

WORK & HEALTH

**Cognitive Activation Theory of Stress applied in an
organisational setting**

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Dedication

This thesis is dedicated to my father (1937 – 1998) who suddenly died when I was too young. I was not ready. To my mother who in the most difficult times imaginable, modelled coping in the most admirable way.

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Erling Svensen, Bergen, 9th of March, 2007.

Abstract

Most models of occupational stress propose that stressors in the work environment lead to negative psychological, physical, and behavioural changes in the individual employee (Jex & Bliese, 1999). This thesis focuses on three potential stressors in the work environment; downsizing, poor work environment in general, and poor leadership. What are the characteristics of these stressors, and can they be causes of ill health? Does a focus on the individual interpretation of the environment give a better understanding of the relation between work and health? The theoretical framework for these discussions is the Cognitive Activation Theory of Stress (CATS) (Ursin & Eriksen, 2004).

This thesis consists of three papers, one for each of these three common causal explanations on the relation between work and health: Downsizing (Paper 1), poor work environment (Paper 2), and poor leadership (Paper 3).

To study if an employee's previous learning experience and characteristics of the working environment are associated with positive attitudes towards **downsizing**, a survey was done in the Norwegian branch of a global oil company (n=467). The results showed that when facing an organisational downsizing, 1/3 of the employees were positive to the coming change and 1/3 was not. There was a strong positive relation between employees' perceptions of their work environment and their attitude

to organisational change (43% explained variance). Statistical significant factors explaining attitude to organisational change were Corporate Social Responsibility (CSR), Involvement & Participation, Team leadership, and Team effectiveness, with CSR being the most important factor. Employees with leadership responsibilities were less positive to change compared to employees without leadership responsibilities and older employees were more positive than younger ones.

Poor work environment and the relation to health was investigated in 5 organisations (total n=458). The results showed that subjective health complaints (SHC) were common, also among workers with high job satisfaction. Satisfied workers reported an average of 5-6 subjective health complaints which corresponds to the prevalence found in a Norwegian general population. Work environment explained 43% of the variance in job satisfaction and 9% of the variance in SHC.

The relation between **poor leadership** and subordinate health was investigated with multilevel analysis of questionnaires from 2915 employees and their 322 leaders. Leadership behaviour was defined as being supportive, empowering and fair. Leadership behaviour (organisational level) was not related to sick leave. However, examining individual perception (individual level) of leadership showed that those who perceived their leader as not being supportive, empowering or fair, had more sick leave in a 1-year follow-up. Furthermore, individual perception of leadership

explained 20% of the variance for work related exhaustion and 17% for job satisfaction. This was more than twice the variance explained by leadership behaviour (organisational level). For all outcomes individual perception of leadership explained more variance than leadership behaviour.

The conclusion in this thesis is that a simple stressor-strain model where downsizing, poor work environment, or poor leadership inevitably leads to ill health is not correct. As postulated in CATS, the important factor is the individual perception of these potential stressors. This might explain why interventions at the individual level have better results than interventions at the organisational level (Reynolds, 1997).

List of publications

Paper 1

Svensen, E., Neset, G., and Eriksen, H.R. Factors associated with a positive attitude towards change among employees during early phase of a downsizing process

Scandinavian Journal of Psychology (2007, accepted for publication)

Paper 2

Svensen, E., Arnetz, B.B., Ursin, H., and Eriksen, H.R. Health complaints and satisfied with the job? A cross-sectional study on work environment, job satisfaction and subjective health complaints.

Journal of Occupational and Environmental Medicine (2007, accepted for publication)

Paper 3

Svensen, E., Lie, S.A., and Eriksen, H.R. Leadership and health: A multilevel analysis of the relative importance of individual perception of leadership.

Submitted to Occupational and Environmental Medicine

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1 The problem area

Sick leave constitutes a huge cost to the Norwegian welfare state and for many other developed countries (McDaid, Curran, & Knapp, 2005). The costs are rising and said to threaten the welfare state (Nachemson, 1994). The main reasons for sick leave is not traditional disease, but health complaints where the causes of the complaints are not fully understood (Nimnuan, Hotopf, & Wessely, 2000; Wessely, 1990). The most common complaints resulting in sickness certificates are musculoskeletal pain, tiredness, and mood disorders (National Insurance Administration, 2005). The majority of these complaints have in common that the etiology is not known. The search for cause(s) is wide, but the results are poor. The lack of results has led to suspicions whether these patients really are sick (Ware, 1992), which increases the burden for these patients. There is no lack of possible explanations for the high sick leave, but there seems to be no agreement. The common factor is the inability to participate in working life. Therefore, much of the attention and many of the attributions are directed at working life conditions (Bultmann, Kant, Van den Brandt, & Kasl, 2002; Hoogendoorn et al., 2002; Karasek & Theorell, 1990; van der Giezen, Bouter, & Nijhuis, 2000; Wergeland et al., 2003) .

In a large meta-analysis of the relation between job satisfaction and health the authors summarised the workers situation like this: “There is growing evidence that current trends in employment conditions may be eroding levels of job satisfaction—and

directly damaging the physical and mental health of employees” (Faragher, Cass, & Cooper, 2005). It has also been suggested that: “Leaders may have a large impact on e.g. demand, control, and social support, which are known to strongly influence employee health” (Nyberg, Bernin, & Theorell, 2005)”. Organisational change, especially when it includes downsizing, is claimed to be quite a destructive process (Kets de Vries & Balazs, 1997) as well as a huge source of stress (Michie, 2002), with possible negative effects on employee health.

1.1 Aim of thesis

The citations above suggest three main attributions for the assumed relations between work and health: Downsizing, poor work environment in general, or poor leadership. All three explanations fit into a stressor-strain model where ill health occurs when too much stress or burdens are imposed on the employee.

This thesis consists of three papers, one for each attribution. In each paper the relevant stressors and their possible role as the cause of ill health is discussed. Does downsizing (Paper1), poor work environment (Paper 2), or poor leadership (Paper 3) inevitably lead to ill health, or does it depend on the individual perception of these potential stressors as suggested in the Cognitive Activation Theory of Stress (CATS) (Ursin & Eriksen, 2004)?

2 Theoretical framework

2.1 Positive psychology

Several authors have noted there is a bias towards a focus on ill health in the field of occupational health psychology (Fredrickson, 2003; Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001). The mission of the positive psychology movement is to counterbalance this negative bias (Seligman, 1998; Seligman & Csikszentmihalyi, 2000). It is not a new methodology, it is simply a shift in focus from negative states such as ill health to resilience factors such as strengths and virtues (Sheldon & King, 2001). In occupational health psychology the influence from the positive psychology movement has led to a shift from what could be called a disease model to a health model (Ruack, 1999). This shift is also present in this thesis. In Paper 1, there is a focus on positive attitudes towards downsizing, as opposed to the common search for negative aspects of downsizing. In Paper 2, I study the relationship between job satisfaction (a typical positive psychology theme) and health complaints. In Paper 3 the importance of individual perception of leadership is discussed, which opens up for a focus on resilience factors- also a typical positive psychology theme. While positive psychology was the inspiration for this thesis, the Cognitive Activation Theory of Stress (CATS) (Ursin & Eriksen, 2004) was the fundamental theory applied in all three papers. CATS, with the focus on coping, is a good example of positive psychology as it is defined by Sheldon & King (2001): “Positive

psychology... is nothing more than the scientific study of ordinary human's strengths and virtues".

2.2 Cognitive Activation Theory of Stress (CATS)

Physiological processes give rise to sensations registered by the brain. The interpretation of these sensations depends on the expectancies of the individual; what do they mean and what consequences will follow (Ursin & Eriksen, 2004). Data from Ursin and colleagues demonstrate that most or all human beings experience pain from muscles, uncomfortable sensations from the gut, and tiredness and mood changes from time to time (Eriksen, Hellesnes, Staff, & Ursin, 2004; Eriksen, Svendsrød, Ursin, & Ursin, 1998; Ihlebaek, Eriksen, & Ursin, 2002). For some individuals, these sensations reach levels that interfere with normal life activities and quality of life to the extent that they require assistance from the health service or even hinder participation in working life (Eriksen & Ursin, 2004). Such complaints constitute the largest source for long term sickness compensation and permanent disability in Norway, at an estimated yearly cost of between 20 and 30 billion Norwegian Kroner (National Insurance Administration, 2005).

Within the CATS framework, illness may be a consequence of sustained activation (Ursin & Eriksen, 2004). Activation is a normal and healthy response that occurs when there is a discrepancy between the value a variable should have and the real value of the same variable, i.e. a difference between what one expected and what

actually happened. At work, such a discrepancy could exist between a working goal and the present situation. A discrepancy elicits an alarm reaction (Ursin & Eriksen, 2004). For instance when an employee is faced with difficult tasks, demands or stressors, the expectancies on whether it is possible to handle the situation is important. When the individual expects to handle the situation (“positive response outcome expectancy”), the activation subsides and is not a health risk. When the individual expects to be unable to handle the situation (“negative response outcome expectancy”), the activation may be sustained with an increased risk of illness (See figure 1).

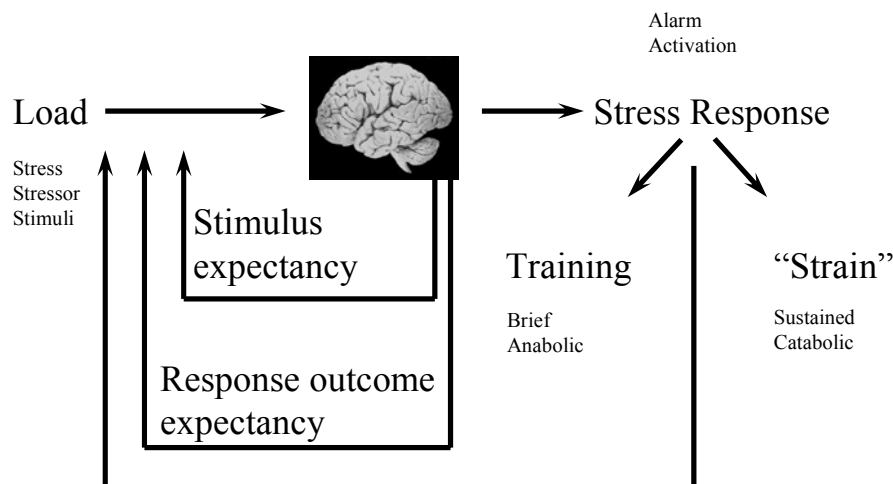


Fig. 1. The four main aspects of stress. The load (stressor, stress stimuli) is evaluated by the brain and may result in a stress response (alarm) that is fed back to the brain. The physiological stress response may lead to training or straining, dependent on the type of activation. Phasic arousal is seen in individuals with a positive expectancy. Sustained arousal may lead to pathology (strain). The brain may alter the stimulus or the perception of the stimulus, by acts or expectancies. (From Ursin & Eriksen, 2004).

The model describes four aspects of stress: The (1) stress stimuli (stressor or load, demand), (2) subjective reports of an experience, (3) the stress response (the alarm),

and (4) the feedback to the brain from this response. According to CATS, the possible ill effect of stress is when the individual is not coping with the situation.

2.3 Health

When the WHO was established more than half a century ago, the text of its constitution defined health as "a state of complete physical, mental and social well being and not merely the absence of disease or infirmity." (World Health Organization, 1948). However, the definition has been criticised for being impossible to fulfil (Saracci, 1997). I agree with this view. If taken into account the high prevalence of physical or mental complaints in the population (Eriksen, Svendsrød, Ursin, & Ursin, 1998), "complete physical and mental well being" seems unrealistic. Saracci (1997) suggested a new definition; "Health is a condition of well being free of disease or infirmity and a basic and universal human right". Health as a human right is an interesting topic for discussion, but beyond the scope of this thesis. Therefore, in this thesis ill health is defined as when the individual does not fulfil this definition: "Health is a condition of well being free of disease or infirmity".

2.3.1 Disease, illness, ill health and complaints.

The term disease is used for physiological and psychological dysfunction, and is classifiable according to the existing systems of diagnose. Illness is used for the patient's own feeling of being unfit (Eriksen, Olff, & Ursin, 2000). Ill health is the condition when the patient does not qualify for the definition adopted by Saracci

(1997); "Health is a condition of well being free of disease or infirmity". Illness and ill health are subjective states and I refer to the health complaints related to illness as subjective health complaints (see chapter below).

2.3.2 Subjective Health Complaints

The patients with labels such as Fibromyalgia, Chronic Low Back Pain, Epidemic Tiredness, Chronic Fatigue Syndrome, Burnout, Chronic pain, Multiple Chemical Sensitivity, Computer Screen Sickness, Post-Viral Fatigue Syndrome (PVFS) Neurasthenia, and Myalgic Encephalomyelitis (ME) may be different groups of patients, but they have many similarities relevant for the discussion in this thesis (Eriksen & Ursin, 2002). Terms like "fashionable diagnosis" (Ford, 1997) and "medically unexplained symptoms" (Wessely, 1990) have been used. These patients report musculoskeletal pain, tiredness and/or gastrointestinal problems as their main complaints, complaints without pathological signs and symptoms, or where the pathological findings are disproportionate to the illness experience. When long lasting and serious the complaints may be classified as somatisation (American Psychiatric Association, 2000), or even "hysteria": "Hysteria remains alive and well and one contemporary hiding place is fashionable diagnoses" (Ford, 1997). However, many patients with these labels do not have a psychiatric disorder (Nimmuan, Hotopf, & Wessely, 2000).

In this thesis I take a pragmatic view and refer to these common health complaints as Subjective Health Complaints (SHC). The SHC term does not offer any diagnosis or clues to causality. It is, simply, a neutral behaviouristic statement – the individual is complaining (Eriksen & Ursin, 2004). These complaints may be measured by the SHC inventory which comprises 29 complaints (Eriksen, Ihlebaek, & Ursin, 1999) and yields five subscales, musculoskeletal pain, “pseudoneurology” (palpitation, heat flushes, sleep problems, tiredness, dizziness, anxiety, and depression), gastrointestinal problems, allergy, and “flu”. SHC may arise from specific or unspecific conditions. Unspecific causes of SHC are most common. For example, 85% of all chronic low back pain cases are unspecific (Airaksinen et al., 2006). It is employees with these unspecific conditions that are the majority of those on sickness leave. It is also the main interest in this thesis.

2.3.3 The stress concept

The term stress is a popular concept in health research. A search in Pubmed in 2007, listed more than 300.000 references to stress. However, the stress term has been used for a wide range of phenomena (Levine & Ursin, 1991) which has confused the scientific debate on stress and health in the working environment (Briner & Reynolds, 1999; Pollock, 1988). For example Michie (2002) defines stress as “the psychological and physical state that results when the resources of the individual are not sufficient to cope with the demands and pressures of the situation”. From this definition it seems clear that individual (lack of) coping is quite an important factor.

However, she then goes on to claim “the typical response from employers to stress at work has been to blame the victim rather than its cause” (Michie, 2002). In other words, according to Michie, the cause of stress is not in the employees (the victims); stress is caused by organisational factors. In Michie’s definition, stress is the result of unsuccessful coping, but still she argues that the organisation is the cause of stress.

Is stress the result or the cause? This is confusing, and it should be no surprise that lay representations of occupational stress are diverse and multi-faceted (Kinman & Jones, 2005).

2.4 Other models of the relation between work & health

2.4.1 The demand-control model

The Demand-Control model (D-C model) (Karasek & Theorell, 1990) has been the most influential model in this field of research (Barling & Griffiths, 2003). A search at Google Scholar in 2007, listed 1868 articles and books with reference to the main book; “Healthy work” (Karasek & Theorell, 1990). According to the D-C model, individuals have high or low demands and high or low control at the workplace. The four possible combinations of these two concepts describe four types of jobs with variable risk of ill health; Low strain jobs (low demands-high control), active jobs (high demands-high control), passive jobs (low demands-low control) and high strain jobs (high demands-low control). Social support has been added to the model, as well as subscales of demand and control (van Veldhoven, Taris, de Jonge, & Broersen,

2005). Individuals working in a job where they have high demands, low control, and low social support carry the highest risk of illness and disease (Karasek & Theorell, 1990). In the discussion of what is most important, the person or the environment, Karasek & Theorell takes an environmental approach; "it is our position that these outcomes (stress-related illness and productive behaviour) are not determined solely, or even primarily, by personal factors" and "our approach is to link causes based in the environment and causes based in the individual, but with environmental causes as the starting point" (page 6 and 9, Karasek & Theorell, 1990). Demand and control are described as qualities of the job, not the individual. However, in a more recent paper, Theorell also discussed how the work environment (e.g. decision latitude) is related to the individual coping (Theorell, Westerlund, Alfredsson, & Oxenstierna, 2005)

According to CATS (Ursin & Eriksen, 2004), the important factor for health is the interpretation of the environment. There may be huge demands, but if the individual expects to cope with these demands there is no health risk. Testing this assumption, the authors behind CATS replaced control with a measure of coping. They found this "demand-coping" model to be closer related to health than the traditional demand-control model (Eriksen & Ursin, 1999) . In the present thesis the assumption of individual perception being more important than the actual environment is tested in a more sophisticated way and discussed in Paper three. The relation between work environment and health is tested and discussed in Paper two.

2.4.2 Person-environment fit

Within the Person-Environment (P-E) fit approach, the focus is on confusing or conflicting role demands. Fit is defined as a match between an individual's skills and abilities and work environment (French, Caplan, & Van Harrison, 1982). The work environment consists (among other things) of role expectations. It is an example of what I will call a stressor-strain model. The stressor is a misfit between person and environment and this causes strain. Unlike CATS (Ursin & Eriksen, 2004), the model does not take into account the different individual responses to stressors. The research on this model has mainly focused on the negative sides of poor fit, not the positive sides of good fit (Nelson & Simmons, 2003). The P-E model has failed to provide good explanations or predictions of the relation between work and health (Eulberg, Weekley, & Bhagat, 1988). Within the CATS framework, the P-E misfit situation could be a risk factor for ill health, but only if the individual does not expect to handle the misfit situation, which may lead to sustained activation and therefore a potential health risk (Ursin & Eriksen, 2004).

2.4.3 The cognitive appraisal approach

Lazarus & Folkman (1984) emphasised the importance of the individual perceptions of the stressors. The individual classifies situations as threatening or non-threatening. This is described as the cognitive appraisal approach (Nelson & Simmons, 2003). Lazarus & Folkman (1984) has developed a questionnaire called "ways of coping" which has been very important in the field (Ursin & Eriksen, 2004), but their theory

lacks an explanation on how “ways of coping” can affect physiology and health. CATS (Ursin & Eriksen, 2004) and the cognitive appraisal approach have in common the focus on individual interpretation and the need for separating the stressor, the individual perception, and the response. In addition, CATS offers a model where coping is related to health through activation.

2.4.4 Lay theories of stress

Lay theories of stress may play an important role in the aetiology and reporting of stress (Furnham, 1997; Kinman & Jones, 2005; Pollock, 1988; Wainwright & Calnan, 2002). People tend to highlight work stress as an important explanation of ill health, and work stress is believed to have increased (Pollock, 1988). Lay theories of health related concepts predict help-seeking, compliance with medical advice and other health behaviours (Furnham, 1997; Kinman & Jones, 2005). After a myocardial infarction, many patients considered stress as having a more influential role than other risk factors, such as smoking and diet (Clark, 2003). Kinman & Jones (2005) found that lay people tend to believe stress is caused by organisational factors. Interestingly, they still believed that stress management among those who experience stress (secondary or tertiary prevention) would be more effective than interventions aimed at preventing stress at work. The development of lay theories on the relation between work and health is an interesting theme. Wainwright & Calnan (2002) describes “the making of a modern stress epidemic” and warn of the danger that arises from the emergence of a new identity—that of the work-stress victim.

According to CATS (Ursin & Eriksen, 2004) the alarm response may lead to ill health if the individual has negative response outcome expectancies. Lay theories of stress may therefore play a crucial role in the individual's expectancy to cope with the situation. If the alarm reaction is believed to be caused by work stress and this is something that the individual does not expect to handle, the activation may be sustained and increases the risk of ill health. Therefore, lay theories of stress may be harmful if they increase negative outcome expectancies.

2.5 Main attributions

2.5.1 “Downsizing as a cause of ill health”

Research on organisational change and downsizing focuses mainly on the negative consequences for the employees. Downsizing is a risk factor for ill health, both for those that have to leave the organisation (Kivimäki, Vahtera, Elovainio, Pentti, & Virtanen, 2003; Westin, Schlesselman, & Korper, 1989) and for those that remain in the organisation (Kets de Vries & Balazs, 1997; Vahtera et al., 2004; Vahtera, Kivimäki, & Pentti, 1997). However, a demonstration of higher risk is not the same as a demonstration of cause. Not everyone affected by downsizing reports more ill health. Medically certified sick leaves were actually reduced among female survivors after a downsizing process (Theorell et al., 2003). Even for the redundants the change may have positive as well as negative effects; other jobs, better jobs, and redundancy

pay (Collett, 2004). Mishra & Spreitzer (1998) argue that trust and justice influence the way employees perceive a future downsizing, and that this may facilitate a more constructive response than when employees do not experience trust and justice.

The risk of losing your job is a major stressor for many employees (De Witte, 1999; Sverke, Hellgren, & Naswall, 2002). Within a simple stressor-strain model a situation like downsizing would inevitably lead to ill health among the employees. According to CATS (Ursin & Eriksen, 2004) the threat of losing your job evokes an alarm response with a general activation. This could potentially be harmful if the activation is sustained. It will be sustained if the individual has negative response outcome expectancies. On the other hand, positive response outcome expectancies will dampen the stress response and shorten the activation period. In the study presented in Paper 1, outcome expectancy was defined as attitude to change and we expected to find some employees that were positive to change (positive outcome expectancy) and some employees that were negative to change (negative outcome expectancy).

Differences in outcome expectancy are based on differences in the individual's learning experiences (Ursin & Eriksen, 2004). In this context we assume that the employee's attitudes to change are based on previous experiences on change within the organisation. Organisational justice theory states that if employees are treated fairly, they will be more likely to have positive attitudes about several work related

factors (Greenberg, 1990; Moorman, 1991). Thus, factors related to how the employees have been treated throughout previous organisational changes were of particular interest to us. In our study presented in Paper 1, this was operationalised as Corporate Social Responsibility (CSR), Team leadership, and Involvement & Participation.

2.5.2 “Poor work environment as a cause of ill health”

Many studies have demonstrated statistically significant relations between self reports of work environment and self reports of ill health. A recent study of van Veldhoven et al (2005) is a good example: They tested the Demand-Control model and several extended versions of it with a sample of 37,291 Dutch employees. The model with best Goodness of Fit explained 25% of the variance of work-related fatigue (van Veldhoven, Taris, de Jonge, & Broersen, 2005). This is in line with previous research on the relation between work environment factors and work related fatigue (de Croon, Blonk, de Zwart, Frings-Dresen, & Broersen, 2002; Sluiter, de Croon, Meijman, & Frings-Dresen, 2003). In this study they used a self reported measure of “work related fatigue” (van Veldhoven, Taris, de Jonge, & Broersen, 2005), and asked explicitly for complaints that were attributed to work. These attributions may well be biased by cultural factors (Pollock, 1988). As we have seen above, lay theories about stress is influenced by several factors, and the lay theories, right or wrong, may bias the individual attributions of the individual health complaints. Subjective health complaints are very common and it is quite natural to search for a common cause for these complaints. In the Western culture, many people are led to

believe that modern working life causes ill health among employees (Pollock, 1988; Wainwright & Calnan, 2002). Asking about “work related fatigue” may bias the results and the interpretation of the results. The question is suggesting the answer or bias – fatigue is work related.

In our study presented in Paper 2, we used the Subjective Health Complaints (SHC) inventory where the respondents simply state which complaints they may have without referring it to any cause, disease, diagnosis or work situation, explicitly or implicitly. The SHC inventory does not invite or suggest any attribution. Testing the assumption that work environment is related to health, we used two comprehensive measures of work environment; Quality Work Competencies (QWC) (Arnetz, 1999) and Q12 (Buckingham & Coffman, 1999; Harter, Schmidt, & Hayes, 2002).

2.5.3 “Poor leadership as a cause of ill health”

A search in PubMed February 2007 found 22037 references to leadership. However, research on the effects of leadership on subordinate health is limited (Nyberg, Bernin, & Theorell, 2005). A recent review found only a few studies that had investigated the relation between leadership, health and health related factors among the subordinates (Nyberg, Bernin, & Theorell, 2005). Good leadership may lower the risk of coronary heart disease (Kivimaki et al., 2005), and increase well-being (Gilbreath & Benson, 2004; van Dierendonck, Haynes, Borrill, & Stride, 2004). Most previous studies on the relation between leadership and subordinate health are based

on the individual's perception of their leaders. This kind of study with self reports of both independent and dependent variables has a methodological weakness (Bliese & Jex, 2002). The analysis is done on a single level, (the individual), but the conclusion is about the leader (the organisational level). All employees are nested in groups that share work environment (including the leader), and therefore the number of unique observations is easily overestimated (Bliese & Jex, 2002). The usual cross-sectional self report data do not conclude if it is work environment (the organisational level) or the individual perception of the work environment (the individual level) that is most important in the relation between work and health.

The same stressor (e.g. leadership behaviour) may cause very different responses among different individuals. Thus, according to CATS (Ursin & Eriksen, 2004), when a relation between leadership behaviour and subordinate health is found, it might not relate to qualities of the leader, but to individual factors such as individual perception and interpretation of leadership behaviour. In Paper 3, using multilevel analysis, we investigated the relative importance of individual perception in the relation between leadership and health.

2.6 Research questions in the three papers

Downsizing (Paper 1), poor work environment (Paper 2) and poor leadership (Paper 3) as causes of ill health are discussed with the following four research questions as the starting point:

1. Are employee's previous learning experience and characteristics of the working environment associated with attitudes towards downsizing? (Paper 1)
2. What is the prevalence of subjective health complaints (SHC) among workers with high job satisfaction in comparison with workers with low job satisfaction? (Paper 2)
3. Are any SHC differences attributable directly to the work environment or is it mediated by the individual perception of the environment (satisfactory or not)? (Paper 2)
4. What is the relation between leadership and individual health related factors such as sick leave, work related exhaustion, job satisfaction, engagement, and psychosocial work environment? Is this explained by individual perceptions of the leader (individual level) or the group assessment of leadership behaviour (organisational level)? (Paper 3).

3 Methods

3.1 Samples

Paper 1 deals with a total of 467 Norwegian employees working in a global oil company (39% were between 41-50 years). Ninety seven were working offshore (7.4% females and 92.6% males) and 366 onshore (31.8% females and 68.2% males). The age spread was similar for employees working offshore and onshore. Only the Norwegian branch (about 500 employees) of the company is presented here. The response rate was about 93%.

Paper 2 included a total of 458 employees from 5 different organisations; newspaper employees (n=124, response rate 91%), public service employees (n=164, response rate 85%), research and development staff in an oil company (n=47, response rate 100%), TV Station employees (n=76, response rate 93%), and high-school teachers (n=47, response rate 90%). The overall response rate was 90%. There were 56% females. The mean number of education years after primary school (9 years) was 5.5 (sd=2.8), and the mean age was 44 (sd=10).

In Paper 3, all employees (n=3400) in a Scandinavian insurance company based in Denmark and Norway were asked to fill in questionnaires. 3180 employees answered, which gives a response rate of 93%. From this sample we identified a total of 322 leaders that had been evaluated by three or more subordinates (Range 3-34, mean 12). These 322 leaders had 2915 subordinates that were selected for further analysis. All 322 leaders, except the chief executive officer (CEO) were also among the 2915 subordinates. The gender distribution was 50% females, and 55% were between 31-50 years of age.

3.2 Procedures

In Paper 1 and 3 all employees in the two companies were contacted by emails with a link to a web page where they were asked to give their views on the working environment in the organisation. The purpose of the survey was general organisational development. In the five organisations in Paper 2 participants filled in the questionnaire with paper and pen. The purpose of the investigation was to gain knowledge about risk factors for ill health.

In Paper 1, the time and context is relevant for the study. The survey was conducted in the second half of the year 2002 at a time when the organisation was in the beginning of a major change process. Top management was not satisfied with the current cost control and a change team consisting of outside consultants was put in

place. Downsizing became part of the plan, and this was communicated by the top management to the employees. The names of the redundants in this downsizing process were not ready and in principle all employees could be made redundant. The organisation had gone through a number of previous organisational changes that included downsizing.

3.3 Choice of instruments

The selection of all instruments used in this thesis was so-called client driven and not research driven. This means that the instruments used were to some extent selected by the organisations involved. The main purpose of the surveys was to benefit the organisation and not necessarily the researchers involved. This has some advantages and some disadvantages. The response rate was very high (85% at the lowest) in all seven organisations that this thesis is based upon. On the other hand, some of the instruments are not thoroughly validated. Especially the concepts measured in Paper 1 suffer from this limitation. In Paper 3, the instruments used were a mixture of validated instruments and some questions that were used for the first time in a research paper. In Paper 2, only questionnaires that had documented reliability and validity were used.

3.4 Instruments

3.4.1.1 *Working environment, Paper 1*

In Paper 1, working environment was measured with 66 statements answered on a 5-point Likert scale; 1= agree, 2= tend to agree, 3=undecided, 4= tend to disagree, 5= disagree. All the items were factor analysed. Based on this, the mean scores for 9 subscales on working environment were computed; Team Effectiveness, Team leadership, Work-life balance, Corporate Social Responsibility (CSR), Articulated vision, Pride, Career development, Remuneration, and Involvement & Participation (see appendix in Paper 1).

3.4.1.2 *Working environment, Paper 2*

Quality Work Competence (QWC)

The QWC consists of 44 items that are aggregated into 11 scales (Arnetz, 1996, 1997a, 1997b; Thomsen, Dallender, Soares, Nolan, & Arnetz, 1998). The specific QWC scales used here were: *Work climate* (3 items, $\alpha = .69$), *Work tempo* (4 items, $\alpha = .74$), *Performance feedback* (3 items, $\alpha = .76$), *Skills development* (4 items, $\alpha = .86$), *Goal clarity* (4 items, $\alpha = .81$), *Participatory management* (6 items, $\alpha = .81$), *Efficacy* (4 items, $\alpha = .81$), *Leadership* (5 items, $\alpha = .87$), and *Internal communication*, (3 items, $\alpha = .70$).

Q12

The Q12 (Buckingham & Coffman, 1999; Harter, Schmidt, & Hayes, 2002) consists of 12 statements scored on a 5 point Likert scale; 1=very satisfied, 2=somewhat satisfied, 3=neither satisfied nor dissatisfied, 4=somewhat dissatisfied, 5=very dissatisfied). The 12 statements were ‘I know what is expected of me at work’, ‘I have the materials and equipment I need to do my work right’, ‘At work, I have the opportunity to do what I do best every day’, ‘In the last seven days, I have received recognition or praise for doing good work’, ‘My supervisor, or someone at work, seems to care about me as a person’, ‘There is someone at work who encourages my development’, ‘At work, my opinions seem to count’, ‘The mission/purpose of my company makes me feel my job is important’, ‘My associates (fellow employees) are committed to doing quality work’, ‘I have a best friend at work’, ‘In the last six months, someone at work has talked to me about my progress’, ‘This last year, I have had opportunities at work to learn and grow’ (12 items, alpha =.86). A sum score based on these 12 items was used.

3.4.1.3 Working environment, Paper 3

In Paper 3, working environment was measured with *Demand* (10 items, alpha=.77), *Control* (9 items, alpha =.81), *Social support* (4 items, alpha =.65), *Role conflict* (3 items, alpha =.72), and *Role ambiguity* (3 items, alpha =.84) from *QPS Nordic* (Lindstrom et al., 1997) and scored on a 5-point Likert scale (Very seldom or never =1, rather seldom =2, sometimes =3, rather often =4 and Very often or always =5).

The concepts demand and control in QPS Nordic are conceptually close to the concepts with the same name described by Karasek & Theorell (1990).

3.4.1.4 Job satisfaction

Job satisfaction in Paper 2

Job satisfaction in Paper 2 was measured with a single item; “How satisfied are you with (Name of Company)” and scored on a 5-point Likert scale; 1=very satisfied, 2=somewhat satisfied, 3=neither satisfied nor dissatisfied, 4=somewhat dissatisfied, 5=very dissatisfied (Buckingham & Coffman, 1999). When used as an independent variable, this scale was recoded into three categories (dissatisfied, neither satisfied nor dissatisfied and satisfied). The “very dissatisfied” group was very small (n=8) and preliminary analysis showed no differences between very dissatisfied and somewhat dissatisfied workers. Single-item measures of job satisfaction have been found acceptable (Wanous & Reichers, 1997).

Job satisfaction in Paper 3

Job satisfaction in *Paper 3* was measured with the mean from two items “Are you looking forward to going to work” and “How often does dissatisfaction make you want to find a new employer?” (2 items, $\alpha = .72$). Both scored on a 5-point Likert scale; Very seldom or never =1, rather seldom =2, sometimes =3, rather often =4 and

very often or always =5. The "dissatisfaction" item was recoded (1=5, 2=4, 3=3, 4=2 and 5=1).

3.4.1.5 Engagement

Engagement (Paper 3) was measured with 3 items "I feel great excitement about my working tasks", "I am strongly engaged in my working tasks" and "I invest a lot of my self to perform my tasks as well as possible" (3 items, alpha =.81). The items were scored on a 5-point Likert scale; totally agree =1, somewhat agree =2, neither agree nor disagree =3, somewhat disagree =4 and totally disagree =5. Although measured with different items, our engagement scale is conceptually close to the "dedication" sub scale from Schaufeli and colleagues measure of job engagement (Schaufeli, Salanova, González-Romá, & Bakker, 2002).

3.4.1.6 Health

Subjective health complaints (SHC)

SHC was measured by 29 items from the Subjective Health Complaint Inventory, SHC (Eriksen, Ihlebaek, & Ursin, 1999). Subjective somatic and psychological complaints experienced during the last 30 days were measured. The SHC inventory yields five subscales, musculoskeletal pain "pseudoneurology" (palpitation, heat flushes, sleep problems, tiredness, dizziness, anxiety, and depression), gastrointestinal

problems, allergy and flu. Preliminary analysis showed that a sum score consisting of the total number of health complaints was an adequate measure of SHC (29 items $\alpha = .83$).

Exhaustion

Exhaustion (Paper 3) was adopted from the Bergen Burnout Indicator (Matthiesen & Dyregrov, 2000) (5 items, $\alpha = .87$) and had a 6-point Likert scale; totally disagree =1, mostly disagree =2, somewhat disagree =3, somewhat agree =4, mostly agree =5, Totally agree =5. The correlation between this scale and a subscale with the same name from Maslach Burnout Inventory (MBI) (Maslach, Jackson, & Leiter, 1996) has been shown to be .80 (Salmela-Aro, Näätänen, & Nurmi, 2004).

Sick leave

Sick leave information (Paper 3) was only available from the Danish part of the organisation ($n=1931$) and measured as the number of registered days off work due to sick leave in the 12 months after the survey took place. Maternity leaves and absences due to sick children were not included. Percentage of days lost to sick leave was 3.3. 67% of the workers had one day of sick leave or more, 9% had sick leave lasting for more than 14 days. These long term sick leaves were doctor certified sick leave.

3.4.1.7 Leadership

Leadership (Paper 3) was measured with 9 items regarding supportive, empowering and fair leadership (Lindstrom et al., 1997), e.g. “Does your immediate superior help you develop your skills?” and “Does your immediate superior treat the workers fairly and equally?” (For the full scale, see appendix in Paper 3). The scale was scored on a 5-point Likert scale; very seldom or never =1, rather seldom =2, sometimes =3, rather often =4 and very often or always =5 (9 items, $\alpha=.91$). The items measuring leadership were close to a measure of organisational justice from Moorman (1991). Using multilevel analysis, the scale was interpreted as measuring both leadership behaviour (organisation level) and individual perception of leadership (individual level).

3.4.1.8 Attitude to change

Attitude to change (Paper 1) consisted of 3 statements answered on a 5 point Likert scale, where 1= Agree, 2= Tend to agree, 3=Undecided 4= Tend to disagree, 5= Disagree. The statements were: “The change process where I work is moving us in the right direction”, "The change process where I work is generating enthusiastic commitment", and “The change process where I work is well managed”. A mean score based on these statements was calculated ($\alpha = .89$).

3.5 Statistics

SPSS (v12.0 (Paper 1), 13.0 (Paper 2) and 14.0 (Paper 3)) was used for most of the analysis. In Paper 3 the multilevel analyses were performed using MLwiN v 2.02 ("MLwiN", 2005). A p value $<.05$ was considered statistically significant. Missing values were excluded listwise.

3.5.1.1 Paper 1

Velicer's minimum average partial (MAP) (Zwick & Velicer, 1986) was used to determine the number of factors in the 66 statements. Principal axis factoring as extraction method and Oblimin with Kaiser Normalization as rotation method were used to examine the factor structure. Subscales were constructed by including items with the highest loadings (above .40). With similar loadings (less than .10 in difference), the items were excluded from further analysis. The dependent variable was attitude to change. Multiple regression analysis was used to find which factors explained a significant proportion of the variance in attitude to change. Step 1 consisted of gender, age, years in the organisation, and team accountability. Step 2 consisted of 9 factors measuring working environment. Working units (dummy variables) were included in step 3.

3.5.1.2 Paper 2

The subjective health complaints scored by the subjects in the study group were compared to reference values from a Norwegian general population, comprising 1240 adults (53% females, mean age 41 years) included in a cross-sectional survey in Norway during 1996 (Ihlebaek, Eriksen, & Ursin, 2002). One-way ANOVA with post hoc Bonferroni was used to measure differences in number of subjective health complaints between the reference group (0) and three groups of workers; somewhat dissatisfied and very dissatisfied=1, neither satisfied nor dissatisfied =2, somewhat satisfied and very satisfied=3. The Q12 and the item on job satisfactions were reversed (1=5, 2=4, 4=2, 5=1). Multiple regression analyses were used to find the explained variance for 2 dependent variables; job satisfaction and total number of subjective health complaints. The first step (entered) included gender, age, and education. The second step (entered) included four dummy variables, one for each organisation. The third step (stepwise) included the work environment variables in QWC. The Q12 sum score was added in the fourth step and in the analysis with SHC, job satisfaction was added in the fifth step.

3.5.1.3 Paper 3

The intraclass correlation (ICC) for leadership was .22, indicating that a fair amount of the variance in this variable was due to shared (group) perception of the leader (Tucker, Sinclair, & Thomas, 2005). To adjust for this nested structure of the

individuals within the large number of leaders (groups) we used a multilevel model. Due to the continuous character of the measures for all the dependent score variables and linear associations with perception of leadership, linear models with normal distributed responses were used. The amount of variance explained by the multilevel regression model (a random intercept model) was divided into an individual explained variance (individual perception of leadership) and a group explained variance (leadership behaviour). This was done using the change in explained variance for both variance components, as a fraction of the total explained variance compared to the total variance for all outcome variables. Relations that occurred between the individual level and outcomes were interpreted as related to the individual perception of leadership. Relations that occurred between the organisational level and outcomes were interpreted as related to the actual leadership behaviour. We also calculated odds ratios for leadership with sick leave as dependent variable.

4 Summary of papers

4.1 Paper 1, Factors associated with a positive attitude towards change

Research question 1: Are employee's previous learning experience and characteristics of the working environment associated with attitudes towards downsizing?

Previous research has demonstrated that not every organisational change process leads to more health complaints. The important dimension seems to be whether the organisational change is seen as a threat or an opportunity for the individual (Dewettinck & Buyens, 2002; Mishra & Spreitzer, 1998). Downsizing is a common and sometimes dramatic organisational change. The attitude to change in the early phases of a downsizing process was examined among 467 employees (73.5 % males) working in a global oil company. All employees were asked to answer a questionnaire with demographic variables, perception of the working environment, and attitude to change (93% response rate).

More than 1/3 of the employees were positive to change, and about 1/3 was negative. Employees' perceptions of their work environment were highly related to their attitude to organisational change (43% explained variance). Statistically significant

factors were Corporate Social Responsibility (CSR), Involvement & Participation, Team leadership, and Team effectiveness, with high perceived CSR as the most important factor. Non-leaders and elder employees were positive to change.

The results were interpreted within the CATS model. According to this theory those with positive outcome expectancy are not at risk for ill health. Positive attitude to change is similar to the concept of positive outcome expectancy (Ursin & Eriksen, 2004).

Paper 1 concluded that it seems important to realise that not all employees are at risk for ill health during downsizing. The population at risk may be reduced by attention to what creates positive attitudes to change, in particular CSR.

After questioning downsizing as the main cause of ill health, poor work environment and the relation to ill health was investigated in Paper 2.

4.2 Paper 2, Health complaints and satisfied with the job?

Research question 2 and 3: What is the prevalence of subjective health complaints (SHC) among the satisfied compared to the dissatisfied workers? Are any SHC

differences attributable directly to the work environment or is it mediated by the individual perception of the environment (satisfactory or not)?

A questionnaire consisting of demographic variables, work environment, job satisfaction, and subjective health complaints was distributed to a total of 458 employees from 5 different organisations; newspaper employees (n=124), public service employees (n=164), Research & Development staff in an oil company (n=47), TV Station employees (n=76), and high-school teachers (n=47). The overall response rate was 90%, and there were 56% females across the organisations.

About 69% of the workers were satisfied with their job. These had an average of 5.6 subjective health complaints the last 30 days. This is the same number of SHC as in the Norwegian reference population (Ihlebaek, Eriksen, & Ursin, 2002). The satisfied worker, therefore, does not satisfy the strict WHO definition of health, “complete physical, mental and social well-being, and not merely the absence of disease or infirmity” (World Health Organization, 1948).

The differences between organisations were considerably larger (range 28.9) in job satisfaction than in SHC (range 5.5). In all five organisations, most employees (>90%) reported 1 or more SHC the last 30 days. Organisational affiliation explained 9% of the variance in job satisfaction and 2% of SHC.

Work environment explained 10 % of the variance in SHC. Skills development from the QWC questionnaire came out as the most important factor of those measured and explained 7% of the variance in SHC, together with work tempo (2% explained variance) and job satisfaction (1% explained variance). Work environment explained 42% of the variance in job satisfaction with skills development (31%), work climate (5%), efficacy (2%), goal clarity (1%), and internal communication (1%) from QWC explaining statistical significant proportions of the variance. Q12 added 2% to the total explained variance. Job satisfaction was largely explained by the perceived work environment, subjective health complaints seemed less related to work environment, albeit statistically significant.

In Paper 2 we concluded that work environment (the organisational level) has limited influence on ill health. Individual perception (the individual level) of the environment appeared as the key factor, as expected from CATS (Ursin & Eriksen, 2004). A comparison of these two levels was done in Paper 3.

4.3 Paper 3, Leadership and health

Research question 4: What is the relation between leadership and individual health related factors such as sick leave, work related exhaustion, job satisfaction, engagement, and psychosocial work environment? Is this explained by individual

perceptions of the leader (individual level), or the group assessment of leadership behaviour (organisational level)?

A web based survey was sent to all employees (n=3400) in a Scandinavian insurance company based in Denmark and Norway. 3180 employees answered, which gives a response rate of 93%. From a total of 365 leaders, 322 were evaluated by three or more subordinates and were selected for further analysis (Range 3-34, mean 12). These 322 leaders had 2915 subordinates that were in the final inclusion of the study. 321 of the subordinates were also leaders.

The individual perception (individual level) of supportive, empowering, and fair leadership was more important than leadership behaviour (organisational) in the relation between leadership and a number of health related factors. Individual perception of leadership behaviour explained 27% of the variance for social support, 20% for work related exhaustion, 17% for job satisfaction, 11% for engagement, and 0% for job demands. Leadership behaviour explained 13% of the variance for social support, 8% for work related exhaustion, 7% for job satisfaction, 3% for engagement, and 0% for job demands. In the logistic regression analysis we found statistically significant higher odds for registered sick leave (> 0 days on sick leave) in those who perceived their leader less favourable compared to those who perceived the leader as being supportive, empowering, or fair (individual level) (OR = 1.2, 95% CI 1.17-1.23, $p < .001$). There was no statistically significant ($p = .95$) effect of the leadership behaviour (organisational level). Our study demonstrated the importance of

individual perception and that the relationships between leadership behaviour, perception of leadership, and employee health were similar for both male and female workers

5 Discussion

5.1 Short summary of results

The aim of this thesis was to discuss three common causal explanations of the relation between work and health. The three explanations, one for each paper were: Downsizing, poor work environment in general, and poor leadership. The theoretical framework for all discussions was the Cognitive Activation Theory of Stress (Ursin & Eriksen, 2004).

Central to CATS is the individual perception of the potential stressors. In **Paper 1**, one potential stressor was the risk of being made redundant during an organisational change process. We found that there were as many who were positive as negative to the coming organisational change. The employee's attitude to change was strongly related to the working environment. Perceived Corporate Social Responsibility (CSR) was the most important factor, followed by the employee involvement, and the way the team was led. Older employees tended to be more positive than their younger colleagues, and employees with leadership responsibilities were more negative than those without such responsibility.

The main findings in **Paper 2** were: Workers that were satisfied with the job had no less Subjective Health Complaints (SHC) than the Norwegian reference population (Ihlebaek, Eriksen, & Ursin, 2002), on average five to six complaints the last 30 days. The satisfied worker, therefore, does not satisfy the strict WHO definition of health, “complete physical, mental and social well-being, and not merely the absence of disease or infirmity” (WHO, 1948). About one third of the workers were not satisfied with their jobs (31%), and they reported higher levels of subjective health complaints (SHC). However, the relationship between work environment and SHC was small, and most of the variance in SHC was due to other factors than work environment.

The results in **Paper 3** confirmed the importance of the individual perception when evaluating a potential stressor. For all outcomes, the individual level explained more variance than leadership behaviour (organisational level). The organisational level did not explain any significant proportion of registered sick leave. Analysis on the individual level showed statistically significant higher odds for registered sick leave in those who perceived their leader less favourable.

These results do not support a hypothesis where downsizing, poor work environment in general, or poor leadership, are the most important factors for ill health. As

postulated in CATS (Ursin & Eriksen, 2004), the individual perception of these potential stressors was more important. This is discussed in the chapters to follow.

5.1.1 “Downsizing as the cause of ill health”

The first aim in this thesis was to investigate downsizing as a cause of ill health. This was investigated in the first paper.

The main findings in Paper 1 were; 1) Facing a downsizing, there are as many with positive as negative attitudes towards the change. 2) Positive attitude to change was strongly related to how the employees perceive the company’s social responsibility. Our data suggest that some of the negative effects of downsizing may be reduced by employee perception of high Corporate Social Responsibility (CSR). It seems reasonable to assume that social responsibility will influence how the organisation handles the changes, which in return influences the attitude to future changes. The organisation in our study had gone through several previous organisational changes. Many of the employees, therefore, were “survivors” from previous changes. Development of a positive response outcome expectancy depends on previous learning experiences (Ursin & Eriksen, 2004). Previous experiences with the same organisation in similar situations influence the individual perception of new stressors (Kalimo, Taris, & Schaufeli, 2003). This may explain the high number of employees that had positive attitudes to the coming change.

Although some employees have a positive attitude to downsizing and positive consequences exist (Collett, 2004), it seems well established in the literature that negative consequences of downsizing do exist (Stensaker, Meyer, Falkenberg, & Haueng, 2002) and put at least some employees at risk for ill health (Vahtera, Kivimäki, & Pentti, 1997; Westerlund et al., 2004). Others have found that it is possible to maintain a stable well-being among employees during and after a downsizing (Nilsson, Hertting, Petterson, & Theorell, 2005; Parker, Chmiel, & Wall, 1997). Well-being among the survivors was not reduced over a 4-year period after the downsizing, when management strategies deliberately buffered the potential negative effects of the change. The success seemed to be related to increased control, clarity, and participation among those who remained in the organisation (Parker, Chmiel, & Wall, 1997). A relation between organisational justice (an example of CSR) and constructive behaviour among employees during downsizing has been suggested by Mishra & Spreitzer (1998).

The conclusion is that downsizing does not necessarily lead to ill health. It depends on individual factors (e.g. outcome expectancy), and also on how the process is being handled by the company. This constructive view of downsizing is also suggested by others; “Reframing the concept so that downsizing is viewed as a continuous process of corporate transformation and change, a way to plan for the continuity of the organisation, seems to be a more constructive approach.” (Kets de Vries & Balazs, 1997).

5.1.2 “Poor work environment as the cause of ill health”

The second aim was to investigate poor work environment in general as the cause of ill health. This was investigated in the second paper.

The suggestion by Faragher et.al (2005), “current trends in employment conditions may be eroding levels of job satisfaction – and directly damaging the physical and mental health of employees”, was not supported by our results in Paper 2. The relation between work environment and health complaints is, at best, limited. Nine percent of our variance in self reported health was explained by our extensive measure of work environment. Job satisfaction explained only 1% of the variance in subjective health complaints. Our study provides a new investigation with a comprehensive measure of work environment (QWC and Q12) (Arnetz, 1999; Buckingham & Coffman, 1999), but the conclusion is not new: “Convincing evidence that stress contributes to the pathophysiology of human disease is sparse, and, even where evidence exists, relatively small proportions are explained” (Cohen & Manuck, 1995). Others claim that the causal link between work environment and ill health has not been demonstrated (Briner & Reynolds, 1999).

The lack of a causal link between work environment and ill health is supported by several findings: First, most studies use self reports of both work environment and health. They demonstrate that many employees attribute their complaints to the work situation. The individual attribution is not a proof of a causal link. For example the popular concept “work related fatigue” (Sluiter, de Croon, Meijman, & Frings-Dresen, 2003) specifically invites the subjects to attribute their complaints to the work situation. According to Briner & Reynolds (1999), the implicit idea behind stressor-strain models is that people respond negatively to things they do not like. “This is essentially tautological and somewhat circular: we do not like things we do not like.” In our study, we used a measure of health (SHC) where we did not invite the answer. This might explain the weaker relation between work environment and health that we found, compared to others that have found that work environment explained 25% of the variance in a measure of work related fatigue (van Veldhoven, Taris, de Jonge, & Broersen, 2005).

Second, multilevel analysis demonstrates that it is not the work environment per se, but the individual perception of the work environment that is most important (Morrison, Payne, & Wall, 2003). Finally, if an organisational factor such as work environment was the most important cause for ill health, then interventions at this level should be superior compared to interventions at the individual level. This is not the case. Counselling at the individual level increased well-being, an organisational intervention did not (Reynolds, 1997). Interventions at the organisational level has

very limited success in changing subjective health complaints or sick leave (Eriksen et al., 2002; Tveito, Hysing, & Eriksen, 2004).

The CATS model (Ursin & Eriksen, 2004) emphasises the importance of individual perception for development of ill health. A competing view on development of ill health is a theory where the work environment is regarded as the most important factor (Karasek & Theorell, 1990). The limited relationship between work environment and ill health found in our Paper 2 was statistically significant, but with such a small explained variance, the work environment seems not to be the right starting point for changing the levels of subjective health complaints. However, emphasising the importance of individual perception is not to be taken as a view where the psychosocial work environment is not important. The individual outcome expectancy (coping) may well be influenced by the work environment, e.g. decision latitude (Theorell, Westerlund, Alfredsson, & Oxenstierna, 2005). In Paper 1, outcome expectancy among employees facing a downsizing process was related to how they perceived the work environment, in particular CSR.

We found that nearly all workers, satisfied and dissatisfied, have subjective health complaints. Our conclusion is that this confirms that for most workers, subjective health complaints are normal physiological processes that are not related to the work situation. On the other hand, it is possible to reach the opposite conclusion: Since

almost all workers have subjective health complaints, being a worker increases the risk of such complaints. However, studies among those without work demonstrate higher and not lower levels of health complaints (Murray, Gien, & Solberg, 2003). The high prevalence of subjective health complaints in different populations (Agreus, 1998; Bassols, Bosch, Campillo, Canellas, & Banos, 1999; Eriksen, Hellesnes, Staff, & Ursin, 2004; Eriksen, Svendsrød, Ursin, & Ursin, 1998; Ihlebaek, Eriksen, & Ursin, 2002; Kind, Dolan, Gudex, & Williams, 1998; Makela et al., 1999; Picavet & Hazes, 2003) confirms that subjective health complaints are normal among all humans.

5.1.3 “Poor leadership as the cause of ill health”

The third aim in this thesis was to investigate if poor leadership may cause ill health. CATS postulates the importance of individual perception. Does this also apply when a subordinate perceives leadership? This was investigated in the third paper.

We found no relation between leadership behaviour (organisational level) and sick leave, but a higher risk for sick leave among those who perceived their leader as not being supportive, empowering, or fair. It is therefore not correct to claim that leadership causes ill health. The suggestion from Nyberg and colleagues “Leaders may have a large impact on e.g. demand, control, and social support”, (Nyberg, Bernin, & Theorell, 2005) is partly supported. There was no relation with demand, a weak relation with control (5% explained variance), and a moderate relation with

social support (13% explained variance). Even if our data do not support poor leadership as a cause of ill health, leadership can nevertheless be important for health through the impact on work environment. Leaders affect a number of people, so even small relations could have a large effect (Barling, Weber, & Kelloway, 1996) on the relation between leadership and health. As postulated in CATS (Ursin & Eriksen, 2004), our results shows that it was the individual interpretation of potential stressors that was most important for employee health. This also applies in the relation between leaders and the health of their subordinates. The individuals that perceive that they are treated unfairly are at risk of developing health complaints (Ursin and Eriksen 2004), and may perform poorly (Pensgaard & Roberts 2002). Their situation may become even worse if their perception of the work situation differs from their fellow employees (Bliese & Britt, 2001). However, when the variable has variance in both levels in the multilevel analyses, there is an additive effect. Perceiving a leader as not being fair might have an effect on the individual, perceiving that also others are treated unfairly may have an additive health effect.

5.2 CATS and our results

5.2.1 Downsizing

In Paper 1, CATS was useful as a model for explaining how some employees might develop ill health as a result from how the downsizing process is handled. As postulated in CATS (Ursin & Eriksen, 2004), individuals differ in how they perceive the stressor. Some employees have positive outcome expectancy, some have negative

outcome expectancy. The differences are more likely to be a result of how the risk of being made redundant is *perceived* as opposed to the “objective” risk of losing a job.

5.2.2 Poor work environment in general

In Paper 2 we operationalised positive outcome expectancy as job satisfaction and expected to find higher levels of subjective health complaints among dissatisfied workers. This was only partly supported. The dissatisfied worker had more SHC, but the relation was weak. Job dissatisfaction may be a situation with sustained activation and therefore a health risk. One explanation of the weak result could be that only 1.7% of the workers were “very dissatisfied” and that employees with low job satisfaction have either quit the job or were on sick leave.

5.2.3 Poor leadership

In Paper 3 we had the statistical power to do a multilevel analysis and compare environmental factors (leadership behaviour) with the individual perception of leadership. CATS (Ursin & Eriksen, 2004) suggests the individual perception as the most important factor explaining ill health and this was confirmed.

5.3 Implications for interventions

CATS (Ursin & Eriksen, 2004) explains how normal physiological processes in the human body might develop into intolerable subjective health complaints. Central to this theory is the assumption that the physiological processes that lead to subjective health complaints are present in all humans. In Paper 2, we found that this was also

true for satisfied workers. They had as much SHC as the Norwegian reference population. This might have some implications for interventions aimed at decreasing sick leave or increasing job satisfaction.

5.3.1 Stress and sick leave reductions

Interventions aimed at reducing stress and sick leave were not part of this thesis.

Nevertheless, our results may have some implications. Stress at the work place has been claimed to be one of the causes for sick leave (Michie, 2002). If this is correct, then it should be possible to reduce sick leave by reducing stress or prepare the employees with better strategies to handle stress. Descriptions of interventions aimed at reducing sick leave take two different approaches (Reynolds, 1997); interventions at the organisational level aiming at preventing stress, and interventions at the individual level aiming at reducing existing sick leave among the individuals. It is common within the literature to claim that organisational interventions are preferable. “An approach that is limited to helping those already experiencing stress is analogous to administering sticking plasters on wounds, rather than dealing with the causes of the damage” (Michie, 2002). Briner & Reynolds (1999) described three reasons for this view. First, preventing (the presumed) cause is more effective than handling (the presumed effect) of stress. Second, stress management training has revealed only limited and short term effectiveness, and third, interventions at the individual level are viewed as somehow blaming the victim.

The preferences towards organisational interventions are clearly seen in a recent review (Caulfield, Chang, Dollard, & Elshaug, 2004). In a 10-year review they found 6 studies that met the inclusion criteria. Only one of these was an organisational intervention, the other 5 were interventions aimed at the individual level. Three out of five studies on the individual level reported some improvements on measures of distress, but there were some methodological weaknesses. The authors behind the organisational level study claimed success, but there was no control group (Caulfield et.al., 2004). This review led the authors to conclude “The success of the organisation-focused approach supports the view that work stress... may be more strongly related to ...aspects of the work environment, than to individual factors” (Caulfield et.al., 2004). In fact, studies on interventions at the work site have yet to demonstrate in a scientific robust way its effectiveness in reducing sick leave. A recent review found only one study on the organisational level and it’s relation to sick leave (Michie & Williams, 2003). The study (Smoot & Gonzales, 1995) claimed success in reducing sick leave, but did not provide any statistical data.

In Paper 2 we found a weak relation between work environment and health complaints and in Paper 3 we found no relation between leadership behaviour (our organisational factor) and sick leave. Our studies confirm the view of Briner & Reynolds (1999): Reducing sick leave by organisational interventions aimed at all employees (prevention) is not likely to succeed. This was confirmed in a recent review (Tveito, Hysing, & Eriksen, 2004). Others have found that sick leave may be

related to other factors such as the economic conditions in the country (Brage et al., 2002; Herekson & Persson, 2004). Preventing sick leave through interventions at the work site seems difficult, but there are successful studies where the intervention is targeted directly at those already sick listed (Blonk, Brenninkmeijer, Lagerveld, & Houtman, 2006; Fleten & Johnsen, 2006; Hagen, Eriksen, & Ursin, 2000; Hlobil et al., 2005).

5.3.2 Well being and job satisfaction

In Paper 2 we found a strong relation between work environment and job satisfaction and this result suggests that changes in work environment could increase job satisfaction. However, despite the number of management books on how to increase job satisfaction among employees, scientific studies with interventions aimed at increasing job satisfaction are hard to come by. In Paper 3 we found that the individual perception of leadership is important for job satisfaction. The individual perception as the best starting point for interventions is confirmed by Reynolds (1997). She found no increase in well-being after an organisational intervention, but such an increase occurred after an individual intervention. Increased happiness was found after an intervention where individuals were encouraged to use their strengths in a new way (Seligman, Steen, Park, & Peterson, 2005). Although not targeted on workers, this result might still have some implications for working life.

6 Conclusions

Three explanations on the relation between work and health have been discussed; Downsizing, poor work environment in general, and poor leadership. Statistically significant relations exist, but they seem to be too small to be of clinical importance. The individual perception of the risk of being made redundant, working in a poor work environment, or individual perception of poor leadership seem to be more important than the actual environment. The importance of individual perception is postulated in CATS (Ursin & Eriksen, 2004), and our results are taken as a support for this model. The importance of individual perception found in this thesis opens up for new research questions: What are the factors that create differences in outcome expectancies among workers?

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Paper I

Personality and Social Sciences

Factors associated with a positive attitude towards change among employees during the early phase of a downsizing process

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Most research on organizational changes in working life, including downsizing, focuses on the negative attitudes and negative consequences of the change. The aim of this study was to evaluate if the employee's previous learning experience and characteristics of the working environment were associated with positive attitudes towards organizational change. The 467 employees (73.5% males) working in a global oil company in the early phases of a downsizing process were asked to answer a questionnaire with demographic variables, perception of the working environment, and attitude to change (93% response rate). Corporate social responsibility (CSR), involvement and participation, team leadership and team effectiveness were important factors related to positive attitudes towards organizational change. Non-leaders and older employees were positive to change. We conclude that employees' perceptions of their psychosocial working environment, in particular the CSR, were highly related to their attitude to organizational change.

Key words: Cognitive Activation Theory of Stress (CATS), downsizing.

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INTRODUCTION

Research on organizational change and downsizing focuses mainly on the negative consequences both for those that have to leave the organization (Kivimäki, Vahtera, Elovainio, Pentti & Virtanen, 2003b; Westin, Schlesselman & Korper, 1989) and for those that remain in the organization (Kets de Vries & Balazs, 1997; Vahtera, Kivimäki, Pentti *et al.*, 2004; Vahtera, Kivimäki & Pentti, 1997). Few studies, if any, focus on which factors are associated with the employees' attitudes towards organizational change, in particular on the positive sides of downsizing. The imbalance in research focus creates a bias in the conclusions in favour of negative effects. For a complete picture of what is going on in an organization during change and downsizing, we need to take into account that positive emotions exist, and that there are employees that might see the change as an opportunity rather than a threat (Dewettinck & Buyens, 2002; Mishra & Spreitzer, 1998). The aim of the present study was to evaluate the number of employees that were positive to change, and what individual and organizational factors were related to positive attitudes to change.

There are extensive organizational changes in working life, including downsizing (Collett, 2004; Quinlan, Mayhew & Bohle, 2001). There are several reasons for this, most of them relates to cutting costs and improving results. We have never seen a proper evaluation of the total cost/benefit of reorganization, including the potential cost/benefit of human

capital. If the change process creates more sick-leave and production loss, the possible gain might be lost for the organization as well as for society. Potential negative effects include a higher risk of mortality (Vahtera *et al.*, 2004), and a higher risk of ending up with disability pension (Westin *et al.*, 1989) for those that have to leave an organization after a major downsizing compared to those that are left. Also among the "survivors" of major downsizing processes, subjective health complaints (muscle pain, fatigue) and sickness absence may be higher compared to redundants than in organizations with only minor changes (Kivimäki, Vahtera, Ferrie, Hemingway & Pentti, 2001; Ostry, Barroetavena, Hershler *et al.*, 2002). Any changes in working life may lead to increased job strain, increased sick leave, and increased incidence of hospitalization (Westerlund, Ferrie, Hagberg, Jeding, Oxenstierna & Theorell, 2004a; Westerlund, Theorell & Alfredsson, 2004b).

Despite these findings, it is not true that all organizational change processes lead to more health complaints. Instances of medically certified sick leave were reduced among female survivors after a downsizing process (Theorell, Oxenstierna, Westerlund, Ferrie, Hagberg & Alfredsson, 2003). Working in a non-secure job compared to a secure one does not necessarily mean higher levels of anxiety and depression (Orpen, 1993). The important dimension seems to be whether or not the organizational change is seen as a threat or an opportunity for the individual (Dewettinck & Buyens, 2002; Mishra & Spreitzer, 1998). Positive emotions have been shown to

influence resilience to crises such as the attacks of September 11th 2001 in New York (Fredrickson, Tugade, Waugh & Larkin, 2003) and positive attitudes towards an organizational change might be an important resilience factor. This depends on individual as well as organizational factors. Even for the redundants the change may have positive as well as negative effects; other jobs, better jobs, and redundancy pay (Collett, 2004). Risk factors for negative outcomes such as sickness absence are higher age, high income, poor health before downsizing, and working in a large workplace (Vahtera *et al.*, 1997).

According to Cognitive Activation Theory of Stress (CATS) (Ursin & Eriksen, 2004) the individual perception of potential stressors are central to understanding the effect the working environment has on the individual. However, characteristics of the (working) environment are also important. And indeed, this has been suggested in influential theories in occupational psychology such as the demand-control model (Karasek, 1979; Karasek & Theorell, 1990) and theories of organizational justice (Greenberg, 1990). Thus, differences in attitudes to change for the employees may also be due to differences in the working environment, in particular the way the organization and the nearest leaders handle the change process (Sirota, Mischkind & Meltzer, 2005).

The risk of losing your job is a major stressor to many employees (De Witte, 1999; Sverke, Hellgren & Naswall, 2002). However, faced with an organizational change some employees see this as an opportunity (Dewettinck & Buyens, 2002; Mishra & Spreitzer, 1998) and not a negative stressor. According to CATS, the way the employee perceives a stressor is heavily influenced by individual factors (Ursin & Eriksen, 2004). Within a downsizing process, some employees will have positive outcome expectancy and some will have negative outcome expectancy (Eriksen, Murison, Pensgaard & Ursin, 2005). Being pessimistic about the outcome, for instance the expectancy to lose a job, has been shown to change the hormone levels (prolactin, cholesterol, testosterone and cortisol) among the employees (Grossi, Theorell, Jurisoo & Setterlind, 1999) and is a risk factor for sick leave (Tveito, Halvorsen, Lauvålien & Eriksen, 2002). The combination of job strain and job insecurity gives higher risks for both mental and physical health problems (Strazdins, D'Souza, Lim, Broom & Rodgers, 2004). In the present study outcome expectancy is defined as attitude to change and we expect to find some employees that are positive to change (positive outcome expectancy) and some employees that are negative to change (negative outcome expectancy).

During organizational change, employees are very concerned about how they are being treated (Kivimäki, Elovainio, Vahtera & Ferrie, 2003a) and in particular they are concerned about being treated with justice (Mishra & Spreitzer, 1998; Sirota *et al.*, 2005). Differences in outcome expectancy are based on differences in the individual's learning experiences (Ursin & Eriksen, 2004). In this context we assume that the employee's attitudes to change are based on previous expe-

riences on change within the organization. Organizational justice theory states that if employees are treated fairly, they will be more likely to have positive attitudes about several work-related factors (Greenberg, 1990; Moorman, 1991). The lack of perceived organizational justice has been shown to have negative effects on health (Elovainio, Kivimäki & Vahtera, 2002; Kivimäki *et al.*, 2003a; Kivimäki, Ferrie, Brunner *et al.*, 2005) and organizational citizenship behaviour (Moorman, 1991). Thus, factors related to how the employees have been treated throughout previous organizational changes were of particular interest to us. Organizational justice, trust and empowerment were expected to evoke constructive responses among survivors after a downsizing (Mishra & Spreitzer, 1998). In our study this was operationalized as CSR, Team leadership, and Involvement & participation. In a more indirect way, pride could also be related to a positive attitude to change. Previous experiences of a well-handled organizational change might raise the pride among the employees (Peterson, 2004). The other factors (Team effectiveness, Articulated vision, Career development, Work-life balance and Remuneration) are related to job satisfaction (Sirota *et al.*, 2005), but we did not expect them to be related to previous experience on organizational change and therefore not related to outcome expectancy. However, it could be argued that those who are positive to organizational change are the same employees who are positive to "all" other work-related factors; positive affectivity (Brief, Burke, George, Robinson & Webster, 1988; Connolly & Viswesvaran, 2000). Therefore variables that were related to job satisfaction, but not necessarily related to outcome expectancy in an organizational change, were added to control for positive affectivity.

In this study we want to evaluate if the employee's previous learning experience and characteristics of the working environment were associated with positive attitudes towards organizational change.

METHOD

Context and procedure

The survey was conducted in the second half of 2002 at a time when the organization was at the beginning of a major change process. Top management was not satisfied with the current cost control and a change team consisting of outside consultants was put in place. Downsizing became part of the plan, and this was communicated by top management to the employees. Previous to the actual downsizing process, the subjects in the present study were asked to evaluate the organization with 66 statements on concepts related to the working environment. The name of the redundants in this downsizing process was not ready and all employees could possibly feel at risk of being redundant. The organization had gone through a number of previous organizational changes that included downsizing.

Subjects

A total of 467 Norwegian employees working in a global oil company (39% were between 41–50 years) participated in the study; 97 were

working offshore (7.4% female and 92.6% males) and 366 onshore (31.8% females and 68.2% males). The age spread was similar for employees working offshore and onshore. The survey was part of a biannual survey where all employees in the company were asked to give their views on the working environment in the organization. Only the Norwegian part of the company is presented here. All employees working in the Norwegian part of the organization were invited to participate in the study; the response rate is estimated at 93%.

Questionnaire

The questionnaire consisted of demographic variables, 66 statements regarding the working environment, including leadership, and 3 statements on attitude to change. The questionnaire was a tailor-made questionnaire developed by International Survey Research (ISR) with items of particular interest for this company.

Demographic variables

Demographic variables included gender (1 = female, 2 = male), age, being a leader (defined as having 3 or more who report directly to them), years in the organization, and which of 19 different working units they belonged to: Offshore work (2 units), Technical (2 units), Administration, Finance and Business (4 units), Projects (3 units), Human Resources and Health, Safety and Environment (3 units), Production (1 unit), and Exploration (1 unit).

Working environment

Working environment consisted of 66 statements answered on a five-point Likert scale, where 1 = agree, 2 = tend to agree, 3 = undecided, 4 = tend to disagree, 5 = disagree. All the items were factor analyzed. Based on this, the mean scores for 9 subscales on working environment were computed; Team effectiveness, Team leadership, Work-life balance, Corporate social responsibility (CSR), Articulated vision, Pride, Career development, Remuneration, and Involvement & participation (see Appendix).

Attitude to change

Attitude to change consisted of 3 statements answered on a five-point Likert scale, where 1 = Agree, 2 = Tend to agree, 3 = Undecided, 4 = Tend to disagree, 5 = Disagree. The statements were: "The change process where I work is moving us in the right direction", "The change process where I work is generating enthusiastic commitment", and "The change process where I work is well managed" (see Table 1). A mean score based on these statements was calculated (alpha = 0.89).

Statistics

SPSS v12.0 was used for all analysis. Velicer's minimum average partial (MAP) (Zwick & Velicer, 1986) was used to determine the number of factors in the 66 statements. Principal axis factoring as extraction method and Oblimin with Kaiser Normalization as rotation method were used to examine the factor structure. Subscales were constructed by including items with the highest loadings (above 0.40). With similar loadings (less than 0.10 in difference), the items were excluded from further analysis. The dependent variable was attitude to change. Multiple regression analysis was used to find which factors explained a significant proportion of the variance in attitude to change. Step 1 consisted of gender, age, years in the organization and team accountability, step 2 consisted of 9 factors measuring working environment. Working units (dummy variables) were included in step 3. A *p* value < 0.05 was considered significant. Missing values were excluded listwise.

RESULTS

The MAP analysis yielded 10 factors, and further factor analysis was restricted to 10 factors. Closer inspection of the factors showed that the 10th factor did not have any variables that loaded exclusively and was excluded for further analysis. In addition, 28 items were excluded from further analyses, either because of loading on more than one factor or because the item did not load on any factor. Based on this, we constructed 9 subscales: Team effectiveness (effective unit with high morale and good cooperation) (5 items, alpha = 0.78), Team leadership (the team leader coach, gives feedback, and motivates) (6 items, alpha = 0.83), Work-life balance (perceived work stress and work interferes too much with personal life) (3 items, alpha = 0.79), CSR (the organization acts responsibly when dealing with employees, community and environment, evokes trust) (8 items, alpha = 0.86), Articulated vision (organization's vision is well understood) (4 items, alpha = 0.80), Pride (proud of working in the company, recommend the organization as a good employer) (4 items, alpha = 0.82), Career development (development and career opportunities) (2 items, alpha = 0.85), Remuneration (salary and benefits are as good as in other organizations) (3 items, alpha = 0.56) and Involvement & participation (involvement in decisions, leaders gives respect and trust) (5 items, alpha = 0.82) (see Appendix for details).

Roughly, there was an even split between positive, negative, and undecided attitudes to change (see Table 1). More than one-third of the employees were positive to change (agreed

Table 1. Frequency distribution and inter-correlations among the 3 variables in the "attitude to change" scale (n = 467)

The change process where I work:	Agree (%)	Tend to agree (%)	Undecided (%)	Tend to disagree (%)	Disagree (%)	1.	2.	3.
1. Is moving us in the right direction	14.6	32.3	29.1	19.1	4.9	1	0.71**	0.70**
2. Is generating enthusiastic commitment	10.8	22.8	27.7	29.7	9.0		1	0.76**
3. Is well managed	8.8	31.8	30.3	21.8	7.5			1

** *p* < 0.001.

Table 2. Multiple regression analyses of working environment with demographic variables as control variables (n = 467)

	Step 1			Step 2*		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
Gender	0.11	2.41	0.017	0.06	1.71	0.088
Age	-0.09	-1.61	0.109	-0.14	-3.28	0.001
Being a leader	-0.03	-0.71	0.481	0.13	-3.32	0.001
Years in the organization	0.09	1.57	0.117	0.08	1.74	0.083
Corporate social responsibility				0.21	4.14	<0.001
Involvement & participation				0.17	3.50	0.001
Team leadership				0.13	2.73	0.007
Team effectiveness				0.12	2.50	0.013
Career development				0.09	1.91	0.057
Articulated vision				0.07	1.76	0.079
Pride				0.07	1.49	0.136
Remuneration				0.05	1.30	0.193
Work-life balance				-0.01	-0.38	0.702
Adjusted <i>R</i> ²	0.01			0.43		
<i>F</i> change	2.48		0.043**	38.26		<0.001**

* Step 3 included the working units. It did not significantly change the variance explained and is not showed here.

** refers to significance of *F* change.

or tended to agree on the three questions). The statement that showed the highest acceptance was that the change was in the right direction (47% agreed or tended to agree), while 33.6% agreed or tended to agree that the change created an enthusiastic environment. While 40.6% thought the change was well managed, there were 29.3% who did not think so. The questions on attitude to change were highly correlated.

CSR, Involvement & participation, Team leadership, and Team effectiveness were related to the employee's attitude to change, and explained 43% of the variance, CSR being the most important variable (see Table 2). Employees with leadership responsibilities were less positive to change compared to employees without leadership responsibilities. When controlled for number of years working in the company, older employees were more positive than the younger ones. The factors "articulated vision" ($p = 0.079$) and "career development" ($p = 0.057$) might be related to attitude to change, but were not statistically significant. Pride, Remuneration and Work-life imbalance were not related to attitude to change and working unit did not add significantly to the variance, and were excluded from the final model. Total variance explained was 43% (see Table 2).

DISCUSSION

The working environment was strongly related to the employee's attitude to change. Perceived CSR was the most important factor, followed by the employee involvement, and the way the team was led. Older employees tended to be more positive than their younger colleagues, and employees with leadership responsibilities were more negative than those who did not have such responsibility. Pride, Remuneration and Work-life balance were not related to the employee's attitude to change.

CSR, involvement, team leadership and effectiveness of the team are all factors that any organization could improve on. Job satisfaction is higher when top management stress ethical values (Vitell & Davis, 1990) and there is a positive link between corporate ethical values and organizational commitment (Hunt, Wood & Chonko, 1989). With the recent scandals in the corporate world, CSR has become an important focus for those who invest in the stock market (Maignan & Ferrell, 2004). The economic success of Indian companies is explained partly by their focus on CSR (Sagar & Singla, 2004). There is some evidence of a positive association between the quality of a redundancy package and shareholder return (Collett, 2004). In our study we have found that CSR was related to attitude to change.

Organizational changes will occur in every organization. The risk of elevated health problems from these changes is real and have many reasons (Vahtera *et al.*, 1997; Westerlund *et al.*, 2004a). It seems important to realize that not all employees are at risk, and that the population at risk may be reduced by attention to what creates positive attitudes to change. In a 4-year longitudinal study, there was no decrease in well-being among survivors after a downsizing, despite increase in demands. This was related to control, clarity and participation (Parker, Chmiel & Wall, 1997). Positive emotions have a general resilience effect on stress experiences (Fredrickson, 2001; Fredrickson *et al.*, 2003). According to CATS (Ursin & Eriksen, 2004) stress experiences might be harmful if it is followed by a sustained activation. Positive response outcome expectancy will dampen the stress response and shorten the activation period. The potential of losing your job is likely to increase activation, but if it is followed by a positive attitude to change, the activation period is not sustained and therefore not harmful. On the other hand,

negative attitudes to change may sustain the activation period, which is potentially harmful (Eriksen & Ursin, 2004; Ursin & Eriksen, 2001). Our data suggest that some of the negative effects may be reduced by employee perception of high corporate social responsibility. It seems reasonable to assume that social responsibility will influence how the organization handles the changes, which in return influences the attitude to future changes. The relation between organizational justice (an example of CSR) and constructive behaviour among employees during downsizing have been suggested by Mishra and Spreitzer (1998). The organization in our study had gone through several previous organizational changes. Many of the employees, therefore, were "survivors" from previous changes. Development of a positive response outcome expectancy depends on previous learning experiences (Ursin & Eriksen, 2004). This may explain some of the findings, for instance that the oldest employees were more positive to change, contrary to the popular belief that the younger ones want changes and the older ones are conservative and are afraid of changes.

Team leaders often have a difficult position during downsizing; most of them do not have anything to do with the decision of downsizing, but still have to defend it to their subordinates. It has been reported that more depression (Kets de Vries & Balazs, 1997) and lower self-esteem (Wiesenfeld, Brockner & Thibault, 2000) exists among managers after a downsizing process and this might explain the lower positive attitudes to change among the team leaders in our study.

Our study is cross-sectional with self-reported data. Some would argue that the associations that are found would be inflated by common method variance (Podsakoff, MacKenzie, Lee & Podsakoff, 2003) and should be treated as method bias that could be adjusted for by statistical techniques. The name "common method" refers to the fact that the same method (e.g. a self-report questionnaire) is used both for the independent and the dependent variable. We think there is more to this than a statistical error. The individual perception of the environment is crucial to CATS (Ursin & Eriksen, 2004) and when associations between self-report of working environment and attitudes are "inflated" it points to important individual factors. It follows from CATS (Ursin & Eriksen, 2004) that all of our relations between working environment and attitudes are "inflated" by individual factors. But neither CATS nor common method variance can explain why some of the working environment factors were strongly related to attitudes to change, and some were not related at all. The relations between working environment and attitude to change were measured at the same time. During the organizational change, the individual perception of these factors may change (Kivimäki, Vahtera, Pentti & Ferrie, 2000).

It must be emphasized that even if we found positive attitudes to change in about one-third of the employees, about one-third of the employees had the expected negative attitudes. This is the main risk group for sickness leave and

costs for the individual, for the organization, and for society. Our data suggest that increased attention to potential benefits from reorganization may reduce the negative attitudes. However, this will not eliminate the risks or all negative attitudes. Our study points to CSR and employee involvement as the most important factors for creating positive attitudes, but only systematic studies can tell if it is possible to create more positive attitudes to change through CSR and employee involvement. The effect of CSR on employees during downsizing and the effect of organizational changes on the perceived CSR remains to be tested and this should be a focus of future research.

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APPENDIX

Table A1. Factor analyses, loadings > 0.10 are presented

	F1	F2	F3	F4	F5	F6	F7	F8	F9
In my current job: I think my unit operates effective	0.71	-0.25		0.20	0.24	0.31	-0.22		0.33
Where I work: We learn from the best practices of others	0.65	-0.33	-0.12	0.29	0.22	0.27	-0.31		0.37
Where I work: We behave in an open way with each other	0.61	-0.35	-0.19	0.33	0.19	0.27	-0.28	0.22	0.40
There is good cooperation between units where I work	0.59	-0.30		0.19	0.20	0.28	-0.26	0.20	0.31
My organization has a working environment: In which different views and perspectives are valued	0.57	-0.42	-0.11	0.38	0.18	0.29	-0.40	0.22	0.33
My team leader:									
- values my contribution	0.27	-0.75		0.27	0.19	0.22	-0.42	0.13	0.44
- gives me regular feedback on my performance	0.32	-0.75		0.16	0.19	0.18	-0.37	0.12	0.29
- coaches me effectively	0.47	-0.70	-0.23	0.21	0.18	0.30	-0.49	0.22	0.22
- is considerate of my life outside of work	0.12	-0.63	-0.34	0.26		0.23	-0.35	0.13	0.22
- encourages team-working	0.39	-0.61		0.18	0.18	0.12	-0.30		0.37
- is usually available when needed	0.39	-0.56	-0.19	0.12	0.14	0.26	-0.27	0.24	0.10
My work too often interferes with my personal life	-0.12	0.14	0.86						-0.11
I find it very difficult to balance my work and my personal life	-0.13	0.13	0.86						-0.16
In my current job: I often feel under excessive pressure		0.18	0.55		0.15		0.29	-0.23	
I think my organization:									
- acts responsibly in the society/community in which we operate	0.20	-0.27		0.77	0.33	0.45	-0.25	0.25	0.29
- achieves the right balance between its social, environmental and financial responsibilities	0.34	-0.26		0.75	0.32	0.36	-0.33	0.24	0.27
- acts responsibly in relation to the environment	0.26	-0.21		0.74	0.28	0.42	-0.22	0.18	0.23
I believe my organization:									
- acts with integrity in its dealings with the society/community in which we operate	0.27	-0.21		0.69	0.35	0.37	-0.34	0.38	0.32
- does not tolerate breaches of the NN Business Principles	0.26	-0.18		0.60	0.36	0.22	-0.22	0.12	0.27
- acts with integrity in its dealings with us	0.39	-0.30		0.58	0.27	0.32	-0.40	0.44	0.36
Leaders in my unit behave in a manner that supports the Diversity and Inclusiveness Standard	0.37	-0.39	-0.13	0.49	0.31	0.31	-0.37	0.35	0.29
I believe my organization does not give or receive bribes	0.12			0.41	0.19	0.17		0.25	0.22
I am well informed about my organization's business performance and results	0.24	-0.19		0.30	0.90	0.29	-0.18	0.17	0.29
I am well informed about my organization's business strategy and objectives	0.28	-0.24	0.13	0.26	0.84	0.37	-0.16		0.27
I am well informed about the NN Business Principles	0.13			0.41	0.61	0.20	-0.17	0.15	0.17
I am proud to be a part of: NN	0.25	-0.19		0.38	0.34	0.87	-0.22	0.23	0.28
I would recommend NN as a good employer	0.32	-0.29	-0.13	0.46	0.26	0.75	-0.37	0.41	0.22
I am proud to be a part of: My organization	0.55	-0.37		0.42	0.35	0.71	-0.40	0.15	0.45
Overall, I think the following are well led: NN	0.35	-0.19	-0.20	0.25	0.27	0.52	-0.18	0.17	0.16
I believe I have the opportunity for personal development and growth	0.32	-0.40		0.30	0.23	0.29	-0.87	0.19	0.47
I believe I have access to good career progression opportunities	0.26	-0.39		0.22	0.18	0.22	-0.84	0.23	0.31
From what I hear, our pay is as good or better than the pay in other organizations	0.10		-0.11		0.17	0.26	-0.12	0.61	
The benefits NN provides as part of my employment meet my needs		-0.12	-0.13	0.28	0.12	0.18	-0.20	0.57	0.12
For my performance and contribution, I feel poorly rewarded	0.12	-0.18	-0.19	0.23			-0.27	0.43	0.11
In my current job:									
- my work gives me a sense of achievement	0.46	-0.33		0.31	0.32	0.33	-0.39		0.78
- I am encouraged to come up with innovative solutions to work-related issues	0.38	-0.50		0.27	0.30	0.29	-0.40	0.15	0.71
- I have sufficient involvement in decisions that affect my work	0.39	-0.33		0.25	0.18	0.25	-0.36	0.18	0.67
- I have the opportunity to do what I do best	0.38	-0.30		0.30	0.26	0.20	-0.44	0.13	0.59
Eigenvalue	10.73	2.90	2.43	1.68	1.55	1.42	1.35	1.23	1.05
Percentage of variance	28.24	7.62	6.38	4.41	4.08	3.73	3.55	3.25	2.75
alpha	0.78	0.83	0.79	0.86	0.83	0.82	0.85	0.56	0.82

Notes: NN = name of company, F1 = Team effectiveness, F2 = Team leadership, F3 = Work-life balance, F4 = Corporate social responsibility, F5 = Articulated vision, F6 = Pride, F7 = Career development, F8 = Remuneration, F9 = Involvement & participation.

Paper II

Svensen, E.; Arnetz, B. B.; Ursin, H. and Eriksen, H. R., (2007), Health complaints and satisfied with the job? A cross-sectional study on work environment, job satisfaction and subjective health complaints. Preprint. Published by Journal of Occupational & Environmental Medicine 49(5):568-573, May 2007. Published by Lippincott, Williams & Wilkins. Copyright 2007 the American College of Occupational and Environmental Medicine. <http://dx.doi.org/10.1097/JOM.0b013e3180577700>

Abstract only. Full-text not available due to publisher restrictions.

Health Complaints and Satisfied With the Job? A Cross-Sectional Study on Work Environment, Job Satisfaction, and Subjective Health Complaints

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Abstract

Objective:

The aim of this study was to examine the prevalence of subjective health complaints (SHCs) among satisfied and dissatisfied workers. The second aim was to evaluate whether any SHC differences were attributable directly to the work environment or mediated by the individual perception of the environment (satisfactory or not).

Method:

In a cross-sectional study of 458 employees (56% women) in 5 different organizations, work environment, job satisfaction, and SHC were measured.

Results:

Satisfied workers reported an average of five to six subjective health complaints that correspond to the prevalence found in a Norwegian general population. Work environment explained 43% of the variance for job satisfaction and 9% of the variance in SHCs.

Conclusion:

SHCs are common among satisfied workers. Work environment has only a limited influence on this validated health indicator.

Paper III

Leadership and health

A multilevel analysis of the relative importance of individual perception of leadership

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Abstract

Objectives: To study the relation between leadership behaviour and subordinate health. Is subordinate health explained by individual perception of leadership among the subordinates, or leadership behaviour?

Method: Multilevel regression analysis with data from cross-sectional self-report and 1 year follow-up on registered sickness days was used to calculate variance components. 2915 employees (93% response rate) , including 322 leaders in a Scandinavian insurance company filled in an annual survey that included measures of work related exhaustion, job satisfaction, engagement, and psychosocial work environment. 50% were females and 55% were between 31-50 years of age.

Results: Individual perception of leadership behaviour explained 27% of the total variance for social support, 20% for work related exhaustion, 17% for job satisfaction, 11% for engagement, and 0% for job demands. Furthermore, leadership behaviour explained 13% for social support, 8% for work related exhaustion, 7% for job satisfaction, 3% for engagement, and 0% for job demands of the total variance. Individual perception of leadership was related to sick leave (OR = 1.2, 95% CI 1.17-1.23, $p < .001$). There was no significant ($p = .95$) effect of leadership behaviour on sick leave.

Conclusion: Optimal interventions aiming at improving health factors in working life should not be directed only at leadership behaviour. The individual perception of leadership may be more important in explaining subordinate health than leadership behaviour.

Main message:

- No relation between leadership behaviour and registered sick leave
- Relation between supportive, empowering and fair leadership behaviour and good health was found
- Subordinate perception of leadership behaviour explains more of the variance in health than leadership behaviour
- Subordinate perception of leadership may be important for interventions

Policy implications

- Interventions aiming at improving health factors in working life should take into consideration subordinate perception of leadership

Any relation between leadership and the health of subordinates may be explained by the leadership behaviour itself or by the subordinate perception of the leadership. We have examined these relationships on the organisational level (leadership behaviour) as well as the individual level (perception of leadership). These two levels are interrelated since our measurement of leadership behaviour was based on individual reports from a group of employees. Scores from subordinates in the same group sharing the same leader are statistically dependent.[1], and it is necessary to adjust for these two levels and dependencies. [2] The choice of level may have practical implications for interventions.[3], for instance, which level is most important for subordinate health?

There are countless definitions of leadership. Most of them include some sort of leader influence on the subordinate. In the present study, leadership is measured as leadership behaviour assessed by the group as supportive, empowering and fair; or not.[4] This measure is close to a measure of interactional justice and procedural justice .[5], and what has also been labelled “relational justice”.[6] Some regard procedural and relational justice as two distinct concepts [6], others regard them as interrelated.[7] The concept “organizational fairness”.[8] is also closely related to our measure of leadership.

Health may be defined very wide.[9], but for research purposes in the working population, sick leave seems more suitable as a health indicator.[10] Leadership measured as organisational justice has been shown to be related to sick leave.[7] Even if there is little support for a direct relation between leadership and subordinate health.[11] it has been suggested that leaders have a strong influence on employee health indirectly through their large impact on psychosocial factors like demand, control, and social support, which are all

known to influence employee health.[11] The demand-control model has been very influential in understanding the relation between work and health.[12], and has been used in several studies, both using single level.[13] and multilevel approaches.[1] This is an environmental model, with the organisational level as the most important factor for work related health: "It is our position that these outcomes (stress-related illness and productive behaviour) are not determined solely, or even primarily, by personal factors" and "our approach...environmental causes as the starting point".[12]

The environment was the starting point for the demand control model. However, multilevel analyses suggest that the individual level may be even more important than the organisational level.[1, 6, 15] Most studies on the relation between leadership and health.[11, 16] are affected by the same two-level problem that occurs when subordinates are nested in groups that share the same leader; the number of unique observations is easily overestimated. The usual cross-sectional self report data do not tell if it is leadership behaviour (the organisational level) or the individual perception of the leader (the individual level) that is most important in the relation between leadership and health of the subordinate.

Previous studies have indicated that coping may be more important than control in the development of subjective health complaints, and a demand *coping* model has been suggested as an alternative to the demand *control* model.[17] Coping may "buffer" demands or the possible negative effects of leadership. The essential element in this model is that coping refers to the expectancy of being able to cope, not to any formal aspects of work or to any specific coping strategy. The model builds on a pathophysiological model and animal research demonstrating why these dimensions may have health consequences.[18] These relationships, including the importance of individual perception of stress (e.g. the leader or the coach), are

systematised in the Cognitive Activation Theory of Stress (CATS).[19] The same stressor (e.g. leadership behaviour) may cause very different responses among different individuals. Thus, when a relation between leadership behaviour and subordinate health is found, it might not relate to qualities of the leader, but to individual factors among the employee such as individual perception and interpretation of the leader or situation. What one employee finds to be insulting and negative, others may accept or agree with.[18] The essential element in CATS is that all demands are appraised.[20] or “filtered” by the brain before they get access to the response system. The main filters are stimulus and response outcome expectancies. It is the individual experience of the demand, e.g. leader, and the individual expectancy of whether or not it is possible to meet these demands, which determine the stress response. If the individual has no expectancy to handle the challenge (“helplessness”) or expects to make things even worse (negative response outcome expectancy – “hopelessness”), the stress response may be sustained over time and cause ill health and sickness leave.[19, 21]

The present study

A previous study with multilevel analysis on the relation between leadership (measured as organisational justice) and sick leave found a statistical significant relation at the individual level in a hospital setting with mostly female workers .[7] We wanted to test this finding in a new setting; an insurance company with an even split among the genders. In addition we wanted to compare the importance of the two levels (individual or organisational) across a wide range of the most common psychosocial factors in studies of health at the work place (Demand, Control, Social support, Role conflict, Role ambiguity, Job satisfaction, Exhaustion, and Engagement).[22-25] The importance of the organisational level for stress has been demonstrated in previous multilevel studies.[26-28], but these studies did not acknowledge the individual perceptions of stress. To our knowledge the present study is the

first study that intends to compare the importance of the two levels (individual and organisational) across a wide range of the most common health and psychosocial work variables, all within the theoretical framework of one systematic stress theory (CATS). In addition to the usual self reported data, we also have individual register data on sick leave from a selected sample in the company.

In summary, the aim of this study was to study the relation between leadership and individual health related factors such as sick leave, work related exhaustion, job satisfaction, engagement, and psychosocial work environment. Is this explained by individual perceptions of the leader (individual level) or the group assessment of leadership behaviour (organisational level)? Our hypothesis is that individual perception of leaders is the most important factor.

Method

Subjects

A web based survey was sent to all employees (n=3400) in a Scandinavian insurance company based in Denmark and Norway. 3180 employees answered, which gives a response rate of 93%. From this sample we identified a total of 322 leaders that had been evaluated by three or more subordinates (Range 3-34, mean 12). These 322 leaders had 2915 subordinates that were selected for further analysis. All 322 leaders, except the chief executive officer (CEO) were also among the 2915 subordinates. The subjects comprised 50% females and 55% were between 31-50 years of age.

Questionnaire

The questionnaire consisted of demographic variables; gender (1= male, 2= female), age (less than 25 years=1, 26-30 years =2, 31-40 years =3, 41-50 years=4, 51-60 years =5 and more than 60 years=6) and tenure (0-2 years =1, 3-5 years=2, 6-10 years =3, 11-15 years =4, more than 15 years = 5) and scales selected from structured questionnaires described below.

Leadership was measured with 9 items regarding supportive, empowering and fair leadership.[4], e.g. “Does your immediate superior help you develop your skills?” and “Does your immediate superior treat the workers fairly and equally?” (For the full scale, see appendix). The scale was scored on a 5-point Likert scale (Very seldom or never =1, rather seldom =2, sometimes =3, rather often =4 and Very often or always =5) (9 items, alpha=.91). Our items measuring leadership are close to a measure of organisational justice from Moorman.[5] Using multilevel analysis, the scale was interpreted as measuring both leadership behaviour (organisational level) and individual perception of leadership (individual level).

Demand (10 items, alpha=.77), *Control* (9 items, alpha =.81), *Social support* (4 items, alpha =.65), *Role conflict* (3 items, alpha =.72) and *Role ambiguity* (3 items, alpha =.84) was adopted from *QPS Nordic*.[4] and scored on a 5-point Likert scale (Very seldom or never =1, rather seldom =2, sometimes =3, rather often =4 and Very often or always =5).

Job satisfaction was measured with two items “Are you looking forward to going to work” and “How often does dissatisfaction make you want to find a new employer? (2 items, alpha =.72). Both scored on a 5-point Likert scale (Very seldom or never =1, rather seldom =2,

sometimes =3, rather often =4 and Very often or always =5).The "dissatisfaction" item was recoded (1=5, 2=4, 4=2 and 5=1).

Exhaustion was adopted from the Bergen Burnout Indicator.[29] (5 items, alpha= .87) and had a 6-point Likert scale (Totally disagree =1, Mostly disagree =2, somewhat disagree =3, somewhat agree =4, Mostly agree =5, Totally agree =5). The correlation between this scale and a subscale with the same name from Maslach Burnout Inventory (MBI) has shown to be .80.[30].

Engagement was measured with 3 items "I feel great excitement about my working tasks", "I am strongly engaged in my working tasks" and "I invest a lot of my self to perform my tasks as well as possible" (3 items, alpha =.81). The items were scored on a 5-point Likert scale (Totally agree =1, Somewhat agree =2, Neither agree nor disagree =3, Somewhat disagree =4 and Totally disagree =5). Although measured with different items, our engagement scale is conceptually close to the "dedication" sub scale from Schaufeli and colleagues' measure of job engagement.[31]

Sick leave was only available from the Danish part of the organisation (n=1931) and measured as the number of registered days off work due to sick leave in the 12 months after the survey took place. Maternity leaves and absences due to sick child were not included. Percentage of days lost to sick leave was 3.3. 67% of the workers had one day of sick leave or more, 9% had sick leave lasting for more than 14 days. These long term sick leaves were prescribed by a physician.

Statistics

Descriptive statistics were found using SPSS v14.0. The intraclass correlation (ICC) for leadership was .22, indicating that a fair amount of the variance in this variable was due to shared (group) perception of the leader.[32] To adjust for this nested structure of the individuals within the large number of leaders (groups) we used a multilevel model. Due to the continuous character of the measures for all the dependent score variables and linear associations with perception of leadership, linear models with normal distributed responses were used. The amount of variance explained by the multilevel regression model (a random intercept model) was divided into an individual explained variance (individual perception of leadership) and a group explained variance (leadership behaviour). This was done using the change in explained variance for both variance components, as a fraction of the total explained variance compared to the total variance for all outcome variables. Relations that occurred between the individual level and outcomes were interpreted as related to the individual perception of leadership. Relations that occurred between the organisational level and outcomes were interpreted as related to the actual leadership behaviour. We also calculated odds ratios for leadership with sick leave as dependent variable. The analyses were performed using MLwiN v 2.02.[33]

Results

Leadership was highly correlated with exhaustion (-.58), job satisfaction (.48) and engagement (.36). The correlation between leadership and registered sick leave was close to zero (.02) (see Table 1).

Table 1
Mean, sd, Intraclass Correlations Coefficients (ICC) and Person correlations for independent and dependent variables.

	mean	sd	ICC	1	2	3	4	5	6	7	8	9	10
1. Leadership	3.86	.76	0.22	1									
2. Demand	3.19	.48	0.25	-.10	1								
3. Control	3.26	.69	0.28	.30	.01	1							
4. Social support	4.13	.61	0.16	.44	-.16	.22	1						
5. Role ambiguity	4.29	.68	0.21	.34	-.05	.06	.26	1					
6. Role conflict	2.49	.74	0.10	-.36	.45	-.16	-.39	-.29	1				
7. Job satisfaction	3.99	.84	0.09	.48	-.17	.28	.37	.33	-.38	1			
8. Engagement	4.39	.65	0.07	.36	.05	.23	.23	.31	-.19	.57	1		
9. Exhaustion	2.33	1.13	0.06	-.52	.19	-.28	-.38	-.29	.42	-.68	-.48	1	
10. Registered sick leave days within 12 mth follow-up (n=1931)	6.63	14.56	0.03	-.02	-.02	-.11	-.01	.03	-.03	-.04	.07	-.03	1

Variables 1-8 were on a 1-5 scale, exhaustion on a 1-6 scale. Range for registered sick leave was 209. All correlations > .05 had $p < .001$.

All ICC were higher than zero, demonstrating that at least some of the variance is explained by group membership. Control, demand, role ambiguity and leadership had relatively high ICC (>0.20), indicating that a fair amount of the variance in the perception of these concepts was due to shared experience among the leader's subordinates. Job satisfaction, engagement, exhaustion and sick leave had relatively low ICC (<.10), indicating that the shared experience among the group members (same leader) was of less importance for these concepts.[32]

The adjusted gradient between leadership and all outcome variables are shown in table 2. All gradients are statistically significant (all $p < .001$), except the relation between leadership and registered sick leave ($p = .534$).

Table 2 Beta coefficient and p values for the relation between leadership and 9 dependent variables in 9 separate multilevel models. The numbers are adjusted for the two levels (individual perception of leadership and leadership behaviour).

	Both genders			Gender differences		
	Beta	95 % CI	p-value	Males	Females	p-value
Demand	-0.05	-0.08 , -0.03	<.001	-0.05	-0.04	0.968
Control	0.27	0.24 , 0.30	<.001	0.28	0.29	0.747
Social support	0.35	0.32 , 0.39	<.001	0.36	0.34	0.420
Role conflict	-0.34	-0.37 , -0.30	<.001	-0.37	-0.28	0.010
Role ambiguity	0.32	0.28 , 0.36	<.001	0.35	0.32	0.092
Job satisfaction	0.53	0.49 , 0.57	<.001	0.53	0.54	0.766
Work related exhaustion	-0.76	-0.81 , -0.71	<.001	-0.75	-0.78	0.617
Job engagement	0.32	0.29 , 0.36	<.001	0.33	0.31	0.076
Registered sick days	-0.40	-1.66 , 0.86	= .534	-0.69	-0.56	0.790

The relation between leadership and the outcome variables was similar for both genders, except Role conflict where males had a statistically significant lower beta coefficient (see table 2). Individual perception of leadership explained 27% of the variance for social support, 20% for work related exhaustion, 17% for job satisfaction, 11% for engagement, and 0% for job demands. Leadership behaviour explained 13% of the variance for social support, 8% for work related exhaustion, 7% for job satisfaction, 3% for engagement, and 0% for job demands. Neither individual perception of leadership nor leadership behaviour explained the variance in registered sick leave when the measure of sick leave was used as a continuous variable (see table 3). For sick leave we used 2 multilevel logistic regression models with cut-off > 0 days (all sick leave) and >14 days (long term sick leave). Individual perception of the leader as not being supportive, empowering, and fair gave statistically significant higher odds for all sick leave (OR = 1.2, 95% CI 1.17-1.23, p<.001). This effect disappeared when comparing those with long term sick leave with all other workers (OR=0.94, 95% CI 0.72-1.24, p=0.42.) There was no statistically significant effect of the leadership behaviour in neither of the two models.

Table 3

Explained variance for individual perception (individual level) and leadership behaviour (organisational level) for 9 dependent variables in 9 separate multilevel models

	Individual perception (n=2915)	Leadership behaviour (n=322)
Demand	0%	0%
Control	6%	5%
Social support	27%	13%
Role conflict	9%	5%
Role ambiguity	9%	3%
Job satisfaction	17%	7%
Exhaustion	20%	8%
Engagement	11%	3%
Registered sick leave (n=1730)	0%	0%

Adjusted for gender, age and group size. All explained variance > 0.5 had $p < .001$

Discussion

Our hypothesis based on cognitive stress theory (CATS).[19] was that individual perception of leaders is the most important factor explaining the relation between leadership and subordinate health. This hypothesis was confirmed. The results showed that individual perception of leadership explained more variance than leadership behaviour on all outcome variables; 20% of the variance for work related exhaustion, 17% for job satisfaction, and 11% for job engagement. This was more than twice the variance explained by leadership behaviour. Leadership behaviour did not explain any of the variance of job demands, a weak relation with control (5% explained variance), and a moderate relation with social support (13% explained variance). Our data, therefore, gave only limited support to the conclusion from Nyberg and colleagues that “Leaders may have a large impact on e.g. demand, control and social support”. [11]

While the organisational factor “leadership behaviour” did not explain any significant proportion of registered sick leave, there was a significantly higher risk for sick leave in the individuals that perceived their leader as less favourable. Our results differ from a Danish study where psychosocial factors at the organisational level and not the individual level predicted long term sick leave. [34]

In many ways our measure of leadership is a measure of social support from the leader .[27] Leadership was defined as being supportive, empowering, and fair. It is also related to concepts like interactional justice and procedural justice.[5], and, likewise, also to what has been labelled “relational justice”. [6] or “organizational fairness”. [8] Relations between these concepts and health are found .[6, 8, 35-36] The difference between our data and these

previous studies is that our study with its multilevel approach also takes into account the individual perception of the leader which may be regarded as a potential stressor.

The importance of the individual level has been demonstrated in previous multilevel studies of job satisfaction.[14], stress.[15], and sick leave. [7] In a multilevel analysis on female hospital workers Elovainio et al.[7] found that individual perception of organisational justice (similar to our leadership scale) was related to sick leave. Our study demonstrated the importance of individual perception also for workers in an insurance company, and that the relationships between leadership behaviour, perception of leadership and employee health were similar for both male and female employees. Previous studies have found contradictory results on gender differences in the relation between management qualities and sick leave.[37, 38] Our study did not show any such differences.

Our results showed that it was not the leadership behaviour per se that was most important in explaining the variance in different health related outcomes, but the employees individual interpretation and perception of the potential stressor (the leader) that was most important for employee health. This is in accordance with CATS.[19], where the response outcome expectancy is important for the stress response and possible negative health effects of stressors or demands. Our results suggest that even if the leader is important in creating a “mastery climate”, for instance in high performance sports teams.[39], the individual perception of the leader is more important than the leadership behaviour itself. In CATS, coping, defined as positive response outcome expectancy, gives rise to a feeling of being able to handle any unfair leader. The individuals that do not acquire this positive expectancy and perceive that they are treated unfairly, are at a risk of both developing health complaints.[19] and perform poorly in demanding situations.[39] The employees situation may become even

worse if their perception of the work situation differs from their fellow employees.[35]

However, when the variable has variance in both levels in the multilevel analyses, there is an additive effect. Perceiving a leader as not being fair might have an effect on the individual, perceiving that also others are treated unfairly may have an additive health effect.

Even if the individual perception had the strongest effect, this does not imply that there was no influence from environmental factors. After all leadership did explain 13% of the variance of social support, 7% of job satisfaction, and 8% of work related exhaustion. Our measure of social support was a measure of support from team mates and differed from a measure of support from the leader. The differences in ICC for the 10 concepts measured are related to differences in shared perception. Demand, control, role ambiguity, and leadership (ICC >.20) are factors more related to the environment than job satisfaction, engagement, exhaustion and sick leave (ICC <.10). In elite athletes the coach may be the main source of stress before and during competition.[40]. When this happens, the athletes have a low degree of perceived control and low satisfaction with their own performance.[40] They do not control the coach. This may affect their performance, more than negative thoughts which the athletes feel they may control.[49]

The instruments used were selected by the organisation as particularly relevant for the problems as they saw it. Some of the concepts are not thoroughly validated, which may be a limitation of the study. However, our intention was mainly to compare the levels rather than identifying the exact relations between leadership and the outcome variables. Another limitation is common method variance, which may artificially inflate the relationships between variables. This was partly solved by not solely relying on self-report, but also on prospective data on sick leave from the company register.

Conclusion

In accordance with our hypothesis individual perception of leadership was more important than leadership behaviour in explaining employee's health on factors such as sick leave, work related exhaustion, job satisfaction, engagement, and psychosocial work environment. This was true for both male and female employees. Our results may contribute to explain why previous studies have found interventions to be more effective at the individual level compared to the organisational level [3]. Even if the leader may be essential in creating a fair and motivational good climate at work, optimal interventions aiming at improving health in working life should not be directed only at leadership behaviour.

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Appendix

The 9 items from the QPS Nordic [4] that were used to measure Leadership (alpha =.91).

1. If needed, can you get support and help with your work from your immediate superior?
2. If needed, is your immediate superior willing to listen to your work-related problems?
3. Are your work achievements appreciated by your immediate superior?
4. Does your immediate superior encourage you to participate in important decisions?
5. Does your immediate superior encourage you to speak up, when you have different opinions?
6. Does your immediate superior help you develop your skills?
7. Does your immediate superior distribute the work fairly and impartially?
8. Does your immediate superior treat the workers fairly and equally?
9. Is the relationship between you and your immediate superior a source of stress to you?

All items scored on a 5-point Likert scale (Very seldom or never =1, rather seldom =2, sometimes =3, rather often =4 and Very often or always =5). Item no 9 was recoded (1=5, 2=4, 4=2 and 5=1).

