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# Psychosocial Work Conditions and Aspects of Health

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*To Magnus, Oscar & Olivia*

*Life is like riding a bicycle. To keep your balance, you must keep moving.*

*Albert Einstein*



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# ABSTRACT

Today's working life has led to new requirements and conditions at the workplace, and additional factors may be of importance for employees' health. Most earlier research has taken place in stable organizations, and has not taken changes in organizations into account. The way in which psychosocial work conditions affect employees' health and well-being has been the topic of several studies but mental ill health is still one of the most common causes of sick leave in Sweden. Little attention is given to the importance of the workplace and organizational context for employees' health. The overall aim of this thesis is to investigate how different aspects of health are associated with psychosocial work conditions in today's working life.

This thesis comprises two empirical studies. The first study is a longitudinal study, based on questionnaire data from 1010 employees at the Swedish Labour Market Administration. The second study is designed as a prospective cohort study, based on questionnaire data from 8430 employees in ten organizations, participating in the LOHP project. Linear and logistic regressions were performed to investigate associations between psychosocial work conditions and different aspects of health. Multilevel analysis was performed in one paper.

The main findings in Paper I are that traditional job stress models are better for predicting ill health than good health. Different psychosocial work conditions may however, be useful for measuring different aspects of health, depending on whether the purpose is to prevent ill health or to promote health. In Paper II, psychosocial work conditions and symptoms of burnout were found to differ between different hierarchical levels, and different psychosocial work conditions were associated with symptoms of burnout at different hierarchical levels. Paper III showed that psychosocial work conditions predict voluntary job mobility, and this may be due to two forces for job mobility: job dissatisfaction and career development. In Paper IV, a strong association between high work ability and better performance was found. Clear goals and expectations may result in improved psychosocial work conditions and work ability, which in turn affects employees' performance.

This thesis has provided knowledge regarding different aspects of health and psychosocial work conditions. Conditions at the organizational and workplace level set the prerequisites for if and how employees use their resources and their ability to act. Access to resources and the capacity to use them may vary depending on the employees' hierarchical position. Occupational health research needs to focus on differences in psychosocial work conditions at different hierarchical levels. Organizations with clear goals and expectations may create more favourable conditions at work, supporting employees' room for manoeuvre, social capital and their ability to cope with working life, hence promoting health. Health promotion has a holistic approach and considers the work environment, the individual and the interplay between them. However, most health interventions at workplaces are directed to employees' health behaviour rather than improvements in organizational and work conditions. To develop a good work environment it is necessary to identify conditions at work that promote different aspects of health. These conditions need to be tackled at the organizational, workplace and individual level, as good health is shaped by the interplay between the employee and the conditions for work.

## Svensk sammanfattning

Dagens arbetsliv har lett till nya förutsättningar och villkor för arbetet, och andra faktorer kan vara av betydelse för anställdas hälsa. Tidigare forskning har till stor del skett i stabila organisationer, och har inte tagit hänsyn till de förändringar som skett i organisationerna. Hur psykosociala arbetsvillkor påverkar anställdas hälsa och välbefinnande har studerats i flertalet studier, men trots detta är psykisk ohälsa den vanligaste orsaken till sjukskrivning i Sverige. Betydelsen av arbetsplatsen och den organisatoriska kontexten för anställdas hälsa har fått begränsad uppmärksamhet. Det övergripande syftet med denna avhandling är att undersöka hur olika aspekter av hälsa är associerade med psykosociala arbetsvillkor i dagens arbetsliv.

Denna avhandling bygger på två empiriska studier. Den första studien är en longitudinell studie, baserad på enkätdata från 1010 anställda på Arbetsmarknadsverket. Den andra studien är designad som en prospektiv kohort och är baserad på enkätdata från 8430 anställda i tio organisationer, deltagande i LOHP-projektet. Linjära och logistiska regressioner har använts för att undersöka samband mellan psykosociala arbetsvillkor och olika aspekter av hälsa. Multilevel analys har använts i en av delstudierna.

Huvudresultatet i delstudie I är att traditionella (jobb)stress-modeller är bättre på att predicera ohälsa än hälsa. Olika psykosociala arbetsvillkor kan däremot vara användbara för att mäta olika aspekter av hälsa, beroende på om syftet är att förebygga ohälsa eller att främja hälsa. Delstudie II fann skillnader i psykosociala arbetsvillkor mellan olika hierarkiska nivåer, samt att olika psykosociala arbetsvillkor har samband med symptom på utbrändhet för de olika hierarkiska nivåerna. Delstudie III visade att psykosociala arbetsvillkor predicerar frivillig rörlighet. Detta tycks bero på två arbetsrelaterade krafter för rörlighet: missnöje med arbetet och karriärutveckling. Delstudie IV fann starka samband mellan god arbetsförmåga och bättre prestation. Tydliga mål och förväntningar kan förbättra de psykosociala arbetsvillkoren och arbetsförmågan, vilket i sin tur påverkar anställdas prestation.

Denna avhandling har bidragit med kunskap om olika aspekter av hälsa och psykosociala arbetsvillkor. Villkoren på organisations- och arbetsplatsnivå sätter förutsättningarna för om och hur anställda kan använda sina resurser och sin handlingsförmåga. Tillgången på resurser och kapaciteten att använda sig av dessa kan variera beroende på vilken hierarkisk nivå den anställde

befinner sig. Forskning om arbetsliv och hälsa behöver fokusera på skillnader i arbetsvillkor för olika hierarkiska nivåer. Organisationer med tydliga mål och förväntningar kan skapa gynnsammare förutsättningar för arbetet, stödja anställdas handlingsutrymme, det sociala kapitalet och förmågan att hantera arbetslivet, och därmed främja hälsa. Hälsöfrämjande har en holistisk ansats och tar hänsyn till arbetsmiljö, individ och samspelet dem emellan. Men, de flesta hälsöfrämjande interventionerna på arbetsplatser är oftast riktade mot anställdas hälsobeteenden snarare än mot förbättrade organisations- och arbetsvillkor. För att skapa en god arbetsmiljö är det nödvändigt att identifiera villkor i arbetet som främjar olika aspekter av hälsa. Dessa villkor behöver hanteras både på organisatorisk, arbetsplats- och individnivå, eftersom hälsa skapas i samspelet mellan den anställde och förutsättningarna för arbetet.

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## LIST OF PAPERS

- I. Cathrine Reineholm, Maria Gustavsson, Kerstin Ekberg (2011). Evaluation of job stress models for predicting health at work. *WORK: A Journal of Prevention, Assessment & Rehabilitation*, 40, 229-237.
- II. Daniel Lundqvist, Cathrine Reineholm, Maria Gustavsson, Kerstin Ekberg (in press). Investigating work conditions and burnout at three hierarchical levels. *Journal of Occupational and Environmental Medicine*.
- III. Cathrine Reineholm, Maria Gustavsson, Mats Liljegren, Kerstin Ekberg (2012). The importance of work conditions and health for voluntary job mobility. *BMC Public Health*, 12, 682.
- IV. Cathrine Reineholm, Maria Gustavsson, Nadine Karlsson, Kerstin Ekberg (submitted). Work ability and performance – associations with clarity of work and work conditions: A multilevel study.

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# INTRODUCTION

Since the 1990's, working life has undergone several changes due to globalization, recessions, new technology etc. (Appelbaum, Close & Klasa, 1999; Hellgren, Sverke & Näswall, 2008). To deal with these changes, organizations need to be flexible and adapt their business to be competitive. However, according to Allwin (2008), flexible organizations have resulted in loose structures, less predictability and increased uncertainty for the employees. New organizational principles, such as Lean Production and New Public Management are often implemented to improve efficiency (Härenstam, Rydbeck, Johansson, Karlqvist & Wiklund, 1999; Landsbergis, Cahill & Schnell, 1999). It is suggested that strategies and decisions taken at the organizational level affect conditions at the workplace level (Baron & Bielby, 1980; Härenstam, Marklund, Berntsson, Bolin & Ylander, 2006; Landsbergis, Cahill & Schnell, 1999; Mark & Smith, 2008). New requirements and new work conditions at the workplace level may in turn affect the employees' health.

The way in which psychosocial work conditions affect employees' health and well-being has been the topic of several studies (e.g. Borritz, Bültmann, Rugulies, Christensen, Villadsen & Kristensen, 2005; Head, Kivimäki, Martikainen, Vahtera, Ferrie & Marmot, 2006; Kivimäki, Vahtera, Elovainio, Virtanen & Siegrist, 2007; Schaufeli & Bakker, 2004; Schell, Theorell, Nilsson & Saraste, 2013; van Veldhoven, de Jonge, Broersen, Kompier & Meijman, 2002) but mental ill health is still one of the most common causes for sick leave in Sweden (Försäkringskassan, 2010). Little attention is given to the importance of the workplace and organizational context for employees' health. Most earlier research has taken place in stable organizations, and has not taken changes in organizations into account (Härenstam et al., 2006). Psychosocial work conditions are generally investigated at an individual level, without taking the organization or the workplace into consideration. Today's working life has led to new requirements and new conditions at the workplace, and additional factors may be of importance for employees' health. In this thesis, the need for a more holistic approach is argued when investigating psychosocial work conditions and work-related aspects of health.

## Psychosocial work conditions

Psychosocial work conditions are often assessed and discussed in terms of the individual's demands at work in relation to his/her ability to control activities and utilizations of skills (e.g. Karasek & Theorell, 1990). It is well known that high psychological demands combined with low control increase the risk of stress and ill health (de Jonge, Bosma, Peter & Siegrist, 2000; de Lange, Taris, Kompier, Houtman & Bongers, 2004; Karasek & Theorell, 1990), while a high degree of control may lead to positive or desirable stress (Karasek & Theorell, 1990). High control, high autonomy and variety at work are known to increase employees' motivation (Demerouti, 2006; Hackman & Oldham, 1975), and may therefore be important factors in today's working life for promoting health at work.

Much of the individual work has been replaced by working in teams or work groups, in order to increase flexibility in the work process. A high degree of control is often delegated from the managerial level to the teams or work groups, which provides the work group more varied work tasks, and more opportunities to plan and decide how work should be performed (Blomqvist, 2001; Delarue, Van Hootehem, Procter & BurrIDGE, 2008; Rasmussen & Jeppesen, 2006). Implementation of autonomous groups has also been found to increase employees' job satisfaction (Delarue et al., 2008; Rasmussen & Jeppesen, 2006; Wall, Kemp, Jackson, & Clegg, 1986). Increased control and autonomy for the work group may also have negative side effects such as increased stress and increased turnover, as the members of the work group have to take inconvenient decisions or deal with problems in the work groups that were previously the manager's job or responsibility (Delarue et al., 2008; Semmer, 2006).

To work as a member of a collective or a team, other skills may also be required from the employees such as great social competence and the ability to communicate, cooperate and negotiate with others (Blomqvist, 2001; Hu & Liden, 2011, Nordenfelt, 2008). The workplace can be viewed as a social arena containing several social relations, where the employees are dependent on colleagues' behaviour and performance, constituting the social capital (e.g. Bourdeaux, 1986; Coleman, 1988) at work. A high degree of social capital at work is known to reduce strain and stress (Oksanen, Kouvonen, Kivimäki, Pentti, Virtanen, Linna et al., 2008; Sapp, Kawachi, Sorensen, LaMontagne &

Subramanian, 2010) but can also be assumed to improve co-operation and performance in the work group.

In general, psychosocial work conditions are assumed to be of equal importance for employees' health, regardless of hierarchical level. Hitherto, little attention has been paid to hierarchical differences in organizations, although some studies suggest that managers and subordinates have different psychosocial work conditions. Managers are often described as having greater demands on them (Johansson, Sandahl & Hasson, 2013; Skakon, Kristensen, Christensen, Lund & Labriola, 2011) and more conflicts between work and private life (Cooper & Bramwell, 1992) than subordinates. On the other hand, managers often experience higher control, greater autonomy (Frankenhaeuser, Lundberg, Fredrickson, Melin, Tuomisto, Myrsten et al., 1989; Johansson et al., 2013; Skakon et al., 2011; Steptoe & Willemsen, 2004) and more social support than subordinates (Johansson et al., 2013; Wilkes, Stammerjohn, & Lalich, 1981). Managers are also described as having better health (Kentner, Ciré & Scholl, 2000; Macleod, Davey Smith, Metcalfe, Hart, 2005; Marmot & Smith, 1991; Muntanez, Borrell, Benach, Pasarin, Fernandez, 2003) than subordinates. The association between psychosocial work conditions and health at different hierarchical levels is however, rarely compared.

Traditional occupational research has contributed with great knowledge regarding how different psychosocial work conditions may relate to employees' health, which has also resulted in several well-validated job stress models (see e.g. Mark & Smith, 2010; Tabanelli, Depolo, Cooke, Sarchielli, Bonfiglioli, Mattioli et al., 2008 for reviews). The main focus has, however, been on identifying risk factors related to ill health rather than factors promoting health (Schaufeli, 2004). Additional factors may be of importance for employees' health. To develop a good work environment and healthy workplaces, more knowledge is needed regarding the psychosocial work conditions that promote health. Furthermore, the focus when studying occupational health needs to be broadened from the individual level to also incorporate the workplace and the organization.

## **Aspects of health**

In this thesis a broader perspective on health is presented, both theoretically but also incorporating work-related aspects of health, in terms of performance and job mobility.

## **Health**

Health is a broad concept, covering a huge range of meanings, from a technical interpretation to a moral or philosophical one (Naidoo & Wills, 2000). As the concept of health is complex and difficult to define, it is even more difficult to measure. This might also explain why most research within occupational health measures health in terms of indicators or symptoms of ill health (Brülde & Tengland, 2003). A main distinction between the different health theories is often drawn, depending on whether they follow the bio-medical perspective or the humanistic perspective (Medin & Alexandersson, 2000). The bio-medical perspective has its starting point in disease or illness, and sees health as the absence of disease (e.g. Boorse, 1977). This is the pathogenic concept, which is the meaning of health according to the western scientific model, with a focus on ill health such as symptoms of burnout, coronary heart diseases, sickness absence etc. The humanistic perspective has its starting point in health, and sees health as something more than the absence of disease (Naidoo & Wills, 2000; Medin & Alexandersson, 2000). Within the humanistic perspective, the focus is on the whole individual, active and creating, in relation to his/her context or environment (Medin & Alexandersson, 2000). Salutogenesis is the origin of health, with a focus on peoples' resources and capacity to create health, rather than ill health or disease (Antonovsky, 1987). Holistic health theorists such as Nordenfelt (1995) and Pörn (1993) relate health to a person's ability or potential to act or to achieve a certain goal.

## **Work ability**

The concept of work ability has been described by Ilmarinen and Rantanen (1999) as the worker's ability to perform work tasks, taking into account work demands, the worker's individual health and resources. Tengland (2006; 2011)

defines work ability as being able to reach (typical) work-related goals, or use one's competence when the work environment is acceptable, or can be made acceptable. According to Nordenfelt (2008), specific work ability relates to work-specific manual and intellectual competence, strength, tolerance, courage, relevant virtues, and required physical, mental and social health to fulfill the tasks, and reach the goals within that specific job, given that the work environment is acceptable, or can be made acceptable. Nordenfelt and Tengland have a holistic approach to work ability, which implies that work ability may be achieved if the individual has the necessary resources, and is allowed to use these resources during acceptable work conditions. Work conditions may help or hinder individuals in using their resources.

According to Swedish public health policy (Regeringskansliet), good health and well-being shall be maintained throughout the entire working life. This implies that individuals need to maintain their ability to continuously perform their work tasks, although the individual's health may deteriorate due to age. The employee contributes to his or her work ability with different human resources, such as health, education, competence, skills, values, attitudes, and motivation. These human resources are in turn related to the work situation, where different organizational factors, such as demands, work content, work community and leadership, influence the employee's work ability (Ilmarinen, 2001). Work ability is thus the result of the interrelationship between the employee and his or her work conditions.

As the conditions for work may be affected by changes in working life, for example by increased demands and transformed requirements for different work tasks, organizational changes may reduce employees' work ability (Nordenfelt, 2008).

## **Performance**

It has been found that good health and good work ability are related to better performance (Tuomi, Huuhtanen, Nykyri & Ilmarinen, 2001), i.e. good health and good work ability can be seen as resources for high performance. In this context, performance can be considered as a work-related aspect of health.

According to the "happy worker hypothesis", happy workers have higher levels of performance and are more productive than un-happy workers (Taris

& Schreurs, 2009; Wright, Cropanzano & Bonett, 2007). There is, however, limited evidence regarding how psychosocial work conditions may affect performance (Lohela Karlsson, Björklund & Jensen, 2012) and only a few studies have investigated this relation. For example, Donald, Taylor, Johnson, Cooper, Cartwright and Robertson (2005) found that psychological well-being and commitment to the organization were strong predictors of performance. A weaker, but significant, association between limited access to resources and performance was also found. Their study was, however, cross-sectional and provided no information regarding confounders or control variables. In a study by Byrne and Hochwarter (1995), employees with high level of chronic pain and low support from the organization were found to have lower performance than employees with chronic pain who experienced high support from the organization. This supports the idea that contextual factors affect how individuals utilize their resources.

Flexible organizations and loose structures have caused increased uncertainty for employees (Allwin, 2008). It is known that uncertainty or ambiguity regarding what work tasks to carry out decreases job satisfaction and moreover, reduces performance and effectiveness (Katz & Kahn, 1978; Lang, Thomas, Bliese & Adler, 2007). Conversely, organizations with clear goals and strategies provide better opportunities for employees to understand what is expected and how to perform the work (Panaccio & Vandenberghe, 2011; Wright, 2004), which in turn increases performance in the organization (Katz & Kahn, 1978, Lang et al., 2007; Shikdar & Das, 2003). It is suggested that organizations with clear goals are more effective (Wilson, 1989); therefore, predicting the quality and quantity of employees' performance may be of major interest for an organization (Graso & Probst, 2012) as a work-related aspect of health.

## **Job mobility**

A general point of view is that job mobility may impoverish the organization as competence and human capital investments disappear with the employees who quit. Today, the picture of job mobility is changing and job mobility may also be both healthy and developing since turnover often brings new ideas and competence to the organization (Mor Barak, Levin, Nissly & Lane, 2006; Origo & Pagani, 2009). Job mobility is therefore considered to be a work-related aspect of health.

Job mobility can be coercive, as in the case of layoffs and outplacements, but it may also give individuals opportunities to find better and more attractive jobs (Mobley, Griffeth, Hand & Megliano, 1979). However, the opportunities to actually change jobs may differ, due to individual and environmental factors, but it is rarely investigated how health, in terms of action ability or a resource, may relate to job mobility. Changing jobs has been shown to improve job satisfaction, improve psychosocial work conditions and decrease physical and emotional strain (Swaen, Kant, van Amelsvoort & Beurskens, 2002), whereas remaining in a non-preferred employment or “being locked-in”, increases the risk of ill health (Aronsson & Göransson, 1999; Fahlén, Goine, Edlund, Arrelöv, Knutsson & Richard, 2008). Thus, changing jobs may increase health (Swaen et al., 2002) but for individuals who lack the ability or the resources to actually change jobs there is an increased risk of being locked in.

The changes in working life have resulted in new work tasks and new types of jobs. For the employees, changing jobs has become a natural part of working life and new patterns regarding career and employment have appeared (Näswall, Hellgren & Sverke, 2008). Job mobility has, however, mainly been studied in terms of employees’ intent to leave the job, rather than actual job mobility. High turnover intentions are related to negative factors at work such as high workload (Conklin & Desselle, 2007) and job dissatisfaction (Coomber & Barriball 2007), i.e. bad psychosocial work conditions seem to affect the willingness to change jobs. Although turnover intentions are often considered to be a strong predictor of future job mobility, the decision to actually change jobs is more complex and depends on several factors such as socio-demographic and geographic factors (Wilk & Sackett, 1996), recession and high unemployment rates (Rosenfeld, 1992). Moreover, good health, in terms of having the resources or ability to act, can also be assumed to be a prerequisite for job mobility.

## **Health promotion**

Health promotion focuses on strategies to increase employees’ health and wellbeing, as compared with prevention that focuses on identifying and minimizing risk factors for ill health. Thus, the different strategies have different foci for interventions, depending on whether the bio-medical or the

humanistic perspective to health has been applied. Health promotion can be described as a process of enabling people to take action, to exert control over the determinants of health (Nutbeam, 1998; WHO), i.e. health may be seen as an ability to act. Thus, health promotion may correspond to holistic health theories where health is seen as a person's ability to act, given the standard circumstances in his environment to fulfill his goals (Nordenfelt, 1995).

To develop a good work environment and healthy workplaces, more knowledge is needed regarding the psychosocial work conditions that promote health, as prevention of risk factors for ill health may not be enough. According to Antonovsky (1996), health promotion needs a change of focus and search for salutary factors, i.e. those that actively promote health, and not only being low on risk factors. This is in line with the Swedish public health policy (Regeringskansliet), which highlights the necessity for organizations to promote health at work, as preventing ill health is not enough. A common problem within workplace health promotion is that interventions are often directed to improving lifestyle and individual behaviours (Bourbonnais, Brisson, Vinet, Vézina, Abdous & Gaudet, 2006; Maes, Verhoeven, Kittel & Scholten, 1998; Semmer, 2006). Although the interventions take place within the workplace, the target is mostly employees' health behavior, as the workplace is a place where people can easily be reached (Semmer, 2006). There is increasing interest in organizational health interventions aiming to improve psychosocial work conditions and employees' health (Nielsen, Randall, Holten & Rial González, 2010), although the effectiveness of these interventions is mixed (Semmer, 2006). In order to understand why some interventions succeed and some fail, there is a need for more knowledge regarding what the "success factors" are (Nielsen, Taris & Cox, 2010; Semmer, 2006). Further, it is necessary to go beyond the traditional risk factors and search for additional or non-traditional factors that promote employees' health and well-being (Nielsen, Taris & Cox, 2010).

## **Concluding remarks**

Most research within occupational health has investigated psychosocial work conditions in relation to ill health, i.e. prevention. To develop a good work environment and healthy workplaces, more knowledge is needed regarding the psychosocial work conditions that promote individual resources and health. Health is a complex concept, and this might explain why it is

measured in terms of symptoms or ill health rather than good health. Psychosocial work conditions are also generally, investigated at an individual level, without taking the organization or the workplace into consideration. In this thesis, the focus is on a holistic approach, in terms of organizational and workplace conditions promoting individual resources and action ability.

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# AIMS OF THE THESIS

## General aim

The overall aim of this thesis is to investigate how different aspects of health are associated with psychosocial work conditions in today's working life.

## Specific aims

The specific aims are:

- To investigate if traditional job stress models or a combination of the models may predict health longitudinally.
- To compare differences in work conditions and burnout at three hierarchical levels: subordinates, first-line managers and middle managers, and investigate if the association between work conditions and burnout differs for subordinates, first-line managers and middle managers.
- To determine what work conditions predict voluntary job mobility and to examine if good health or burnout predicts voluntary job mobility.
- To explore associations between clarity of work, work conditions and work ability, and if work ability affects performance, given the organizational and work conditions.

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# METHOD

## Design and settings

The data in the present thesis are based on two empirical studies with results presented in four papers. The first study was a longitudinal study, based on questionnaire data collected at the Swedish Labour Market Administration (Arbetsmarknadsverket), AMV, at three regional organizations (Jönköpings län, Örebro län and Östergötlands län), in 60 local employment agencies (Papers I and III). The second study (Papers II and IV) is designed as a prospective cohort study. The data included in this thesis are cross-sectional, based on questionnaire data from ten organizations (nine organizations in Paper II) from different sectors of the labour market, participating in the research project Leading and Organizing for Health and Production (LOHP). Table 1 gives an overview of the two studies.

Table 1. Overview of the overall design of the four papers.

	The AMV study		The LOHP study	
	Paper I	Paper III	Paper II	Paper IV
<b>Study design</b>	Longitudinal	Longitudinal	Cross-sectional	Cross-sectional
<b>Data</b>	Employees (N=1010) at the AMV. Questionnaire data.	Employees (N=1010) at the AMV. Questionnaire data.	Subordinates and managers (N=6841) in 9 organizations within the LOHP-project. Questionnaire data.	Subordinates (n=4442) in 10 organizations within the LOHP-project. Questionnaire data.
<b>Method</b>	Correlations, Student's <i>t</i> -test, ANOVA, simple and multiple linear regressions.	Chi-square test, Student's <i>t</i> -test, logistic regressions.	Correlations, chi-square test, Fisher's exact test, Student's <i>t</i> -test, ANOVA, multiple linear regressions.	Chi-square-test, multi-level logistic regressions.
<b>Dependent variable(s)</b>	Self-rated health and burnout.	Voluntary job mobility.	Burnout.	Work ability and performance.
<b>Independent variable(s)</b>	Demand, control, social support, effort, reward, variety, feedback, autonomy, task identity.	Variety, feedback, autonomy, task identity. Self-rated health and burnout.	Demand, control, social capital, role clarity, role conflict, interaction work - private life, span of control.	Clarity of work, demand, control, social capital, work ability.
<b>Control variables</b>	Sex, age education.	Sex, age, education, civil status, having children living at home.	Sex, age, education. Organization and work group.	Sex, age, education. Random effects of organization and department.

## **The Swedish Labour Market Administration**

The Swedish Labour Market Administration (AMV) is under the direct control of the Government (Regeringen) and the Ministry of Enterprise, Energy and Communications (Näringslivsdepartementet). In 2001, the AMV consisted of one central authority, 20 regional organizations and 334 local public employment offices. The main tasks of the AMV's were: (a) to match unemployed individuals with organizations looking for employees; (b) to promote employment and competence among the unemployed; (c) to help individuals with a weak position in the labour market and prevent exclusion; (d) to prevent long-term unemployment and; (e) to prevent a gender-segregated labour market and promote gender equality and heterogeneity (AMS, 1999).

The AMV study is based on questionnaire data collected at three regional organizations (Jönköpings län, Örebro län and Östergötlands län), in 60 local employment agencies at the AMV.

## **Leading and Organizing for Health and Production**

Leading and Organizing for Health and Production (LOHP) is a prospective cohort study, conducted at HELIX VINN Excellence Centre, Linköping University. The overall aim of the LOHP project is to improve knowledge about the interplay between organization, leadership and work conditions for health and development of production.

The LOHP study includes ten different organizations in Sweden: four municipalities, one industrial company, three governmental agencies, one public health care organization and one private healthcare company. The representatives in the organizations were contacted by the researchers and asked if they were interested in participating in the study. Organizations from different sectors were selected to ensure variety in the material. Questionnaires were collected between 2010 and 2012.

## Data collection

### The AMV study

A questionnaire was sent to all employees ( $N=1010$ ) in the three participating organizations in 2001. A reminder was sent to the non-respondents after two and four weeks. To ensure confidentiality, each respondent sent the completed questionnaire back to the researchers. In all, 792 subjects (78%) responded to the questionnaire. A follow-up questionnaire was sent two years later (2003) to the employees who had responded to the first questionnaire. The follow-up questionnaire was answered by 662 respondents (66%).

### *Non-response analysis*

Differences between respondents and non-respondents were analysed by available data (sex and age). The respondents were older than the non-respondents (Baseline: ( $\chi^2(3, 1010) = 10.02, p<.05$ ), Follow-up: ( $\chi^2(3, 970) = 30.38, p<.001$ ). The difference between respondents and non-respondents regarding sex was not significant at baseline ( $\chi^2(1, 1010) = 0.23, p: \text{n.s.}$ ) but it was significant at the follow-up ( $\chi^2(1, 970) = 3.20, p<.05$ ) where the response rate was higher for women than for men.

### The LOHP study

Questionnaires were sent by post or e-mail to employees ( $N=8430$ ) in ten different organizations, participating in the LOHP project. A total of 4904 (58%) employees responded to the questionnaire. To ensure confidentiality, each respondent sent the completed questionnaire back to the researchers. A reminder was sent after two weeks, and a second reminder after another two weeks.

Paper II was based on empirical data ( $N=6841$ ) from nine different organizations within the LOHP project: four municipalities, one industrial company, two governmental agencies, one public health-care organization, and one private healthcare company. A total of 4096 employees (60%)

responded to the questionnaire: 3659 subordinates, 345 first-line managers and 92 middle managers. The response rate was 57 percent for subordinates, 84 percent for first-line managers, and 74 percent for middle managers.

Paper IV was based on empirical data ( $N=8430$ ) from ten organizations within the LOHP project: four municipalities, one private industrial company, three governmental agencies, one public health-care organization, and one private health-care company. In Paper IV, only the subordinates were included ( $n=4442$ , response rate 57%).

### *Non-response analysis*

Differences between respondents and non-respondents were analysed by available data (sex and age).

The respondents were older than the non-respondents ( $\chi^2(4, 8082) = 23.33$ ,  $p < .001$ ). There was no significant difference in the distribution of sex between the respondents and non-respondents ( $\chi^2(1, 8420) = 1.28$ .  $p$ : n.s.). The response rate varied between 49 percent and 78 percent for the ten organizations.

## **Statistical analysis**

In Paper I, the relationship between the included variables (work conditions, health and burnout) was examined with Pearson's coefficient correlation. The relationship between work conditions and health was analysed by multiple linear regressions, controlling for sex, age and education.

In Paper II, differences in distributions of categorical variable between subordinates, first-line managers and middle managers were examined using the chi-square test or the Fisher's exact test. The relationship between the variables (work conditions and burnout) was examined using Pearson's correlation coefficient. The distribution of the means and standard deviations for work conditions and burnout among subordinates first-line managers and middle managers was calculated using ANOVA. To investigate the associations between work conditions and burnout, multiple linear regressions were performed, controlling for sex, age, education, work group and organization.

In Paper III, mobility and non-mobility was analysed by the chi-square test. Differences in the distribution of means and standard deviations of work conditions and health in relation to mobility or non-mobility were assessed by *t*-test. The relationship between the work condition variables, self-rated health and job mobility was analysed by logistic regressions, controlling for sex, age, education, civil status and having children living at home.

In Paper IV, differences in proportions between groups were assessed with the chi-square test. The outcome variables, work ability and performance, were dichotomized by the median for use as outcome variables in logistic regression. Multilevel logistic regression was used to take into account clustering effects within department and organization. The associations between clarity of work, demand, control and social capital with work ability, and the associations between clarity of work, demand, control, social capital, and work ability with performance were analysed using multilevel logistic regression controlling for sex, age, education, and the random effects of department and organization.

In the LOHP study, missing items in a scale were replaced according to the convention of the SF-36 questionnaire (Ware, Snow, Kosinski & Gandek, 1993). A total score was calculated for a person if he/she had answered at least half of the questions of the scale. The missing items were given the average score of the other items in the scale. In the AMV study, only complete scales were included.

*P*-values less than 5% were regarded as statistically significant.

## **Instruments and measures**

To investigate health and psychosocial work conditions, a number of different instruments have been used and presented below.

### **Aspects of health**

Four different health measure instruments (or parts of the instruments) have been used to capture a full range from good health to ill health:

## *36-Item Short-Form Health Survey, SF-36*

SF-36 is a multi-purpose, short-form health survey with 36 questions (Sullivan, Karlsson & Ware, 1995; Ware & Sherbourne, 1992). SF-36 attempts to represent a multi-dimensional health concept and measure the full range of health status, including well-being and personal evaluations of health. The Vitality-scale (4 items), capturing a health state ranging from feeling tired and worn out to feeling full of pep and energy, was used in Papers I and III.

One example item for measuring vitality is: “How much of the time during the 4 past weeks did you have a lot of energy?” The response scale is an 8-point Likert scale (1, all of the time; 8, none of the time). Cronbach’s alpha for vitality was .82.

## *EQ5D*

The EQ-5D is a non-disease-specific instrument that aims to cover the full health spectrum from best to worst (Brooks, 1996). Health-related quality of life was measured by the Visual Analogue Scale (VAS) from the EQ-5D instrument in Papers I and III.

The purpose of the self-rating scale VAS scale is to capture overall health. The respondents rate their current physical and mental health state ranging from 0 (“the worst state you can imagine”) to 100 (“the best state you can imagine”).

## *Copenhagen Burnout Inventory, CBI*

The Copenhagen Burnout Inventory (CBI) was developed to measure ill health, burnout, anxiety and fatigue (Kristensen, Borritz, Villadsen & Christensen, 2005). The generic part of the CBI, personal burnout, was used in Papers I, II and III, as an indicator of general burnout since the generic part can be answered by everyone, regardless of occupational status (employed, unemployed, retired, etc.).

The scale (6 items) is intended to answer the question “How tired or exhausted are you?” and the response scale is a 5-point Likert scale (1, always; 5, never/almost never). The scale ranges from 0 to 100; the first category

(always) is scored 100 and the fifth category (never/almost never) is scored 0. Cronbach's alpha for personal burnout was .87 in Papers I and III, and .89 in Paper II.

## *Work Ability Index, WAI*

The Work Ability Index (WAI) is a generic tool to assess workers' ability to work in relation to the demands or the requirements for work, individual health and resources (Ilmarinen, 2007; Toumi, Ilmarinen, Jahkola, Katajarinne & Tulkki, 1998). The WAI consists of seven dimensions; current work ability, work ability in relation to physical and mental demands, estimated health impairment, sick leave over the last 12 months, estimated work ability over two years to come, and mental resources. The WAI ranges from 7 to 49 points and can be categorized into four levels from poor work ability (7-27 points) to excellent work ability (44-49 points).

Work ability was measured by the work ability score, a single item measuring current work ability compared with the lifetime best: "Assume that your work ability at its best has a value of 10 points. How many points would you give your current work ability?". The scale ranges from 0 (meanings that you cannot currently work at all) to 10 (meanings that your work ability is at its best right now), and was used in Paper IV.

## **Psychosocial work conditions**

Six different models/instruments were used to measure psychosocial work conditions:

### *Demand-Control-Support model*

The Demand-Control-Support (DCS) model (Karasek & Theorell, 1990) combines high and low demands with high and low control. High demands in combination with low control increase the risk of stress and ill health, while high demands in combination with high control may promote health and learning.

An example capturing demands (5 items) is “Do you have to work very fast?” and an example capturing control (6 items) is: “Do you have influence over how to perform work?”. The response is a 4-point Likert scale ranging from “Yes, often” (1) to “No, never” (4). Cronbach’s alpha for the demand scale in Paper I was .69, .80 in Paper II and .79 in Paper IV. Cronbach’s alpha for the control scale was .54 in Paper I, .70 in Paper II, and .67 in Paper IV.

Social support (6 items) was used in Paper I. An example capturing social support is “People I work with are friendly”, and the response scale is a 4-point Likert scale ranging from “Strongly disagree” (1) to “Strongly agree” (4). Cronbach’s alpha for the social support scale was .85.

### *Effort-Reward Imbalance model*

The Effort-Reward Imbalance (ERI) model (Siegrist, 1996) focuses on the interaction between high cost and low gain, i.e. the imbalance between perceived effort invested at work and the rewards for it (money, esteem and status control). Employees who feel that they have invested great effort but have received low rewards for it experience emotional distress and run a higher risk of stress and negative health effects. The ERI model was used in Paper I.

An example item capturing effort (6 items) is: “I am often pressured to work overtime” and an example item capturing reward (11 items) is: “My job promotion prospects are poor”. The response scale is a 4-point Likert scale ranging from “Strongly disagree” (1) to “Strongly agree” (4). Cronbach’s alpha was .74 for the effort scale and .78 for the reward scale.

### *Job Characteristic Inventory*

The purpose of the Job Characteristic Inventory (JCI), by Sims, Szilagyi and Keller (1976) is to measure how different job characteristics relate to productivity and job satisfaction in different organizations. The JCI is based on six different dimensions of psychosocial work conditions: variety, autonomy, task identity, feedback, dealing with others and friendship. The first four

dimensions; variety (5 items), autonomy (5 items), task identity (4), and feedback (3 items) are labelled as core variables, and used in Papers I and III.

An example item for measuring variety is: "How much variety is there in your job?", for measuring autonomy: "To what extent are you able to do your job independently of others?", for measuring task identity: "How often do you see jobs projects or jobs through to completion?", and for measuring feedback: "To what extent do you find out how well you are doing on the job as you are working?". The response scale is a 5-point Likert scale ranging from "Very little (1) to "Very much (5). Cronbach's alpha was .84 for the variety scale, .69 for the autonomy scale, .82 for the feedback scale and .79 for the task identity scale.

### *Social capital at work*

Social capital at work is designed to assess cognitive and structural components of social capital in a work context (Kouvonen, Kivimäki, Vahtera, Oksanen, Elovainio, Cox et al., 2006), and is used in Papers II and IV. The scale (8 items) measures social capital perceptions at both the individual and the work-group level, capturing whether people feel they are respected, valued and treated equally.

An example item for measuring social capital at work is: "People feel understood and accepted by each other". The response scale is a 5-point Likert scale ranging from "Fully disagree" (1) to "Fully agree" (5). Cronbach's alpha was .90 in Papers II and IV.

### *QPS Nordic*

QPS Nordic is a general questionnaire, constructed to assess employees' perceptions of organizational, psychological and social work conditions (Lindström, Elo, Skogstad, Dallner, Gamberale, Hottinen et al., 2000). QPS Nordic consists of 129 questions pertaining to different factors at work such as: job demands, control at work, role expectations, predictability and mastery of work, social interaction, leadership, group work, organizational climate, work motives, and the interaction between work and private life. Role conflict (3 items), and interactions between work and private life (2 items) have been

used in Paper II, role clarity (3 items) has been used in Papers II and IV, mastery of work (2 items) has been used in Paper IV.

An example item for measuring role clarity is: "Have clear, planned goals and objectives been defined for your job?", for measuring role conflict: "Do you have to do things that you feel should be done differently?", and for measuring the interactions between work and private life: "Do the demands from your work interfere with your home and family life?". Cronbach's alpha was .66 for role conflict, .63 for interactions between work and private life, and .75 for role clarity in Paper II and .76 in Paper IV. In Paper IV, two items from mastery of work: "Are you content with the quality of the work you do?" and "Are you content with the quantity of the work you do?" were used as an outcome measure, capturing quality and quantity of performance (Cronbach's alpha=. 73).

The response scale is a 5-point Likert scale ranging from "Very seldom" (1) to "Very often or always" (5).

## *Adjustment latitude*

It has been found that opportunities to adjust work when you are tired, out of sorts or feeling ill are associated with higher work ability and lower sick leave (Hultin, Hallqvist, Alexanderson, Johansson, Lindholm, Lundberg et al., 2010; Johansson, Lundberg & Lundberg, 2006). Adjustment latitude (Johansson et al., 2006) describes opportunities to adjust work, or the individual's decisions authority to adjust his or her work in order to maintain sufficient work ability. Adjustment latitude consists of nine questions with a 3-point Likert scale, ranging from "Always" (1) to "Seldom/Never" (3).

In Paper II, three questions to investigate opportunities to adjust work were used: "Can you work at a slower pace?", "Can you shorten the working day?", and "Can you get help from work colleagues?".

## **Ethical considerations**

Ethical principles for social science and medical research have been fulfilled, such as explaining the purpose of the research, received informed

content, maintained confidentiality etc. (American Psychological Association; World Medical Association). The participants in the two studies received information about the study and its purpose; it was clear that no individuals could be identified, that participation was voluntary and that they could withdraw their participation at any time.

In the AMV study, the questionnaires were sent to each individual by post; they were returned by the respondent in an enclosed response envelope and were only read by the researchers. In the LOHP study, questionnaires were sent to each individual by post or e-mail; they were returned by the respondent in an enclosed response envelope or by e-mail and were only read by the researchers. The responses were handled confidentially and all results were analysed and presented only at group level, in order to avoid identifying individuals and to infringing their integrity.

The two studies were approved by the Ethics Committee at Linköping University.

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# FINDINGS

This chapter presents the findings of the four papers.

## Paper 1

### **Evaluation of job stress models for predicting health at work**

Paper 1 was a methodological study where the aim was to investigate if the DCS model, the ERI model and the JCI model were correlated; if the subscales predicted health; and to analyse which combination of subscales was the most useful predictor of health longitudinally.

In the correlations analysis, three groups of work conditions emerged with high inter-correlations between variables from the three original job stress models: 1) demands and effort, 2) support and reward, 3) control, variety and autonomy. The results of Paper I further showed that all three original job stress models were better predictors of burnout than health, probably due to the fact that the models are developed to identify risk factors associated with ill health. Based on the results of a linear regression analysis, the three work condition variables from the three models with the highest score for each health measure instrument (VAS, vitality, burnout) were used as predictors in a multiple stepwise regression analysis. Reward, variety and effort were the best predictors of health longitudinally, measured by the VAS scale and the vitality scale. Effort, reward, variety and demands were the best predictors of ill health longitudinally, measured by burnout. The analysis resulted in a new model based on low effort, high reward and high variety, with a higher predictive power to predict health longitudinally than the original models.

## Paper II

### **Investigating work conditions and burnout at three hierarchical levels**

The objective of Paper II was to compare differences in work conditions and burnout at three hierarchical levels: subordinates, first-line managers and middle managers; and to investigate if the association between work conditions and burnout differs for subordinates, first-line managers and middle managers.

The results of Paper II showed that managers had similar work conditions, regardless of managerial level, and differed from subordinates. Managers rated demands, control, and social capital as higher than subordinates. Middle managers experienced more interactions between work and private life than subordinates and first-line managers. Middle managers had more opportunities to shorten their working day than subordinates and first-line managers, and more opportunities to work at a slower pace than subordinates, while subordinates had more opportunities to get help from work colleagues. No differences were found between the three hierarchical levels regarding role clarity and role conflict. Subordinates experienced more symptoms of burnout than managers.

The results further showed that different work conditions were associated with symptoms of burnout for subordinates, first-line managers and middle managers. For subordinates and first-line managers, interactions between work and private life were strongly associated with burnout. Social capital was associated with fewer symptoms of burnout for subordinates and first-line managers, but was not significant for middle managers. For both first-line and middle managers, opportunities to get help from work colleagues were associated with more symptoms of burnout. Role conflict was highly related to symptoms of burnout for middle managers.

## **Paper III**

### **The importance of work conditions and health for voluntary job mobility: a two-year follow-up**

The objective of Paper III was to determine what work conditions predict voluntary job mobility and to examine if good health or burnout predicts voluntary job mobility.

The results of Paper III showed that work conditions were related to voluntary job mobility in terms of low variety and high autonomy. Low variety may predict voluntary job mobility due to job dissatisfaction, and high autonomy may predict voluntary job mobility due to career development. After adjusting for health variables (VAS, vitality, burnout), low variety and high autonomy remained associated with voluntary job mobility. The associations between health and voluntary job mobility were not significant, but burnout was close to significance. Younger respondents and respondents with no children living at home were also more mobile.

## **Paper IV**

### **Work ability and performance – associations between clarity of work and work conditions: A multilevel analysis**

The aim of Paper IV was to explore associations between clarity of work, work conditions and work ability, and secondly if work ability affects performance, given the organizational and workplace conditions.

The results showed that a higher degree of clarity of work, a higher degree of control and a higher degree of social capital were associated with better work ability. A higher degree of demands was associated with lower work ability. Sex, age and level of education were not statistically significantly related to work ability.

The results further showed that a higher degree of clarity of work, a higher degree of control, a higher degree of social capital and a higher degree of work ability were associated with better performance. A higher degree of demands was associated with lower performance. Higher age and having a secondary education were associated with better performance, while sex was not statistically significantly related to performance.

In Paper IV, the strongest associations were found between clarity of work and good work ability, and clarity of work and better performance. Good work ability was also strongly associated with better performance, indicating that good work ability is an important factor for employees' performance.

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# DISCUSSION

The overall aim of this thesis was to investigate how different aspects of health are associated with psychosocial work conditions in today's working life. The findings in Paper I imply that traditional job stress models are better for predicting ill health than good health. In Paper II, psychosocial work conditions and symptoms of burnout were found to differ between different hierarchical levels, and different psychosocial work conditions were associated with symptoms of burnout at different hierarchical levels. Paper III showed that psychosocial work conditions predict voluntary job mobility. This may be due to two forces for job mobility: job dissatisfaction and career development. Good health may affect job mobility through several offsetting channels, involving the resources and ability to change jobs. In Paper IV a strong association between high work ability and better performance was found. These aspects of health were associated with organizational aspects such as clear goals and expectations, which led to improved psychosocial work conditions.

## Health as action ability

In the four papers, different work-related aspects of health were assessed. An underlying purpose in Paper I was to investigate whether standardized health measure instruments might capture a more holistic approach to health. With a holistic approach, health is seen as a person's ability or potential to act or to achieve a certain goal, and the balance between a person's action ability and goal (Nordenfelt, 1995; Pörn, 1993). Good health, in terms of resources, may be created in everyday activities and in the social relations between employees at the workplace. Employees with good health may also contribute to good health through their interactions with others (Paper I). In contrast to burnout, good health was a difficult outcome to capture. Generic health measure instruments are designed to capture symptoms, and may be too coarse for a healthy, working population (Papers I, III).

Availability of different resources can protect individuals from detrimental consequences of stressful situations (Antonovsky, 1987; Grebner,

Elfering & Semmer, 2010; Hobfoll, 1989). Individuals who possess resources are also more likely to gain more resources, and a surplus of resources is assumed to result in a sense of well-being (Hobfoll, 1989). Being in possession of these resources, but also having the capacity and the opportunity to use them, may help individuals to cope with stressors (Antonovsky, 1987). Good health is not only a matter of having the resources but also the ability to act and use them. According to these theories, health is determined by the ability to act and the balance between a person's action ability and goal, as suggested by Nordenfelt (1995) and Pörn (1993). However, this was difficult to capture with generic health measure instruments. As a result, in Paper IV we tried out an additional health outcome: work ability. Good work ability is a dynamic process, and is created in the relation between the employee's individual resources and the conditions for work. Good work ability may in turn, promote employees' work performance. Work ability has mainly been used within the research areas of sickness absence- and return to work (e.g. Ahlström, Grimby-Ekman, Hagberg & Dellve, 2010; Sell, 2009; Willert, Thulstrup & Bonde, 2011) but may also be an important aspect of health within a healthy population, in terms of having the necessary resources and the ability to perform.

As suggested in Paper III, good health may be a prerequisite for job mobility. Employees who possess the necessary resources and the ability to use them may be more able to take the step and actually change jobs. Employees who lack these resources may not be able to change jobs despite job dissatisfaction (Aronsson & Göransson, 1999; Fahlén et al., 2008). This might also explain why the generic health measure instruments did not predict job mobility in Paper III; good health affects job mobility through several offsetting channels, involving the resources and ability to seek a new job.

## **Psychosocial work conditions associated with different aspects of health**

Different psychosocial work conditions may provide opportunities for utilizing health resources. Although most job-stress models or instruments measuring psychosocial work conditions are designed to capture risk factors, single items or subscales may be useful when identifying psychosocial work conditions promoting health. On the other hand, as found in Paper I,

psychosocial work conditions that were negatively associated with ill health, had positive associations with good health. Psychosocial work conditions associated with ill health were also negatively associated with good health. Thus, reduction of risk factors may have much in common with factors promoting good health (Mackenbach, van den Bos, Joung, van de Mheen & Stronks, 1994). For example, a high degree of variety at work is known to promote employees' motivation and increase job satisfaction (Demerouti, 2006; Hackman & Oldham, 1975), while a low degree of variety at work leads to decrease in job satisfaction but also an increase in the intent to leave the job (Brannon, Barry, Kemper, Schreiner & Vasey, 2007). High autonomy is often described as a strong predictor of good health (Pousette & Johansson Hanse, 2002; Biaggi, Peter & Ulich, 2003; Morgeson & Humphrey, 2006) while low autonomy increases sickness absence (Lin, Yeh & Lin, 2007; Spector & Jex, 1991). Thus, psychosocial work conditions that promote health seem to have similar, but mirrored patterns as psychosocial work conditions that predict ill health (Mackenbach et al., 1994).

Psychosocial work conditions associated with good health may also promote performance (Paper IV). Good psychosocial work conditions are known to increase employees' motivation and job satisfaction (Hackman & Oldham, 1976; Humphrey, Nahrgang & Morgeson, 2007; Sousa-Poza & Sousa-Poza, 2000), which in turn may affect employees' performance and productivity (Humphrey, Nahrgang & Morgeson, 2007; Judge, Bono, Thoresen & Patton, 2001; Shikdar & Das, 2003). In Paper IV, organizational aspects such as clarity of work were found to be an important factor for employees' health but also for their performance. Clear goals and strategies provide better opportunities for employees to understand what is expected of them and how to perform their work (Panaccio & Vandenberghe, 2011; Wright, 2004). Clear goals and work roles may also affect the interaction between the individual and other colleagues' work, the social climate and social behaviours at the workplace (Hu & Liden, 2011).

Psychosocial work conditions differed for subordinates, first-line managers and middle managers (Paper II) although all managers, regardless of managerial level, seem to have reasonably similar work conditions. Managers experienced higher demands, but also more control, more social capital, and more opportunities to adjust their work than the subordinates. A high degree of control and social capital may mitigate the effect of a demanding work situation, indicating that managers have more resources

than subordinates to deal with the demands from work (Bernin & Theorell, 2001; Skakon et al., 2011).

Different psychosocial work conditions were also found to have different importance for health at the various hierarchical levels. The findings in Paper II showed that psychosocial work conditions associated with symptoms of burnout were similar for subordinates and first-line managers, while the middle managers differed somewhat from the other two in this respect. As first-line managers and subordinates often work in the same place and encounter the same problems, their work tasks are often inter-linked (Broadbridge, 2002; Kraut, Pedigo, McKenna & Dunette, 1989; Pavett & Lau, 1983; Styhre & Josephson, 2006). For example, social capital was associated with fewer symptoms of burnout for subordinates and first-line managers, but not for middle managers. This indicates that good social relations at work may be more important for subordinates and first-line managers as they may be more dependent on their colleagues than middle managers. Instead, middle managers may rely on contacts outside their workplace (Ibarra & Hunter, 2007; Kaplan, 1984). This highlights the importance of differentiating between the various hierarchical levels in health promotion interventions, as access to resources and the capacity to use them in dealing with stressful work conditions may differ between hierarchical levels in the organization.

Psychosocial work conditions and their impact on employees' health may differ from one organization to another (e.g. Barley & Kunda, 2001; Cox, Karanika, Griffiths & Houdmont; 2007; Härenstam et al., 2006). By using a multilevel analysis in Paper IV, it was possible to distinguish the relative importance of individual, department, and organization. A multilevel analysis was performed to investigate associations between subordinates' psychosocial work conditions, work ability and performance. The findings imply that employees' health is mostly influenced by organizational and work conditions, while individual factors such as sex, age and education only explained a smaller part.

## **Room for manoeuvre and social relations**

In the four papers two domains of psychosocial work conditions for promoting health emerged: 1) room for manoeuvre and 2) social relations. In all papers psychosocial work conditions capturing the individual's room for

manoeuvre, such as control, autonomy, variety or clarity of work, were strongly associated with different aspects of health. The findings in Paper IV imply that organizations with clear goals may create favourable conditions at work and support employees' control and their ability to cope with working life. Considering this, clarity regarding goals and expectations from the organizational level may become even more important in today's flexible working life. A high degree of control may not be of benefit if goals and expectations are unclear (Bliese & Castro, 2000; Hellgren, Sverke & Näswall, 2008). A high degree of control may on the opposite, cause frustration and stress if the goals are unclear, as suggested by Hellgren et al. (2008).

The second domain captures the importance of good social relations at work, such as social support, social capital and reward. Since work in teams or work groups is becoming increasingly common, the social dynamics and relations at the workplace will probably become even more important for the different aspects of health that have been studied in this thesis, as employees become more dependent on each other. It is suggested that social relations are of major importance in today's working life (Blomqvist, 2001; Hu & Liden, 2011, Nordenfelt, 2008), and social support and social capital at work is known to reduce stress and strain (Bakker, Hakanen, Demerouti & Xanthopoulou, 2007; Johnson & Hall, 1988; Oksanen et al., 2008; Sapp et al., 2010).

Room for manoeuvre may help employees to maintain a balance between their resources and the demands and requirements from work and good social relations may be a consequence and function as social resources that promote employees' ability to act (Papers I-IV). Psychosocial work conditions that promote employees' room for manoeuvre and social relations at the workplace promote good health by strengthening employees' resources and their opportunities to use them. It is the organizational conditions that determine room for manoeuvre and opportunities for health improvement. These findings are in accordance with Antonovsky (1996) and Hobfoll (1989), who emphasize that individuals can cope with demands and requirements at work if they have the necessary resources and the capacity to use them. Thus, employees who have the necessary resources and the ability and opportunity to use them may experience good health and wellbeing.

## **Methodological considerations**

Quantitative research methodologies were used in the two studies and the material was extensive. The questionnaires used in both studies consisted of well-established and validated instruments, which provide opportunities to generalize the results. However, the self-reported data could be considered a limitation. The AMV study (Papers I and III) was based on extensive, longitudinal material, which may allow causal interpretations. The relatively high response rate may also provide opportunities for generalizing the results. Nevertheless, a weakness of the study is the homogeneous population, as all of the participants were well-educated, white-collar workers, working in the same organization with similar work tasks. This may have caused imprecise estimation of associations, compared with a more heterogeneous population.

The LOHP study was based on extensive material (ten organizations) containing three hierarchical levels, where all respondents answered the same questionnaire. The design of the LOHP study made it possible to match subordinates, their managers and the organization (Paper II) or subordinates, department and organization (Paper IV). This coding procedure allowed us to control for the possible random effects of differences in organizations and departments. Nonetheless, the material was cross-sectional. Longitudinal material is needed in order to strengthen our results.

## **Conclusions and Implications**

This thesis has provided knowledge regarding different aspects of health and psychosocial work conditions. Conditions at the organizational and workplace level set the prerequisites for if and how employees use their resources and their ability to act. Access to resources and the capacity to use them may vary depending on the employees' hierarchical position. Occupational health research needs to focus on differences in psychosocial work conditions at different hierarchical levels. Organizations with clear goals and expectations may create more favourable conditions at work, supporting employees' room for manoeuvre, social capital and their ability to cope with working life, hence promoting health. Health promotion has a holistic approach and considers the work environment, the individual and the interplay between them. However, most health interventions at workplaces

are directed to employees' health behaviour rather than improvements in organizational and work conditions. To develop a good work environment it is necessary to identify conditions at work that promote different aspects of health. These conditions need to be tackled at the organizational, workplace and individual level, as good health is shaped by the interplay between the employee and the conditions for work.

Future research should continue to investigate psychosocial work conditions and the association with different aspects of health. This thesis shows that health is created in the interrelation between the organization, the workplace and the individual, but further investigation, especially using longitudinal material is needed.



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