The importance of organizational characteristics for psychosocial working conditions and health

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Umeå 2009

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ISBN: 789-91-7264-735-0
ISSN: 1104-2508
Printed by: Print & Media
Umeå, Sweden 2009

To Annika, my mother

Abstract

Background The importance of organizations for understanding differences in the working conditions and health of employees is often emphasized but rarely explored empirically. The general aim of this thesis is to describe organizational characteristics of workplaces, and to assess their impact on the psychosocial working conditions and health of employees. In modern working life, it is assumed that employees' working conditions and health are affected by a general transformation of workplaces from bureaucracy to post-bureaucracy.

Methods The organizational data used are based on structured interviews with managers at workplaces in different types of operations in mid-Sweden, whereas the individual data consist of a questionnaire to all employees working in the participating workplaces, resulting in a dataset of 90 workplaces and 4306 individuals. Descriptive analysis was carried out for comparison of organizational characteristics in different types of operations, while multilevel analysis was applied to investigate the magnitude of the organizational impact on psychosocial working conditions, and to analyze associations between organizational characteristics, psychosocial working conditions and health.

Results The workplaces were mainly displayed by a combination of bureaucratic and post-bureaucratic characteristics, and these were unequally distributed between types of operations. A systematic variation in the psychosocial working conditions and health of employees was found between workplaces, and the variation in psychosocial working conditions was attributed to several organizational levels. The variation between workplaces was explained by both organizational characteristics of the workplaces and individual characteristics of the employees. Formalization, centralization, job enrichment, individual responsibility, soft control systems, and performance control were associated with psychosocial working conditions when controlled for occupational class, gender and age of employees, and a high degree of customer adaptation was associated with increased sickness absence of employees.

Conclusion Bureaucracy and post-bureaucracy should not be regarded as dichotomies. Organizational characteristics of workplaces have an impact on the psychosocial working conditions and health of employees beyond occupational class. This has implications for both the theory and the practice of occupational health research.

Preface

Standing here at the end of the road it is hard to understand that those optimists were right: it ends, it really does, and not by choosing to walk out of the front door. In my case, it's been a long trip in many ways, both personally and professionally. Don't misunderstand me, it's been a fantastic journey with its many ups and downs, and I can't imagine what I would have been without those years. On the way I've had the privilege of meeting many inspiring and interesting people who have contributed to making this work possible.

First of all, this trip would never even have started if my supervisors Professor Annika Härenstam, Professor Staffan Marklund, and Professor Björn Halleröd had not given me the chance. Thank you for bringing me into the world of research! Staffan and Annika, thank you for the unique opportunity to be part of the whole process of a larger research project, from set-up to conferences with participating workplaces – a valuable experience I wouldn´t want to be without. You have been truly inspiring and provided me with great knowledge and practical guidance. Staffan, above all I want to thank you for believing in me when I needed it most. It kept me on the track and really made a difference!

I also want to express my gratitude to Professor Peter Westerholm and the whole WOLF group for being a research family, offering continuity and a place of belonging, manifested in the WOLF seminars, when workplaces have shifted and vanished. This meant a great deal to me! An especially warm thank-you to my dear colleague Monica Söderholm, who was my next-door neighbor at work for many years, and to my research sisters Chatrine Höckertin and Maria Nordin, who not only became my doctoral colleagues but also dear friends. I would interview managers or visit occupational health services with you any time! Thank you for supporting me, and for all the fun we had. Chatrine, you are the best life coach there is. Thank you for sharing personal and job matters whenever needed.

On the road I have passed a number of workplaces. I would like to thank former colleagues at the National Institute of Working Life (NIWL) in Stockholm for creating a stimulating research environment and for always having your doors open. I would especially like to thank Thomas Lind for valuable statistical help and advice, and, together with Antonio Ponce de Leon, for helping me get into the world of multilevel analysis. I also want to thank the Orgdok group for constructive seminars, discussions, and valuable comments on my work, as well as my co-workers in Miljonprogrammet. Last but not least, thanks to my NIWL colleagues Claudia Bernhard-Oettel, Miriam Eliasson, and John Sjöström, who helped through this process by

being good friends and contributing to a social life at work with many pleasant lunches and coffee breaks. After the closure of NIWL, I had the good fortune to come to the Section of Person Injury Prevention at Karolinska Institute, Stockholm. My warmest thanks to you all for giving me a place to be and for your social support, especially to Kristina Björklund, Arja Lehto, Malin Lohela, Marjan Vaez, and Margaretha Voss for valuable comments on my work! Many thanks also to Christian Garheden for impressive assistance in IT. Now in the final stages of this work, I am employed at the Occupational and Environmental Medicine Section, Umeå University. We haven't got to know each other so well yet, but I hope that we soon will.

I would also like to express my gratitude to Hilary Hocking for raising my chances of making myself understood in this world, thanks to her excellent language editing. Thanks also to Maritha Lundgren at the Department of Sociology for valuable guidance and assistance in finishing this work.

Finally, my sincere thanks to my family, and especially my mother Annika to whom I dedicate this thesis. Our sociological (not that we knew it then...) conversations at the kitchen table about all aspects of life, from the functioning of society, to eager attempts to understand causes and effects of human behavior, strongly contributed to my research interest. Not only did you provide me with the tools I needed when you raised me, you have also always believed in me and supported me in every way. Your encouragement and practical help made it possible for me to finish this project. Thank you for being there for me! My deepest gratitude also goes to my son Leo, for giving me distance to my work and for reminding me everyday why I should get out of bed and do something meaningful with my life. I love you all.

Malin Bolin
Kramfors, February 2009.

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Article I Bolin, M., & Härenstam, A. (2008) An empirical study of bureaucratic and post-bureaucratic characteristics in 90 workplaces. *Economic and Industrial Democracy,* 29, (4): 541-564.

Article II Bolin, M., Marklund, S., & Bliese P. (2008) Organizational impact on psychosocial working conditions. *WORK: A Journal of Prevention, Assessment, and Rehabilitation,* 30, (4): 451-459.

Article III Bolin, M. (2008) Exploring the organizational framework of psychosocial working conditions. *Manuscript.*

Article IV Marklund, S., Bolin, M., & von Essen, J. (2008) Can individual health differences be explained by workplace characteristics? – A multilevel analysis. *Social Science & Medicine,* 66: 650-662.

Introduction

Differences in individuals' working conditions and health are the starting point for this thesis. Research in the field of occupational health has succeeded in identifying systematic differences in working conditions and work-related health, but has been less successful in identifying the mechanisms that can explain the patterns found. The invisible role of organizational context in this research area has been proposed as one central explanation (Diez-Roux, 1998; Morrison & Payne, 2003). As jobs are not performed in a vacuum, but are structured and controlled activities, it is reasonable to assume that differences in work organization generate differences in work environments and distribution of health risks. Nevertheless, the dominating strategy within occupational health research has not included a systematic analysis of organizations, but has focused on the individual, using individually oriented measurements and interpretations, or socioeconomic structures. This means that individual working conditions, and the organizational context in which these factors are created, have mainly been studied separately, resulting in a gap (Cappelli, 2006; Barley & Kunda, 2001; Wharton, 1994). An organization-oriented approach for occupational health studies is required (MacDonald et al., 2008).

Organizations are central units in society. Societal changes occur and affect individuals to a large extent through organizations, and it is in organizations human action is transformed into social action (Ahrne, 1994; Kalleberg, 1990; Baron & Bielby, 1980). Furthermore, organizations constitute the primary context of work and are important means of social stratification among individuals (Rubery, 2005; le Grand et al,, 1996; Kalleberg, 1994). Thus, understanding organizations would increase our awareness of the conditions that individuals experience in the labor market. In contrast to occupations, organizations represent specific social arenas where preventive actions can be implemented.

Organizations are complex units consisting of several dimensions and levels that have a potential impact on working conditions and health. Despite the central role of organizations, explicit conceptualizations are rarely presented, and competing perspectives on organizations are rarely explored in empirical studies (Barley & Kunda, 2001; Baron & Bielby, 1980). Few previous studies have focused on the effect of genuine organizational characteristics on employees' working conditions and health (for exceptions, see Söderfeldt et al., 1997; Dhondt et al., 2000; Tummers et al., 2003; Karlsson & Eriksson, 2000; le Grand et al., 1996). Instead, occupational titles and aggregated individual data have been used as a substitute. Empirical studies require a clear delimitation of the organizational unit

under study and a theoretical basis for the choice of dimensions. In comparison with measurements of working conditions and health, measurement of organizations is a relative new area under development, which gives rise to the theoretical question of how organizations should be defined.

During the last decade, the prefix "new" has been frequently used when organizations, as well as working life and society as a whole, are referred to in general (Beck, 2000; Baldry et al., 2007; Sennett, 2006; Perrucci & Perrucci, 2007). Both popular and academic attempts to identify new organizational forms have been common (Alvesson & Thompson, 2005; Child, 2005). Different concepts used are united by being focused more on sharpening the contrast between new and old, rather than providing detailed information about new organizations *per se*. They are mainly described as the opposite of bureaucracy, which has been the basis for large parts of the theoretical inspiration for organization, and this has also dominated earlier empirical organizational research. The assumed transformation from bureaucracy is illustrated by one of the concepts: post-bureaucracy. However, it has been questioned whether post-bureaucracy is a solid empirical indicator of contemporary workplaces, as it is often presented (Alvesson & Thompson, 2005); also, whether the existence of post-bureaucratic characteristics means that bureaucracy is counted out. In order to clarify these issues, bureaucratic and post-bureaucratic characteristics need to be assessed in relation to each other in a large sample of organizations.

Work and organizations are closely intertwined with each other and new types of organizations are described as bringing out new working conditions. Working conditions in post-bureaucracy are often described in a freedom discourse, and are associated with positive effects on employees (cf Peterson, 2005). At the same time, psychosocial working conditions have worsened for all occupational groups in the labor force since the mid-1980s (Toivanen, 2007). Exploring the organizational context of work is one way to understand such paradoxes. Recent empirical studies have shown that working conditions vary systematically between organizations (Oksanen et al., 2008; Christensen et al., 2005; Härenstam et al., 2004a; Härenstam et al., 2004b; Söderfeldt et al., 1997, Höckertin & Härenstam, 2006), and that there are systematic differences in health outcomes and sickness absence between workplaces (Tummers et al., 2006; Elovainio et al., 2004; van Veldhoven et al., 2002; van Yperen & Snijders, 2000; Vahtera et al., 1999, de Jonge et al., 1999). Studies have also found regular variation in sickness absence between municipalities (Szücs et al., 2003).

These studies illustrate the importance of identifying organizational characteristics that are related to both working conditions and health outcomes, in order to achieve a deeper understanding of these structural

patterns. However, the significance of organization for working conditions depends on how one thinks work is structured in the first place. The extent to which new and old organizational characteristics describe contemporary workplaces needs to be clarified before they can be seen as explanations for differences in individual working conditions and health.

Aims and objectives

The overall aim of the thesis is to describe organizational characteristics of different workplaces, and to assess their impact on employees' psychosocial working conditions and health. More specific objectives are:

- To characterize bureaucratic and post-bureaucratic characteristics of the organizational structures of contemporary workplaces in different types of industries

- To assess the magnitude of organizational impact on psychosocial working conditions, and examine what organizational level is most important for psychosocial working conditions

- To examine whether specific organizational characteristics are related to differences in psychosocial working conditions between workplaces

- To explore whether individual health outcomes differ between workplaces, and whether specific organizational characteristics can explain these differences

Theoretical framework

In this chapter, the perspectives, theories, and concepts that have been used are presented. Organization, psychosocial working conditions, and health of individuals are all multilevel phenomena that have been studied within different disciplines and research areas. A multidisciplinary approach is needed in order to combine these phenomena. The main assumptions about the relationship between working conditions and health are derived from the field of job design theory and occupational health research, whereas statements about organizations are derived from the field of organizational research.

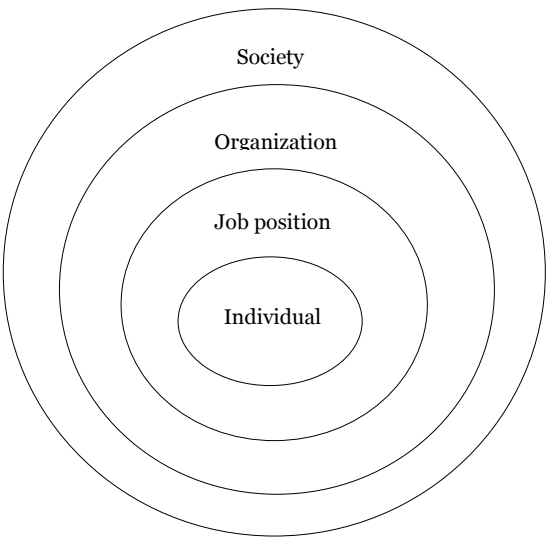

Figure 1. Theoretical model illustrating units at different analytical levels.

A multilevel perspective

A multilevel perspective means considering how factors at different analytical levels affect the outcome under study. Organizational characteristics, psychosocial working conditions, and health are the main concepts of this thesis. These are multilevel phenomena, as they are interrelated with factors operating at different analytical levels. “Generally, levels comprise units that can be observed, sampled, and analysed” (Leyland & Groenewegen, 2003:272). Individuals as well as organizations are embedded in larger environments or social structures that in different ways restrict or promote individual and organizational actions and behaviors. As illustrated in Figure 1 above, what is considered as environment depends on

the unit under study. If organization is the unit under study, the environment consists of factors and actors in the surrounding society; whereas if the individual is the unit under study, job position, organization, and society constitute the environment.

Organizations constitute a filter between societal changes and individual conditions. The way organizations adjust to societal changes may alter the organizational context in which individuals perform their work. This also means that the design of organizations affects the distribution of good and bad jobs in the labor market. Organizations also affect who holds good or bad jobs, by matching individuals to the jobs that have been created. The distribution of employees in the labor market is not equal, in terms of gender and occupational class. Due to selection strategies, the demographic composition of individuals might vary from one organization to another. Individual characteristics such as occupational class, gender, and age are well-known predictors of differences in both the working conditions and health of employees. Therefore, the composition of individuals with regard to these factors is an important aspect to consider in studies of organizational impact on working conditions and health. Organizational characteristics, working conditions, and health are also multilevel phenomena, in the sense that they represent units at different analytical levels. Organizational characteristics refer to organizations; psychosocial working conditions are examples of dimensions used to identify different types of jobs; different health outcomes are individual characteristics.

The difference between levels is illustrated by different strategies aimed to improve employee conditions. Strategies can be classified according to the unit identified for intervention: the individual, the job, the organization, or society at large (Shoaf et al., 2004). The aim of strategies at the individual level is to strengthen the individuals' resources and capacity to handle demands, by for example stress management and health promotion. Strategies directed to the job level aim to improve individual conditions by means of job redesign. Finally, strategies at the organizational level involve changing the conditions under which work is performed. However, the level at which factors operate is not always given.

Working conditions are mainly the result of interaction between factors in the organizational context and the individuals performing a job. It is in organizations that job positions are created. By holding a job position, the individual perceives working conditions and is exposed to different risk factors. This means that working conditions can be treated as an organizational outcome as well as an individual asset.

Generally, multilevel phenomena concern the classical sociological question about the nature of the relationship between the individual and the organizational context. In short, the question concerns in what direction arrows should be drawn between the different levels in Figure 1. In this

thesis, a structural approach is taken, emphasizing the contextual role for understanding individual action. This means that the impact of organization on working conditions and health is emphasized. However, social structure is also seen as constituted and produced by individual action. Organizations are what Anthony Giddens refers to in terms of "duality of structure" (Giddens, 1984): they are social structures including both opportunities and hindrances for individuals to perform their job and develop their potential. Individuals, on the other hand, reproduce, uphold, and transform organizations by their actions. Individuals interact with the social context to which they belong, and organizations constitute the primary context of work.

Health

Health is a multidimensional concept, which has been defined and measured in several aspects and dimensions (Medin & Alexanderson, 2000; Ware, 1995; Bjorner et al., 1996; Lindberg, 2006). In Figure 2, different aspects of health are roughly summarized in order to provide an overview of the concept, as well as the different perspectives and strategies used for exploring health (see Medin & Alexanderson, 2000, for more details).

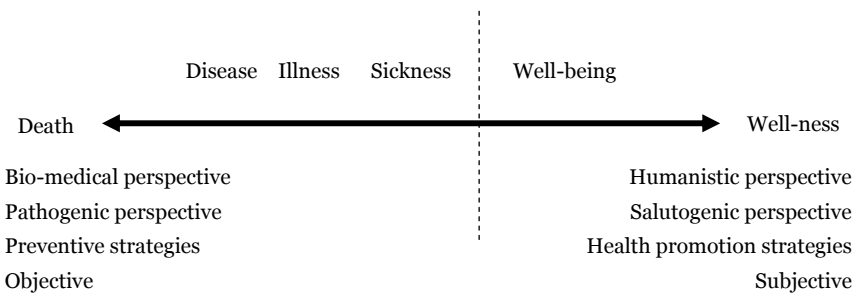

Figure 2. An overview of health versus ill health, including different aspects, perspectives, and strategies.

A main distinction between theories exploring health is whether they follow a bio-medical or a humanistic perspective on health (Medin & Alexanderson, 2000). The perspectives are differentiated by how they look upon the association between health and ill health. In a bio-medical perspective, health is seen as being the opposite of ill health; whereas from a humanistic perspective, health is defined as being more than absence of ill health. The general definition of health given by the World Health Organization (WHO) illustrates a humanistic perspective on health: "Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity" (WHO, 1948). The two perspectives overlap in what has

been referred to as pathogenic versus salutogenic perspectives on health (Antonovsky, 1996). The type of strategy used for improvement of health depends on whether a bio-medical or humanistic approach is applied. Prevention refers to identification and prevention of risk factors for ill health, while health promotion focuses on health itself, by using strategies to increase the well-being of employees.

Ill health, or lack of health, may be seen as an illness, a disease, or a sickness. While an illness is generally self-experienced and defined by the individual herself/himself in relation to pain or suffering, the concept of disease is related to conditions that can be medically diagnosed by experts such as medical doctors, physical therapists or psychologists. The concept of sickness refers to the social role of ill health taken and/or given by society at large (Wikman et al., 2005). For example, an individual may accept a sick role which gives her or him reason to behave in a certain way. In relationship to employment, one option is to be absent from work and be on sick leave. These aspects are related but do not always overlap. Consequently, an employee can be at work despite her/his illness or disease; s/he can also be on sick leave without having an illness or disease.

Another dimension concerns the relationship between specific health and general health (Krause & Jay, 1994). It cannot generally be assumed that general health is the sum of a number of specific aspects of health. An individual may report some health problems and still report that s/he is in excellent health. It is also possible that an individual may report lack of general health but no specific health complaints. Thus, although global health measures have generally been seen as efficient in predicting future illness and disability, specific health measures may be of interest in relationship to other aspects of health (Bjorner et al., 1996).

The causal mechanisms underlying health and ill health are complex. In this context it should be pointed out that although the focus is on how organizational characteristics affect health, a number of other factors, such as lifestyle, individual conditions, and conditions in private life, play an important role in explaining the individual's health conditions. In sum, health is multidimensional and it is reasonable to use different measurements when the idea is to explore how different aspects of organization are associated with health. Due to the multidimensional character of health and ill health, it is reasonable to believe that different orgaizational characteristics might be associated with different concepts of health.

Working conditions

How to accomplish an integration of individuals that is fruitful for both organization and individual is the main issue in work science (Allvin, 1997). The ideal is to find a solution that results in healthy working conditions for

employees while simultaneously providing increased productivity for the organization. The definition of favorable working conditions for the individual has changed over time. In Taylor's Scientific Management (Taylor, 1911), the integration of the physical individual into mechanical production was emphasized. This was followed by the School of Human Relations (Roethlisberger & Dickson, 1947) proposing the importance of fulfilling the social and emotional needs of employees, such as security, belonging, and well-being. The Socio-Technical School (Trist & Bamforth, 1951) emphasized the need of the individual to take responsibility for her/his action, and focused on autonomy and participation. Finally, the basic needs of intellectual stimulation and learning by qualified work have been in focus (Allvin, 1997).

These different schools illustrate an accumulative development of individual needs to be fulfilled in order to achieve work-related health. The different needs of individuals are summarized in Maslow's "hierarchy of needs" (Maslow, 1954; Flaa et al., 1998; Bakka et al., 2006). *Physiological needs* (basic requirements for human survival) come first, followed by *safety needs* (material welfare, health and security), *social needs* (such as human contact, love and belonging), the *need for esteem* (referring to self-esteem, recognition and respect from others), and finally the *need for self-actualization* (by taking responsibility and developing one's potential).

Thus, the focus in industrial work was initially on physical risks, with the objective of preventing those risks by minimizing exposures to chemicals, noise and physical overload. Since then, the area has widened to include all types of work and to emphasize psychosocial aspects of work. This development over time is illustrated by changes in the Occupational Safety and Health Act of 1978 (Eriksson, 1996), when psychosocial factors gained importance. It was not only a matter of preventing physical risks at work; the individual should also be given an opportunity to grow and develop. Thus, even though the definition of healthy work has partly varied over time, some general aspects can be discerned; e.g., there should be opportunities for individual participation (Lysgaard, 1972; Emery & Thorsrud 1969; Gardell, 1971) and control (Aronsson, 1989), intellectually challenging and varying job content (Hertzberg et al., 1959; Hackman & Oldham, 1976; Karasek, 1979), and social interaction with other people (Durkheim, 1979; Johnson & Hall, 1988).

Psychosocial working conditions – the job demands and control model

Psychosocial working conditions are the result of the interaction between factors in the organization and the individual performing a specific job. More specifically, psychosocial working conditions refer to "those factors that are determined by work content, its organization and the social relationships at

the workplace" (Eriksson, 1996:10). A similar definition is given by Cox et al., (2003), and has also been expressed as "the sociostructural range of opportunities that is available to an individual person to meet his or her needs of well-being, productivity, and positive self-experience" (Siegrist & Marmot, 2004:1465).

Two perspectives have dominated the research in this area: the qualifications perspective and the stress perspective (Karasek, 1979; Hanson, 2004). The former has focused on complexity and qualification levels in job tasks (Volpert, 1974; Kohn & Schooler, 1983), while the latter has paid attention to stress reactions to these demands (Gardell, 1971; Karlsson & Eriksson, 2000). These two perspectives are brought together in the Job Demands and Control (JDC) model by Karasek and Theorell (1990). In this thesis, the main components of the JDC model have been used as a definition of psychosocial working conditions.

The two main dimensions of the JDC model are job demands and control, see Figure 3 below. Job demands refer to psychological stressors in the work environment (Karasek, 1979), whereas control refers to the worker's ability to control her/his own activities and utilization of skills (Karasek & Theorell, 1990:60). The control dimension consists of two factors: decision authority and skill utilization. Decision authority refers to the employee's opportunities to use the breadth of her/his skills, whilst skill utilization refers to authority in decision-making. The model has been extended with social support as a third dimension (Karasek & Theorell, 1990; Johnson & Hall, 1988). However, in this thesis it is the two main dimensions that are focused.

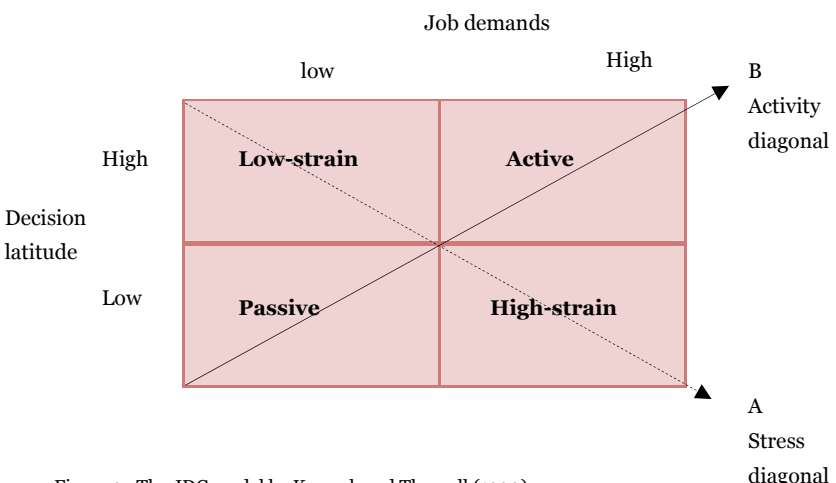

Figure 3. The JDC model by Karasek and Theorell (1990).

In the JDC model, the two dimensions are combined into four types of jobs. These jobs are assumed to have different effects on health. Low-strain jobs with a high level of control and a low level of job demands are referred to as the healthiest jobs. Active jobs with a high level of both job demands and control are identified as positive for learning and personal development. High-strain jobs and passive jobs on the other hand are identified as the risk jobs in the model, being characterized by a low level of control. The reason for this is given by the diagonals in the model, which represents two predictions made in the model. The stress diagonal, labeled A in Figure 3 above, illustrates the assumption that psychological strain occurs when job demands are high and control in the work situation is low for the individual. The activity diagonal, labeled B in Figure 3 above, illustrates the hypothesis that an optimal situation for learning and motivation occurs when the situation is characterized by a high level of job demands and control. In such situations, the energy aroused by the job demands is translated into action, as the individual can meet those demands by optimal problem-solving. If the individual does not have enough control, the energy transforms into strain instead of action (Karasek & Theorell, 1990). In short, decision latitude, or control, reduces stress and increases learning, whereas job demands increase stress and learning.

Criticism of the model has mainly focused on conceptualization and operationalization (Kasl, 1996; Kristensen, 1995; de Jonge & Kompier, 1997 for overview). A common criticism is directed towards the interaction effect between job demands and control. The nature of the interaction is questioned, and also the extent to which there is empirical evidence for an interaction effect (Kasl, 1996; de Jonge & Kompier, 1997). Another criticism refers to conceptualization and operationalization of the dimensions in the JDC model. For example, it has been questioned whether the two sub-dimensions of control – decision latitude and skill utilization – can be seen as one dimension, as they do not always correlate (Kristensen, 1995; de Jonge & Kompier, 1997; Kasl, 1996). Furthermore, certain items used to measure control might also capture job demands, making it difficult to distinguish which of the two dimensions contributes to differences in the outcomes found.

Nevertheless, the JDC model has several advantages. The model highlights the importance of organization for understanding working conditions. Organizations are pointed out as the means by which good jobs (healthy work) are accomplished. This makes the model suitable for exploring organizational impact on psychosocial working conditions. The way in which work is organized is assumed to be the cause of job stress, and as a consequence, “its cure lies in the transformation of the workplace” (Karasek & Theorell, 1990:2). Organizations are seen as deliberately designed, and therefore redesignable. However, redesign presupposes that

the organizational cause of illness is a result of redesignable characteristics in the organization, and that it is shown to be independent of the employee's personal characteristics. Finally, it is proposed that if the psychosocial aspects of organization are not highlighted by the management, this will result in illness and lower productivity. Thus, the JDC model is theoretically linked with the formal structure of organizations. However, it is the effects of the model more than its organizational roots that have been focused in empirical research.

Another advantage of using the JDC model is that it is one of the most established models in the area (Kristensen, 1995). It has been well explored and the assumed effects on different health outcomes have gained considerable support in several empirical studies, such as cardiovascular diseases (Karasek & Theorell, 1990; Theorell & Karasek, 1996; Kristensen, 1995; Belkic et al., 2004; Schnall et al., 2000), musculoskeletal disorders (Fjell, 2007), mental health outcomes (van der Doef & Maes, 1999; Dollard et al., 2000), and absence from work (Lidwall & Marklund, 2006). This explains why the JDC model still has a dominating role after 20 years.

Organization

In order to understand what organizations look like and why they should matter for individual working conditions and health, two issues need to be addressed. Firstly, organizations need to be defined, in order to describe and compare them. Secondly, links between organization and individuals need to be established, in order to understand how and why organizational characteristics might affect individuals. The main emphasis here is on capturing what defines organizations and what effects this might have on individuals, rather than exploring why organizations are designed as they are. Theoretical concepts are needed to delineate organizations at a level of generalization that makes identification possible in a wide range of different types of operations. In the debate on new and changing working life, organizations are often referred to as being the opposite of bureaucracy, as some type of post-bureaucracy. Here, these two ideal types are put into the context of organizational theory, to enable us to interpret and analyze what organizations are, and why it is reasonable to assume that they are important for working conditions.

Organizational research is multidisciplinary, with specialized theoretical perspectives and schools, focusing on different aspects and levels of organizations. Despite this diversity, some generic features can be discerned, making it possible to refer to organizations as social units of their own. These universal aspects of organizations are illustrated by the general definitions found in most textbooks on organization theory. An example is the definition given by Thompson & McHugh (2002), who define organizations as *"consciously created arrangements to achieve certain goals by collective*

means" (p.10). Another illustrative example is given by Flaa et al., (1998): "*An organization is a conscious, stable, and goal-oriented cooperation between people"* (p.9, my translation), and by Barnard (1938): *"Formal organization is that kind of cooperation among men that is conscious, deliberate, purposeful"* (p.4). The words "goal-oriented" and "purposeful" indicate that organizations are created for a specific purpose and to solve certain issues. Conscious and deliberate arrangements, on the other hand, refer to the fact that the relations between individuals are (con)structured and regulated in order to fulfill their purpose. The arrangements created give organizations a formal structure that makes it independent of specific individuals.

General definitions also express the duality of organizations: they consist of and cannot exist without individuals, but at the same time the conscious arrangements make them more than the sum of these individuals. Organizations are not machines. They are dependent on individuals in order to accomplish organizational performance (Ahrne, 1994). It is by coordinating actions of several individuals that organizational activities are carried out. As a consequence, integration of individuals into organizations and managing human factors in organizational activity is also a general feature of organizations. In organizational theory, structural features of organizations and human factors are mainly studied separately. Focus on the formal structure of organizations follows what Scott has defined as a rational perspective in organizational theory (Scott, 2003), also defined as a modern perspective by Jo Hatch (1997); while human factors on the other hand is the main focus in theories following Scott's definition of a natural perspective on organizations (Scott, 2003). However, in order to understand how structural features of organizations affect individual working conditions and health, both features need to be addressed.

Formal structure

Formal structure is a result of the issues to be solved when a number of individuals are organized to accomplish a certain outcome over time. Arrangements of activities require some basic issues to be solved, such as division of labor, authority structure, and control strategies; and organizational design refers to how these issues are solved with different organizational forms as a result (Mintzberg, 1983). Organizations are managed. Choice of organizational form is an active decision, and organizational characteristics are the tools which are used to accomplish different types of structures. The choice of organizational form affects prerequisites for how tasks are carried out and by whom, as the outcome of the formal structure is a network of positions into which the individual is integrated. Tasks and authority are deliberately divided and coordinated, and different types of job positions are created (Flaa, 1998; Robbins &

Barnwell, 2002; Mintzberg, 1983). Accordingly, the creation of positions, which become the individuals' jobs, is closely intertwined with the formal structure of organizations. Through the division of labor, activities are split up into tasks and different types of jobs. The way in which authority is designed decides the amount of decision latitude each job is assigned (Littler, 1982), and control strategies are associated with the degree of job standardization. Therefore, job positions can vary from being standardized to being complex, requiring varying amounts of qualifications or knowledge in order to fulfill the tasks. Thus, the job position held by the individual can be altered through changes in the formal structure, and thereby in the working conditions of employees.

For most of the twentieth century, the formal structure of organizations has mainly been described as some variant of bureaucracy (Barley & Kunda, 2001). Weber's model or theory of bureaucracy (Weber, 1947; 1987) has dominated earlier empirical studies of organization as well as organizational theories (Thompson & McHugh, 2002). Empirical applications performed by the Aston School (Pugh, et al., 1963; 1968; 1969; Pugh & Hickson, 1976) and others (Blau & Schoenherr, 1971; Child, 1973) measured bureaucracy as a set of characteristics such as formalization, centralization, specialization, and standardization.

Bureaucracy can be identified by a number of characteristics (Weber, 1947; 1987; Ahrne & Hedström, 1999; Scott, 2003). It consists of a well-defined hierarchy of offices with decision-makers who have distinct assignments and distinct areas of authority, a fixed division of labor with specialization into specific competence areas, and a reliance on general rules and written documents that govern performance. Formalization of rules and roles is stressed as a method for control and coordination of positions. The content in positions is clearly delimited in terms of authority and tasks to be carried out, but also standardized (formalized). Within occupational health research it is mainly organizations based on Taylor's Scientific Management that have been focused. These display an extreme form of bureaucracy in which the bureaucratic principles of division of labor have been exaggerated (Kvist, 2006). Thus, the principles are general and can be used in varying degrees.

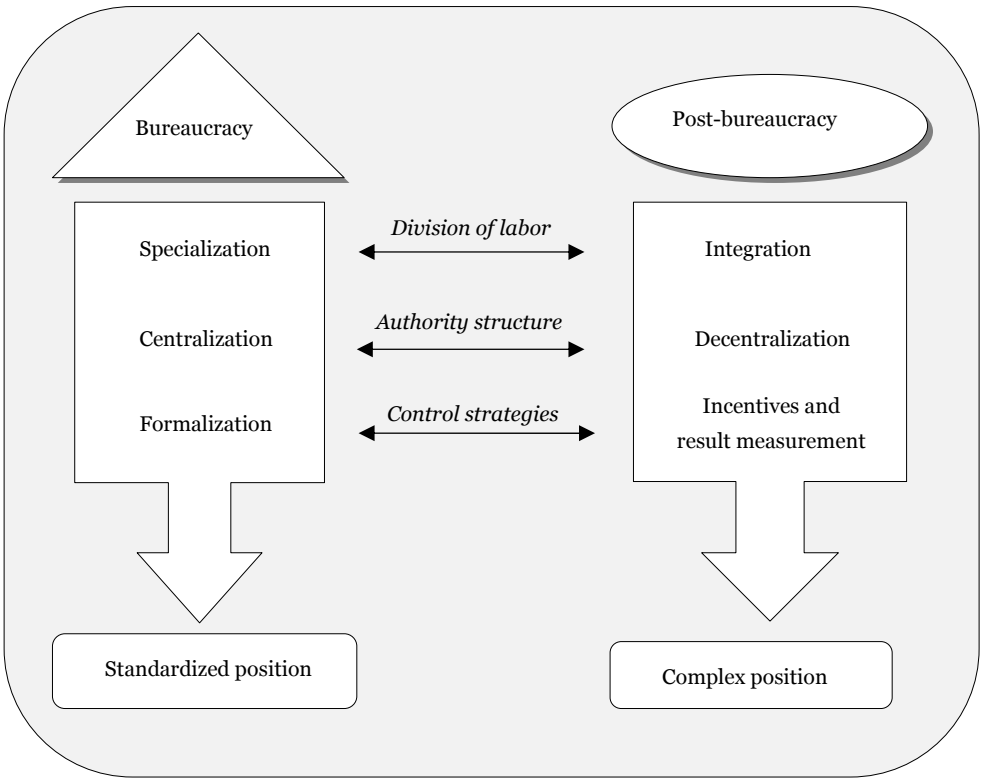

Figure 4. Characteristics of "bureaucratic" and "post-bureaucratic" organizations for the three main dimensions of formal structure.

Bureaucracy has been the object of considerable criticism over time, and it has even been suggested that it has vanished and been replaced by new organizational forms, as society changes from an industrial to a service- or post-industrial society (Castells, 2000; Child, 2005). In other words, bureaucracy is no longer seen as the best option to achieve an efficient organization. Instead, new forms of flexible organizations are referred to that are assumed to replace bureaucracy as the best way of designing the formal structure of organizations. Many definitions have been used for this new organizational form, such as "Network enterprise" (Castells, 2000), "Postmodern organization" (Clegg, 1990), "Flexible organization" (NUTEK, 1999), "The flexible firm" (Volberda, 1998; Atkinson, 1984), and "Post-bureaucracy" (Child, 2005; Maravelias, 2002; Peterson, 2005; Heckscher, 1994). These variants can be summarized as post-bureaucracies, as their main characteristic is that they are non-bureaucratic (Maravelias, 2002; Peterson, 2005). Thus, there is no generally adopted concept of post-

bureaucracy as there is for bureaucracy, but it is often described as a non-hierarchical, flattened and integrated, fluid network organization (Child, 2005; Alvesson & Thompson, 2002).

In empirical studies it has mainly been measured as a set of flexibility strategies (Grönlund, 2004; OECD, 1999; Karlsson & Eriksson, 2000; Osterman, 1994). Flexibility is mainly accomplished by means of integration between horizontally specialized competence areas, and by decentralization of hierarchical managerial structures (Alvesson & Thompson, 2002). Instead of distinct areas of authority and competence, the emphasis is on being able to place individuals where they are most needed, so-called functional flexibility that requires multi-skilled individuals (Atkinson, 1984). Therefore the stress is on strengthening the feeling of belonging by means of incentives, rather than control by rules. The relevance of measuring results instead of detailed regulation of job performance is also regarded as functional in the changing society. In sum, bureaucracy and post-bureaucracy represent two ways of solving the main issues of formal structure. The result is two types of organizational structures with different types of job positions into which the individual employee is integrated.

Integrating the individual into the formal structure

What does it mean that organizational performance is based on and dependent on individuals? Göran Ahrne (1994) presents a theoretical framework of organizations that addresses general conditions for the regulation of human interaction by organizations, and this can be used to describe and analyze how individuals are integrated into organizations.

In the first place, individuals become affiliated. Organizations are gate-keepers that unite some people while separating them from others (Ahrne, 1994:3). This means that the individual is selected and included into an organization, and that s/he can be excluded if certain requirements are not met. Employees are integrated and admitted to an organizational context by their job contract. From an organizational point of view, affiliation means that the human part of the organization is identified and recognized. From an individual point of view, affiliation implies a commitment to return and contribute to organizational activities. Another implication for individuals is that they accept and grant the right to control certain aspects of their actions to the organization. In exchange, individuals are given access to resources they would not otherwise be able to get. Rights and obligations of employees are regulated. The parts of individual action or behavior to be controlled are regulated in the so-called zone of indifference (Barnard, 1938; Ahrne, 1994:90-91). The range of this zone of indifference can vary, as the range of individual abilities needed for performance of organizational activities might differ for varying types of activities. Physical requirements are necessary in

certain jobs, while social skills might be more important in other types of jobs.

Once individuals are identified and let in, the relationship needs to be managed. There are mainly two aspects that require a solution: substitutability and recorded control (Ahrne, 1994). The dependency on individuals for organizational performance means that no affiliate can be indispensible. Individuals that for some reason cannot carry out their tasks need to be replaced in order to secure organizational performance. In the short run, empty positions need to be staffed by reserves to make sure that day-to-day activities are carried out. In the long run, a succession order is required to guarantee continuity of organizational activities. For the same reasons, some kind of recorded control is essential, as organizational activity cannot be carried out if individuals for some reason deviate from their positions. Therefore, it must be possible to watch, register, and record individual performance, which in turn implies that each individual has a unique identity that can be registered (Ahrne, 1994:22). Additionally, recorded control is needed to avoid free-riders. Individuals contribute as long as others also deliver their part, and the use of recorded control makes it possible to tell if they do. Hence, the relation between organization and individual is one of authority, as individuals perform organizational actions, and organizations needs to manage this dependency in order to secure organizational activities (Ahrne, 1994).

Different strategies can be chosen for managing the human part of the organization. Substitutability and recorded control overlaps with exchangeability of individuals and surveillance possibilities of individuals' work, two factors that have been identified in several theories such as class theory (Goldthorpe, 2000), transaction cost theory (Williamsson, 1981), theory of the flexible firm (Atkinson, 1984; 1987), as being central for understanding why organizations design job positions in different ways, with varying work-related outcomes for individuals as result. The possibility of surveillance gives the organization control over the individuals' work, although this presupposes that it is possible to measure and evaluate what an individual worker does and how s/he does it. The more standardized the job, the better the basis for control. If surveillance of the job content is difficult, the organization has to rely on the individual performer instead. Exchangeability on the other hand refers to an organization's dependency on the skills of specific individuals, and is connected with the extent to which surveillance is possible. Unique skills or qualities make the individual less exchangeable, and the organization becomes dependent on the individual. Generally, unique skills refer to qualified work which demands a longer formal education or training, but this can also refer to company-specific skills (Atkinson, 1984). In both cases, the individual is difficult to replace due to limited competition and/or the fact that it takes a long time to train a

successor. This is what Williamson (1981) refers to as “asset specificity”. In sum, limited opportunities for surveillance and a low degree of exchangeability favor the individual, as this makes the organization more dependent on the individual; whereas the opposite favors the organization, which becomes less dependent on specific individuals.

In sum, degree of dependency on individuals decides the strategy by which individuals are integrated into organizations. Two strategies can be discerned: i.e., incorporating as much as possible, or as little as possible, of the individual into the organization, illustrated by a large or a small zone of indifference. If the relation favors the individual, the strategy of widening the zone of indifference is chosen. On the other hand, if the relation favors the organization, the strategy of minimizing the zone of indifference is chosen instead.

Bureaucracy and post-bureaucracy also illustrate the two types of strategies. The main idea of bureaucracy is to achieve predictability of organizational performance by reducing human factors in organizational activity, and making the individual’s behavior more predictable through standardization and regulation. Therefore, the content in positions is standardized (formalized) in order to guarantee that the outcome delivered is independent of the individual holding the position. Formalization is also used as an attempt to separate human factors from organizational activity by making the structure of relations more explicit and visible, and thereby less dependent on informal relations. By means of a visible and rather complex structure, individuals become more interchangeable and easier to replace.

In post-bureaucracy, the opposite strategy is used. Loosely defined positions mean that organizational activity is based on specific individuals rather than on well-defined positions. Thus, complexity is transferred from the structure to the individual’s job. Therefore, binding the individual to the organization is seen as necessary in order to guarantee organizational performance. This strategy results in integrating as much as possible of human factors into organizational activity. The focus is on socialization and incentives, as means of reducing the differences between organization and individual, but the individual’s internalization of the organization’s interests is also stressed.

Accordingly, the two main features of organization, the formal structure and the authority relationship between organization and individual, are interlinked with each other. The way the formal structure is designed results in different types of positions. These can include aspects of individuals’ abilities (to a greater or lesser extent), and this in turn affects the relation between organization and individual, as well as the strategy chosen for integration of individuals into organizations. The more loosely defined the positions, the greater the dependency on the individual, and the larger the zone of indifference.

Theoretical links between organization, psychosocial working conditions and health

Two main features of organizations that can be related to employees' psychosocial working conditions and health are: the authority relationship between organization and individual, and the formal structure of organizations. Working conditions originate from the meeting between the individual and the organization. The different levels are linked by the fact that organizational performance is based on individuals, and the concept of affiliation illustrates how individuals are linked to organizational units and consequently affected by how organizational units are designed. As illustrated above, integration of individuals into organizations can be based on two principles: either integrating as much as possible, or as little as possible, of individual abilities into organizational activity.

The importance of being a whole individual at work and being able to use and develop one's full potential of individual abilities is stressed if the goal of work-related health for employees is to be achieved. Therefore, it can be assumed that there are good prerequisites for employees to enhance their working conditions if the relationship between organization and individual is based on the first principle. In other words, the more of the individual that is integrated into organizational activities, the better the chance for employees to use and develop their full potential, with positive health effects as a result. The individual becomes enriched instead of limited.

Another prerequisite for accomplishment of work-related health is the type of context into which the individual is integrated. From an occupational health perspective, psychosocial working conditions and work-related health are the consequences of individuals holding a job position. The main emphasis is on the importance of designing job positions that fulfill the need for taking responsibility and being intellectually challenged. From an organizational perspective, job positions are the outcome of formal structure. Positions vary from being complex to standardized, depending on the tasks included and the amount of authority assigned, but also the degree to which the content is given beforehand.

Bureaucracy and post-bureaucracy illustrate that type of authority relationship and type of structure is assumed to exist in specific patterns. The strategy to include as much as possible of the individual into organizational activity, i.e. to enlarge the zone of indifference, is assumed to be necessary in a loose structure consisting of complex positions, and vice versa. The reason for this is that in complex positions there are few opportunities for surveillance of individual work and for exchangeability of specific individuals, which necessities reliance on control by incentives instead of standardization. A less standardized job gives the individual more opportunity to exercise control, but also provides a more qualified and stimulating job content. A decentralized authority structure is also assumed

to improve the individual's opportunities for exercising control, and an integrated division of labor loosens up or widens positions, which increases the qualifications that are needed to perform the job.

An illustration of the organizational framework of the JDC model

When looking at the JDC model, the assumption that a higher level of qualifications, in combination with a high degree of decision authority, will have a positive effect on individual development and learning is represented by the activity diagonal. This means that a transformation from bureaucracy to post-bureaucracy follows the activity diagonal in the JDC model. Furthermore, in the JDC model, jobs that give employees control possibilities to handle job demands at work are defined as healthy jobs, in contrast to jobs with a low degree of control that are identified as risk jobs. Thus, a complex position matches an active job in the JDC model, characterized by a high degree of job demands and control. Authority and control are two sides of the same coin (Ahrne, 1994), and qualifications correspond with job demands.

Theoretically, post-bureaucracy, complex positions, and active jobs represent units at different analytical levels that symbolize individuals who have healthy working conditions, while their opposites: "bureaucracy", "standardized positions", and "passive jobs", are related to individuals with unhealthy working conditions. In Figure 5 below, all of these are added into the JDC model to illustrate assumptions made between work and health at different analytical levels. Hence, the JDC model can be seen as a three-level model. Post-bureaucracy and bureaucracy illustrate different types of organizations assumed to result in good versus bad working conditions. The same is true for complex versus standardized positions that represent the level of job position, and active and passive jobs which represent the individual level of perceived working conditions.

However, in occupational health research the focus has mainly been on the (un)healthy effects of high-strain jobs – those associated with organizations formed by Taylor's Scientific Management (Eriksson, 1996). Unlike bureaucracy and post-bureaucracy, Scientific Management follows the stress diagonal in the model: but the different organizational models agree on the importance of improving opportunities for exercising control. This might explain why they are often used interchangeably as representatives for the old that has been replaced in modern working life.

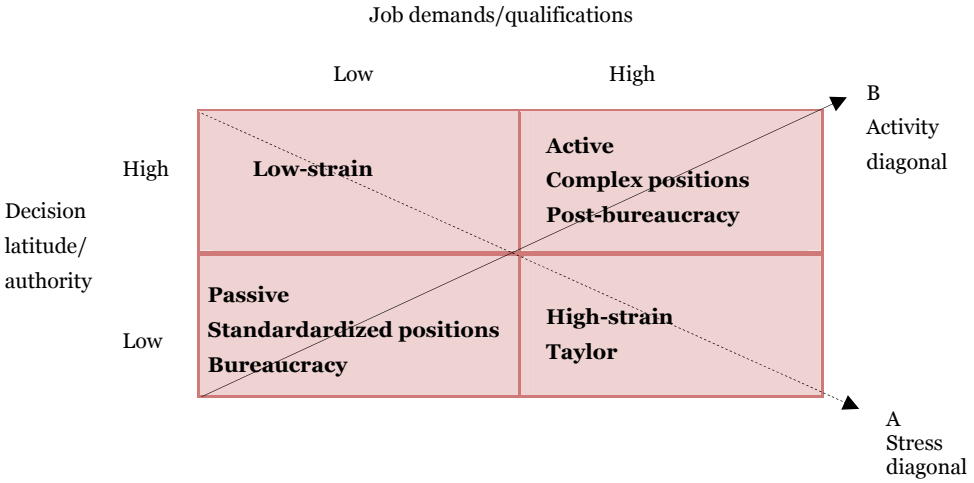

Figure5. An expanded JDC model, illustrating theoretical links between types of organizations, positions, and jobs.

The models presented above can be used in different ways. On the one hand, bureaucracy and post-bureaucracy can be seen as ideal types highlighting distinctive features and principles of organizations; on the other hand, they can be used as organizational models of formal structure that can be explored in empirical studies just like the JDC model. The models elucidate dimensions that distinguish what characterizes units at different levels. These dimensions can be used for classification and comparison of units at a certain level, but they can also be used to highlight possible connections between units at different levels. Bureaucracy and post-bureaucracy illustrate two extremes of organizational structures. Theoretically, post-bureaucracy should result in good working conditions, although empirical studies of new types of organizations indicate that reality is more complicated than is proposed above. Thus, it is problematic to define post-bureaucracy as good and bureaucracy as bad for working conditions. Besides, organizational design is connected with other structural principles of working conditions and health.

Alternative structural principles

Organizations are arenas in which several principles for social stratification of individuals coexist, such as occupational class, gender and type of operation. The organizational impact on psychosocial working conditions can be a result of differences between types of operations as well as differences in compositional effects of individuals in terms of occupational

class and gender. According to social stratification theory, these structures should be seen as complementary, and as independently having an impact that cannot be reduced to either the one or the other. It is also assumed that they are interrelated and affect each other in certain patterns (Kalleberg & Berg, 1988). There are two alternative interpretations of the relation between these structural principles and organizational characteristics. Type of operation, occupational class, and gender can either be seen as alternative and complementary determinants of working conditions and health, or they can be seen as proxies for organizational characteristics, based on the idea that activities as such determine work content and thereby working conditions and health. Certain job tasks need to be done in certain types of operation, as well as in certain occupations, which might delimit the possible alternatives for how work can be organized.

Types of operations

Organizations are heterogeneous in terms of size, ownership, market conditions, type of operations, technology, and many other aspects. The concept "type of operations" can be seen as the most general classification of what an organization does. Some studies suggest that organizational structures and strategies, as well as working conditions, are strongly matched to type of operations (see e.g. Giertz, 2000). Early organization research mainly studied industrial production. In recent decades, however, empirical research and theories on human service organizations have been developed (Hasenfeld, 1983). More recently, a new categorization of organizations that attends to the question of what is being produced, the position on the market, financing and payment flows, and the need for knowledge, technology and management strategies, has been developed (Giertz, 2000). This classification system of operation types has been useful in studies on the distribution of "good" and "bad" jobs (Härenstam et al., 2005).

Generally, redesign of jobs by altering the organizational structure of work is seen as a strategy available in all types of operations, but improvement of working conditions is assumed to be more likely in operations where the organizational activity is based on individuals rather than on machines. The nature of service production differs from manufacturing, in that employees are face-to-face with the customer, and service is most often produced and consumed simultaneously (Höckertin & Härenstam, 2006). As a consequence, there may be a difference between service industries and manufacturing in general, regarding the extent to which surveillance and exchangeability are possible

Occupational class

Occupations are seen as social entities that give information about organizational position, type of job performed, and the organizational preconditions under which the job is carried out. Occupations and socioeconomic position have been used as a measure of organization by Karasek & Theorell (1990) and others (Kristensen, 1996). However, it has rarely been explored whether occupational groups have similar jobs because their jobs are actually organized in a similar way. An exception is a study of Kristensen, who found that considerable differences in working conditions within the same occupation were explained by the fact that those jobs were organized differently at different workplaces (Kristensen, 1996). Viewing working conditions as a group property is based on the assumption that work content is given by occupation, or the assumption that occupational groups are organized differently.

Research has shown that working conditions are positively related to class (Kristensen et al., 2002; Hemström, 2005; Marmot & Theorell, 1988), with white-collar workers having better working conditions than blue-collar workers in general. There is a class gradient in working conditions, especially for control, and it has even been suggested that control is a measure of class (Kristensen et al., 2002). Furthermore, studies have also shown that working conditions are related to gender. In general, men have better working conditions than women (Toivanen, 2007; Gellerstedt, 2005). Part of the explanation for gender differences in health has been attributed to women and men performing different jobs. The Swedish labor market is highly sex-segregated, from type of industry to workplaces, and occupations (Pettersson, 2000). Studies have also shown that women and men even have different work content within the same occupation and workplace (Messing et al., 2003; Gonäs et al., 2005; Christenson, 2000).

Stratification by class and gender are often ignored in descriptions of organizational change, due to the coming of the service society (Kvist, 2006). One reason is that these traditional factors of stratification are assumed to lose their significance in modern working life. It is no longer who you are in terms of occupational class position that decides your working conditions, but what knowledge you can offer (Grönlund, 2004). Therefore, decreased differences between occupational classes and gender are expected as a consequence of the new society, although this has not been totally confirmed by empirical studies (Peterson, 2005; Grönlund, 2004; Kvist, 2006). Even though a general up-grading of all types of jobs has been proposed as a result of the service society (Bell, 1974), this does not mean that the class gradient in working conditions and health will be dissolved.

However, the main idea is that all types of job positions within different types of operations can be altered by design, even though type of activity performed reduces the number of options available for how work can be organized.

Material and methods

Materials

This thesis is based on cross-sectional data on organizations and individuals respectively. Data collection was carried out in the project ”The Healthy Workplace Study” (HWS) between the years 2000 and 2003 in two regions of mid-Sweden (Marklund et al., 2006). According to Kalleberg (1994), the best choice of sampling to analyze the relation between organization and individuals, is to include a population of organizations in the first step, and a sample of individuals from these organizations in the second step, since representative samples of both organizations and individuals can be executed, and the sample is truly nested. Ideally these should be measured independently to avoid bias. This strategy was followed, and a two-stage sample was used in the Healthy Workplace Study (HWS). As a first step, organizations that had an agreement with an Occupational Health Service (OHS) were invited to participate in the study, and as a second step, all employees within these organizations were invited to answer a survey.

A problem that is often discussed concerns the level in an organization where relationships with working conditions and health can be found (Rousseau, 1985; Kalleberg, 1990; Klein et al., 1994). By their very nature, organizations are multilevel, consisting in varying degrees of hierarchical levels (Klein & Koslowski, 2000). Therefore, in empirical studies of organizations it is necessary to delimit the unit of study, i.e. to establish what an organization is, at what level of the organization it is most reasonable to collect organizational data. In the HWS, the primary organizational unit in focus was the workplace. It was at the workplace level that organizational data were collected. The specific criteria for selecting the workplace units of an organization to be studied were that a unit should have an address, one manager responsible for the personnel, budget, and production of the unit, and it should constitute a separate accounting unit.

Three hierarchical levels of organization were identified and were labeled parent organization, workplace, and sub-unit respectively. The majority of the workplaces belonged to a larger organization, such as a syndicate, a firm, a hospital, or a municipal authority. This organizational level is referred to as the parent organization. Finally, many of the workplaces were organized into sub-units, and at this formal level beneath the workplace level, only parts of our criteria were fulfilled. In total, the dataset consisted of 4306 individuals at 90 workplaces divided into 141 sub-units and belonging to 32 parent organizations. The workplaces stand for a broad variety of production activities/ industries rather than a representative sample of the Swedish labor force. Giertz’ (2000) classification scheme was used to classify the type of industry at the workplaces (Study II). Of the 90 workplaces, 9 were in

manufacturing, 34 in knowledge-intensive services, 19 in manual services, 12 in caring, and 16 in teaching. Most of the workplaces had fewer than 50 employees, and the total range in size varied from 5 to 655 employees. The majority of them were private enterprises, one third were in the public sector, and the rest were divided between public enterprises and cooperatives.

Workplace data

Data at the workplace level were collected by interviewing managers and by collecting documents. Interviews were performed at the workplace in question. The interviews lasted on average two hours and were conducted by two members of the research team. Questions covered a wide range of organizational characteristics such as ownership, the production process, market competition, organizational change, management strategies, personnel structure, and occupational health and safety management. There was no interest in attitudes or subjective values. Instead, the focus of the interview was on objective and factual information, and information as specific and concrete as possible was used to reduce the degree of subjectivity. The interview template was based on other surveys, mainly on the MOA study (Härenstam et al., 1999; 2004b), but was also influenced by other studies (Marklund et al., 2006). Most of the questions had closed-ended response alternatives ranging from "low" to "high". Since very different workplaces were included in the sample, and the intention was to compare workplaces, some questions had to be "translated" into concepts that were applicable to and meaningful for the specific industries. To guarantee that the same criteria were used for all workplaces, each answer was classified by two researchers. Each interviewed manager received a written copy of the interview and, later on, a summary of the main results for their organization in relation to all organizations in the dataset.

Individual data

The individual data consisted of a questionnaire with questions concerning physical and psychosocial working conditions, health, work–family balance, and conditions of employment. In most cases, the questionnaire was distributed by the Occupational Health Service (OHS) to be filled out at home. The questionnaires were then returned by mail and full anonymity was guaranteed to all employees. A total of 4306 out of the 5293 employees responded, giving a response rate of 81.4%. The participating individuals were between 18 and 66 years old (M=44, SD=10.2). The majority of the participants were men (72%), and blue-collar workers constituted a large share (46%).

Design of the four studies

To bring organizations closer to individual working conditions and health, a number of steps must be taken. The first is to establish at what level of the organization it is most reasonable to carry out the study, and to find reasonable ways of measuring the specific aspects of an organization that may affect working conditions and health. The second is to find specific organizational characteristics that can be linked to individual working conditions and health, and to explore the frequency of these in contemporary organizations. The third step is to investigate whether differences in individual conditions are at all linked to differences at the workplace level and the degree of this variation. The final step is to explore whether the specific organizational characteristics can explain the variation in individual conditions that are linked to organizations. These steps were carried out in four separate studies. The relationships between the four studies are shown in Figure 6 below.

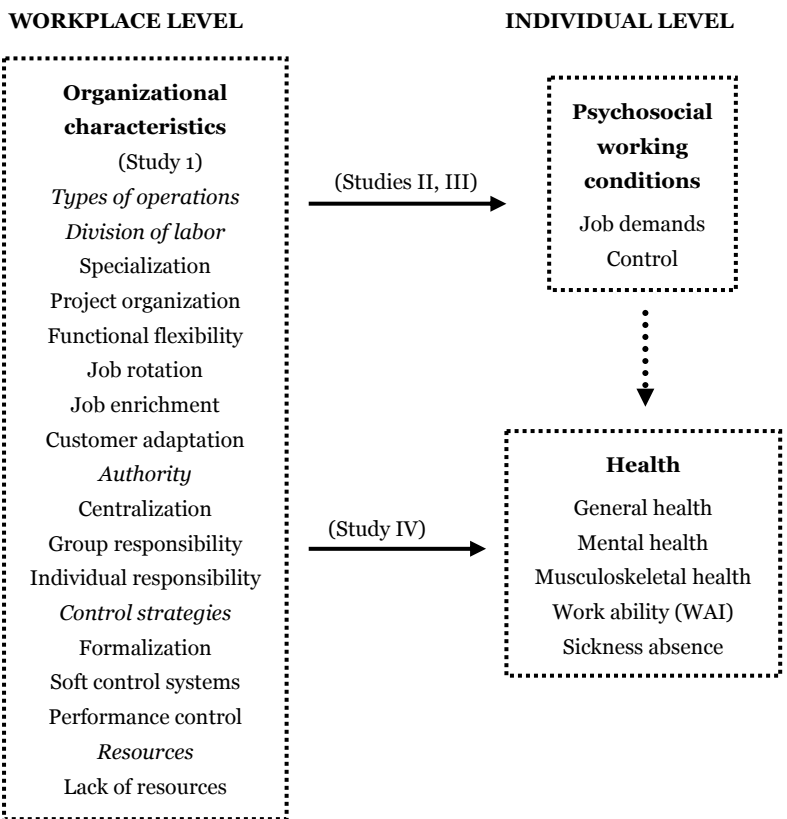

Figure 6. Analytical model of the relationships between the four studies in the thesis.

Thus, the four studies were designed to range from general descriptions of workplaces and overall relationships between organizational levels and working conditions, to an investigation of more specific associations between organizational characteristics of workplaces, working conditions and health of individuals. In Study I, attention was directed to the organizational structure of the 90 workplaces. More specifically, it was investigated whether the workplaces were characterized by bureaucratic or post-bureaucratic characteristics of organizations. A comparison between types of operations was also made, as these characteristics are assumed to be related to type of industry. This gave information on the frequency of different organizational characteristics at the workplaces before exploring their impact on working conditions and health. Thus, only workplace data were used in this study.

In *Study II*, we aimed to explore the magnitude of organizational impact on job demands and control, but also to look at what part of the organization seemed most relevant for understanding organizational impact on psychosocial working conditions. Therefore, several parts of the organization were assessed, and only organizations that consisted of a genuine hierarchy with three organizational levels were included in this study. Of the total of 90 workplaces, 51 were included.

Study III, explored the impact of organizational characteristics on job demands and control, testing whether workplace differences in job demands and control of employees between the 90 workplaces could be explained by the organizational characteristics of the workplaces, mainly presented in the second study. It was also tested whether those differences were due to compositional effects in terms of occupational class, gender, and age of employees, as the association between these individual characteristics and working conditions is well-established and known to be unevenly distributed between different industries.

Finally, the analysis was extended to include the impact of the organizational characteristics on different health outcomes in *Study IV*. As health is strongly associated with individual characteristics and working conditions, these were taken into account in the analysis. The overall design of the four studies is summarized in Table 1 below.

Study	Research question	Data	Method	Dependent variable	Independent variable(s)	Confounders
I	What characterizes the organizational structure of workplaces?	90 workplaces in different types of operations	Mean comparisons between types of operations. Fisher exact test.	Organizational characteristics: specialization, project organization, functional flexibility, centralization, individual responsibility, formalization, performance control, soft control systems	Types of operations: 9 manufacturing, 34 knowledge-intensive services, 19 manual services, 12 caring, 16 teaching	
II	How much does organization matter for job demands and control?	10 parent organizations 51 workplaces 141 sub-units 3485 individuals	Multilevel analysis, four -level empty model	Psychosocial working conditions: job demands and control		
III	What organizational characteristics are related to job demands and control?	90 workplaces 4039 individuals	Multilevel analysis, two-level random intercept models	Psychosocial working conditions: job demands and control	Organizational characteristics: job rotation, job enrichment, centralization, individual responsibility, formalization, performance control, soft control systems	Class, gender, and age
IV	What organizational characteristics are associated with individual health differences?	90 workplaces 4306 individuals	Multilevel analysis, two-level random intercept models	Health outcomes: general health, mental health (GHQ12), musculoskeletal disorders, work ability (WAI), sickness absence	Organizational characteristics: functional flexibility, customer adaptation, individualization, group responsibility, performance control, lack of resources	Gender and age, and physical and mental job strain as mediators

Table 1. An overview of the overall design of the four studies.

Organizational characteristics are the central variables in this thesis. In Study 1, organizational characteristics are the outcome to be explored in relation to type of industry, while Studies III and IV explore the impact of organizational characteristics on job demands and control, and health. In three of the four studies, psychosocial working conditions are the outcome to be explored, but in the fourth article they are included as mediators when the association between organization and health is focused. Individual characteristics are used as confounders.

Methods

Psychosocial working conditions and health are multilevel phenomena, as they are associated with factors in different societal contexts, from individuals to social groups, organizations, living areas, and society at large. These phenomena are part of a rather complex reality; thus, it was necessary to have a statistical method which could utilize the fact that the study deals with mainly two levels: a workplace level and an individual level. For this purpose, multilevel analysis was applied. However, in order to clarify what characterizes the units at the organizational level, descriptive methods were also used in one of the studies.

Multilevel analysis

In multilevel models, the social context is viewed as a hierarchical system where individuals and different contexts are defined as separate levels of this system. Multilevel analysis is a general term for all models with a nested and hierarchical data structure, such as individuals belonging to different organizations. Thus, the population is hierarchical and the sample is viewed as a multistage sample from this population (Hox, 2002). In a study of individuals within organizations, there is one population of organizations and one population of employees (Snijders & Bosker, 1999).

Multilevel reasoning implies that individuals can be influenced by factors that characterize those contexts or levels, but also that individuals might influence their contexts (Hox, 2002). Thus, the origin of contextual effects can be interpreted as a consequence of factors in the specific context, or as a result of individuals with certain individual characteristics who are clustered in certain contexts, so-called compositional effects (Duncan et al., 1998). In Occupational Health Research (OHR), the latter is the most common interpretation of the relation between organization and individual outcomes, and occupational class is often used as a proxy for organization.

Multilevel analysis makes it possible to explore the relative effect of contextual and compositional effects, as several relevant levels are considered simultaneously. Then it is possible to separate these effects from each other, and also explore interaction effects between those levels. Thus, the advantage of multilevel models in comparison with traditional regression

analysis is that explanatory factors can be specified at any level of the hierarchy, and intra-organization and intra-individual relations can be identified within the same analysis.

Statistically, multilevel models extend ordinary regression models by including random effects to represent variability between units at each level. The inclusion of random effects is used as a measurement of nesting, i.e., the extent to which individuals belonging to the same organizations differ from individuals belonging to other organizations, or the extent to which individuals in one organization are similar to each other as compared with individuals belonging to other organizations. This allows the total variance of the dependent variable to be split into levels. The amount of variance attributed to different variables is calculated by the intra-class coefficient (ICC). The ICC measures the proportion of variance at each level in the model, compared with the total variance. A significant ICC indicates that there is an organizational effect, as the means of the organizational units differ significantly from each other (Snijders & Bosker, 1999; Hox, 2002).

However, due to selection bias it is problematic to interpret a contextual effect as a causal inference. In studies of neighborhood effects on individual outcomes, the selection bias has been discussed. Selection into and out of neighborhood areas is not random (Brännström, 2006). The same problem is relevant when exploring the organizational effect on individual outcomes, as the Swedish labor market is highly segregated. This means that selection in and out of organizations is not random, and as mentioned above it cannot be ruled out that the contextual effect of organizations reflects unmeasured differences instead of the relation explored (see Brännström, 2006 for detailed discussion).

Nevertheless, multilevel models have been described as a method that can handle statistical and conceptual problems identified when the multilevel structure of the data is ignored. One such problem is violation of the basic assumption of independent observations, which has consequences for the significance test of the results. If this assumption is violated, estimation of standard error will be too small, which results in "spuriously significant results" (Hox, 2002:5). Another problem often referred to concerns moving variables between levels by aggregation or disaggregation. A common procedure is to aggregate individual data into organizational level data. A consequence of using aggregated data is loss of power in the analysis due to the fact that the amount of information is considerably reduced. The opposite is the result when data is disaggregated. Then data are blown up, as data of relatively few units at the macro-level are given to a larger number of micro-units: the so-called atomic fallacy (Hox, 2002). A conceptual problem is the shift of meaning (Snijders & Bosker, 1999), the so-called ecological fallacy (Robinson, 1935). The data describe individuals but the results are interpreted as organizational characteristics. These problems are avoided or

at least minimized by use of global (Hox, 2002), or “genuine” data, in this case, by measuring individual data at the individual level and organizational data at the level of organizations.

Main findings

Organizational characteristics (Study I)

The aim of the first study was to empirically scrutinize what characterizes the structure of contemporary workplaces, but also to investigate whether possible differences were related to type of operations. Organizational characteristics constituting the ideal types of bureaucracy and post-bureaucracy were conceptualized and measured. Indexes were constructed from separate questions. Three measures of bureaucracy (specialization, centralization, and formalization), and 5 measures of post-bureaucracy (project organization, functional flexibility, individual responsibility, soft control systems, and performance control) were used. The results indicate that a majority of the 90 workplaces were characterized by a combination of bureaucratic and post-bureaucratic characteristics.

Centralization of power to the strategic level coexisted with individual responsibility for planning of daily work. Formalization was combined with application of performance control, and the use of soft control systems in governing daily work. Project organization and functional flexibility were used in order to accomplish an integrated production process rather than the principle of specialization. As the results indicate, it should not be assumed that organizations in general are post-bureaucracies in the place of bureaucracy.

The comparison showed significant differences between types of operations in seven out of eight organizational characteristics, the exception being functional flexibility. This means that these characteristics are unequally distributed between different industries, and that the overall picture given above is not valid as a description of organizational structure in all types of industries. This was especially true for manual services and caring, which indicates that prerequisites for organizational design vary between industries. However, there was also variation within each type of operation, showing that other factors are relevant for understanding differences in the organizational structure of workplaces.

Organizational impact on psychosocial working conditions (Study II)

The main idea of the second study was to explore the magnitude of organizational impact on job demands and control in the JDC model. An additional aim was to identify which organizational level is the most important for job demands and control respectively. Therefore, the dataset was restricted to organizations that consisted of three genuine organizational levels, resulting in 3485 employees at 51 workplaces divided into 141 sub-units and belonging to 10 parent organizations. The results of multilevel

analysis showed that organization clearly matters for psychosocial working conditions. There is a systematic variation in job demands and control between organizations. A rather high proportion of the variance for the two dimensions of psychosocial working conditions, job demands and control, was attributed to the three organizational levels. In total, 13% of the variation in job demands and 20% of the variation in control was attributed to the three organizational levels.

The results also showed that all three levels of organization had an impact on the two psychosocial dimensions, but in varying degrees. For job demands, the workplace or establishment level was the most important, with a variance of 8%. For control, the largest proportion of variance was attributed to the sub-unit level (12%). The results support the contextual assumptions of the JDC model, and support job redesign as preventive action for accomplishment of healthy work. Furthermore, the implication is that the delimitation of organization in empirical studies needs to be discussed within occupational health research, as the magnitude of organizational impact on working conditions depends on how organization is delimited.

Organizational characteristics, job demands and control (Study III)

The aim of the third study was to explore whether the systematic variation in job demands and control between workplaces could be explained by the organizational characteristics of the workplaces. The dataset consisted of 90 workplaces and 4039 employees in those workplaces. Two bureaucratic and five post-bureaucratic characteristics of the formal structure were chosen that were known to characterize contemporary workplaces and were theoretically linked with working conditions. Post-bureaucratic characteristics tested were job enrichment, job rotation, individual responsibility, soft control systems, and performance control; and bureaucratic characteristics chosen were centralization and formalization. In total, seven organizational characteristics were tested.

The results showed that five of the seven tested organizational characteristics were significant for control. The three post-bureaucratic characteristics: job enrichment, individual responsibility, and soft control systems, were associated with high level of control; while the two bureaucratic characteristics: centralization and formalization, were associated with a low level of control. The results remained when controlled for occupational class, gender, and age of the employees.

Organizational impact on job demands was also tested. The results show significant association between job demands and six organizational characteristics. Of these, all except formalization represent post-bureaucracy. Job rotation and performance control were related to a low

level of job demands for employees, while job enrichment, individual responsibility, formalization, and soft control systems were related to high job demands. The effects remained for all associations, with the exception of job rotation and job enrichment, when the confounders "occupational class", "gender", and "age" were included.

Thus, the two psychosocial dimensions of the JDC model are associated with several organizational characteristics. The variation in job demands and control between workplaces was partly explained by the organizational characteristics of the workplaces, and partly by the individuals' occupational class, gender, and age. Overall, the results implied that occupational class is a complementary structure of work rather than a proxy for organization. On the other hand, the effect of job rotation and job enrichment on job demands showed that organizational characteristics seem, in varying degrees, to be more linked to occupational class than to workplaces.

Organizational characteristics and different health outcomes (Study IV)

The main idea of the fourth study was to explore whether there was a direct link between organizational characteristics and individual health outcomes. The material consisted of 4306 employees nested within 90 workplaces. Five health outcomes were measured: general health, mental health, musculoskeletal health, work ability, and sickness absence. The results showed that a significant proportion of the variance in four of five health outcomes was attributed to the organizational level. There was systematic variation between workplaces for all health outcomes except mental health.

Of eight tested organizational characteristics, three could explain some of the between-workplace variances in the four health outcomes. Customer adaptation was associated with increased sickness absence. The organizational characteristic "performance control" meant decreased musculoskeletal health and increased work ability. Finally, lack of resources was associated with decreased work ability. However, when controlled for the individual confounders "age" and "gender", as well as the mediators "physical strain" and "job strain", only one relationship remained. This was the association between customer adaptation and sickness absence. The variation in the different aspects of health is clearly linked to workplace characteristics, but it is also a fact that individual characteristics and individual exposure to working conditions affects this link.

Concluding discussion

In studies on working conditions and health there has been a long tradition of assuming that organization matters; however, there has been a weaker emphasis on establishing empirical evidence for the way in which organization affects individual conditions. Addressing these issues means that the gap between organizational research and research on working conditions and health needs to be approached. In this thesis, the impact of organization on psychosocial working conditions and health was studied and confirmed. The gap was addressed by exploring the association between characteristics constituting the organizational models of bureaucracy and post-bureaucracy with the main dimensions of the JDC model, and with different health outcomes of employees.

How different are workplaces?

Dichotomization between the old and new organizational characteristics has been frequent in the dominating rhetoric and theories on the coming of the service society. The new post-bureaucracy is contrasted with Max Weber's work on bureaucratic structures. According to the results of this thesis, this dichotomy did not work empirically (Study I). A majority of the 90 workplaces were characterized by both bureaucratic and post-bureaucratic characteristics. This implies that focusing on certain aspects of post-bureaucracy is problematic when exploring what characterizes workplaces and their impact on individual outcomes. Instead, a comprehensive and comparative approach is needed. The results support some of the contemporary criticism of the organizational dichotomy that proposes a more nuanced and empirically based discussion about what characterizes different workplaces today (Alvesson & Thompson, 2002; Karlsson & Eriksson, 2000; Lounsbury & Carberry, 2005).

As a consequence of the focus on how organizations transform into a new organizational form, findings of new aspects are commonly interpreted as evidence that old aspects have been replaced. Instead, this might reflect a shift in terms of what aspects of organizations are measured. However, what is now referred to as new versus old characteristics might in fact have existed the whole time, but there was no interest in searching for them until they became modern. Changes in what is searched for in empirical studies reflect changes in our time. Working life has without doubt undergone considerable transformation since the high days of bureaucracy, implying different prerequisites for organizational activity. Nevertheless, environmental changes are filtered through organizations. The extent to which modern ideals are used in the process of adaptation to environmental circumstances and in the performance of daily activities is an active managerial choice. This

study provides empirical support for the self-evident truth that organizations are a heterogeneous group rather than being one type of organization. The study also shows that it is fruitful to explore organizations empirically, but more studies of different combinations of organizational characteristics are needed to further improve our knowledge about what contemporary workplaces look like.

Do organizational characteristics affect individual working conditions and health?

The transformation of organizations from bureaucracy to post-bureaucracy illustrates that organizations are seen as redesignable, and that organizations in general are seen as possible to alter by means of organizational design. According to the authors of the JDC model, job demands and control must be found to be associated with changeable aspects of organization and the effects needs to be independent of the personal characteristics of the individuals before redesign can be suggested to managers. The results support the assumption that the JDC model is a situation-oriented model, with three organizational levels associated with job demands and control (Study II). The findings also confirm the assumption that job demands and control are associated with changeable and designable aspects of organization (Study III). This means that the main criteria given by the authors for their model suggesting redesign of work are fulfilled.

Even though workplaces cannot be defined as being bureaucratic or post-bureaucratic in this study, these models are useful when exploring the association between organizations and employees' working conditions, because they highlight general characteristics of organizations that are assumed to affect working conditions. The models can be understood as different answers to the main issue in work science. Integration of individuals into a post-bureaucracy is assumed to result in working conditions that are identified as healthy by the JDC model, while the opposite is expected if individuals are integrated into a bureaucratic organization. Bureaucracy is often seen as being negative for employees' opportunities to exercise control, since it includes strict authority and detailed regulation of performance. Jobs with a low degree of control are defined as unhealthy jobs in the JDC model. Post-bureaucracy on the other hand is assumed to result in general improvement of working conditions with increased opportunity for control.

The assumed negative effect of bureaucratic characteristics on job control was found, and the assumed positive impact of post-bureaucratic characteristics on control was also mainly supported. This can be seen as support for the assumption that control lies more in formal structure than in individual jobs within bureaucratic organizations, whereas the opposite is the case in post-bureaucracies. The effects on job demands were not as

straightforward. Both bureaucratic and some post-bureaucratic characteristics were found to increase job demands, and some post-bureaucratic characteristics were also associated with decreased job demands.

Balance between job demands and control is the key to good working conditions, and lack of control is defined as the main problem to be solved. However, to reach a balance between job demands and control by increasing the amount of control for employees might be problematic, as the results show that job demands depend as much on organization as on control. It can be questioned whether job demands should be seen as more or less given by the type of work performed, and therefore not possible to alter. Several aspects of the organization were of importance for job demands and control, and the associations went partly in the opposite direction. This means that job redesign seems to be a strategy for changing job demands as well as control, but also that changing one aspect makes it difficult to estimate what the overall effect might be on psychosocial working conditions.

Organizational characteristics were also found to have a direct impact on employees' sick leave that was not mediated by working conditions. The association found between customer adaptation and sickness absence has not been found in earlier studies of organization and health. It can be concluded that organizational characteristics of workplaces contribute to differences in employees' working conditions and health.

Compositional and contextual effects

Organizations generate a formal structure that affects individuals and their working conditions and health, but they also affect individuals by matching them to the jobs that have been created. The selection process decides the composition of individual characteristics in the organization that are known to be related to working conditions and health, such as occupational class, gender, and age. It has been suggested that health and a healthy lifestyle are deliberately used as a sorting mechanism by employers in the selection process (Holmqvist & Maravelias, 2006). Matching the right person would mean matching the healthy individual to the organization. This illustrates that directions of associations found between organization and individuals can go in both directions.

The authority relationship between organization and individual has been identified as one explanation for differences in how individuals are matched into organizations. A complex position is assumed to increase the organizational dependency of the individual, with better working conditions as a result. However, the authority relationship is also affected by other factors, such as supply of labor. The rise of Scientific Management and the Japanese firm has mainly been explained by differences in labor force supply (Kalleberg & Reve, 1992; Ahrne & Hedström, 1994). A good supply of labor

due to high levels of unemployment and few opportunities for employees to find another job made Taylorism a success in the US, while contrary conditions resulted in focus on long-term commitment and family values in Japanese industry.

General or task-specific?

Although organizational theory strives to be general, it has been suggested that the way work is organized is contingent on the type of task performed, represented by the type of operation performed in the specific organization, and the occupational class of its employees. Working conditions are affected by what activity is performed, as well as how it is performed. The question is whether the 'how' issue depends on the 'what' issue.

Changing organizations are assumed to affect how work is performed. The assumption that post-bureaucracy leads to improved working conditions is a question that has been raised here. However, the rise of post-bureaucracy has also been seen as a consequence of a change in the type of work that is performed. Service production has been presented as demanding another type of organization than manufacturing (Castells, 2000). The coming of post-industrial society means that the service sector replaces manufacturing as the major sector in the labor market. The post-industrial, or service, society has been referred to as the third industrial revolution (Magnusson, 2000), and the reasoning has clear parallels with descriptions of the rise of the industrial society. Classical writing of Marx, Weber and Durkheim focused on the change of work itself in the rise of the industrial society.

If the way work is organized is contingent on the type of activity performed, differences would be found between types of operations. In this study, we compared frequencies of bureaucratic and post-bureaucratic characteristics in different types of operations (Study I). Differences were revealed between types of operations, but these could not be dichotomized as differences between manufacturing and service. Instead, it was caring, teaching and manual services that deviated most from the general pattern. Furthermore, all organizational characteristics measured were found in all types of operations, but in varying degrees. The role played by type of activity in understanding the association between organizational characteristics and working conditions and health needs to be further explored, especially as the Swedish labor market is highly segregated with a female-dominated public sector (caring and teaching) and a male-dominated manufacturing industry. The results imply that gender differences in working conditions and health can be related to differences in how work is organized in different types of operations.

The results in this study (Study III) also showed that most of the associations found between organizational characteristics and working conditions remained when controlled for occupational class of employees.

The results support the idea that all types of jobs can be altered by organizational means (Parker et al., 2001), instead of the assumption that occupational classes are organized differently due to the task performed. Occupational class is often used as a proxy for organization in empirical studies of health. The results indicate that this is problematic, as has been suggested by Kristensen (1996). As an alternative, occupational class and organization should be seen mainly as two separate sources for differences in working conditions, rather than as reflections of each other. The association between organizational characteristics and occupational class is a central issue to be explored in future studies.

The result raises questions about how occupational class should be interpreted in health studies. It is possible that occupational class captures differences in tasks performed, the 'what' issue; while organizational characteristics capture differences in the way tasks are carried out, the 'how' issue. No matter how work is organized, there will always be a division of labor within organizations that generates differences in the tasks performed, which in turn can affect working conditions and health; however, the extent to which occupational class captures differences in work content or factors outside paid work can also be questioned. Occupational class is associated with different lifestyles, different cultural codes and norms (Ahrne, 1994), but also with health differences (Marmot, 2004).

Methodological considerations

A few studies exploring the organizational impact on working conditions and health have used a population of organizations and collected data at the organizational level (le Grand et al., 1996; Dhondt & Kraan, 2001; Härenstam et al., 2004a), but to my knowledge, none of them have a large sample of organizations and individuals in which several organizational levels are identified. Instead, most researchers have focused on studying individuals within one type of industry, using data about the individuals alone, and have based their information about the organization on surveys addressed to the employees and aggregated information about employee conditions.

As mentioned earlier, a number of steps are necessary to bring organizations closer to individual working conditions and health in empirical studies. These range from establishing at what level in the organization specific organizational characteristics can be found, to establishing that those characteristics can explain differences in individual working conditions and health. As these steps together are part of a rather complex reality, the methodological design of this study had to meet some special requirements. One was to obtain information, both about the workplaces and also about the individuals working in these workplaces, ideally measured independently to avoid bias. Another requirement was to have some ideas about what specific

organizational patterns might be of relevance. This was met by testing a large number of organizational aspects where theories and previous studies have suggested that there might be correlations.

Implications for future studies

Other studies are needed in order to validate the results from this study. The results of Study I indicate that the way in which organization is defined is essential. Other definitions of organization might give other results. In this project, organizational characteristics were measured at the workplace level. However, it is reasonable to believe that there are characteristics in other parts of the organization that are also of importance for job demands and control. In the first study, the organization as a focal unit of analysis was scrutinized, and several organizational levels were tested. The results indicate that organizational impact is probably underestimated, due to the fact that most studies are based on aggregated data of individuals. Other measures might give other results than those found here. In this thesis, material from one point in time was available; however, for causal analysis, longitudinal data are optimal. Organizational impact on working conditions and health might be better captured during a period of time, as there might be a time lag between cause and consequence.

The findings of this study imply that an organizational approach contributes to our understanding of why working conditions and health vary between employees, in that such an approach makes it possible to seek explanations for this variation beyond the individual. The main finding was that organization matters beyond occupational class, which has consequences for how occupational class should be interpreted. Further research is needed to deepen our understanding of how organizations affect employees' working conditions and health. Hopefully, this study will encourage future studies to be carried out.

Implications for practice

In prevention work and health promotion, the aim is to achieve healthy working conditions for employees. However, the perceived cause of the problem sets the limits for the plan of action that is seen as available. The approach of exploring how differences in organization affect working conditions and health is justified for practical as well as theoretical reasons. The practical reason is that prevention work and the creation of healthy working conditions cannot be carried out at the individual level, but must be organized at the workplace for those employed in that specific context. It is the employer who is legally responsible for leading and allocating work. However, when the individual's responsibility for defining and planning work increases, there is a risk that the employer's responsibility will be neglected or become invisible and transformed into an individual issue.

Improvement strategies are based on the idea that it is possible to alter situational and individual factors in order to improve employees' working conditions and health. Organizations, and jobs, are designed entities and thereby redesignable, which means that individuals are integrated into potentially different organizational contexts. Ignorance of the organization can be defined as a risk factor in itself, as the lack of options means that work-related issues can only be seen as an individual outcome. Working conditions occur in the meeting between organizations and individuals. In this study, the association between organization and working conditions and health was confirmed, implying that differences in working conditions cannot be reduced to differences in individual behavior or attitudes. The results support the idea that all types of organizations and occupations can be redesigned by organizational means.

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