While many employees are engaged in their jobs, others suffer from poor working conditions and impaired well-being. Research suggests that job demands may impair employee work attitudes and health while both job resources and personal resources can have positive effect. Therefore, the aim of this study was to examine the relative importance of job demands, job resources, and a personal resource (self-efficacy) for employees’ health and motivation at work. Questionnaire data were collected from white-collar employees of a Swedish construction company \((n = 156)\). Results of hierarchical multiple regression analyses showed the relative importance of job demands, job resources and personal resources. The job demands were negatively related to health and motivation at work, while the job resources and the personal resource were linked to better health and motivation. The findings generally supported the hypotheses. The specific types of demands and resources were significant varied across outcomes and, unexpectedly, workload was positively correlated with job performance. The findings contribute to a growing literature which indicates that lower job demands and access to both job resources and personal resources may improve employees' health and motivation at work.

**Keywords:** job demands–resources model, job demands, job resources, personal resources, self-efficacy, work climate, health, motivation at work

Many people are satisfied with their work but others associate it with problems, particularly in terms of health and well-being. There may be many reasons for such an association, including aspects of the job and the individual, but it needs to address because it can have severe implications for the workplace, the workforce, and wider concerns (e.g., society). Work and organizational psychology not only investigates how jobs affect an individual’s health and well-being but also concerns any such problems and further any positive connections. Interest in health and well-being around the world has accelerated in recent years and the public health movement resulted in the First International Conference on Health Promotion in 1986. The main document of this Conference, The Ottawa Charter for Health Promotion (WHO, 1986), describes health as a positive concept that includes social and personal resources but also physical capacities. Health is thus a multidimensional concept. A widely known definition of health derives from the World Health Organization (WHO), which says that health involves not only the absence of disease but also physical, mental, and social well-being (WHO, 1946). Broadly speaking, an individual’s health is an immensely important human capital but psychology typically focuses on a person’s subjective experiences of health and well-being. Hence, given its focus and approach, so does this study. In it, health therefore concerns an
individual’s subjective experience of three health characteristics: physical health (physiological analyses and biomedical symptoms), mental health, and sleep quality.

It is well documented that work conditions may impact on employees’ health and work-related attitudes and behavior (Schaufeli & Bakker, 2004). Much research has investigated either health or work-related attitudes and behavior, so the present study assesses two main outcomes – health and motivation at work – at the same time. Most research studies in these areas have been conducted in the USA so whether their results are generalizable to Sweden is unclear. Hence, more specific research needs doing in Sweden.

Health
Work conditions may influence physical health and can impair it under certain circumstances (Bakker, Demerouti, de Boer, & Schaufeli, 2003; Hauke, Flintrop, Brun, & Rugulies, 2011). Therefore, much scientific research focuses on how the work environment can harm employees’ health and how to prevent such harm. The present study considers physical health in terms of employees’ perceptions of different somatic health complaints (Andersson, 1986; Isaksson & Johansson, 1997). According to Schaufeli and Bakker (2004), some job aspects are work stressors and Goldberg (1979) argues that stressors produce biological stress reactions that can affect physical and mental health. On this basis, the present study also incorporates mental health, which concerns worry, strain, happiness, self-confidence and enjoyment of life (Goldberg, 1979). In addition, sleep quality relates to recovery and is an important marker for health in the sense of whether it is easy/difficult to fall asleep or/and wake up, or if one constantly wakes up during the night (Gustavsson, Jönsson, Linder, & Weinryb, 2003). Sleep quality is particularly associated with health in adolescents (Paiva, Gaspar, & Matos, 2014) and adults (Chen, Gelaye, & Williams, 2013) so the present study assesses this aspect. As many studies tend to focus on a specific indicator of health, one way to understand the relationships between work and health more broadly is to include a wider selection of health outcomes, which this study does.

Health is evidently important for individual employees but it may also affect an organization’s productivity (Donald et al., 2005; Quick, 1999). A study in Sweden showed that 66 % of individuals on sick leave for more than one year believed this was because of their job (Göransson, Aronsson, & Melin, 2002), and this has social implications. For example, the Swedish Social Insurance Agency paid 27 504 018 328 Swedish krona in sickness benefits in 2014 (Swedish Social Insurance Agency, 2015) so the impact on employees’ health in Sweden is a serious matter that needs addressing, despite existing laws that aim to regulate this. For example, the Swedish Work Environment Authority stresses the employer’s responsibility for its staff’s health in the workplace (Swedish Work Environment Authority, 2009) yet it remains a concern. In 2010, 25 % of European workers believed that their work influenced their health mostly negatively (European Foundation, 2012). Work factors thus seem key, especially as certain work characteristics are unique predictors of absence duration and absence spells (Bakker et al., 2003).

Motivation at work
Work may not only affect employees’ health but also their motivation at work. Maslow (1965) believed in a fundamental human motivation for personal growth, and he introduced a motivational model in the form of a hierarchy of needs. It describes individuals’ hierarchical steps to their main goal – self-actualization. Self-actualization involves achieving one’s maximal potential. This motivates individuals to educate, to explore, to grow, and to perfect themselves. Similarly, Deci and Ryan’s (2000) self-determination theory sees motivation as involving three key psychological needs: competence, autonomy, and relatedness.
Competence motivation refers to people’s need to grow, to learn, to be better. Autonomy leads to better self-regulation because of internal forces. Relatedness represents the basic need to make meaningful relations with other people. All of these needs have a positive influence on an individual’s health and well-being (Ryan & Deci, 2000). Applying this to work and organizational psychology, it is important to identify factors that motivate employees at work because motivated employees work more effectively but more significantly here because a better work atmosphere can help well-being (Quick, 1999). Overall, motivation at work has a positive impact on both employees and organizations (Fernet, Austin, & Valleran, 2012) and there are ways to improve it. For example, employees become more motivated when they vary their job tasks and believe that their work is important (Hackman & Oldham, 1975).

While certain factors in the work situation can evoke stress others can contribute to health, motivation, and enjoyment. In other words, work conditions cause various outcomes such as health and specific work-related attitudes and behavior. Motivation at work is an outcome and can appear in different ways. One of these is job satisfaction, which reflects employees’ enjoyment of their work (Brayfield & Rothe, 1951). Another is organizational commitment, which is evident when people have a strong emotional connection to their organization, enjoy talking about it with other people outside the organization, and feel the organization’s problems as their own (Allen & Meyer, 1990). The term job performance concerns employees believing they are doing their job professionally and competently (Hall & Hall, 1976). If employees experience motivation at work it is good for their own health and that of the organization (Quick, 1999). For example, motivated employees who like their work tend to stay with their organization but high labor turnover, which often relates to the work climate and low employee motivation, can be bad for the company, it particularly financially. The company must spend money on recruiting new employees and even sometimes giving them all the necessary education. The present study includes three indicators of motivation at work: job satisfaction, organizational commitment and job performance.

Work climate

Work and organizational psychology analyzes work climate to help individuals, organizations and society identify favorable work conditions for all, but work climate has different characteristics on an individual and organizational level. The physical work environment clearly affects employees’ health and well-being, with lighting, air conditions, noise, and security risks being obvious risks. However, psychological and social factors can also affect employees’ physical health, such as by causing musculoskeletal disorders (Hauke et al., 2011). Many different models take different approaches to studying work climate. One model is the job characteristics model (Hackman & Oldham, 1976). This considers aspects such as feedback (information about one’s own job performance) and feeling work to be meaningful, and it argues that such factors can have positive consequences for internal work motivation, organizational commitment, job engagement, and well-being (Hackman & Oldham, 1976). The vitamin model (Warr, 2007) compares some work climate factors with vitamins in the sense that they are also important for an employee’s health and motivation at work. These ‘vitamins’ include social support (open communication with the manager) and goal clarity (clear, planned goals for one’s work tasks), for example (Warr, 2007). The model about psychological climate conceptualizes factors related to the job itself: the workgroup, leadership, and group processes (James, Hartman, Stebbins, & Jones, 1977). One of the most popular and studied models is the demand–control–support model (DCS) that was developed from stress research and states that the work climate plays a predictive role in employees’ health and well-being (Karasek & Theorell, 1990). All these models are similar insofar as they explore the work climate and identify job characteristics as important for employees’ work motivation and health. However, some focus only on positive outcomes.
such as good health and work enjoyment while others mostly focus on negative consequences including depression and turnover intention. Although separating positive and negative outcomes in the work situation may be useful (e.g. to scrutinize each separately), doing this within one framework and the same model gives more valid results for direct comparisons. A model that is suitable for such research is the job demands–resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001).

The job demands–resources model (the JD–R model) predicts both outcomes (health and motivation at work) on an individual level and covers positive and negative consequences such as health or illness, enjoying work or not, and intention to stay with the current employer or turnover intention (Demerouti et al., 2001; Schaufeli & Bakker, 2004). Much attention has been given to human service employees, nurses, teachers (e.g. Hakanen, Bakker, & Schaufeli, 2006) but it is not clear whether these results can be generalized to other occupations. To understand how work characteristics relate to health and work outcomes, the present study will use the job demands–resources model (the JD–R model) developed by Demerouti, Bakker and Schaufeli, (2001). The JD–R model is broad and includes many work climate characteristics under two main categories: job demands and job resources (Demerouti et al., 2001; Schaufeli & Bakker, 2004). The JD–R model argues that job demands predict employees’ health while job resources buffer the negative influence of job demands and have a motivational potential (Schaufeli & Bakker, 2004). The present study investigates three job demands (workload, role ambiguity, role conflict) and three job resources (job control, feedback, social support) as independent variables. The JD–R model has in recent years been supplemented with another important block of predictors, namely personal resources such as self-esteem, self-efficacy and optimism (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). Personal resources may have the same motivational influence as job resources (Xanthopoulou et al., 2007). Therefore, one personal resource, self-efficacy, is also used as an independent variable in the present study.

**Job demands**

One of the most widely studied job demands is workload, which concerns how employees feel about the quantity of work they have to do within a certain time (Beehr, Walsh, & Taber, 1976). Workload relates to health and predicts exhaustion, a component of burnout (Schaufeli & Bakker, 2004), and job demands are unique predictors of burnout (Bakker et al., 2003). In accordance with the JD–R model the present study defines job demands in terms of physical, psychological, social, and organizational demands at work, which have physical and mental costs for individuals (Demerouti et al., 2001; Schaufeli & Bakker, 2004). Job demands are not automatically negative but can become job stressors when the costs required to meet demands becomes too high (Schaufeli & Bakker, 2004). Empirical research has found that workload may have negative effects on health and well-being (Greenglass, Burke, & Moore, 2003). Job demands such as workload, role ambiguity, role conflict (when breaking rules is necessary to complete the work), interpersonal conflict, and lack of control over work hours have been found to relate to employees’ health, having eight physical symptoms (Nixon et al., 2011). Role ambiguity and role conflict have also been found to negatively influence motivation at work, such as job satisfaction and job performance (Pozner & Randolph, 1980; Rizzo, House, & Lirtzman, 1970). Role ambiguity occurs when employees do not have clear information about their responsibilities and goals (Caplan, 1971). Role conflict appears when employees need to break a policy within work to get the job done. On this basis, the present study investigates three job demands: workload, role ambiguity, and role conflict as independent variables. In the author intrinsic interest about why people get sick in their workplace and suffer so much evoked a personal desire to discover possible explanations for this phenomenon. The answers are important for individuals, for companies, and for society.
Job resources
According to the JD–R model, job resources concern physical, psychological, social, and organizational characteristics of the work that help to complete work tasks, reduce job demands, or stimulate personal development (Demerouti et al., 2001; Schaufeli & Bakker, 2004). They are health-protecting features of the work climate and may even have a positive influence on health (Hansen, Sverke, & Näswall, 2009). Job resources influence work motivation positively (Xanthopoulou et al., 2007). The present study assesses three job resources: job control, feedback, and social support. Job control occurs when employees engage in decision-making about their work. Feedback means that employees get information about their own work performance (Hackman & Oldham, 1975). In this study social support means that employees get clear explanations and all the necessary information for their work, and they have open communication with the manager. A good manager must play a protecting role (European Foundation, 2010). Job resources are unique predictors of organizational commitment (Bakker et al., 2003) and promote job satisfaction (Demerouti et al., 2001; Fernet et al., 2012; Schaufeli & Bakker, 2004).

Personal resource – self-efficacy
All people are different and have their own multifaceted mosaic of inherited and learned personal traits influencing their behavior. The JD–R model argues that personal resources (self-esteem, self-efficacy, optimism) are important (Xanthopoulou et al., 2007). Self-efficacy means the belief to be capable to fulfill an action. Self-efficacy, a personal resource which the present study focuses on, is an important factor in many models. According to social-cognitive theory, people learn by observing other individuals doing certain actions, and the chain that shapes behavior is stimulus-observation-reaction. The important phenomenon in this theory is self-efficacy (Bandura, 1977; Bandura, 1997). Self-efficacy requires four key aspects: attention to an action, keeping in mind this action, being capable of replicating this action, and being motivated to reproduce this behavior. Social-cognitive theory stresses that the key factor in producing the desired action is motivation (Bandura, 1977; Bandura, 1997) and that self-efficacy is very important for human functioning (Bandura, 2000). Personal resources may have as much a motivational potential as job resources (Xanthopoulou, Bakker, & Schaufeli, 2009) and self-efficacy is an important element for employees’ psychological health and motivational outcomes (Xanthopoulou et al., 2007). Self-efficacy influences how individuals think and behave; in a work situation it relates to job performance (Stajkovic & Luthans, 1998). In general little is known about the personal resource of self-efficacy in work life settings.

The present study
Previous research has supported the basic statements of the JD–R model: that job demands negatively impact on employees’ health whereas job resources and personal resources are the main predictors of motivation at work (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003; Bakker, Demerouti, & Verbeke, 2004; Schaufeli & Bakker, 2004). The JD–R model talks mainly about the main effects of job demands, job resources, and personal resources, and most studies focus on such main effects. On this basis, the present study investigates how job demands (workload, role ambiguity, role conflict) and job resources (job control, feedback, social support) together with a personal resource (self-efficacy) relate to health (physical health, mental health, sleep quality) and motivation at work (job satisfaction, organizational commitment, job performance). This study aims to identify job characteristics that can create both health and motivation at work, and reduce the risk of sick leave.

Hypothesis 1: Job demands are negatively related to (a) health and (b) motivation at work.
Hypothesis 2: Job resources are positively related to (a) health and (b) motivation at work.
Hypothesis 3: Self-efficacy is positively related to (a) health and (b) motivation at work.

Method

Sample and procedure
This study is based on data collected within a larger project about salaried employees in the modern working life, financed by SALTSA, joint programme for working life research in Europe (Näswall, Baraldi, Richter, Hellgren, & Sverke, 2006). Several organizations were included in the longitudinal project but the present study makes use of data from 2004, from a large Swedish manufacturing company that produces household appliances, forestry and farming equipment with headquarters in Gothenburg. The organization was informed about the project, asked if they wanted to participate, and promised to get a report of the results. The organization provided the research team with addresses of the employees in the administrative positions. Then the research team sent the surveys by post in an envelope including a cover letter that informed about the objective of the study, instructions about how to fill in the scales, and information about confidentiality and data treatment. The envelope also contained a letter from the organization, stating they approved of the study, and a reply-postage paid envelope to return the questionnaire to the research team. While questionnaires were sent to all employees, the present study concerns those 247 white-collar employees of a Swedish construction company, who received questionnaires including all variables of interest for the present study. The questionnaire was answered by 159 employees (a response rate of 68%). Of these 159 participants, there were 156 individuals who answered all items that were included in this study. The effective sample comprised 110 men (70.5%) and 46 women (29.5%). The age of participants ranged from 25 years old to 64 years ($M = 44.59$, $SD = 10.71$).

Measures
The questionnaire was developed to capture numerous different characteristics for the employees in the working situation. All variables were measured with well-known scales, each containing multiple items, that have been used in numerous studies. Their psychometric properties, including reliability and validity, have been subject to empirical tests in previous research (for an overview, see Näswall et al., 2006). The items were randomized so similar questions were not close to each other. Negatively phrased items were reverse-coded before mean indexes were computed. Principal axis factoring (PAF) was made for all variables to check out their measurement characteristics. With one exception (job performance), the variables had an internal consistency that met the typical criterion of Cronbach’s alpha of at least .70 (Nunnally, 1978). Table 1 presents means, standard deviations, reliability estimates (Cronbach’s alpha) and correlations of all variables that were concluded in the present study.

Demographic control variables. Age was measured in years. Gender was a dichotomous variable ($1 =$ woman, $0 =$ man).

Job demands. Workload was assessed with the three-item scale ‘Quantitative role overload’ developed by Beehr, Walsh and Taber (1976) and measured how much work employees experienced to have. The scale contains statements like ‘I am given enough time to do what is expected of me in my job and demonstrated an acceptable reliability ($\alpha = .77$). Role ambiguity at work was measured with four items (for example, ‘I know exactly what is expected of me’) developed by Rizzo, House and Lirtzman (1970) and revised of Caplan (1971). The scale investigated if the employees felt that they had clear, planned goals for their job and knew
what they were responsible for. The reliability of the scale was high ($\alpha = .82$). The index assessing role conflict at work had five items (Rizzo et al., 1970) and showed a high reliability ($\alpha = .81$). This index contains statements like ‘I receive incompatible request from two or more people’ and measured if employees needed to break some policies to get work to be done. All demand items were answered on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

**Job resources.** Job control investigated the degree of freedom within employees’ own work tasks and was measured with four items (for example, ‘I have satisfactory influence over decisions concerning my job’). The scale was developed by Sverke and Sjöberg (1994) and based on scales of Hackman and Oldman (1975), Walsh, Taber and Beehr (1980) and showed an adequate reliability ($\alpha = .79$). Feedback was tapped with four items (Hackman, & Oldman, 1975) with a reliability estimate of .86. The scale contains statement like ‘I usually know whether or not my work is satisfactory on this job’. The scale that measured the quality of communication with the manager (Colquitt, 2001) was used to capture social support. The scale had five items (for example, ‘My manager has an open communication with me’) and had a high reliability of .88. Also for job resources, the same five-point Likert scale was used.

**Personal resource.** Employees’ self-efficacy was measured by the eight-item scale (for example, ‘I am strong enough to overcome life’s struggles’) that was developed by Judge, Locke, Durham and Kluger (1998). The index investigated employees feelings about their capacity to produce needed action to manage a work task, and showed a high reliability ($\alpha = .86$). Responses were given on the same five-point Likert scale.

**Health.** Physical health was assessed with a ten-item measure reflecting somatic health complaints, developed by Andersson (1986), and modified by Isaksson and Johansson (1997). The items ask the employees how frequently during the past 12 months they had experienced a variety of symptoms (e.g., stomach problems, neck-shoulder pain), with response options ranging from 1 (never) to 5 (always). The scale demonstrated an acceptable reliability. The ‘General health questionnaire’ (Goldberg, 1979) was used to measure mental health, how the employees felt about their mental states. It included twelve items asking about various symptoms experienced over the past two weeks (for example, ‘Been able to concentrate on whatever you’re doing’, ‘Felt that you could not overcome difficulties?’, with a response scale ranging from 0 (never) to 3 (always). The measure had a high reliability. To assess sleep quality a four-item index reflecting various sleeping problems was used (Gustavsson et al., 2003). This index contains items like ‘I have difficulties falling asleep’, with response options ranging from 1 (never) to 5 (always), and demonstrated a high reliability. All health measures were recoded so high values represent better health.
Table 1. Correlations, means, standard deviations and reliability estimates (Cronbach alpha) for all study variables.

| Variables               | M     | SD    | Alpha | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   |
|-------------------------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| **Demographics**        |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1. Age                  | 44.59 | 10.71 | -     | -    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 2. Gender (woman)       | .29   | .46   | -     | -.24 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| **Pers resources**      |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. Self-efficacy        | 4.24  | .51   | .86   | -.22 | -.08 | -    |      |      |      |      |      |      |      |      |      |      |      |      |
| **Job demands**         |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 4. Workload             | 3.35  | .89   | .77   | -.03 | -.15 | -.08 | -    |      |      |      |      |      |      |      |      |      |      |      |
| 5. Role ambiguity       | 2.46  | .83   | .82   | -.14 | -.02 | -.15 | .37  | -    |      |      |      |      |      |      |      |      |      |      |
| 6. Role conflict        | 2.34  | .85   | .81   | -.08 | -.15 | -.11 | .53  | .61  | -    |      |      |      |      |      |      |      |      |      |
| **Job resources**       |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 7. Job control          | 3.65  | .73   | .79   | .04  | -.19 | .24  | -.06 | -.42 | -.24 | -    |      |      |      |      |      |      |      |      |
| 8. Feedback             | 3.00  | .89   | .86   | .08  | -.05 | .09  | -.21 | -.46 | -.28 | .37  | -    |      |      |      |      |      |      |      |
| 9. Social support       | 3.14  | .86   | .88   | .10  | .04  | -.25 | -.44 | -.38 | .41  | .70  | -    |      |      |      |      |      |      |      |
| **Health**              |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 10. Physical health     | 4.26  | .56   | .73   | -.05 | -.08 | .32  | .02  | -.28 | -.12 | .21  | .04  | .05  | -    |      |      |      |      |      |
| 11. Mental health       | 2.26  | .41   | .87   | -.14 | -.03 | .66  | -.29 | -.32 | -.27 | .36  | .27  | .30  | .34  | -    |      |      |      |      |
| 12. Sleep quality       | 3.79  | .83   | .82   | -.20 | .05  | .40  | -.27 | -.19 | -.24 | .28  | .16  | .11  | .43  | .60  | -    |      |      |      |
| **Motivation at work**  |       |       |       |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 13. Job satisfaction    | 3.78  | .88   | .89   | .19  | -.02 | .28  | -.21 | -.46 | -.43 | .57  | .49  | .51  | .14  | .58  | .42  | -    |      |      |
| 14. Org. Commitment     | 3.36  | .83   | .72   | .14  | -.08 | .20  | -.17 | -.53 | -.34 | .55  | .42  | .48  | .17  | .36  | .20  | .57  | -    |
| 15. Job performance     | 4.24  | .44   | .69   | -.16 | -.08 | .62  | .12  | -.12 | .01  | .33  | .06  | .11  | .25  | .52  | .28  | .29  | .21  |

For r ≥ .16, p < .05. N=156.
Motivation at work. The aspect job satisfaction was measured with the three-item scale developed by Hellgren, Sjöberg and Sverke (1997), based on Brayfield and Rothe (1951). The scale assessed how much employees enjoyed their work (for example, ‘I enjoy being at my job’). The reliability of this scale was α = .89. The scale that assessed the aspect organizational commitment was a short-form version with seven items of Allen and Meyer (1990). The scale reflects employees’ perceptions of their affective connection to the work (for example, ‘I enjoy discussion my organization with people outside it’) and showed an adequate reliability (α = .72). The aspect job performance was operationalized using a five-item scale (Hall, & Hall, 1976) that measured employees’ estimation if they do their job professionally. A sample item is: ‘I manage most of the situations that arise in my work’. The scale demonstrated a reliability of .69. All motivation items were scored on the same five-point Likert scale used for demands and resources.

Results

Hierarchical multiple regression analyses were used to study the relative importance of job demands, job resources, and the personal resource for employees’ health and motivation at work. Separate analyses were conducted for each aspect of health (physical health, mental health and sleep quality) and motivation at work (job satisfaction, organizational commitment and job performance). The independent variables were arranged in four pre-determined steps. In the first step of regression analyses the demographic variables (age and gender) were statistically controlled. The personal resource, self-efficacy, was entered in Step 2 and its contribution was investigated. The third step contained the job demands (workload, role ambiguity, and role conflict) and their relative impact was examined. Finally, in Step 4, job resources (job control, feedback and social support) were entered to examine their relative importance after controlling for all variables included in previous steps. Table 2 presents the results of the hierarchical regression analyses.

Regarding physical health, the background factors showed no relation to the criterion. The personal resource (self-efficacy) had a significant positive association and explained 9 percent of the variance in physical health. Thus, the more capable the employees felt in terms of managing their work, the better their physical condition. When the job demands were entered in Step 3, the amount of explained variance increased with 7 percent. Role ambiguity was negatively related to physical health. Therefore, if employees did not know their responsibilities and had no clear, planned goals, their physical health was worse. Workload and role conflict were non-significant. In Step 4 job resources were entered. They were unrelated to the criterion, and not one of them showed significant associations with physical health. In total, the model explained around one-fifth ($R^2 = .19$) of the variance in physical health.

Regarding mental health, the background factors were unrelated to mental health. Self-efficacy, entered in Step 2, was positively associated with mental health and explained 41 percent of the variance. The more the employees experienced self-efficacy, the better mental health they reported. In Step 3, the job demands contributed to the prediction of mental health, and they helped explain an additional 8 percent of the variance. Workload demonstrated a significant negative association with mental health, so the higher workload the employees experienced the poorer their mental health was, while role ambiguity and role conflict were unrelated to the criterion. The final step, in which job resources were added to the equation, explained an additional 3 percentage units of the variance in mental health. Only job control showed a significant positive association; thus, the employees who experienced more control
at work reported better mental health. The two other job resources variables, feedback and social support, were unrelated to mental health. In total, all model variables explained more than half ($R^2 = .55$) of the variance in employees’ mental health.

The next analysis concerned sleep quality. Four percent of the variance in employees’ sleep quality was accounted for by the demographic variables in Step 1. When the personal resource self-efficacy was entered in Step 2, the amount of variance explained increased substantially with 14 percent. Self-efficacy correlated positively with sleep quality. When employees felt more capable of doing their work, they slept better. The third step, which contained job demands, accounted for an additional 7 percent. However, only one demand, workload, had a significant negative association with sleep quality. Therefore, the more workload the employees had, the worse they slept. In Step 4 the job resources variables explained an additional 4 percent of the variance and job control showed a significant positive association with sleep quality. Thus, the employees slept better when they had more control in their work. Taken together, the model variables accounted for almost 30 percent ($R^2 = .29$) of the variance in sleep quality.

The next model assessed job satisfaction. In Step 1, the variable age had a significant positive association with criterion. The older the employees were, the more they enjoyed their job. Self-efficacy was entered in Step 2 and explained 11 percent of the variance in job satisfaction. It was positively correlated with the criterion so the more the employees felt capable of doing their work tasks, the more they enjoyed their work. Job demands in Step 3 helped explain an additional 17 percent. While workload and role ambiguity were unrelated to the criterion, role conflict had a significant negative effect on job satisfaction. When employees experienced role conflicts at work, they were less satisfied with their jobs. Step 4, which contained job resources, explained 21 percent of the variance in job satisfaction. Job control and feedback contributed positively to the prediction of job satisfaction. Therefore, the more job control and feedback employees experienced, the more they enjoyed their work. Social support was not associated with the criterion. In total, the model explained 53 percent ($R^2 = .53$) of the variance in job satisfaction.

Regarding organizational commitment, the background factors were unrelated to the criterion. In Step 2, self-efficacy helped explain 5 percent of the variance in organizational commitment. In Step 3, the job demands accounted for 23 percent of the variance. Only role ambiguity showed significant negative effects in organizational commitment. Therefore, the fewer the clear, planned goals and the less knowledge about their responsibilities employees felt they had, the less committed they felt to their organization. Workload and role conflict were unrelated to the criterion. Finally, job resources in Step 4 explained 15 percent of the variance in organizational commitment. However, only two resources (job control and social support) showed significant positive effects on organizational commitment. Thus, the more control employees felt they had over the job and the more social support they received from their manager, the stronger their commitment to the organization was. Feedback was not related to the criterion. Taken together, demographics, job demands, job resources, and the personal resource accounted for 45 percent of the variation in organizational commitment ($R^2 = .45$).
Table 2. Results of hierarchical multiple regression (standardized regression coefficients from the last step).

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<th></th>
<th>Health</th>
<th>Motivation at work</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physical health</td>
<td>Mental health</td>
</tr>
<tr>
<td><strong>Step 1: Demographics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.03</td>
<td>-.04</td>
</tr>
<tr>
<td>Gender (woman)</td>
<td>-.04</td>
<td>.01</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.01</td>
<td>.03</td>
</tr>
<tr>
<td><strong>Step 2: Personal resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.26***</td>
<td>.58***</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.09***</td>
<td>.41***</td>
</tr>
<tr>
<td><strong>Step 3: Job demands</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workload</td>
<td>.12</td>
<td>-.19**</td>
</tr>
<tr>
<td>Role ambiguity</td>
<td>-.34**</td>
<td>-.06</td>
</tr>
<tr>
<td>Role conflict</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.07**</td>
<td>.08***</td>
</tr>
<tr>
<td><strong>Step 4: Job resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job control</td>
<td>.07</td>
<td>.14*</td>
</tr>
<tr>
<td>Feedback</td>
<td>-.10</td>
<td>.06</td>
</tr>
<tr>
<td>Social support</td>
<td>-.05</td>
<td>.07</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.02</td>
<td>.03*</td>
</tr>
<tr>
<td>Total R²</td>
<td>.19***</td>
<td>.55***</td>
</tr>
<tr>
<td>F (9,146)</td>
<td>3.90***</td>
<td>5.91***</td>
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N =156,  
*** p < 0.001, ** p < 0.01, * p < 0.05
Demographic characteristics accounted for 4 percent of the variance in job performance. When the personal resource (self-efficacy) was entered in Step 2, the amount of variance explained increased substantially with 34 percentage units. Self-efficacy had a positive effect on job performance: the more the employees felt capable of doing their work, the better they reported their performance at their work. In Step 3, job demands accounted for an additional 4 percent. While role ambiguity and role conflict were unrelated to the criterion, workload showed a positive association with job performance. Therefore, the more work employees had, the more they felt they were doing their work competently. Step 4, containing job resources, explained a further 4 percent of the variance in job performance. However, only one resource, job control, showed a positive association with job performance, indicating that job performance increased when employees experienced a higher degree of job control. In total, the model variables accounted for 46 percent of the variance in job performance ($R^2 = .46$).

Discussion

The purpose of the present study was to investigate how job demands (workload, role ambiguity, role conflict), and job resources (job control, feedback, social support) together with personal resources (self-efficacy) correlate with employees' health and motivation at work. Contemporary scientific understanding provides evidence for high job demands and low job resources, as well as the absence of personal resources, having a negative impact on employees’ health and motivation at work (Demerouti et al., 2001; Xanthopoulou et al., 2007). This work developed hypotheses on the negative effects of job demands and the positive effects of job resources and a personal resource on specific outcomes: job demands are negatively related to (a) health and (b) motivation at work; job resources and self-efficacy are positively related to (a) health and (b) motivation at work. It used the JD–R model as a point of departure.

The results of this study demonstrate that employees who experienced higher job demands felt that their health was worse, they were less satisfied with the job, they did not have a strong emotional connection to the organization for which they worked, and they felt that they worked less professionally. In support of Hypotheses 1a and 1b, job demands, in the present study, were negatively related to health and motivation at work. Workload was negatively associated with mental health and sleep quality. It can be that when employees experience to have too much work they are thinking a lot about it, and probably ruminating that it is unfair also. These thinking can influence mental health and sleep quality. Role ambiguity correlated negatively with physical health. In this case role ambiguity could be a stress factor in work environment. The feelings when employees do not know what they are responsible for, do not know their goals can cause psychological pressure, mental stress that shows in impairment of physical health. Role conflict unexpectedly did not show any significant relationship to any of the health outcomes. Role ambiguity was negatively associated with organizational commitment. Mental stress of not knowing own goals, responsibilities, probably feelings a kind of absence of one’s job position are stressful that employees do not want to be attached to their work, do not want to talk about it with others outside the office because it is stressful. Role conflict was negatively related to job satisfaction. When employees must overstep work policy to manage work tasks it can be stressful and could trigger negative emotions also. Therefore, also employees do not enjoy their work. This was in line with the previous research results which found that job demands negatively impact on employees’ health (Hakanen et al., 2006;) and motivation at work (Bakker et al., 2003). A high workload was connected to mental health complaints, as predicted by the JD–R model and supported by
empirical work (Demerouti et al., 2001; Schaufeli & Bakker, 2004), as was impaired sleep quality. Generally, there is little empirical evidence was about the correlation between workload and sleep quality. The present research showed also that while the absence of clear goals and responsibilities was associated with physical health complaints and a lack of an emotional bond with the organization, the need to break a rule to complete a work task meant that employees enjoyed their work less. The results regarding role ambiguity and role conflict also were in line with the previous empirical studies that noted how these impact negatively on work motivation (Nixon et al., 2011). Not all of this study’s job demands were significantly correlated to all of the health and motivational variables, though workload was important and correlated with many of these outcomes significantly and role ambiguity correlated significantly several times. This is in line with previous empirical findings about the JD–R model: job demands (workload, role ambiguity, role conflict) negatively impact on employees’ health and work motivation (Hakanen et al., 2006; Pozner & Randolph, 1980). Unexpectedly, workload was positively related to job performance. A possible explanation for this can be that employees who are highly professional and effective are usually doing much more than those who are new to the work. Studies find also a positive relationship between workload and performance (Tims, Bakker, & Derks, 2014), so it seems necessary to work hard in order to perform well. The data are also cross-sectional. It might be that high performance results in a greater workload; that is, performance is the predictor in this case.

The other important block in the JD–R model concerns job resources. The present study provides support for Hypothesis 2a about the positive relationship between job resources and health. Regarding job resources, job control had a positive relationship with mental health and sleep quality, but not with physical health, while feedback and social support did not correlate with the health variables. A possible explanation of these results can be locus of control. When employees feel that they have control over their work tasks it can be comfortable, not stressful and the more control they may experience they feel better mentally and sleep better. Feedback and social support are actually other people’s opinions and may not be so important for individual’s health. Hypothesis 2b was partially supported: job resources were positively related to motivation at work. Feedback associated positively with job satisfaction. A possible explanation can be that when employees get clear knowledge about their performance they feel more relaxed and enjoy the work more. Social support was positively associated with organizational commitment. When people get social support they feel more comfortable and get attached to their organization where they get this kind of support also. Job control related positively to all three motivational outcomes: job satisfaction, organizational commitment, and job performance. When employees participate in decision making process about their work, and are relatively free within their work task they can feel that they are important for the organization, their voice is heard and taken in account. These kind of feelings can make them enjoy their work more, get attached to their organization, and they experience working professionally. There is a clear pattern for job control, this variable correlated positively with all health and motivation outcomes apart from physical health. Previous investigations about job resources have also found that high levels of job resources positively influenced employees’ health and motivation at work (Bakker et al., 2003; Schaufeli & Bakker, 2004). In conclusion, the results showed that job resources had a positive association with health and motivation at work. Consequently, the more job resources that were available, the better health conditions the employees reported and the more motivation they had at work. These results support previous research (Hansen et al., 2009). Among the study’s three job resources, job control correlated with almost all the dependent variables. The employees who engaged in decision-making about their work and had relative freedom within their work tasks
experienced better mental health than others and slept better than them. They also enjoyed their work, liked to talk about it outside the organization with other people, worked more competently, and had more motivation at work. The results of this study generally support previous studies that found positive effects of job resources on employees’ health and motivation at work (Bakker et al., 2003).

The next aspect in the model concerned a personal resource. Hypotheses 3a and 3b were confirmed. In line with previous findings, self-efficacy in the present study had a positive association with all the health and motivational outcomes, except for organizational commitment. The more self-efficacy employees experienced, the healthier they felt physically and mentally but they also slept better. A possible explanation can be that when employees believe that they are capable to do work they are not stressed and feel comfortable with their work and there is a mental balance and therefore they feel better mentally, physically and sleep better. Self-efficacy was also positively associated with job satisfaction and job performance. This can be because of self-fulfilling prophecy when they feel that they can do a lot in the organization, they act like it is truth and they experience joy with their work. They feel that they work competently also. In accordance with previous research and the JD–R model, self-efficacy, a personal resource, was positively related to health and work-related motivation (Bakker et al., 2003; Stajkovic & Luthans, 1998; Xanthopoulou et al., 2007). The more the employees believed in their ability to manage work tasks, the better they felt physically and mentally and once again they slept better. They enjoyed their work more and felt that they worked more professionally. The personal resource self-efficacy had the most significant relation to all variables. The next strongest predictor was workload, which contributed to variation of all the dependent variables. In third place was the predictor job control, which correlated to all of the dependent variables apart from physical health. The results in the present study are mainly in line with the whole JD–R model. This study found job demands, job resources, and the personal resource to be important both for the health outcomes and for the indicators of work motivation. The personal resources of self-esteem, self-efficacy, and optimism have been added to the JD–R model relatively recently and these have demonstrated their positive impact on health and work motivation (Xanthopoulou et al., 2007; Xanthopoulou et al., 2009).

Nevertheless, the findings of this study can be useful for organizations and managers to learn about these relationships. The organization can create a work climate that promotes employees’ health and motivation at work via concrete manageable impacts. Managers can learn to give proper feedback and provide social support. Organizations can create job policies that involve employees in the decision-making process regarding their own work. Although it is perhaps difficult to decrease workload, it is probably possible to avoid role ambiguity and role conflict. Regarding self-efficacy, it was important for almost all the outcome variables in this study. Maybe self-efficacy has a more complicated influence in the workplace than workload. If employers recruit only individuals that have high self-efficacy, what will others who have a lower such personal resource do? These tendencies can create segregation. If workload decreased maybe self-efficacy would improve. Employees could therefore increase their belief in their own ability to manage their work tasks. Workload was important for mental health in the present study. Mental health is a softer indicator. Possibly, employees that experienced an excessive workload became ill and were on sick leave when the study was being conducted. The other employees that were affected by the large workload and were beginning to be stressed about it, they were at the start to be sick and it was shown through the mental health complaints, like the first indicator on health impairment which could develop into physical health problems in the future. Empirical findings from previous research and the JD–R model show the negative impact of workload to be work stress, which
affects mental health (Schaufeli & Bakker, 2004). Given the premise that job demands and job resources together with personal resources are predictors of employees’ health and their work motivation, more research is needed on factors that can promote good health and motivation at work.

Methodological considerations

A limitation of the present research is its cross-sectional character. The results should therefore not be taken as causal effects. Longitudinal data is needed. However, the outcomes are generally in line with, for example, the organizational stress (Caplan, 1971) and the JD–R model’s (Schaufeli & Bakker, 2004) predictions and with what others have found when using both cross-sectional data (Ford et al., 2011; Xanthopoulou et al., 2007) and longitudinal data (Fernet et al., 2012; Xanthopoulou et al., 2009). In fact, the causative connection could be the opposite: that physically and mentally strong employees who sleep well can manage more work and different demands on fewer job resources, and they believe in their efficacy to do their job. It could be that the employees who like their work and believe they are doing the work competently do not experience job demands as being cumbersome, and their experience is that they are capable of doing the work tasks.

As numerous studies have used data from other countries (Bakker et al., 2003; Fernet et al., 2012; Hakanen et al., 2006) and from other occupational groups (Fernet et al., 2012; Ford et al., 2011; Hauke et al., 2011) but have found similar results to the present study, the present results might be generalized to other countries and professions so job demands, job resources, and personal resources are important for health and work outcomes.

Regarding the predictors, three job demands, three job resources, and one personal resource were included in the present study. They were chosen on the basis of the JD–R model’s predictions (Demerouti et al., 2001; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007) and previous empirical research (Pozner & Randolph, 1980; Rizzo et al., 1970). Nevertheless, other factors have been found to be important in other studies, as for example, problems with reorganization (Bakker et al., 2003), job insecurity (Sverke et al., 2002), work hours (Nixon et al., 2011). Concerning job demands, job resources, and personal resources, the present study focused on workload, role ambiguity, role conflict, job control, feedback, social support and self-efficacy; however, there are naturally other factors in the work climate that I did not control for and that could have contributed to the results. In addition to other demands it may also be relevant to include aspects of the physical work environment. For instance, previous research has shown that the psychosocial and physical factors impacts on employees’ health and motivation at work (Bailey, Dollard, McLinton, & Richards, 2015). Future studies could therefore add the physical work environment to job demands and control how they correlate with mental health, physical health, sleep quality as well as job satisfaction, organizational commitment, and job performance for salaried employees in Sweden. It could make a difference if there are many employees working in the same room or if they have individual offices, how large the windows are, if there is a railway near the office, the color of the walls in the office, if there is lighting on the ceiling for everyone or if there is a lamp on each table, etc. The physical work environment can also influence employees’ job satisfaction, whether they enjoy their work or not, if they like to talk about their work with others outside the office, and if they feel that they work professionally.

While the present study included a range of outcomes reflecting health and work motivation, other outcomes that I included could also be relevant. For instance, previous research has focused on aspects such as burnout, work engagement (Hakanen et al., 2006), and presenteeism (Demerouti, Le Blanc, Bakker, Schaufeli, & Hox, 2009). It was found that job
resources are important for work engagement over a period of 18 months (Xanthopoulou et al., 2009). One of the job resources of that study, opportunities for professional development, could have influenced the results also. For example, when employees know they can develop professionally and progress in their career they could consequently feel better, sleep better, be more motivated at work, like to talk about it, and feel that they work professionally. It would be necessary to control job engagement in Sweden as many studies about work engagement have been conducted in other countries (e.g. Hakanen et al., 2006; Xanthopoulou et al., 2009). The next variable that could be included in the future research is presenteeism. Unsuspected, job demands caused more presenteeism in one longitudinal study among nurses (Demerouti et al., 2009). The phenomenon presenteeism is a problem because employees are staying at work when they should be on sick leave. This reduces work productivity. Sick leave and presenteeism could be studied to investigate any association of job demands, job resources, and personal resources with sick leave and presenteeism.

One advantage of the JD–R model is that it can include various demands and resources that may be more relevant for specific organizations. Given that the present study focused on certain job characteristics proposed by the JD–R model, future research could expand the model with more characteristics that were not originally included, such as self-esteem, optimism, interpersonal conflicts, sick leave, and salary levels. The possible variant could be to merge the JD–R model with other existing theories and make a new framework to study relationships between the work climate and its outcomes for employees. It may be worth exploring other factors that could influence employees’ health and motivation at work such as self-consciousness, individualism versus collectivism traits, and moral reasoning, for example.

The present study investigated data from questionnaires that measured employees’ subjective perceptions, which therefore did not need to reflect the actual situation in the workplace. Nevertheless, the present study focused on how the employees felt about their work situation; it was done according to contemporary research about work climate, job demands, job resources, personal resources, and health and motivation at work (Schaufeli & Bakker, 2004; Xanthopoulou et al., 2007). It could also be useful to include non-self-reported data, for example, medical measurements of health outcomes. Another possible way to study these relationships could be via interviews, but it would mean fewer participants because of the high costs of such assessments; these would also be subjective because the employee and the researcher would influence the results. A qualitative study has demonstrated that job resources are important for problem solving (Daniels et al., 2013). To find out about job satisfaction and organizational commitment without asking the individual could be tricky. Maybe it is possible to check how many times and in what ways employees talk about their work while on breaks: if they speak about their work a lot, speak positively or could complain about it much.

**Conclusions**

In summary, the results indicate that higher job demands were connected with poorer health and lower motivation at work while higher job and personal resources related to better health and higher work motivation. These results are in line with previous research and the JD–R model (Schaufeli & Bakker, 2004; Xanthopoulou et al., 2009). However, it is not possible to unequivocally state from the findings that high job demands lead to poor health and poor motivation at work or that high job resources and personal resources result in better health and better work motivation. In contrast, these relationships can be reciprocal, good health and high work motivation can minimize the strain from job demands and enhance the presence of job and personal resources. Further research on the relationships between job demands, job
and personal resources, and their outcomes, could assess them under two different circumstances: with and without resources.

References


