based on the full $N = 1503$ sample, with data from the $N = 185$ sample).

Using a multigroup strategy, we first inspected the differences in chi-squares for the two T1 model models, and next for the two T2 models. The chi-square difference at T1 was not significant, $\Delta\chi^2(5) = 3.09$, $p = 0.686$. Similarly, the chi-square difference at T2 was not significant either, $\Delta\chi^2(5) = 3.03$, $p = 0.695$.

Hence, with regard to the *associations* between the present study variables, we assumed that they were the same for those of the participants who completed both questionnaires as compared to those who only completed either the T1 or the T2 questionnaire.

Regarding the size of the regression weights, the results from the models were consistent with the results from the zero-order correlations. No direct effect from job resources to health and sick leave were included in the model, and we did not observe any direct effect from work engagement to sick leave.

Figure 2 shows our final model, which integrated information from both data waves. The model adequately fit the data with $\chi^2(25)$, $N = 184$) = 34.92, $p = 0.089$, CFI = 0.98, RMSEA = 0.05 [0.00−0.08], SRMR = 0.05. The model showed the cross-sectional stability between variables and crossover effects within variables. For example, the cross-sectional paths from health to sick leave were β = −0.21 and β =−0.22 at T1 and T2, respectively (both *ps* < 0.01). A direct path from health at T1 to sick leave at T2 was nonsignificant, β = −0.09, $p = 0.259$.

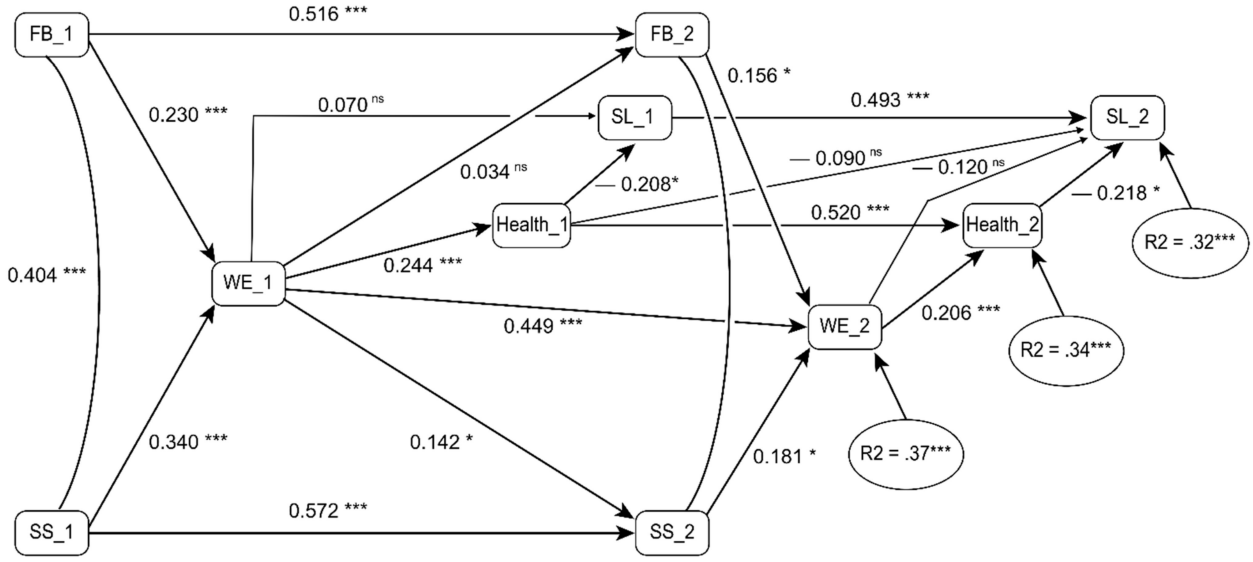

Figure 2. Longitudinal model. FB = Feedback; SS = Social Support; WE = Work engagement; SL = Sick leave episodes; 1 = T1; 2 = T2, * = $p < 0.05$; *** $p < 0.001$; ns = non-significant.

Our first hypothesis (H1a) stated that job resources predict work engagement, which is confirmed in the path from feedback to work engagement (β = 0.23, $p = 0.001$) and from social support to work engagement (β = 0.34, $p < 0.001$) in Figure 2. Our second hypothesis (H1b) was partly supported. It suggests that work engagement at T1 predicts job resources at T2, which it does for social support (β = 0.14, $p = 0.021$) but not for feedback (β = 0.03, $p = 0.617$).

Our final hypotheses are that work engagement is negatively related to sick leave (H2a), and that this relationship is mediated by health (H2b). Hypothesis 2a was not supported, since no significant paths between work engagement and sick leave were found (*ps* > 0.073). Hypothesis 2b was supported, however, since the indirect effects at both T1 (β = −0.07, $p = 0.044$) and T2 (β = −0.06, $p = 0.034$) were significant and in the expected direction. Longitudinally, a small but significant indirect effect was found from work engagement at T1 through general health at T1 on sick leave at T2 (β = −0.02, $p = 0.047$).

4. Discussion

The aim of this paper was to show that the JD-R model could be expanded by including health-related indicators as outcomes in the motivational process. Hence, we examined antecedents (i.e., job resources) and consequences (i.e., health and sick leave) of work engagement within the framework of the JD-R model.

As expected, we found longitudinal evidence that social support and feedback predicted work engagement (H1a). Our findings support the main notion of the motivational process of the JD-R model, namely, that job resources have a positive effect on employee well-being [2]. Hence, it is likely that a resourceful job environment enhances the chances of having engaged workers. These findings are in line with the assumption in the COR theory of an accumulation process resulting in resource gains. When employees hold resources they value, they are more likely to continue to invest resources, which in turn increases

work engagement. Our final model also supports previous studies that have revealed a positive association between job resources and work engagement [31,48].

Drawing on the reciprocal process described in COR theory, we also hypothesized that work engagement at T1 would predict job resources at T2 (H1b). This hypothesis was only partially confirmed. We found a significant relationship between work engagement at T1 and social support at T2, but a nonsignificant relationship between work engagement and feedback at T1 and T2. There might be several reasons for this finding. One issue to consider is the relatively high stability of work engagement [49]. Due to the relatively stable nature of many psychological constructs, the predictors will fail to account for any additional variance in the outcome variable. Time lags that are too long may also lead to the underestimation of the true causal impact [50]. The two-year follow-up period may have been suitable to investigate the association between work engagement and social support among colleagues. Often, employees are colleagues for several years, and social support, which also has a relational aspect, may therefore not be very vulnerable to longer time lags between measurement points. On the other hand, it is possible that the two-year time lag is unsuitable to investigate the association between feedback and work engagement. Feedback is a transaction between the leader and the employee and is often tied to job tasks and performance [34]. It may be that levels of feedback change more during a two-year period than the social relations among colleagues, and feedback may therefore be more vulnerable to long time lags between measurements. Future studies should investigate the longitudinal relationship between feedback and work engagement in more detail. However, the overall results were meaningful and support the motivational process in the JD-R model.

Finally, we wanted to investigate the inclusion of health-related indicators as outcomes of the motivational process in the JD-R model. The results did not provide longitudinal evidence that work engagement directly led to reduced sick leave (H2a), but a significant mediating effect was found via self-reported health (H2b). Thus, it seems that engaged workers experience better subjective health than less engaged workers and that they are less absent from work. Hence, our findings support the pathway described in the COR theory in which job resources are positively related to health-related outcomes via engagement through long-term gains.

There might be several reasons why engaged workers report better health and are less absent from work. Previous studies have revealed that compared to less-engaged workers, engaged workers recover from their workdays better [51] and more often experience positive emotions [52]. Engaged workers also report that they more often participate in leisure-time activities that help them relax and detach from work, such as sports and exercise, social activities, and hobbies [53]. Additionally, Schaufeli and Bakker [10] found that engaged workers suffered less from self-reported headaches, stomach aches, and cardiovascular problems. Hence, work engagement may lead to something else beyond positive organizational outcomes. Our results provide evidence that the JD-R model could also be used to more broadly predict positive health, as well as the (negative) health outcomes that often follow the health-impairment pathway.

Limitations and Future Research

The current study has some limitations that should be mentioned. We used questionnaires to collect the data, and there are some limitations to this method. First, the results are based entirely on single-source self-ratings, which may imply that the relationships among the variables are due to common method variance. However, applying a longitudinal design has been shown to reduce the problem with unmeasured third variables and common method variance [54]. We also conducted Harman's single-factor test, and the results showed that common method variance did not pose a problem in this data set [55]. Still, future studies could enhance the explanatory power of the model by including other measures. For example, observer ratings have previously been used successfully to study working conditions [31] and could be applied. Future studies could also attempt to apply

a mixed-methods design, in which a representative sample of the participants that have answered the questionnaire are also interviewed. This may deepen and expand the findings. We also want to acknowledge that, although the study design was longitudinal, there was no experimental manipulation of independent variables and therefore we cannot make any causal inferences with confidence [56].

There are also limitations inherent in the measurement of subjective health. In questions about self-reported health, there is often a norm or benchmark attached to it. Participants may, for example, compare themselves to similar others (e.g., how my health is compared to others at my age) or take time into account (e.g., my current health status compared with one year ago). In order to overcome these challenges, objective measures could be applied. In addition, our study may display a selection bias called "the healthy worker effect", that is, only the strongest and healthiest employees stay in the work force while those who are unhealthy leave working life. However, empirical studies suggest that problems with nonresponse are more severe for estimations of population means than for estimations of associations [57].

There are also limitations in the measurement of sick leave. The reliability of the measure of sick leave in this study may have been reduced due to memory bias, since what we actually measured was employees' recalled sick leave. Again, objective measures, such as absence registers, may be employed in future studies. Another important factor is that the sickness absence of employees in Norway is completely financially compensated during their first year. Hence, employees on sick leave experience no loss of income. It cannot be ruled out that other results would be obtained in countries where sickness absenteeism leads to income loss. In these countries, it might be that disengaged employees are less inclined to be absent from work. This restricts generalizations of the findings beyond Norwegian employees. Future studies should attempt to replicate the study in other countries that have different financial policies regarding compensation during sick leave in order to overcome this problem.

Finally, there are some limitations regarding the sample in our study. Although the participants represent a large variety of professions and workplaces within the municipality, they are all from the same geographical area and have the same overall employer. Thus, there might be that our findings cannot be generalized to other communities. Future studies should attempt to investigate the associations between job resources, work engagement, health and sick leave in both the private and public sector, in different occupations and workplaces and in different areas of the world.

5. Conclusions

In summary, our results provide firm longitudinal evidence that job resources promote work engagement and that engaged workers experience good health and are less absent from work. Therefore, our results support the expansion of the motivational process of the JD-R model to include not only organizational outcomes but also health-related outcomes. Although the responsibility for own health is individual, it is also a societal responsibility to create conditions that enable people to influence their health and well-being. The notion that work engagement is a predictor of positive subjective health that, in turn, leads to reduced sick leave emphasizes the importance and implications of facilitating a resourceful work environment.

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Appendix C Chapter 4 Published Article

sustainability

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Article

Here, There, and Everywhere: Applying Vignettes to Investigate Appraisals of Job Demands

Benedicte Langseth-Eide * and Joar Vittersø

Department of Psychology, UiT The Arctic University of Norway, 9019 Tromsø, Norway; joar.vitterso@uit.no
* Correspondence: benedicte.langseth-eide@uit.no

Abstract: The job characteristics literature has revealed that job demands can be differentiated into hindrance and challenge demands. However, there has been little consensus on this categorization. Additionally, studies have revealed that job demands can be perceived as hindering and challenging at the same time. The present study aims to bring nuance to this topic by investigating two job demands (i.e., time pressure and emotionally demanding situations) and to what degree they are appraised as challenging and hindering for two occupational groups (i.e., nurses and real estate agents). This study also investigates the impact of emotional dispositions on demand appraisals. A convenience sample (N = 851 Norwegian students) read vignettes and reported their appraisals for six different job situations. A factor analysis revealed that our measures of demand appraisals differed from those reported in previous studies. We therefore labeled the two kinds of appraisals as hindrance-like and challenge-like since they overlap without being identical to the previously reported labels of hindrance and challenge, respectively. Furthermore, we found that job demands were appraised as hindrance-like and challenge-like at the same time but to different degrees. Job demands for core tasks were typically appraised as more challenge-like than hindrance-like. Job demands for non-core tasks were typically appraised as more hindrance-like than challenge-like. Positive trait emotions predicted challenge-like appraisals. By documenting how imagined job demands appear as hindrances and challenges, our study supports previous studies showing that challenge-like demands may play a role in the motivational process in the job demands–resources model. Limitations to vignette studies are discussed.

Keywords: job demands; challenge appraisal; hindrance appraisal; JD-R model; vignette studies

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1. Introduction

The job-demands (JD-R) model [1,2] proposes that working conditions initiate two distinct processes that lead to well-being and ill-being at work. Specifically, job resources start a motivational process that leads to engagement and positive outcomes, whereas job demands start a health impairment process that leads to burnout [3], workaholism [4,5], and negative outcomes. Thus, job demands are positioned as predictors in the health impairment process but have no roles in the motivational process. However, it has been argued that job demands can also be motivating. For example, LePine, Podsakoff, and LePine [6], as well as Podsakoff, LePine, and LePine [6] made a distinction between hindrance and challenging demands, in which hindrance demands have a negative impact and challenge demands have a positive impact on employee well-being. In their paper, in which they summarize the development of the JD-R theory and address issues that need to be solved, Bakker and Demerouti [2] specifically raise the concern about the two types of job demands (i.e., with a positive or negative impact on well-being) and suggest that new research may try to uncover the conditions under which job demands act as challenges versus hindrances.

The JD-R model states that several job resources and job demands should be grouped into general higher-order factors of resources or demands. However, some studies have

suggested that job demands may not always belong to one overarching construct. For example, Luchman and González-Morales [7] found that a model, in which several job demands were included as individual factors, fit the data better. It is possible that this finding is due to the notion that demands can be differentiated into demands that have a positive or negative impact (i.e., challenge or hindrance) on employee well-being. Additionally, the confirmatory factor analyses reported in the study of Van den Broeck and De Cuyper [8] supported the differentiation between job hindrances and job challenges. Additionally, structural equation-modeling revealed that job challenges were positively associated with vigor and were unrelated to exhaustion, while job hindrances were positively related to exhaustion and negatively related to vigor. Furthermore, Searle and Auton [9] found that even when the effects of demands were accounted for, it was the individual differences in the appraisal of the demands that consistently explained the unique variance in the outcomes (i.e., affective states). Webster and Beehr [10] revealed that although a demand was primarily perceived as either challenging or hindering, it could also be perceived as both challenging and hindering at the same time. Taken together, this suggests that more research is necessary to clarify the role and denomination of job demands by investigating them in various jobs and work situations, and by assessing how individual characteristics influence appraisals of job demands.

1.1. Differentiation of Job Demands

LePine, Podsakoff, and LePine [6], as well as Podsakoff, LePine, and LePine [6] introduced the differentiation of job stressors into challenge stressors and hindrance stressors. Hindrance job stressors have been defined as "job demands or work circumstances that involve excessive or undesirable constraints that interfere with or inhibit an individual's ability to achieve valued goals" ([11], p. 67). This description corresponds with the definition of job demands described in the JD-R model, which describe it as "physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (i.e., cognitive or emotional) effort" ([12], p. 296). Examples of hindrance job demands reported in previous studies include role ambiguity (e.g., [13,14]) and illegitimate work tasks (e.g., [15]). These job stressors are considered negative. Conversely, stressors that have the potential to promote personal growth as well as goal achievement are defined as challenge stressors [6]. Examples of challenge stressors reported in the literature include high workload levels (e.g., [16]) and responsibility (e.g., [17]). These demands, although they require effort, may lead to beneficial individual and organizational outcomes, and are therefore considered stressors with positive potential.

It is not yet known whether the differentiation between job demands as challenging and hindering is valid due to the lack of evidence regarding this issue. Moreover, it is still unclear whether such a differentiation between job demands is valid for every occupation [18]. For example, some studies have classified role conflict as a hindrance demand [19], while others have considered it a challenge demand [20]. Similarly, emotional demands have been considered a hindrance demand by some [21,22] and a challenge demand by others [23]. Hence, regarding job demands, the observations, opinions, categorization, and conclusions are not always the same in the scientific literature, and the same job demands are not consistently classified as either hindrances or challenges. Furthermore, it has been shown that employees will not always experience job demands as either hindrances or challenges; indeed, several researchers have argued that the categorization of job demands into being either a hindrance or challenge demand is too simplistic (e.g., [24,25]). A more fruitful approach to the hindrance–challenge framework of job demands may be to investigate the degree to which employees experience job demands as hindering and challenging at the same time. For example, Bakker and Sanz-Vergel [18] showed that nurses perceived work pressure more as a hindrance than as a challenge demand. This approach in which employees report the degree to which they experience each job demand as hindering and challenging may provide more nuanced insight into the differentiation and role of job demands.

1.2. Appraisal of Job Demands

Whether or not the same job demand is appraised similarly by individuals has seldom been tested [25] but some studies have reported on individual subjective appraisal accounts for the differences regarding whether a job demand is classified as hindering or challenging (e.g., [9,25]). Appraisal, in the context of the present study, can be defined as an individual's perception and interpretation of specific job characteristics, and how these job characteristics hold potential for personal growth, gain, and goal achievement (i.e., challenging) or whether they are appraised as constraints that are hindering [26]. Research by Lazarus [27], Lazarus [28], and Bagozzi [29] has contributed to the literature on occupational stress models and appraisals, and they argue that employees make continuous appraisals of their work environments. Based on these appraisals, they form mental representations of which behavior they may apply to cope with these appraisals. Specifically, the Lazarus [27] transactional model of stress and coping (TMSC) suggests that individuals first make primary appraisals, that is, evaluating the significance and importance of a stressful episode, followed by secondary appraisals, which is an evaluation of the available options and resources to handle stressful events [30]. The TMSC suggests that not all stressful episodes will lead to negative stress reactions, which will happen only when the stressors are appraised as exceeding the available resources, and that they will impact well-being negatively. Thus, individuals will appraise stressors or stress episodes differently, and the same stressor may therefore be appraised negatively by one and not by another [28]. Hence, according to the TMSC, appraisals can function as mediators between job demands, well-being, and work outcomes. Research has also revealed that appraisals of job demands may function as moderators of the relationship between job demands and work outcomes [25,26]. In line with the person–context interaction theory [31], which states that individual functioning is a result of the interaction between the individual and the environment, Li and Taris [25] as well as Li and Peeters [26] argue that individuals may appraise a stressor (i.e., job demand) as potentially impacting them positively (i.e., challenging), negatively (i.e., hindering), or both. This may, in turn, moderates the relationship between job demands, well-being, and other work outcomes. Although a body of research has revealed a link between job demands, employee strain, and well-being (e.g., [32–34]), this relationship is not fully understood. Job demands may be perceived and experienced in several ways. Investigations of appraisals of job demands are needed to gain knowledge and to validate the hindrance–challenge framework of job demands.

1.2.1. Nature of Work Belonging to an Occupational Group

One of the reasons why a given job demand has been classified as hindering or challenging may be due to the nature of work that they are related to. For example, Bakker and Sanz-Vergel [18] found that nurses perceived workload and time pressure as hindering rather than challenging. These hindering demands were experienced as inhibitory and destructive for both personal growth and achieving work goals. Specifically, high levels of time pressure reduced the quality of patient care. In the same study, the authors describe how a different occupational group, namely journalists, appraised time pressure as a challenging job demand. The nature of many journalists' jobs is to work under a strict time regime. Time pressure may be a job demand that does not hinder journalists from achieving their work goals and rather is a challenge demand they often and successfully overcome, which leads to goal achievement.

Emotional demands at work have been perceived as positive indicators for better performance by some occupational groups. Bakker and Sanz-Vergel [18] reported that emotional demands were experienced as more challenging than hindering among nurses. Nurses experienced both interactions with patients and the need to confront emotional demands as part of their everyday work lives and as part of their job. Conversely, it might be that other occupational groups find emotional demands hindering and not a natural part of their jobs. For instance, it might be that real estate agents can experience emotional

demands as something outside their core job tasks and as something that will hinder them from achieving their work goals.

Although there are individual differences among employees in occupational groups, there are some characteristics belonging to the job performed by certain occupational groups that may influence the appraisal of job demands. Hence, the role of a given job demand may vary by occupation and may therefore be appraised differently (i.e., as hindering or challenging) not only individually but also based on the nature of the work belonging to that occupational group.

1.2.2. Positive Trait Emotions

In addition to the context in which job demands occur (i.e., occupation), individual traits and differences may also impact appraisals of job demands, of which positive trait emotions may play a role. Over the last decade, positive emotions related to work have received increased attention in the literature [35]. For example, evidence has revealed that positive emotions are associated with beneficial job attitudes [36], productivity [37], creativity [38], job crafting [39], organizational citizen behavior, and cooperation with others [40]. However, the majority of the research on the relationship between positive emotions and work outcomes has focused on general positive emotions and thus suggested that all positive emotions are equally related to other work variables [41]. By applying the functional wellbeing approach (FWA, [42,43]), we aim to bring nuance to this topic. According to the FWA, two distinct categories of positive emotions are particularly important for well-being: hedonic feelings, such as pleasure and happiness, and eudaimonic feelings, such as interest and immersion. Hedonic feelings are important because they help sustain homeostatic stability, whereas the major function of eudaimonic feelings is to facilitate change. Hedonic feelings are typically experienced when goals are achieved or needs are fulfilled, i.e., when an equilibrium has been reestablished. Hence, hedonic feelings signal to our minds that our current actions appear to succeed in maintaining our well-being. Relatedly, hedonic feelings also facilitate a kind of mental flexibility, including broadened attention, thus preparing the organism for a change of goals and plans. In contrast, eudaimonic feelings narrow attention to help us stay focused in the process of reaching a difficult goal. Eudaimonic feelings commit us to put in extra effort and to value the striving toward goals, even when the going is rough. Thus, eudaimonic positivity feels different and functions differently than hedonic positivity.

Previous research on emotions in the workplace corroborated the association between hedonic feelings and goal achievement, on the one hand, and that between eudaimonic feelings and the process of overcoming a challenging work task, on the other. For example, Stone and Schwartz [44] found that happiness increased when the workday ended, while building competence had the highest levels during midmorning when demands were dealt with. Similarly, Straume and Vittersø [45] found that hedonic feelings decreased during challenging work tasks, whereas eudaimonic feelings increased. Additionally, research on goal pursuit and goal achievement has revealed similar findings. Thorsteinsen and Vittersø [46] reported in their longitudinal study that eudaimonic well-being initiated and sustained goal pursuit processes, while hedonic well-being was more related to goal achievement.

FWA encompasses both momentary state feelings and more stable and trait-like feelings. According to the FWA, high levels of hedonic feelings predict well-functioning stability, while high levels of eudaimonic feelings predict well-functioning change processes. The orientation to life in hedonic feelings is typically the tendency to evaluate the environment and oneself as good rather than bad, while for eudaimonic feelings, it is the proneness to develop and attain personal growth. Thus, when facing demanding job situations, it is likely that individuals with higher levels of hedonic and eudaimonic feelings will more often evaluate those demands positively and possibly overcome (i.e., good rather than bad) as well as see them as opportunities for utilizing and developing abilities to experience personal growth. This is also in line with [47], in which the authors

reported that positive emotions at work did not decrease hindering demands but increased challenging demands.

1.3. Applying Vignettes

Vignettes are usually short stories portraying a made-up person and/or a made-up scenario, and vignette studies can very powerful. For example, Kahneman and Tversky's contributions to economics and psychology was to a large extend due to their observations of the responses people provided to small vignettes [48]. By identifying salient characteristics in a specific context, a vignette approach makes it possible to elicit critical patterns in human thinking and emotions [49,50]. One of the advantages of the methodology for the current study concerns how it makes a standardization of a demanding job situation possible, thus allowing for all participants to respond to the same stimuli [51]. The imaginary nature of vignettes poses a limitation to the design. Hence, a probable association between the imagined and real-life response must be established to generalize the results.

In the present study, we have chosen to investigate appraisals of time pressure and emotional demands for two occupational groups, namely nurses and real estate agents. There are several reasons for choosing these occupational groups. Firstly, we have made an effort to choose occupational groups that differ regarding core work tasks. In line with this, we aimed to investigate job demands (i.e., emotional demands and time pressure) that could have different positive and negative denominations (i.e., hindering or challenging) based on the demands in relation to core tasks within those occupational groups. This includes, for example, that one of the core tasks for nurses is to care for and comfort their patients (i.e., emotional demands), while this is not the case for real estate agents. On the one hand, time pressure is related to core tasks for real estate agents, particularly during bidding rounds. According to Norwegian regulations, when real estate agents receive bids, they are obliged to communicate them in writing to the sellers and other potential bidders, and it is a common practice with 5 to 15 min deadlines, a process that is commonly known to be hectic. On the other hand, time pressure is not recognized as a built-in part of nurses work tasks but may rather be understood as a consequence of understaffing. Finally, both occupations are well-known in Norway and the general population have at least basic knowledge about their core work tasks. Hence, it is reasonable to assume that it is possible for the participants to read vignettes about nurses and real estate agents, and appraise the job situations described.

1.4. Aims of the Study

With the present study, we aim to contribute to the job characteristic literature by applying vignettes to investigate the degree to which participants will appraise two job demands (i.e., time pressure and emotionally demanding situations) for two occupational groups (i.e., nurses and real estate agents) as hindering and/or challenging. Additionally, we aim to reveal how the participants' positive trait emotions are related to their appraisals. A vignette study applied on a convenience sample of Norwegian students provides empirical data for the study. We posit the following hypotheses:

Hypothesis 1 (H1). *Job demands (i.e., time pressure and emotionally demanding situations) are appraised as hindering and challenging.*

Hypothesis 2 (H2). *For nurses, time pressure is appraised as more hindering than emotionally demanding situations.*

Hypothesis 3 (H3). *For nurses, emotionally demanding situations are appraised as more challenging than time pressure.*

Hypothesis 4 (H4). *For real estate agents, emotionally demanding situations are appraised as more hindering than time pressure.*

Hypothesis 5 (H5). *For real estate agents, time pressure is appraised as more challenging than emotionally demanding situations.*

Hypothesis 6 (H6). *Time pressure is appraised as more hindering for nurses than for real estate agents.*

Hypothesis 7 (H7). *Emotionally demanding situations are appraised as more hindering for real estate agents than for nurses.*

Hypothesis 8 (H8). *Time pressure is appraised as more challenging for real estate agents than for nurses.*

Hypothesis 9 (H9). *Emotionally demanding situations are appraised as more challenging for nurses than for real estate agents.*

Hypothesis 10 (H10). *Hedonic and eudaimonic feelings are different concepts and will be accounted for by separate factors.*

Hypothesis 11 (H11). *Hedonic and eudaimonic feelings are differently related to hindering and challenging appraisals.*

2. Materials and Methods

2.1. Design

To investigate the circumstances under which time pressure and emotional demands are perceived as hindering or challenging, we developed a quasi-experimental study with vignettes. Specifically, we provided two vignettes to the participants, three times each. For each subsequent time the vignette was presented, additional information about the occupation of the person in the vignette was provided. The first time the vignettes were presented, only the employee's name (Hans or Hanna) and demand category (time pressure or emotionally demanding situation) were included. The second and third times the vignettes were presented, we included the occupation of the fictional person in the vignette, who was either a nurse or real estate agent.

The first vignette described a job situation with high-time pressure: "Hanna/Hans has been at work for a few hours. She or he has not been able to take a break yet. It is not certain that she or he will have time to sit down during the rest of the workday. There are many job tasks to be done, and the tempo is high. It is often like this at Hanna's/Hans' job. She or he must often choose which job tasks should be prioritized and which job tasks must wait. A hectic day at work often means that Hanna/Hans are not able to perform all the tasks of the day before she or he goes home, and it is not unusual that she or he must work extra hours and at unfavorable times of the day. To what degree do you think Hanna/Hans is experiencing her or his job as . . . " Then, six appraisal items were presented as detailed in the Section 2.3 below.

The second vignette described an emotionally demanding job situation: "Hans/Hanna has been at work a few hours when he or she gets into a situation with a woman who is having a very hard time. The woman cries a lot. Hans/Hanna feels like the woman is overwhelmed with emotions and that she is seeking help from him or her to handle the situation she is currently in. It is hard for Hans/Hanna to understand what the woman is trying to tell him or her; she cries so much that it is hard to have a conversation. The woman takes a long time to be able to find the words to describe what she wants and appears somewhat chaotic when meeting Hans/Hanna. To what degree do you think Hans/Hanna is experiencing his or her job as . . . ". Again, the six appraisal items were presented (see below).

The participants were randomly selected into one of two conditions, in which the persons' gender and profession in the vignettes varied. See Figure 1 for the flow diagram.

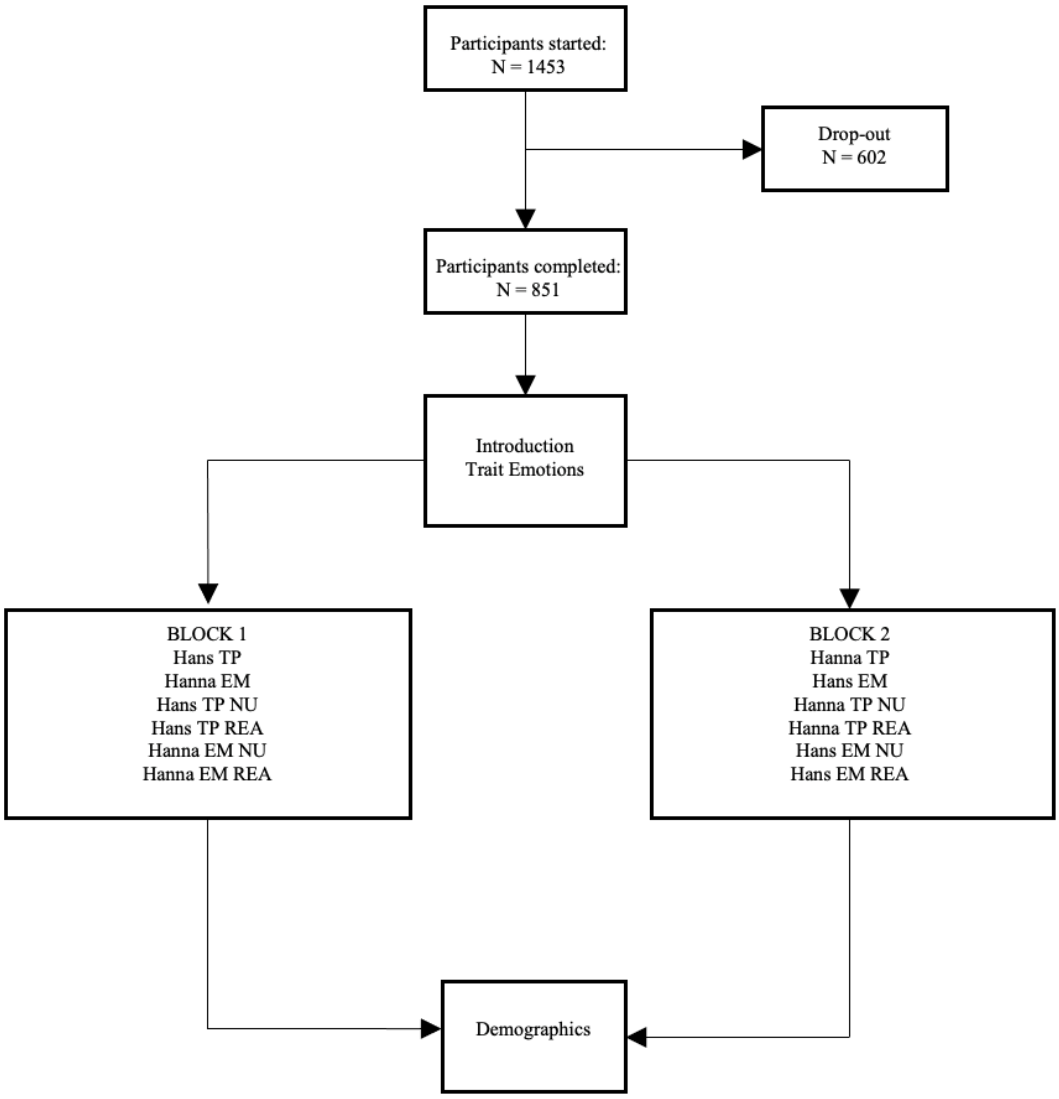

Figure 1. Flow diagram. Abbreviations: TP = time pressure; EM = emotionally demanding situation; NU = nurse; and REA = real estate agent.

2.2. Participants

Of 1453 students, 851 in the age range from 16 to 56 (M = 25.22, SD = 5.25) completed the survey and were included in the analyses, of which 77.6% were women (N = 664) and 21.8% were men (N = 187). The students came from a broad variety of study fields: 191 (22.3%) in psychology, 221 (25.8%) in nursing, 30 (3.5%) in real estate, 84 (9.8%) in economics, 111 (13%) in law, and 213 (24.9%) in "other study fields". The students were invited to participate in an electronic survey through various social media platforms and by e-mail.

2.3. Measures

Data were analyzed using IBM SPSS 25 (IBM, Armonk, NY, USA) and Mplus version 8 [52]. Age and gender were controlled for.

2.3.1. Appraisal of Job Demands

To measure the participants' appraisal of job demands as hindering or challenging, we applied six items previously used by Bakker and Sanz-Vergel [18]. The adjectives

were introduced after the vignettes with the text: "To what extent do you believe that Hans/Hanna experienced the situations as . . . .". Responses were given on endpoint-labeled scales, ranging from 1 (to a small degree) to 5 (to a large degree). A principal axis exploratory factor analysis with promax rotation suggested that two factors may account for the correlations between the demand variables. Two eigenvalues were higher than 1 and a parallel analysis [53] also supported the choice of a two-factor solution. Since the correlation between the two factors was trivial (r = −0.05), we reran the final model with varimax rotation. Different from Bakker and Sanz-Vergel [18], who conceptualized hindrance demands as consisting of the three items of "hindering", "stressful", and "demanding", our analysis also revealed that the item "challenge" belonged to this factor. Furthermore, our results revealed that the second factor consisted of the items "interesting" and "motivating." We believe this result is due to the Norwegian language, in which the term "challenge" has a more negative connotation than in English and even more so when reading about demanding situations (i.e., vignette stories). Hence, "challenge" is therefore associated with negative appraisals, while "interesting" and "motivating" represent positive appraisals. Accordingly, we believe that our factor structure does correspond to the hindrance–challenge framework reported in previous studies. Nevertheless, to make visible that our factor structure is different, we chose to apply the terms "hindrance-like" for hindering (i.e., negative) appraisals and "challenge-like" for challenging (i.e., positive) appraisals when reporting our findings. Two mean-score demand variables were computed with Cronbach's $\alpha = 0.82$ for the hindrance-like subscale and $\alpha = 0.83$ for the challenge-like subscale.

2.3.2. Emotions

Trait-level emotions were measured with the Basic Emotions Trait Test (BETT, [54]). A short version of the scale is comprised of nine items reflecting five basic emotions (happiness, interest, fear, anger, and sadness). The two positive emotions represent hedonic (i.e., happiness) and eudaimonic emotions (i.e., interest), respectively, whereas the three negative emotions may be summarized as a single negative composite score [43]. The participants were asked to report the overall frequency of the five basic emotions in their lives overall. The introduction reads "In general, how often do you feel . . . " followed by nine adjectives or adjective phrases. For example, "happy" or "scared" (adjectives) or "completely absorbed in what I am doing" (adjective phrase). The response options ranged from 0 = never to 6 = all the time. To check the three-dimensional structure of the test, we ran a principal axis exploratory factor analysis with promax rotation. Three eigenvalues were higher than 1 and a parallel analysis [53] also supported the choice of a three-factor solution. Negative emotions were not used in the present study; hence, two mean-score emotion variables were computed for subsequent analyses with Cronbach's alphas $\alpha = 0.86$ for the hedonic emotions subscale and $\alpha = 0.79$ for the eudaimonic emotions subscale. We take this result as evidence for H10.

3. Results

Table 1 presents the means, standard deviations, skewness, and varimax-rotated factor loadings for the demand items.

The participants' gender (man = 0, woman = 1) was significantly related to hindrance-like appraisals ($B = 0.18$, $p < 0.001$), whereas age was not ($p = 0.485$). Similarly, the participants' gender ($B = 0.20$, $p < 0.001$), but not age ($p = 0.720$), was related to challenge-like appraisals. Hence, age was excluded from subsequent analysis. A multilevel (mixed model) regression analysis with grand-mean-centered variables showed that the intraclass correlations (ICC) were 0.29 for hindrance-like demands and ICC = 0.19 for challenge-like demands. Overall, no mean differences were found between time pressure and emotional demands, neither for hindrance-like ($p = 0.401$) nor challenge-like ($p = 0.061$) demands. Looking more closely at the different vignettes, however, provides a more differentiated picture. A factorial repeated measure (GLM) was conducted with gender as the

between-participant covariate. Separate models were run for hindrance-like demands and challenge-like demands, and the results are summarized in Figures 2 and 3, respectively, showing means and standard errors for the six vignettes for males and females separately. For hindrance-like demands, the Huynh–Feldt sphericity was $\varepsilon = 0.81$. The main effect was significant, $F(4.02, 3400) = 68.64$, $p < 0.001$, as was the interaction with gender, $F(4.02, 3400) = 4.79$, $p = 0.001$. Although the overall interaction test was significant, the 95% CI for males and females did not overlap in the no-job emotional and the two nurse vignettes. For challenge-like demands, the Huynh-Feldt sphericity was $\varepsilon = 0.92$. The main effect was significant, $F(4.62, 3891) = 186$, $p < 0.001$, but the interaction with gender was not, $F(4.02, 3400) = 1.81$, $p = 0.113$. Although the overall interaction test was non-significant, the 95% CI for males and females did not overlap in the no-job emotion, nurse time pressure, and real estate time pressure vignettes, indicating a post-hoc interaction effect for these three conditions.

Table 1. Means, standard deviations, skewness, varimax-rotated factor loadings, eigenvalues, and explained covariance for the demands items.

	Mean	*SD*	*Sk*	*F1*	*F2*
Demanding	4.04	0.89	−0.84	**0.88**	0.00
Difficult	3.64	0.99	−0.34	**0.83**	−0.17
Challenging	4.00	0.87	−0.76	**0.80**	0.19
Stressful	3.88	1.08	−0.77	**0.74**	−0.10
Interesting	3.14	1.16	−0.20	0.02	**0.92**
Motivating	2.90	1.19	0.02	−0.08	**0.92**
Eigenvalues				2.67	1.75
Explained covariance (%)				44.54	29.22

Note: $N = 5081$. Factor loadings > 0.30 in bold. Abbreviations: $F1$ = hindrance-like and $F2$ = challenge-like.

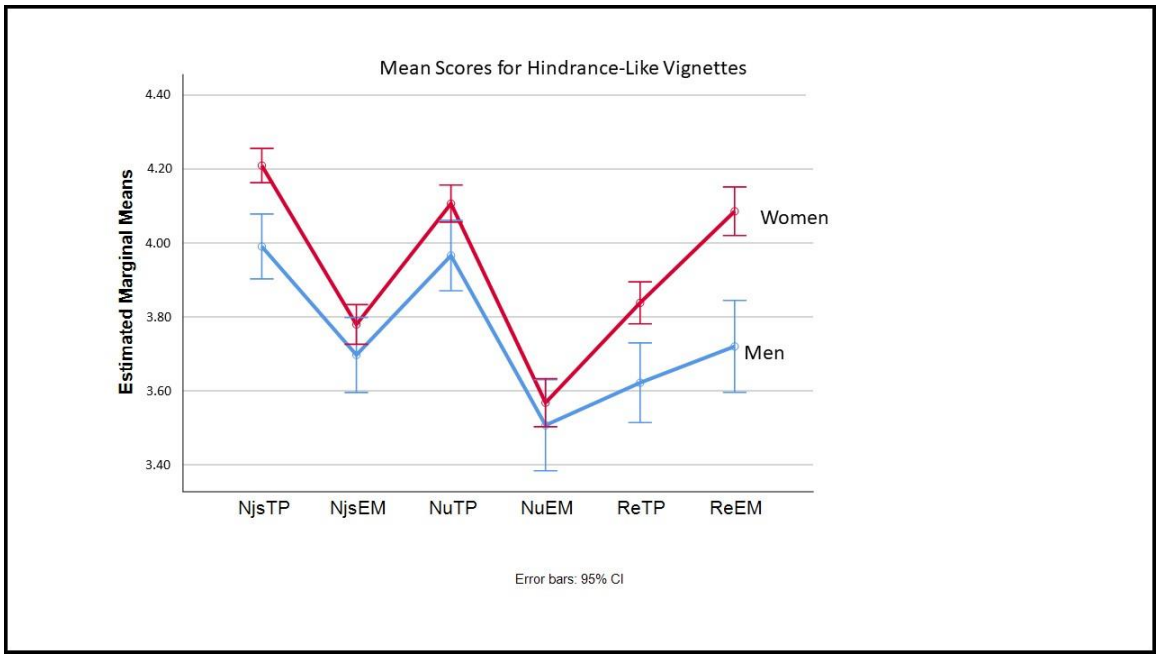

Figure 2. Means and error bars for hindrance-like appraisals across six vignettes. Abbreviations: NjsTP = no jobs specified in time pressure condition; NjsEM = no jobs specified in the emotionally demanding condition; NuTP = nurse in the time pressure condition; NuEM = nurse in the emotional condition; ReTP = real estate agent in the time pressure condition; and ReEM = real estate agent in the emotionally demanding condition.

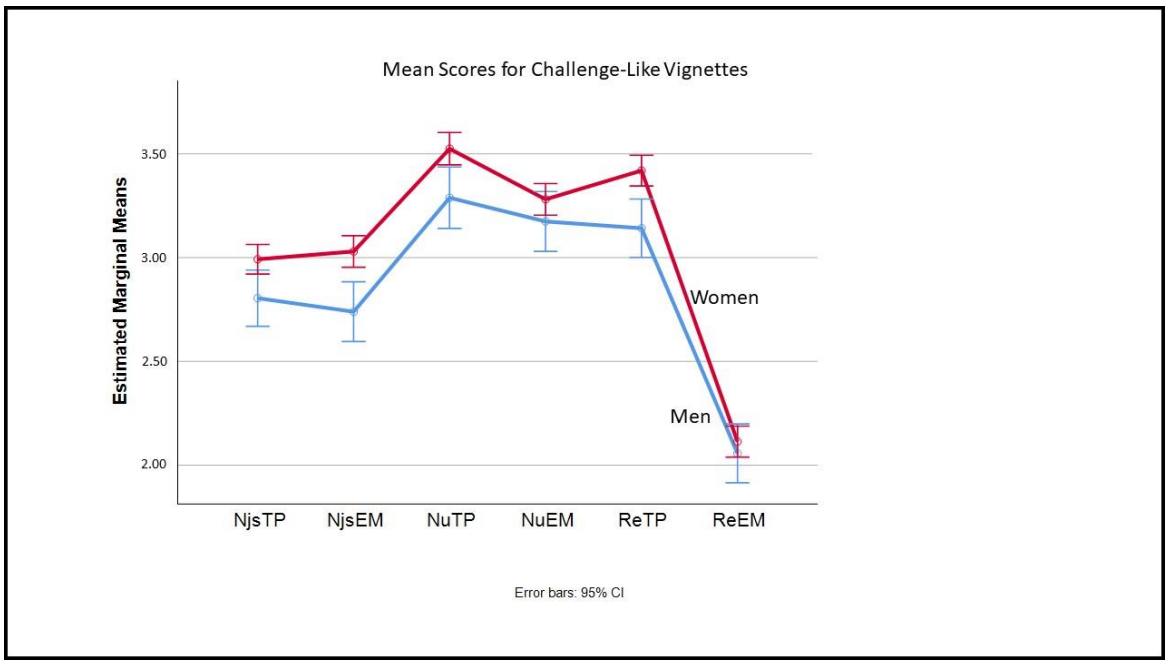

Figure 3. Means and error bars for challenge-like appraisals across six vignettes. Abbreviations: NjsTP = no jobs specified in time pressure condition; NjsEM = no jobs specified in the emotionally demanding condition; NuTP = nurse in the time pressure condition; NuEM = nurse in the emotional condition; ReTP = real estate agent in the time pressure condition; and ReEM = real estate agent in the emotionally demanding condition.

To further test the hypotheses, we conducted post-hoc paired sample *t*-tests. As hypothesized in H1, time pressure and emotional demands were appraised as hindrance-like and challenge-like. Specifically, the overall mean hindrance-like score, $M = 3.89$, $SD = 0.50$, was higher than that of the challenge-like score, $M = 3.02$, $SD = 0.62$. A paired sample *t*-test showed that this difference was significant, $t(850) = 34.61$, $p < 0.001$ (two-tailed). We further divided the two variables into time pressure hindrance-like and time pressure challenge-like, and observed that the former ($M = 4.01$, $SD = 0.54$) was significantly higher than the latter ($M = 3.2$, $SD = 0.73$), $t(850) = 24.6$, $p < 0.001$ (two-tailed). For the emotional demands, the hindrance-like scores ($M = 3.77$, $SD = 0.59$) were also higher than the challenge-like scores, ($M = 2.77$, $SD = 0.75$), $t(850) = 32.61$, $p < 0.001$.

The hindrance-like scores for nurses during time pressure situations ($M = 4.07$, $SD = 0.66$) were higher than those during emotionally demanding situations ($M = 3.56$, $SD = 0.85$) and a paired-sample *t*-test showed that the difference was significant, $t(846) = 18.75$, $p < 0.001$ (two-tailed), supporting H2. The challenge-like scores for nurses during emotionally demanding situations ($M = 3.25$, $SD = 1.00$) were lower than those during time pressure situations ($M = 3.47$, $SD = 1.03$) and a paired-sample *t*-test showed that the difference was significant, $t(846) = 5.98$, $p < 0.001$ (two-tailed). H3 was not supported.

In line with H4, the hindrance-like scores for real estate agents during emotionally demanding situations ($M = 4.01$, $SD = 0.87$) were higher than those during time pressure situations ($M = 3.80$, $SD = 0.76$) and a paired-sample *t*-test showed that the difference was significant, $t(846) = -7.02$, $p < 0.001$ (two-tailed). The challenge-like scores for real estate agents during time pressure situations ($M = 3.36$, $SD = 0.98$) were higher than those during emotionally demanding situations ($M = 2.01$, $SD = 0.98$) and a paired-sample *t*-test showed that the difference was significant, $t(845) = 30.28$, $p < 0.001$ (two-tailed). H5 was supported.

The hindrance-like scores for time pressure were higher for nurses ($M = 4.07$, $SD = 0.66$) than for real estate agents ($M = 3.79$, $SD = 0.75$) and a paired-sample *t*-test showed that the difference was significant, $t(848) = 10.66$, $p = 0.001$ (two-tailed). H6 was supported. The hindrance-like scores for emotionally demanding situations were lower for nurses

(M = 3.56, SD = 0.85) than for real estate agents (M = 4.01, SD = 0.87) and a paired-sample t-test showed that the difference was significant, $t(846) = -11.72$, $p < 0.001$ (two-tailed), confirming H7.

The challenge-like scores for time pressure were higher for nurses (M = 3.47, SD = 1.03) than for real estate agents (M = 3.35, SD = 0.98) and a paired-sample t-test showed that the difference was significant, $t(848) = 2.76$, $p = 0.006$ (two-tailed). H8 was not supported. The challenge-like scores for emotionally demanding situations were also higher for nurses (M = 3.25, SD = 1.00) than for real estate agents (M = 2.10, SD = 0.98) and a paired-sample t-test showed that the difference was significant, $t(845) = 28.53$, $p < 0.001$ (two-tailed), confirming H9.

The only effect of gender of the employee in the vignette was seen for hindrance-like scores among nurses: Hanna was assigned higher scores for the emotional vignette, (M = 3.64, SD = 0.81) than Hans (M = 3.46, SD = 0.89) and a paired-sample t-test showed that the difference was significant, $t(846) = 3.04$, $p = 0.002$ (two-tailed).

In line with H10, our results revealed that hedonic and eudaimonic feelings are different concepts accounted for by different factors. Table 2 presents the means, standard deviations, skewness, pattern matrix, and factor correlations for the trait-level emotions.

Table 2. Means, standard deviations, skewness, pattern matrix, eigenvalues, explained covariance, and factor correlations for the Basic Emotions Trait Test (BETT). Note: N = 828; promax rotation; factor loadings > 0.30 in bold; $F1$ = hedonic emotions; $F2$ = eudaimonic emotions; and $F3$ = negative emotions.

	Mean	***SD***	***Sk***	***F1***	***F2***	***F3***
Pleased	4.76	1.09	−0.59	**0.94**	−0.02	0.09
Satisfied	5.18	1.01	−0.98	**0.79**	0.03	−0.05
Happy	4.91	1.20	−0.83	**0.75**	−0.02	−0.02
Immersed	4.35	1.30	−0.19	−0.05	**0.83**	0.03
Engaged	4.88	1.23	−0.43	0.10	**0.77**	−0.02
Absorbed	4.16	1.34	−0.28	−0.05	**0.68**	0.00
Sad	3.20	1.27	0.48	−0.09	−0.04	**0.76**
Scared	2.54	1.25	1.01	0.02	0.06	**0.62**
Angry	2.97	1.19	0.63	0.08	0.00	**0.51**
Eigenvalues				3.32	1.87	1.15
Explained covariance (%)				32.80	15.99	7.37
Factor correlations $F1$				1.00	0.33	−0.55
Factor correlations $F2$					1.00	−0.15
Factor correlations $F3$						1.00

Factor loadings > 0.30 in bold.

Finally, we fitted a multilevel path model to the data (Figure 4). The model included hindrance-like and challenge-like appraisals as dependent variables, alongside hedonic feelings, eudaimonic feelings, and gender as the independent variables. The model depicted in Figure 4 was saturated, with zero degrees of freedom (hence, no goodness-of-fit estimates were available). Gender predicted both hindrance-like appraisals (β = 0.18, $p < 0.001$) and challenge-like appraisals (β = 0.18, $p < 0.001$). Hindrance-like appraisals were not significantly associated with emotions ($ps > 0.239$), whereas challenge-like appraisals were predicted by both hedonic feelings (β = 0.12, $p = 0.008$) and eudaimonic feelings (β = 0.12, $p = 0.014$). This result was not consistent with H11.

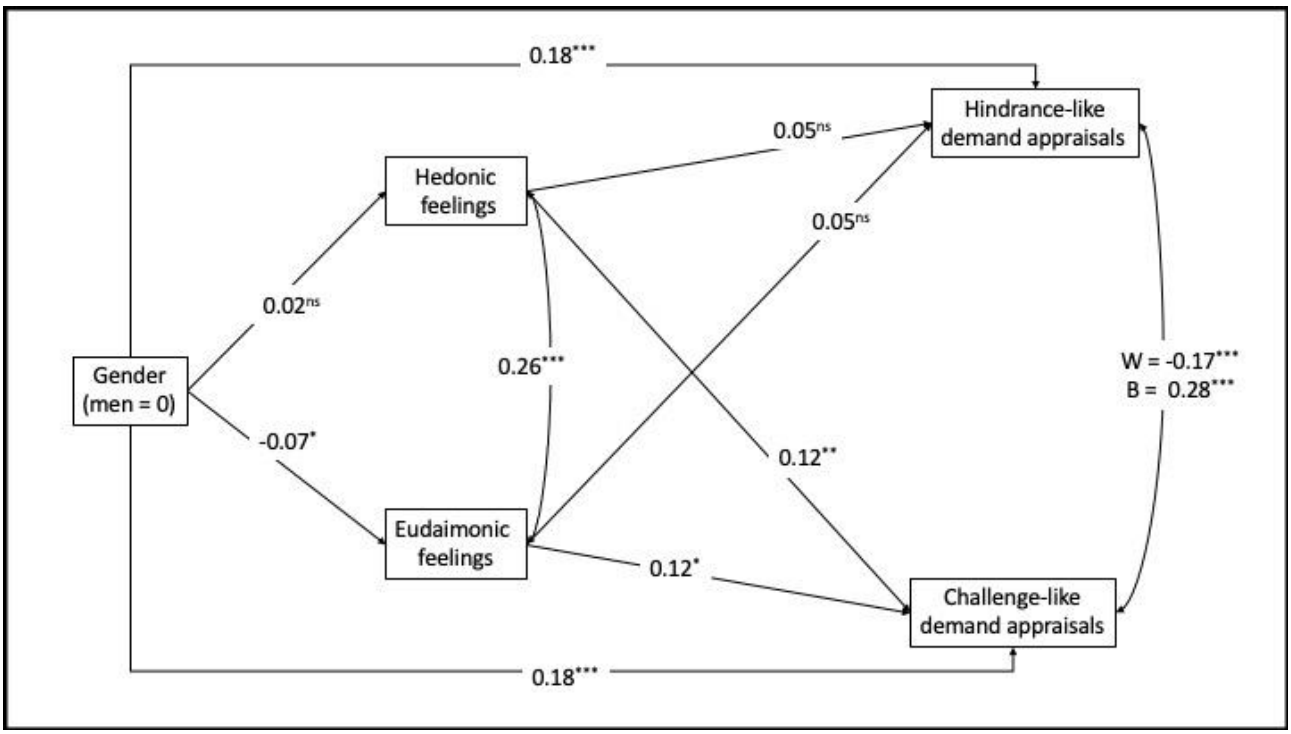

Figure 4. Between-participants standardized regression paths. The correlation between hindrance-like and challenge-like between-participants (*B*) and within participants (W). * = $p < 0.05$; ** = $p < 0.01$; *** = $p = 0.001$; ns = non-significant.

4. Discussion

We aimed to contribute to the job characteristics literature by using a vignette study. Norwegian students with no specified work experience imagined how time pressure and emotionally demanding situations might have been appraised as hindrances and/or challenges for nurses and real estate agents. We also analyzed the participants' own trait emotions and how these were related to the vignette appraisals.

Typically, when differentiating job demands, the scientific literature has presented this in a hindrance–challenge framework (e.g., [6,16,21,55]). In previous research, the items that have been used to measure challenge and hindrance demands were most often decided a priori; that is, researchers decided which items (i.e., adjectives) measure hindrance demands and challenge demands before the measures are done. In our study, we wanted to explore to what degree the appraisals could have both a positive and negative denomination at the same time. Thus, we chose to apply the six adjectives previously applied to measure hindrance and challenge demands [18], but also applied a data-driven approach that grouped the items in accordance with the result from the factor analysis. Our results revealed a similar division between "good" and "bad" job demands, as did the Bakker and Sanz-Vergel [18] study, but differed from those of previous studies in that the item "challenge" was loaded with items belonging to the previously reported subscale of hindrance demands (i.e., "hindering", "stressful", and "difficult") and not with the more positive appraisal items "motivating" and "interesting". Several reasons may account for these results. First, it might be due to language. Although the Norwegian word for challenging (i.e., utfordring) holds both positive and negative connotations, depending on the context, the term has more negative connotations than the English term. It is not unreasonable to assume that this difference in meaning contributed to the different factor structures. Second, when applying vignettes, the reader might underestimate the engagement of the person in the vignette in demanding situations. When a person is engaged, the term challenge is often positively charged. When a person is disengaged or stressed, the term challenge is often negatively charged. In connection with our previous

argument regarding the Norwegian term for challenge, when evaluating the fictional persons' experience (i.e., how do you think Hanna/Hans experienced this situation), it might be that underestimation of engagement led to challenge having mostly negative connotations in our study. Taken together, we believe that our factor structure does correspond with the previously reported labels of hindrance and challenge demands. Nonetheless, since our results did have a different factor structure than previous studies, instead of using the labels hindrance and challenge, we applied the labels hindrance-like and challenge-like, respectively. However, when we used the terms hindrance-like and challenge-like, our intention was merely to make visible that our results revealed that one item (i.e., challenge) loaded differently from previous studies. Hence, the new labels (i.e., hindrance-like and challenge-like) are, in our opinion, representing the same meaning as the previously used labels (i.e., hindrance and challenge).

In line with H1, when no job was specified, both job demands (i.e., time pressure and emotionally demanding situations) were appraised as hindrance-like and challenge-like to different degrees, specifically more hindrance-like than challenge-like. This is in line with the literature reporting that all job demands require sustained effort and even if some job demands have motivational potential, all job demands have costs [56]. This is also in line with the literature reporting that the same job demands can be appraised as hindering and challenging at the same time [18,26]. Thus, it seems that imagined and real-life job demands share some basic characteristics, although the results from the two approaches are not identical.

We argued that the nature of work belonging to an occupational group could impact the degree to which job demands were appraised as hindering or challenging and that this was related to whether job demand typically hindered the occupational group from achieving their work goals. Thus, we hypothesized that time pressure would be appraised as more hindering for nurses than emotional demands (H2). Specifically, and as expected, time pressure for nurses was appraised as more hindrance-like than emotional demands, in line with the literature that revealed how time pressure prevents nurses from achieving their work goals and attending to patient care [57]. In addition, emotional demands in which a nurse is offering care and comfort are viewed as one of the core work characteristics for nurses and therefore as less preventive of goal achievement, although these situations require effort. Moreover, among the appraisals of hindrance-like demands, the vignette with nurses facing emotional demands received the lowest score. We also hypothesized that emotional demands would be appraised as more challenging than time pressure (H3). This hypothesis was not supported, as we unexpectedly found that time pressure was appraised as more challenge-like than emotional demands. One of the reasons for this finding may be that when the participants, who were not nurses, read the vignettes, they interpreted emotional demands as a very clear part of the nurse's daily job tasks. Thus, their appraisal may reflect that they believe the nurse will solve these situations (i.e., they are to a little degree hindering) and that emotional demands are such an integrated part of their daily jobs that they were not appraised as challenging, as expected.

Furthermore and in line with H4, we found that for real estate agents, the participants appraised emotional demands to be more hindrance-like than time pressure. Moreover and in line with H5, time pressure was appraised as more challenge-like than emotional demands. This may be explained by the nature of work belonging to this occupational group, in which emotional demands may not be considered a core work experience, while time pressure is part of real estate agents' daily activities (e.g., bidding rounds). Additionally, emotional demands were appraised to be less challenge-like for real estate agents than the other six job situations described in the vignettes. These findings are also in line with the literature that describes how short-term time pressure (e.g., during a workday with deadlines), which is something real estate agents regularly face during their workday, can be motivational [58].

When comparing appraisals of the job demands for the two occupational groups, we found, as hypothesized in H6, that time pressure was appraised as more hindrance-like

for nurses than for real estate agents and, in line with H7, that emotional demands were appraised more hindrance-like for real estate agents than for nurses. These results align with the literature which revealed that job demands that are typically part of the nature of work in an occupation are appraised as less hindering than job demands that are faced less frequently as part of the work (e.g., [18,55]). Although nurses are struggling with time pressure on a frequent level, it is not considered a part of their work in a way that helps them achieve their work goals. Thus, time pressure is appraised as hindering them to a greater degree than time pressure is hindering real estate agents, who frequently encounter time pressure as a part of their work tasks. Conversely, real estate agents are not as experienced in facing emotional demands as part of their job; therefore, real estate agents may appraise emotional demands as more hindering compared to nurses who are expected to handle emotional demands as an integrated part of their work.

We hypothesized that time pressure would be appraised as more challenging for real estate agents than for nurses (H8). However, and unexpectedly, time pressure was appraised as more challenge-like for nurses than for real estate agents. This result may be related to the finding that time pressure unexpectedly was appraised as more challenge-like than was emotional demands for nurses (H3). Thus, overall, time pressure for nurses was appraised as more challenge-like than we expected, both when we measured this only for nurses (i.e., comparing challenge-like appraisals between time pressure and emotional demands for nurses) and between occupational groups (i.e., comparing challenge-like appraisals of time pressure between nurses and real estate agents). These findings may also reflect what the participants, who are not nurses, believe about nurses' jobs. For example, in the Norwegian media, nurses are often portrayed as working under intense time pressure. This portrayal of nurses working under constant time pressure may lead others (i.e., participants) to interpret time pressure as a core job characteristic that nurses must overcome, different from nurses themselves who report time pressure as preventing them from doing their job in the way they want to. Hence, the appraisals of time pressure for nurses may therefore be appraised as more challenge-like than we expected. Additionally, emotional demands were, as expected and in line with H9, appraised as more challenge-like for nurses than for real estate agents. This result is in line with how we expect nurses to handle emotionally demanding situations as a part of their daily work, while the same is not expected for real estate agents. Additionally, it is in line with the literature reporting on how some demands do have motivational potential, although they require sustained effort, e.g., [8].

Altogether, our findings from H1–H9 revealed that the same job demands can be appraised as hindrance-like and challenge-like to different degrees within an occupational group and that when two occupational groups are compared, the same pattern follows. Thus, categorizing job demands a priori as having either a negative or positive impact on employee well-being does not seem to bring enough nuance to the understanding of job demands. Rather, it seems that the degree to which job demands are appraised as hindrance-like or challenge-like is not only due to the job demand itself but is also connected to the context within which the job demand occurs (i.e., occupation). Even though H3 and H8 were not supported, the overall results were meaningful and supportive of our suggestion that job demands are better understood when approached more nuanced, as opposed to categorizing them a priori. Moreover, our findings support our proposal that each job demand should be measured in such a way that the degree of positive (i.e., challenge-like) and negative (i.e., hindrance-like) appraisals may be captured when they occur simultaneously. Additionally, our results support the notion that some job demands (i.e., challenge-like) may also play a role in the motivational process of the JD-R model and not only in the health-impairment process.

We wanted to investigate how the participants' positive trait emotions were related to their appraisals of job demands. Specifically, we hypothesized that hedonic and eudaimonic feelings would be differently related to hindrance and challenging demands (H11). Our Hypoth was, however, not confirmed. This result was surprising given the large number

of previous studies showing how hedonic feelings are unrelated or even negatively related to challenging tasks, whereas eudaimonic feelings are positively associated with such tasks (see Vittersø, 2016, for an overview). Again, a possible reason might be that our data derives from participants imagining how other people might be feeling in challenging situations and not from real feelings in such situations. Some studies indicate that people underestimate the positivity evoked in the process of being immersed in overcoming a challenging task (e.g., [59]) and we speculate that an underestimation of eudaimonic feelings in challenge-like demand appraisals may account for the current result.

Finally, some gender effects were found. We observed gender differences among the participants in which women reported higher scores on all appraisals of job demands, both in the hindrance-like and challenge-like conditions. This finding may be explained by a relatively consistent finding in the literature, namely that women are expected to display stronger emotional expressivity than men. These differences are observed both for negative and positive emotions [60]. The underlying reason for these differences may stem from role development by which women are socialized to be emotionally expressive and men are socialized to express fewer emotions [61]. According to poststructuralist feminist theories, different emotional roles for women and men have also been found in workplaces integrated as part of organizational norms and practices [62]. Thus, when responding to the questionnaires used in our study, women may tend to score higher than men. Nonetheless, although women reported higher scores than men on all 12 appraisal conditions, the responses followed the same patterns, as depicted in Figures 2 and 3.

We also found one effect of the gender of the employee in the vignette, namely that when reading about nurses, the emotional demands were rated as more hindering for Hanna than for Hans. This one-employee gender effect may be explained by the shifting standards model [63], which suggests that when we make judgments about members of a social category (e.g., men) based on stereotype-relevant dimensions, these judgments are based on comparing standards for the within-group (e.g., judging a man relative to a male standard). Society still views nursing as a gender-specific occupation and the public perspective is that nursing consists of female-associated qualities, such as compassion and caring [64]. Additionally, women are overrepresented as nurses; for example, in Norway, only 11.4% of nurses were men in 2020 [65]. Thus, when the participants evaluated Hans' experience in the emotionally demanding situation, they may have attributed female-associated traits of nursing (i.e., care and compassion) to him and with that, according to the shifting standards model, compared him to other men, which again led to lower hindrance-like scores for Hans in the emotionally demanding situations. These findings were not obtained when the participants appraised the job demands faced by the real estate agents. One reason for this may be that this is a profession with more gender equality, as almost 40% of this profession in 2020 in Norway were women [66]. Moreover, for the other vignettes, there were no effects of the gender of the employee.

4.1. Limitations and Future Research

There are some limitations to this study that need to be acknowledged. First, when applying vignettes, it is possible that the assessments of the hypothetical job demands were less externally valid than if they were obtained by actual nurses and real estate agents. Moreover, the external validity could also be stronger if the situations were experiences in the field and not in fictional stories with fictional characters. Furthermore, our participants were relatively young and their job experiences were unknown. Nevertheless, previous studies have found that hypothetical situations can evoke similar reactions to those obtained in the field [67], even if it cannot be guaranteed that the same reactions and appraisals would have found place in real-life settings [49]. Another limitation that must be recognized is that we do not know if the participants based their appraisal on occupational stereotypes and how this may have influenced the results. Moreover, all participants were students and it is unknown whether they had previous work experiences. Thus, our findings cannot be generalized to other populations. Clearly, a replication study

with nurses and real-estate agents reporting from their actual work experiences would strengthen the generalizability and external validity of the presented results.

Although our factor analyses resulted in similar differentiations of job demands as in previous studies, that is, positive and negative, our study differed in that the items "hindrance" and "challenge" belonged to the same factor (i.e., hindrance-like demands). Future studies should attempt to validate the differentiation of challenge-like and hindrance-like demands, particularly in Norway but also in other areas of the world.

Finally, we focused only on job demands (i.e., time pressure and emotionally demanding situations) and on how knowledge of an occupational group and individual trait emotions affected the appraisals of these demands. We did not investigate how these demands were related to, for example, work engagement and burnout, or other outcome variables. To validate that challenge-like job demands have motivational potential, it would be fruitful to design studies that also measure these relationships.

4.2. Conclusions

Despite the limitations, our study extends the understanding of the challenge–hindrance framework for job demands. Using a vignette approach, the present study showed that hindrance and challenge are separate, though related, dimensions of the concept of job demands. We also found that the same job characteristics were appraised differently depending on the occupational group they belonged to. In addition, our study revealed that positive trait emotions predicted challenge appraisals but not hindrance appraisals. Furthermore, our results revealed that job demands can be appraised as challenges and hindrances at the same time. This indicates that it is too simplistic to categorize a job demand as hindering or challenging a priori. Knowledge about the positive and negative potential of job demands is important when researching the nature and consequences of job demands, and calls for a nuanced approach in future job characteristics research.

Our findings also have implications for the development of sustainable work environments. That is, knowledge concerning to which degree demands have a motivational potential (i.e., challenge) and/or are distressing (i.e., hindrance) is important for facilitating and strengthening employee well-being.

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Data Availability Statement: The data are protected and not openly available.

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