Background
The vast majority of workers in developed countries take for granted that going to work daily does not compromise their physical safety. The data, however, may tell a different story. While there has been a decline in the annual number of occupational fatalities in the United States, there are still more than 6,000 fatal work injuries per year, with approximately 3.6 million disabling injuries. The costs in human suffering alone should be sufficient to challenge researchers, but there are other severe economic and social costs as well. The number of days of work lost because of occupational injuries in Canada between 1993 and 1996 exceeded the number of workdays lost due to labor unrest. Estimates from the European Union suggest that an average of 30 days of work is lost for each workplace accident. Moreover, it is estimated that the total cost of each workplace injury in Ontario, Canada, is $6,000 (CDN), with the cost of each workplace fatality being $492,000.

The most frequent attempts to account for occupational safety have emphasized the so-called “accident prone” individual, ergonomic design of equipment, and/or external regulatory systems (i.e., legislation and collective bargaining) (see Sheehy & Chapman, 1987). The modal response by organizational researchers has been one of neglect. Less than 1% of organizational research has focused on occupational safety. This provides a unique challenge to occupational health psychology, and the present research program forms part of an endeavor to confront this problem. We argue that management action directly affect perceived safety climate. In this research program, we focus on the extent to which management actions and human resource management practices affect occupational safety.

Study 1
This first study focuses on transformational leadership. Each of the four components of transformational leadership is relevant to occupational safety. With its emphasis on managers becoming role models by doing what is moral or right, idealized influence would encourage managers to shift their focus toward occupational safety, and away from the short-term focus that results from the productivity pressures they must bear. Leaders high in idealized influence would convey occupational safety as a core value through their own personal commitment. Leaders manifest inspirational motivation when they challenge subordinates to go beyond their individual needs for the collective good. They do so by convincing their followers that they can achieve safety levels previously thought unattainable, using symbols and stories to clarify their mission. Using intellectual stimulation, leaders challenge their followers to confront long-held assumptions, motivating them to think in innovative ways that enhance occupational safety, and encouraging them to address occupational safety issues. Lastly, leaders demonstrate individualized consideration in the subordinate-supervisor relationship by showing an active interest in their followers’ well being, including their physical safety. In this way, would no longer be satisfied with achieving minimal external requirements (e.g., government standards).

This study is conducted within one specific industry, i.e., the restaurant industry, focusing on two specific jobs (i.e., people working in restaurants and fast food outlets), because many occupational injuries are job or industry-specific (see Castillo, 1999). The average age of the 174 participants (64% males) was 26.75 years (range: 15-64). Their average experience at the restaurant, hotel or fast food outlet was 3.13 years (range: 1-21), and they worked an average of 27 hours per week (range: 1-60).

In both Studies 1 and 2, the proposed models were operationalized as an observed variable path analysis with parameters estimated with maximum likelihood estimation as implemented in LISREL VIII. All analyses were based on the covariance matrix.

As shown in Figure 1, the proposed model hypothesizes that the effect of leadership on safety outcomes is fully mediated by safety consciousness and safety climate. Standardized parameter estimates for the fully mediated model are shown in Figure 2 (all p < .01). Injuries were predicted by events (β = .64), and events by safety climate (β = -.39). In turn, safety climate was predicted by individual safety consciousness (β = .36). Both safety climate (β = .30) and safety consciousness (β = .36) were predicted by safety-specific transformational leadership.

Study 2
While the restaurant industry (the focus of Study 1) is a major employer, focusing on a single industry limits external validity. The sample for this second study is based on group of employees with a more restricted age range who held a wider variety of jobs. We focus on young workers (i.e., < 25 years of age) because occupational safety is an especially critical issue for this group (Castillo, 1999; Runyan & Zakocs, 2000). In addition, we did not restrict sample selection to any one occupation, thereby resulting in a heterogeneous group of occupations.

Another aim of this second study was to place the effects of transformational leadership into a wider perspective by focusing on an additional predictor, and we included the subjective experience of role overload for several reasons. [a] This would be consistent with an emphasis placed by management on productivity, possibly at the expense of safety, and would be inconsistent with a transformational leadership style. [b] Research has consistently shown that the subjective experience...
of role overload is associated with injuries at work with adults (Zohar, 2000), and young workers (Runyan & Zacós, 2000). Thus, we focus on role overload and safety-specific transformational leadership as possible predictors of occupational safety in this second study (see Figure 3).

Although participants were employed in different jobs, 88% were employed in the service sector, as would be typical for a sample of young workers. The average age of the 164 participants (48.7% females) was 19.5 years (range = 14-24). Sixty percent of the sample was still in high school, they worked for an average of 28.7 hours per week years (range = 3-60), and were employed in their current job for an average of seven months (range = 1-36).

Standardized parameter estimates for the model are presented in Figure 4 (all \( p < .05 \)). Injuries were predicted by safety events (\( \beta = .44 \)) and safety climate (\( \beta = -.27 \)). Safety events were also predicted by safety climate (\( \beta = -.32 \)). Safety climate was predicted by safety consciousness (\( \beta = .52 \)), safety-specific transformational leadership (\( \beta = .13, p < .05 \)), and role overload (\( \beta = -.17 \)). Safety consciousness was predicted by both safety-specific transformational leadership (\( \beta = .55 \)) and role overload (\( \beta = -.15 \)).

Thus, these two studies show that safety-specific transformational leadership is indirectly associated with occupational safety. Because previous research has shown that transformational leadership can be taught, future research should now assess whether changes in transformational leadership are followed by changes in employees’ occupational safety, and whether it is possible to teach managers safety-specific transformational leadership.

**Study 3**

Just how management deals with the issue of occupational safety is of both academic and practical significance. The most frequent organizational approaches used to produce a sufficient level of safety have focused on the optimal design of equipment (i.e., an ergonomic approach), adherence with government-imposed standards (i.e., a legislative approach), or compliance with the terms of collective agreements. The modal response to safety issues from a managerial perspective has been reactive, emphasizing the importance of management control on the one hand, and employee compliance on the other. This approach emphasizes rule enforcement, the punishment of infractions, and incentives for achieving predetermined safety goals, all of which are consistent with a control-oriented approach to management (Arthur, 1994). In contrast, high performance work systems would use practices that raise trust in management and loyalty to the organization, thereby increasing employees’ motivation to enhance their own safety and that of others. There is now a burgeoning body of empirical data showing the superiority of high performance work systems in producing organizationally valued outcomes.

The consistency of these findings across different outcomes invites speculation as to whether high performance work systems might also affect occupational safety, and in this study we investigate whether a high performance system comprising employment security, extensive training, contingent compensation, job quality, and leadership affects occupational safety through the mediating effects of employee morale (see Figure 5).

Following Zohar (2000), occupational safety is assessed (in Study 3 and 4) on a three point scale, reflecting no injuries (coded as 1), injuries that required no time off work (coded as 2), and injuries that required one or more days off work (coded as 3).

Based on data from the Australian WIRS95 database (N = 15,453), employment security, extensive training, leadership and job quality all exerted direct effect on injuries, and indirect effects through the mediating influence of employee morale. In contrast, contingent compensation exerted neither direct nor indirect effects on workplace injuries.

**Study 4**

This fourth study explored the relationship between family-friendly workplace policies and occupational injuries. Previous research has shown that family-friendly policies are associated with corporate financial performance, presumably because family-friendly policies send a signal to employees that they are valued by the organization. For the same reason, we hypothesized that family friendly policies would positively affect safety: When organizations demonstrate their concern for employees, the employees are likely to take more care of themselves and their coworkers.

Data from the 1995 Australian Workplace Industrial Relations Survey (Employee Survey Questionnaire) were again used in this study. This data set allowed us to construct three scales reflecting different nuances within family-friendly policies. The first reflected positive family-friendly policies (e.g., “can get maternity/paternity leave”), while the second reflected negative policies (e.g., “can use paid sick leave for sick family”, “can use own paid holiday leave for sick family”), in which employees could take time off work at their own expense. Clearly, the symbolic message differs substantially between these two variables. The third scale comprised traditional dependent care (e.g., availability of child/elder care).

After controlling for age, gender, level of education, occupational group, annual pay, and job dissatisfaction, ordinal regression analyses showed that traditional dependent care was negatively associated with workplace injuries, positive family-friendly policies were not associated with injuries, while negative family-friendly policies were associated with occupational injuries.
General conclusion
The results of these four studies all point in the same direction: Management practices are meaningfully associated with occupational safety. Thus, while the area of occupational health psychology has long acknowledged the link between management practices and employee well being, focusing on management practices might well achieve additional benefits with respect to employees’ physical safety at work.

Author Notes
Involvement of E. Kevin Kelloway, Catherine Loughlin and Rick Iversen in different phases of this research is gratefully acknowledged.

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Extended versions of these studies may be obtained from Julian Barling, School of Business, Queen’s University, Kingston, Ontario K7L, Canada; internet address: jbarling@business.queensu.ca.

References
A new tool for assessing psychosocial factors at work: The Copenhagen Psychosocial Questionnaire

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Background
The need for valid and reliable instruments for assessment of exposures applies to the psychosocial field as well as to other fields of work environment research and practice. At the National Institute of Occupational Health (NIOH) in Denmark the Copenhagen Psychosocial Questionnaire (COPSOQ) for assessing psychosocial work environment factors has been developed in three versions: A long version for researchers, a medium size version to be used by work environment professionals, and a short version for the workplaces. The whole concept has been labelled “the three-level concept”.

By developing the COPSOQ, we have tried to reach a number of goals:
1. To develop valid instruments for use at different levels.
2. To improve communication between researchers, work environment professionals, and workplaces.
3. To make national and international comparisons possible.
4. To improve surveys of the psychosocial work environment.
5. To improve and facilitate evaluations of interventions at the workplaces.
6. To make it easier to operationalise complicated theories and concepts.

Methods
The whole project has consisted of a number of phases. During the first phase psychosocial questionnaires from a number of countries were collected in order to study the different models, concepts, and questions. Sixteen questionnaires from Finland, Sweden, UK, USA, Denmark, and the Netherlands were included in this process. We found several of the questionnaires inspiring and of good quality but concluded that we could not use any of them for our purpose. During the second phase we selected 145 questions from the 16 questionnaires and added 20 new questions of our own. These 165 questions were tested empirically in a survey of a representative sample of 1858 adult Danish employees (20-60 years of age, 49% women, response rate 62%). During the next phase the responses were analysed for internal consistency, factorial validity, missing values, and response patterns. Our purpose was to develop a number of scales, each based on several questions in order to improve reliability and validity of the assessments. In this way the research questionnaire was developed with 141 questions comprising 30 different dimensions (scales). (See figure 1, next page).

During the following phase the length of the scales was reduced so that the maximum number of questions in each scale was 4 (in a few cases: 5). Also, a number of scales on individual characteristics were excluded. In this way the medium size questionnaire with 95 questions and 26 dimensions was developed. In the long and the medium size versions of COPSOQ all scales go from 0 to 100 points.

Finally, the short questionnaire was developed by reducing the number of dimensions as well as questions. The short questionnaire comprises 44 questions and only 8 dimensions. Some of these dimensions include several of the dimensions of the longer versions of COPSOQ (see figure 1).
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**Figure 1.** The dimensions and number of questions of the Copenhagen Psychosocial Questionnaire in all three versions: long, medium, and short.

The medium size questionnaire for work environment professionals has been developed in a computerised version in which all dimensions have a national average of 50. Values above 60 and below 40 are considered statistically different from the national average. Average results are presented in light grey. Results better than the national average are presented in mid grey, while negative deviations from the average are shown with dark grey bars. When the questionnaire is used for assessing the psychosocial work environment of a workplace it is possible to compare each department as well as the whole workplace with the national average on all 26 dimensions. It is also possible to compare jobs, age groups, wage systems etc. This version of the questionnaire is being used by the occupational health services (OHS), the clinics of occupational health or by private consultants. All these professionals have been able to acquire the system (including computer software) for a moderate price of $150. Figure 2 shows the distribution of jobs in the national sample on one of the key dimensions: Influence at work.
Figure 2. An example of the distribution on jobs of one of the COPSOQ dimensions: Influence at work. All the 32 jobs have at least 20 respondents.

The short questionnaire can be used by the workplaces without use of computer or even desk calculator. The points on each of the eight dimensions can be added by hand, and average values for departments or workplaces can then be calculated. A small pamphlet makes it easy to compare with national average values. If a better and more elaborate evaluation is wanted, the workplace is encouraged to contact work environment professionals for further assistance. In this connection the medium size questionnaire can be used in order to give a more detailed picture of the work environment.

Results

The three questionnaires have been used for about two years. Almost all OHSs and many other work environment professionals in Denmark are now using the system. The short questionnaire has been distributed free of charge in more than 6,000 copies and has been copied from the Internet by hundreds of users. We do not collect the data and we have no surveillance system of users. The philosophy of the concept has been that the users could use the system as a tool for dialogue and development at the workplaces.

The researchers at NIOH cannot and do not wish to control the use of the questionnaires in practice. We have, however, developed a number of “soft guidelines” for the use of COPSOQ:

1. Never start a survey of the work environment in a workplace unless there is a clear intention to take action if indicated by the results.
2. All results are anonymous and participation is absolutely voluntarily.
3. The workers have the right to see and discuss all results.
4. The results from a workplace survey should be considered as a common tool for dialogue and future development – not as a judgment or a grade book!

5. All parties – workers, middle management and management – should participate and be committed during the whole process.

The National Institute in Copenhagen receives reactions, comments and questions concerning the concept almost every day, and many of the users have developed the system further for specific workplaces. It is our clear impression that this system has been an unprecedented success. Researchers at the Danish NIOH and other institutions in Denmark have used the COPSOQ dimensions for many studies, which facilitates comparisons between different investigations.

We hope to be able to update the database for national comparison values in 2002 on the basis of a new national survey in order to keep the system valid and reliable. In this connection we will look into the possibility of developing reference values for specific industries and branches.

The questions of the COPSOQ have been translated into English, and some of the questions also into Japanese. Spanish, German, and Flemish versions are under development.

Conclusions

The three-level concept of the COPSOQ has been successful in improving communication between researchers, work environment professionals, and the workplaces. The questionnaire seems to provide valid assessments of a broad range of psychosocial work environment factors. In Denmark the NIOH has plans for developing similar instruments for other fields of research.

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www.ami.dk/apss (Shows the Danish version and average values on more than 30 jobs. English version is under preparation).

Stressed Teams in Organizations. A multilevel approach to the Study of Stress in Work Units

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The importance of teams and teamwork in organizations

Work teams have become the basic units of work system in organisations. In addition, working in teams is more and more a temporary and transient experience that requires adaptation and socialisation processes in different teams.

In spite of this, research on stress at work has approached this phenomenon predominantly from an individual perspective, even when focusing on people who work in teams. Social phenomena have been considered in stress models either as antecedents or as moderator variables that buffer stress-strain relationships. However stress as a collective phenomenon in teams has hardly been considered as the focus of research.

Multilevel and cross-level theory and research on organisational issues, such as climate, culture, and team effectiveness have developed models and methods that show the benefits of studying team phenomena at a collective level paying attention to cross-level analysis.

It is our view that the study of stress of people working in teams would largely benefit from a collective approach. Shared appraisal by team members of common stressors should be the focus of the analysis. These shared experiences will lead to affective and emotional responses that could also be shared by team members. Finally, these cognitive and emotional experiences can stimulate, under certain circumstances, co-active and/or collective coping strategies. However, research on stress has been mainly carried out from an individual approach that misses most of these relevant phenomena.
A critical approach to the classical paradigm of stress research

During the last half century, research on work stress and burnout has developed a number of models that have emphasised the role of the environment and the person in stress experiences, the strategies of the person to cope with them and their consequences on psychological well being and health. A recent and updated overview of the contributions on stress research from this perspective is presented by Buunk B.P., Ybema, Y., De Jonge, J. & De Wolff, C.(1998) and Peiró (1999) among others.

Some common features can be seen from these contributions: First, the individual is taken as the focus unit of analysis. Second, some kind of misfit is taken as the basis of stress and burnout. Third, stress is analysed predominantly from a differential perspective. Fourth, individuals are considered as the main agency to manage stress. Fifth, stress is conceptualised as having negative effects on health and well being.

However, changes taking place in the world of work and in organizations bring into question some of the propositions derived from these models. So, the increase of cognitive work, higher flexibility in terms of qualifications and in terms of employment, more work in the service sector, and so on, are producing deep changes in work activities. Changes in organizations are also having an impact. So it does work in non-bureaucratic organizations requiring more content innovation and risk taking, the increase of emotional work, dramatic changes in psychological contracts and a higher rate of industrial mutations.

These changes question most of the assumptions of the classical approach to stress. In this context, the critical historical review on the development of the stress concept, carried out by Newton (1995), is of particular interest. That author argues that "present accounts of stress give a very narrow view of the stressed subject as someone who is apolitical, ahistorical, individualised, decontextualized" (p. 10) and that along the history of the development of the stress construct a process of individualisation and naturalisation has been produced.

A collective approach to stress

Stress can be conceptualised from a social perspective that acknowledges the collective nature of people's adaptation to the work environment and the dynamic unfolding of collective coping strategies. Handy (1995) has reviewed several contributions to the study of stress from a collective perspective and identified some common features that describe this alternative, yet complementary, approach. "Firstly, they all take the relationship between interlinked social groups as the key unit of study and use the insights provided by this focus to derive the enhanced appreciation of individual experiences. Secondly, they all emphasize that subjective experiences of stress cannot be fully understood either through a theoretical stance which isolates individual experiences from its context. Thirdly, they all argue that contradictions within society and organizations are reflected in people's fragmentary and ambiguous understanding of their situation, with the results that actions often take place within unacknowledged conditions and have unintended consequences... Fourthly, they all suggest that these unintended outcomes tend to undermine the efficacy of people's coping strategies, thus increasing their subjective experiences of stress. Finally, they all utilise in-depth qualitative data to demonstrate the complex unfolding of these processes over time" (Handy, 1995, 90-91).

Some studies carried out in recent years, using qualitative or quantitative methodologies, have provided evidence showing that stress experiences are significant not only at an individual level but also at a group or collective level (Länsisalmi, Peiró & Kivimäki, 1999). So, a multilevel and cross-level approach will contribute to a more precise and wide understanding of those phenomena. The analysis of shared experiences of stress and burnout, stressors that release them, collective strategies that groups engage in to cope with them and collective consequences will allow researchers to identify new facets of stress processes that are not noticed when an individual approach is undertaken (Peiró & González-Romá, 2000).

Collective stress, burnout and emotional climate

Lazarus (1993) has pointed out the advantages of considering emotions as a part of the stress process. He states that "because psychological stress theory is tantamount to a theory of emotion, and because the two literatures share overlapping ideas, the two fields might usefully be conjoined as the field of emotion theory" (p. 10). The recognition of 15 or so specific emotions instead of the several dimensions of stress greatly increases what we can say about an individual's coping and adaptation. The use of stress as a source of information about the adaptation of an individual to environmental pressures is extremely limited compared with the use of the full array of emotions. Different emotional states are related to particular ways in which an individual appraises and copes with circumstances. Lazarus emphasises that "coping shapes emotion, as it does psychological stress, by influencing the person-environment relationship and how it is appraised... We will understand the coping process better when we understand the general goals and situational intentions, as well as the emotions of the parties in encounters" (p.16). Another advantage of considering emotions as a relevant part of the stress process is that it makes it more explicit that stress, as are other emotions, is social (Parkinson, 1996) and it plays an important role in the process of organising (Fineman, 1996).

Collective consideration of emotions brings us to study how the members of a group share them. Recent research on team and organizational climate puts a clear emphasis on the social context of organizational knowledge, on interspsychic as opposed to intrapsychic cognitive phenomena. "This interest goes beyond the mere recognition that actors think about and make sense of social collectivities, such as industries, organizations or work groups, to a strong interest in how such collectivities act as cognitive communities to shape both the contents and processes of thought itself" (Porac, Meindl & Stubart, 1996, xii-xiii).
In this context, the notion of emotional climate, developed by De Rivera (1992) to study emotional dynamics in different societies, can usefully be borrowed for the study of work teams and organizations. De Rivera states that "it is possible to define environment in a way that does not separate its objective and subjective attributes... By a nation's emotional climate I mean an aspect of its objective-behavioural environment. It, necessarily, affects everyone in the environment and is a characteristic of the society as composed of interacting persons. It may be observed to dominate the behaviour of its citizens and others subjected to its government." (p.200). The structural theory of emotions shows how they may be conceived as existing between people, in societies, and they may function to maintain the political unity or cultural identity of the people of that nation.

Emotional climate can be considered as part of the stress process, and can be researched as a collective phenomenon in teams and organizations (González-Romá, Peiró, Subirats & Mañas, 2000; Peiró & González-Romá, 2000). Its consideration, in addition to that of individual emotions, is extremely useful to better understand the nature of organizational order and control, providing the springs to self-regulation that social enterprises require in order to function. (Fineman, 1996)

In summary, research on work stress will profit from a systematic collective-level analysis in order to provide a more integrated understanding of it and its functions within an organization or work team. Members of teams, groups and organizations, as collective social agents, share stress experiences and develop collective coping strategies and emotional responses. All these phenomena play an important part in group and organizational order. However, until now they have not received much interest from stress researchers.

**Emotional climate formation processes**

Recently there have been several efforts to improve the understanding of the processes though which stress and burnout, as collective emotions, are shared. Some approaches have looked for the process through which individual experiences become collective (e.g. emotional contagion), while others have paid attention to collective affects and emotions as the starting point in understanding how individuals experience them.

The interaction processes, Attraction-Selection-Attrition phenomena, leaders’ sense-making processes, common stimuli, and socialisation contribute to the emergence of this shared interpretation of the environment. Furthermore, emotional contagion and interaction processes influence the emergence of a team affective tone and/or emotional climate.

Schaufeli & Enzman (1998) reviewed existing evidence on contagion as the basic process to explain shared burnout in a group or organization. In short, the contagion model assumes that the origin of shared burnout should be one or several burnt-out individuals who act as the focus of contagion from where burnout experience spreads like an infectious disease through conscious or unconscious imitation and empathic processes that are influenced by several personal and psychosocial features.

However, recent developments on organizational cognition have changed the emphasis on the starting point towards probing collective minds. "Whereas most traditional cognitive research in organizations started from the perspective of individual minds and asked how individual thinking aggregates into collective cognitive phenomena, more recent research begins with the assumption that all thought is inherently social and asks how individual thinking is derived from collective cognitive order" (Porac, Meindl & Stubbart, 1996). In a similar way, this rationale could be applied to emotions and affects.

Within this framework, George (1990) coined the term group affective tone to refer to consistent or homogeneous affective reactions within a group. As she states "the term consistent is key; if affective reactions are not consistent within groups then it is meaningless to speak of an affective tone of the groups. If consistency within groups is demonstrated, then affective tone exists for groups at the group level of analysis; affective tone is a group-level phenomenon because it depends on a group property, namely, whether or not there is consistency (in affect) within groups" (p. 108). This group level of analysis is not intended to replace the individual level. However, it is important to note that the theoretical rationale is different for each level, and collective processes have to be considered in order to study group phenomena. In our view, the group affective tone construct is similar to the group emotional climate one that can be generalised to other collective formations such as organizations.

Group affective tone can have important consequences for a group. First, it contributes to the development of team mental models or shared cognitive structures that groups use in order to represent and make sense of knowledge and information. In addition they influence group decision-making, prosocial behaviour, withdrawal behaviour and the well-being of group members. More specifically, when teams share their interpretations and their emotions about stress, they will probably engage in collective coping strategies such as shared absenteeism norms or withdrawal patterns, collective actions to reduce or eliminate stressors and in socio-cognitive reinterpretations of the situation.

One last issue that is becoming more and more relevant is that stress cognitions, emotions and behaviours can be more or less strongly shared by team members. Dispersion theory is useful in understanding the role that cognitive and affective climate strength plays in the configuration of common stress experiences (González-Romá, Peiró & Tordera, in press). From a time perspective, it is important to identify which are the relevant causes that contribute to the unfolding of a shared experience of stress or burnout in a team and how it could be prevented.

**Implications for psychosocial risk prevention at work**

The European Framework Directive on Health and Safety at Work (89/391/EEC) has devoted attention to some relevant aspects of stress and well being. This Directive has been implemented by national laws in European Union member states,
and from country to country they vary on the emphasis placed on the prevention of work stress and on the improvement of well being at work. Several efforts have been made to develop an approach that makes it possible to deal with psychosocial hazards and to place stress within the field of occupational safety and health (Cox & Griffiths, 1996; Cox & Rial-González, 2000, Peiró, 2000).

A study carried out by Kompier, De Gier, Smulders & Draaisma (1994) offers a perspective of the situation on the regulations, policies and practices concerning work stress in five European countries. The authors of this research found differences across countries in terms of the attention paid to stress and to its prevention and/or correction. The practices used, when they exist, are characterised as 1) focusing on the individual, rather than on the organization as the main target, 2) being concentrated disproportionally on reducing the effects rather than reducing the presence of stressors at work, and 3) mostly oriented towards the management of stress (Kahn & Byosiere, 1992).

One of the factors that could contribute towards explaining this state of affairs is the dominant paradigm that has inspired the mainstream research on stress. Most of that research focused on individuals, was conceived in a rather a-historical and decontextualized way, and paid more attention to individual coping and stress management than to collective coping and prevention strategies.

A complementary approach emphasised the need to focus on collective stressors, shared stress experiences and coping strategies, as well as on the collective consequences and well being. It would bring new insights for work stress diagnosis and risk prevention. In addition, if stress is re-conceptualised from emotion theory, the identification of the emotions related to stress experiences, at an individual and social level, can contribute to improve the understanding of stressful situations, the way they are experienced and the actions (individual and collective) that are being taken to prevent or cope with them.

As Bliese & Halverson, (1996) stated, "the nomothetic perspective may be particularly useful in designing interventions (Schwartz, 1994). For example, it may be more efficient to find ways to reduce the workload requirements for a group under a heavy work load than to attempt to teach members of the group how to cope with the heavy workload" (p. 1173). However, the nomothetic approach need not necessarily lie in a realistic epistemology, it can also lie in a socio-constructivist approach. Identifying the "socially constructed" situation and shared emotional experiences, as well as collective ways of preventing and coping with such experiences at a team or an organizational level, can provide new insight for diagnosis and for preventive and corrective interventions. Evidence reviewed in this paper gives some hints that support what has been stated. We expect that in the near future, more efforts will be invested on research on these issues, and that they will contribute to improving the quality of working life and teamwork.

References


Philosophical and Methodological Challenges in Real World Research: a View From Several Disciplines.¹

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Introduction
Although the association between work design, organisation and management on the one hand and work-related ill-health on the other, has been known for some time, (Barling & Griffiths, 2002; Griffiths, 1998), the incidence of such ill-health continues to be a cause for concern. Not surprisingly, managers, health-related professionals, unions, government bodies and employees are looking to researchers as experts, for advice and solutions. They are not seeking the ‘perfect’ solution: one that is ‘good enough’ would do. In essence, what they want to know can be summarised in five questions:

Q1. Exactly which aspects of the work environment are associated with these major health-problems?
Q2. How are they related?
Q3. Is there any evidence that intervening to change those work characteristics improves health?
Q4. If not, why not?
Q5. How can researchers best give this knowledge away to help organisations help themselves?

Many people have spent a lot of time answering Question 1. This is usually done by means of cross-sectional studies, undertaken in an ever-increasing variety of work groups, organisations and countries. Much of their focus is on the development of measures and testing existing theories. Such studies appear to be readily publishable. Some people have looked at Question 2. This involves an examination of cause and effect and requires longitudinal studies. These are hard to fund, time-consuming and are not so easy to publish. Very few people have tackled Question 3. This also requires longitudinal research, a considerable amount of organisational expertise and credibility, is expensive, time-consuming, challenging to undertake and very difficult to publish. Because of this, very, very few have attempted to answer Question 4. And since the academic research establishment currently rewards publications in journals read by academics, not practitioners, answering Question 5 seems to be very low on the agenda indeed.

This paper focuses largely on Question 3 (and by implication, Questions 4 and 5) and asks why are there so few accounts in the literature of attempts to evaluate the effects of organisational-level interventions? Why is it that those few that are published show modest or no effects? Why is it that experienced researchers suspect that organisational-level interventions are having an effect, but that we are failing to measure it? Goldenhar & Schulte (1994) suggested that absence of evidence about the outcome of these interventions “should be viewed not as a negative assessment of their potential but rather as an opportunity to develop a new, research-based body of literature”. Some of the barriers to fulfilling that opportunity are discussed in this paper.

Current research methods
When looking at the health effects of work design and management, and particularly when attempting to understand, to explain, and to intervene (rather than simply describe), many applied psychologists have independently formulated a

common approach, and many of these have also suggested that accepted ways of examining organisational life are inadequate (eg. Cox, Griffiths, Barlow, Randall, Thomson & Rial-González, 2000; Griffiths, 1999; Hugentobler, Israel & Schurman, 1992; Israel, Cummings, Dignan, Heaney, Perales, et al., 1995; Israel, Schulz, Parker & Becker, 1998; Kompier, Geurts, Grunendedam, Vink & Smulders, 1998; Kompier & Kristensen, 2000; Landsbergis & Vivona-Vaughn, 1995; Lindström, 1995; Nytro, Saxvik, Mikkelsen, Bohle & Quinlan 2000; Schurman. & Israel 1995). It is clear that this type of research involves the (otherwise often misnamed) ‘participants’, acknowledging them, not the researchers, as the ‘experts’ in their jobs. But the way their views are collected and analysed, the manner in which conclusions are constructed may be limited by the current availability of accepted methods and analyses, as well as by researchers’ knowledge of current publishing conventions. In other words, there are two major problems. First, conventional research methods may not allow the depth required to say anything meaningful to participants or to offer anything new in terms of theory. Second, researchers are constrained in developing these activities because of the way their work is judged and rewarded by the academic establishment. It is important to note that such reflections about the need for paradigm change usually come from experienced researchers who have attempted to implement and evaluate organisational interventions themselves. Those who conduct research from their laboratories, university base camps or from relatively brief data-gathering sorties into organisations are usually among those who are critical of attempts to move into less certain territory.

Colarelli (1998) has described the basic assumptions among psychologists that custom and belief is not useful, that laypersons’ ways of doing things are not to be trusted, that action based on anything but scientifically valid, ‘certain’ knowledge is based on ignorance and error, and that only the ‘scientific elite’ should play a central role in organising and managing society. The scientific elite, of course, operates within the tenets of the natural science paradigm, where the only way of examining organisational change is would be as an ‘experiment’. Experiments were designed to discover whether or not desired changes occur as a result of the manipulation of some important variable or the introduction of some treatment. They were originally a laboratory-based exercise in the natural sciences where the three minimum requirements for establishing cause and effect are generally feasible (i) identification of the order of events, (ii) control over important variables, and (iii) random allocation of subjects to control or experimental groups.

But these conditions are unavailable in most organisations. Changes to work design and organisation involve highly complex, multi-factorial, social and psychological processes. Laboratory conditions do not apply. Interventions are not isolated, sterile technologies that are neatly and surgically implanted into organisations. It is not possible to have ‘control over important variables’. In addition, in the real world of organisations, interventions are often grafted on to existing and unstable systems, usually with opposition from a minority (or, if the intervention has been imposed, with opposition from the majority). Researchers are guests, not autocrats in their laboratories, and managers have more important things to do than to satisfy their whims. Colarelli (1998) points out that is extremely unlikely, given such complexity, that one intervention will have much of an effect. He suggests that clusters of interventions in organisations are more likely to produce noticeable results. This is clearly a nightmare scenario for the experimentalist who would much prefer the tidy manipulation of one factor at a time.

Randomly allocating subjects to groups is also virtually impossible in organisational research. So, quasi-experiments were proposed - ingenious designs that try to deal with the threats to causal inference that exist without randomised groups (Campbell & Stanley, 1963). They try to establish that the intervention is the only systematic difference between groups. However, it has become apparent, 30 years on, that properly implemented quasi-experiments are very rarely used in organisational-level research (Cook & Shadish, 1994). People, unlike rats, often become aware if they have been selected for different treatment (an experiment). Far from helping us to draw conclusions about cause and effect, or to understand the effect of interventions, in real world research control groups can actually represent a threat to causal inference. People in a control group may object to the fact that others are getting ‘better’ treatment. They may get competitive and try harder. Or, they may hear about what is happening and try to implement it themselves. Or, intervention providers become unwilling to tolerate inequalities and try to overcome them in some other way. These four effects have all been observed in social experiments (Cook & Shadish, 1994).

**Questioning the usefulness of current research methods**

Questions about the limitations of the natural science approach and its dominant methods of enquiry for exploring complex social worlds have been noted by many distinguished academics from several disciplines in the social sciences. The anthropologist Clifford Geertz (1995, p.127) describing the development of ideas over the last two decades among his fellow social scientists at the Institute for Advanced Study in Princeton, New Jersey noted:

"We are hardly of one mind on everything and we have different interests and different problems before us; but we are all suspicious of casting the social sciences in the image of the natural sciences, and of general schemes which explain too much.... Human beings, gifted with language and living in history are, for better or worse, possessed of intentions, visions, memories, hopes, and moods, as well as of passions and judgements, and these have more than a little to do with what they do and why they do it. An attempt to understand their social and cultural life in terms of...objectivised variables set in systems of closed causality, seems unlikely of success."

And yet this is the type of research that is still highly valued in the most prestigious psychology journals. The currently acceptable way of building a scientific body of knowledge (and an academic career) is via publication in refereed,
peer-reviewed international, English-language journals. However, it is possible that journals now over-rely on judgements about the sophistication of methods and analyses when deciding the potential worth of a piece of research. This can mean that, although technically and statistically competent, published papers often do not convey much that is interesting, new or with any obvious implication for practice. Edgar Schein (1991, p.2) considered that:

The "traditional research paradigm ... has not worked very well ... [it] has produced very reliable results about very unimportant things.... In that process, we have lost touch with some of the important phenomena that go on in organizations, or have ignored them simply because they were too difficult to study by the traditional methods available."

A way forward

How might we look more meaningfully at the process of organisational change? What are we ignoring? What other methods could we be using? There are at least six steps forward.

(1) Evaluate macro-processes

A major problem with much organisational intervention research is that it concentrates on the outcome. It ignores the process of an intervention. Many process and contextual issues (macro-processes) might be having a major impact on the outcome. For example, the traditional interpretation of no change in the dependent variable would be that the intervention did not work, or that it was badly chosen. But the reasons for change and no change should be carefully examined. This is made more difficult by the fact that ‘non-significant’ results and process analyses are rarely published. Interventions include both intentional and unintentional processes: all can play a role. Identifying under what types of conditions interventions flourish, can be just as important as looking at the specific content or outcome of any intervention (Griffiths, 1999).

(2) Use partial comparisons

Interventions are complex, unpredictable social processes and yet researchers fondly believe that what they intended as the intervention is what actually happened. This is not usually the case (Nytrø et al, 2000). In addition, it is not a question of ‘having’ an intervention or ‘not having’ an intervention: it is not a simple dichotomy. Many subtle levels of variation occur. One way forward might be to identify and use these natural individual variations as part of an evaluation. Yin (1994) has referred to these as ‘partial comparisons’. At Nottingham we are working on such an approach (Randall, Griffiths & Cox, 2001).

(3) Examine micro-processes

There is little known about the mediating mechanisms underlying associations between work and health. How, for example, might having little control at work, or having a supportive line-manager, translate into health outcomes? These micro-processes are important and generalisable, but little understood.

(4) Abandon the fruitless quest for certainty

It should not be expected that different stake-holders involved in a real life situation will share the same view of it, or that their differing views can be reduced to a single simple agreed ‘true’ account, expressed in numbers. The analysis of real life experiences and behaviours cannot be meaningfully treated in this way. Some researchers are still pursuing the quest for errorless, certain knowledge - the ‘complete’ picture. Psychologists should be able to accept uncertainty: even in physics this was accomplished many years ago – one sign of a mature discipline.

(5) Accept different methods and analyses

In 1959, reviewing the contribution of psychology, Sigmund Koch wrote (p. 783) "From the earliest days of the experimental pioneers, man's stipulation that psychology be adequate to science outweighed his commitment that it be adequate to man." Things have not changed much. The conventional methods and analyses we are trying to use in organisational intervention research are clearly inadequate. They are often determined by the perceived needs of the research establishment, not by the needs of our clients. They are not enabling us to answer important questions. Why can we still not tell managers with any authority how to avoid much work-related ill-health? Manicas and Secord (1990, p.410) suggest:

"If our aim is to explain behaviour as it occurs in ordinary life there is no escaping the ordinary description of behaviour and experience. Certainly causal mechanisms and structures discovered by experimental psychology or other sciences apply to such behaviour, but by themselves they do not provide sufficient explanation, and they certainly do not enable us to dispense with ordinary language and to substitute a pure language of behaviour."

Qualitative approaches, based on ‘ordinary language’, ask ‘what is it like?’ not ‘how much of it is there?’ They are good for examining the richness and the significance of people’s experiences, and for initial problem analysis. Cronbach (1982) proposed that the qualitative methods of historians, ethnographers or journalists might be useful to generate and explore hypotheses about the micro-mediating processes involved in interventions. But, as Cook & Shadish, point out (1994, p.575), "although we personally have a lot of sympathy for this qualitative approach, it is likely to fall on deaf ears in the social science community at large." Qualitative approaches are good for the generation of new theories (quantitative methods are
criticised for only examining existing theories), adapt themselves well to examining the fast-changing nature of work, and are ideal for looking at the complex dynamics of work redesign (Parker & Wall, 1997). There are calls for their increased use and acceptance (Henwood & Pidgeon, 1995; Greenwood & Levin, 1998; Bannister, Burman, Parker, Taylor & Tindall, 1994; Richardson, 1996; Symon & Cassell, 1998). But, they are hard to fund, time-consuming, challenging to publish, not considered as prestigious by the establishment, and therefore little used. Although some Journal Editors acknowledge, in principle, the potential contribution of qualitative approaches, they may be constrained by their traditional body of reviewers - many of whom may not be trained in qualitative approaches, not well versed in the philosophy of science or the importance of continued re-evaluation of their own ways of thinking. Equally, many may not have first hand experience of the study of organisational life and change.

(6) Educate the next generation of students differently
It is clear from the limitations of current research, and from the demands of the current generation of postgraduate students, that we need to teach and train researchers and practitioners (and thus journal reviewers, policy-makers and decision-makers in research funding bodies) differently. They need to be well versed in the philosophy of science and in the complementary use of both quantitative and qualitative traditions.

Conclusion
It is necessary to move forward and develop a new research paradigm (i) that is more suited to an understanding of process, not just outcomes, (ii) that is more helpful for the generation of new theories, not just the continued exploration of old ones, (iii) that is more suited to solving promptly the needs of today's organisations, and (iv) that enables researchers to recognise its limitations. As Noam Chomsky (1988, p.159) proposed: "It is quite possible...that we will always learn more about human life and human personality from novels than from scientific psychology."

References
Meaning Constitution Analysis (MCA): A Three-Step Methodology Aimed At Bridging The Quantitative, Qualitative Divide.

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Background

Science and ethics are considered to be two separate realms of human activity. However, science is also defined by its capacity to question all so-called “evidences”. It is now time to reconsider the status of psychology as a human science, and even to re-actualise the old English term of moral science. One way to do this would be through the careful consideration of its object of study, the human being. Both ethics and multi-culturality can be seen to characterise human beings. Ethics implies the continuous responsivity of man in their relations to others, necessarily included in all her activities. The phenomenological point of view implies the priority of meaning over fact. Seeing the human being as the one where meaning originates in and by his continuous activity with others in their common life-world makes the ethical characterisation of man essential in any study striving towards scientific objectivity. Objectivity primarily means the utmost attention and care for the essential characteristics of the object studied. The second aspect, multi-culturality is an indeniable fact of contemporary societies.

The main question for a scientific research on human beings in general and on health problems in particular should be: how can we reach the individual so that they are allowed to present themselves in their own words and expressions, and indicating in this way both their singularity and their cultural specificity? Also, and of an equal importance, we could avoid any kind of ethnocentrism whereby we, western researchers, would define, may be unconsciously and hence even more dangerously, health, work, working life, life in general from our point of view, resulting once again in a form of mental and consequently physical colonisation. Any quantitative treatment necessitates a previous work of categorisation, differentiation, definition and precision; for example the development of questionnaires. This preliminary work of the mind is by necessity the work of the mind of the researcher involved in this process of questionnaire formation. Consequently, researchers impose, willingly or not, their own subjectivity. From the very beginning, the researcher misses their aims.

Qualitative approaches can show greater degrees of flexibility. It allows for the formulation of questions, observations or necessary adjustments depending on the ever changing conditions of life in the situation studied. Although these ever changing conditions are considered to hinder a strict scientific approach (where experimentation under strictly controlled conditions according to a design formulated prior to the investigation proper is postulated as the strictly speaking
sole adequate way of research) and to create serious difficulties for (if not endangering completely) generalisations of results in the common positivistic understanding of science and scientific activity. Their ecological validity makes them not only unavoidable but, on the contrary, especially desirable from a phenomenological point of view, with its reliance on an emergent design, changing progressively in accordance with the developing understanding of the subject (Sages, 1998a).

It appears an impossible task to strive for quality in working life, to try to achieve any kind of improvement in the several aspects of organisational structures, working conditions, productivity or work satisfaction and integration with other aspects of life without a careful analysis of the individual meaning all these aspects may hold. In analysing texts freely produced by the individual, one focus on understanding how the individual constitutes meaning in his work and life based on their own subjective experiences. “Subjective” here is not to be seen as a step back from objectivity; quite the contrary. Rather, it should be interpreted as the most appropriate way to remain as close as possible to the individual’s own living experience. The individual is the one constituting meaning in and by his daily life activities; she or he is then the source of meaning. A careful analysis of meaning as constituted by the individual give us a means to generalise and formulate typologies and classifications above the individual level. This allows us to look for what may be expected from the individual, which is how future possibilities as well as actual experiences or previous events significant for him can be delineated from the intentional implications uncovered in the text.

**The Method of Meaning Constitution Analysis**

The MCA method has been described previously (Sages, 1998) and is supported by a software (MCA, 4.3, 1997-2001). It is a method of text analysis based on Husserl's phenomenological psychology (Husserl, 1925-1982). It proceeds from a self-report. A person is asked to answer a carefully formulated question concerning a topic that is of significance to the person and that is also of scientific interest. The question should be phrased so that individuals’ can express themselves freely and without any restrictions. The way of formulating the question can be varied. The following is an example formulated by Sages, Falk, Johansson (1999): “Try to imagine the following: One day, a person comes to your place of work. He/she comes from a totally different culture, and understands nothing at all about what goes on where you work. How would you try to explain your job to him/her? Write exactly right off, as you think, without worrying about wording, spelling and the like – this is completely unimportant in this context! Leave your contribution in a sealed envelope at the reception as soon as possible, to be forwarded to me. THANK YOU IN ADVANCE FOR YOUR CO-OPERATION!”

A phenomenological analysis begins with the application of the epoché (the word epoché refers to the suspension of all our preconceptions, whatever their origins may be) to obtain a pure vision as free as possible from preconceptions of the problem under study. The problem has first appeared to us in our natural attitude, as part of our daily preoccupations. As a result of this, it is imbued in the several and different kinds of uncritically admitted (and, for the most part, not even consciously realised) prejudices and presuppositions, which, as consequence of this natural attitude, are taken for granted and as existing as such. The report may be based on a text written by the person or on a transcript of the person's oral account. A text may also be a transcript from an interview or a conversation between two or several persons or even a policy document from a company, trade union, local or central authority or some other organisation. A synopsis of the steps followed in the process is given below:

**Step 1: First application of the epoché**

The method seeks to identify smaller meaning units as a result of this conception of the epoché. This is done for three reasons: 1) a more clearly defined partition of a person’s report means that there is less room for uncontrolled interpretation. 2) smaller meaning units increase the veridicality and the possibilities to validate the analysis in so far that other researchers will be able to more easily compare their results step by step and identify differences and errors or omissions that may occur within each meaning unit. 3) the different partial intentions (forming together the complex meaning of the intended object) can be structured in a very detailed way, which makes it clear how the individual constitutes meaning.

**Step 2: Second application of the epoché**

The epoché involves the separation of the pure meaning from its modalities of expression. The modalities and the pure meanings, which appear as a result of the application of the epoché, follow the appropriate meaning units. Modalities can be of different kinds and express the degree of belief, e.g. doxa (absolute certainty), probability, possibility, hesitation, assumption etc. They can also express function, such as signitive, imaginative or perceptive. Other modalities include will, time, property etc. Every produced meaning is always an acceptance of one or another form of existential thesis (like certainty, probability, possibility or negation, according to the natural attitude), intending its intentional object in one or another form of function (perceptive, imaginative or signitive), delineated by a time horizon (although every experience, by definition, always happens in the living present, it can be oriented toward it or toward the past or the future, always framing every living experience).

**Step 3: Application of the phenomenological reduction**

The next step is the intentional analysis, which is an analysis of the meaning content obtained by the epoché. In the intentional analysis, the researcher tries to find all the partial intentions, the meaning contents, which when taken together, lead to the constituted meaning-structure. The aim is that this analysis should be as specified and rigorous as possible so that all the general and specific components of the meaning be clarified.
Step 4: Synthesis of the meaning structure
The next step is to discern which entities form meaning constellations of the intended object. These are found in a survey of the whole intentional analysis. An entity is something that appears as something that "exists" for the experiencing individual. Everything which is tied to an entity, is now accounted for in all its found variations. The words and expressions used to speak of the entities, the predicates, are tied to their respective entities and highlight their meanings as experienced by the respondent. Put in relation to the groups of entities and predicates we obtain a picture of the intended object as it is intended by the respondent in its full richness, the complete lived meaning structure.

Step 5: Formulation of the horizon
The horizons of comprehension, what they contain, what we can see through and what becomes visible through a joint consideration of them, completes the analysis. An attempt is made to gain insight into the life-world of the person and how the surrounding world is constructed and experienced in it. It strives at an understanding of the temporal structure of the individual’s experience, taking into consideration the totality of the obtained horizons.

The MCA method is basically a qualitative one, but allowing for both descriptive and inferential statistics from the obtained sets of entities, predicates and modalities. This paper does not call for a qualitative approach alone but for the use of qualitative or combined of methods where appropriate. With Prof. J. Moscarola of Savoie University, author of the software Le Sphinx Lexica, I am analysing the occurrence and correlation of morphemes with statistical methods, allowing for a combination of both a quantitative and a qualitative treatment of the same data, increasing the validity and generalisation possibilities of the results. The three-step methodology, with the aim of exploring the life-world of the other from his/her own perspective can be summarised in the following way: 1) Creating an initial situation; exposing the subject to a broad question or a concrete but fuzzy situation, the researcher inviting to an orientation, provoking a reaction or taking an already existing opportunity 2) looking for the subject’s reactions; collecting written narratives or texts. 3) analysing the obtained corpus according to researches purposes and methods, ready for the use of a combination of methods if deemed necessary.

Case Study

Background
The lack of financial resources in the department of geriatric care in a municipality in Sweden lead to the deterioration of the quality in the care of the elderly and an unsatisfying work-environment for the employees over a number of years. The MCA approach was used to evaluate employees’ experiences of work before planning improvement strategies.

The Survey
All 267 employees where asked to freely and anonymously describe their experiences of their work, leisure and family life. Biographical information collated included work title and ward (1 – 4). Employees were coded into two groups at the department: Carers and Others (physiotherapists, occupational therapists etc). 207 individuals responded (~ 80%) and responses were analysed using MCA. The results of the analyses were communicated to the employees and the management about three months after that they answered the question.

The burden of work and stress
Many employees reported that the work environment was increasingly stressful, some individuals reporting that they suffer from insomnia as a result. Three reasons were reported to contribute to the increased stress: i) the increasing number of tasks required including non-core administrative and organisational tasks. ii) understaffing and inefficient organisation was thought to be a contributor to stress iii) unavailability of physicians and nurses. Working in this stressful environment was thought to influence the level of patient care and patient contact time. This causes feelings of worthlessness among the employees.

The efficiency of the organisation
Physicians and nurses are often are hard to catch when they are needed. One of the carers said that the nurses are often at other wards at the department. Nurses are often in difference wards when patients require attention or medication and physicians are often unavailable to answer questions from relatives. These situations are experienced as a stressful moment for both nurses and carers.

Satisfaction with the job
Those employees who reported a high level of engagement in their tasks reported that they were satisfied with their job and that it gave them a sense of enjoyment and something personally. Some also reported that patient feedback, the appreciation the patients show the employees function as a measurement of quality of the care that is given.

How the employees express themselves
When talking about the efficiency of the organisation the employees express themselves in a perceptive, concrete modality. Meaning units about stress and high burden of work expressed in a perceptive modality are common. When talking about the job, the meaning and the satisfaction with it the employees express themselves in a less concrete modality. About the organisation of the department the employees do not express any will in the will modality. But when they are talking about the patients they express themselves in an engagement category in the will modality.
Main trends in the results
There might be a contradiction between the descriptions of the work-environment as stressful and descriptions of the job itself as satisfactory. Earlier research might explain this seeming paradox. A study including secretaries, teachers and factory workers indicates that job involvement is based on intrinsic need congruence, but work involvement is not. In the theoretical base of the study the concept of job refers to the specific work tasks a person has to make, the concept of work refers to work in general. Work involvement can be associated with either a high or a low level of well being. Job involvement is significantly associated to a high level of well being (Riipinen, 1997). When the employees are describing the tasks and the nature of their job they express satisfaction. When they are describing the work-environment and the organisation of the department they express feelings of stress. If the need congruence of the job at the geriatric care is high it could be an explanation to the satisfaction with the job itself expressed by the employees.

Individuals who have jobs in which the interaction with other persons is an essential part (medical care, education and manufacturing) are more satisfied with their jobs than individuals who have other kinds of jobs (Gallie & White, 1993). There is some evidence that the satisfaction with the job is higher when performance targets are clear. (Robertson, 1990). A study about motivation among employees in the retail sector shows that the reactions from the customers constitute a motivational factor for the employees. It is important for people to be satisfied in their job in order to perform well (Bent & Freathy, 1997). These studies may explain why the employees at the geriatric care feel satisfied with their job. It seems likely that it is not the job itself that makes the employees feel stressed but rather the organisation of the department and dissatisfaction with the management. The employees talking about the time they spend with the patients. This is mentioned in the context of stress and the burden of work. In talking about the care given to the patients in the same context as talking about stress the employees express engagement in their jobs. They are reflecting about how the stress influence themselves but their engagement in the care for the patients makes them reflect about the influence of the stress on the patients. This indicates that the patients are the focus of the interest of the employees, not the organisation of the department. It seems like the employees have, according to the terminology used in the studies made by Riipinen (1997), a high level of job involvement. It is the job, and the tasks within it, that constitutes the meaning for the employees.

References

Using the Experience Sampling Method in Organisational Studies

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Experience Sampling Method (ESM) is a unique self-report, random sampling diary technique, well suited for organisational research. Among the major advantages are the possibility to get representative data, with respect to both frequency and duration, on work activities, related to social activities and the mood and emotional experiences of those activities. Because of the random sampling technique, the emotional data and mood data are representative. Data can be collated at at least two levels, event and person level, but could also include an organisational level. Analysis on each level is described, as well as data reduction techniques and methods for handling the multilevel nature of the data. ESM is a demanding technique for both the researcher and the informants. The informants need to be fully aware of the purpose and
the technique of ESM: it is participative in nature. The unique insights in work conditions yielded by ESM, however, compensate the effort.

**Introduction**

The Experience Sampling Technique (ESM) was developed by Csikszentmihalyi and colleagues as a tool for investigating flow processes and creative experiences Csikszentmihalyi, M., Larson, R., 1987). ESM is closely linked to Flow theory originating from Csikszentmihalyi, but ESM is also a member of a family of methods, which could be called random sample techniques. They are all self-report or diary methods, but characterised by information that is collected at random points in time, rather than at equal interval points in time, or when certain situations or events occur. The application of ESM is in principle quite simple. A person well informed on the purpose and the details of ESM, is given a beeper with a processor administrating beeps at random intervals. Certain restrictions may be set i.e. shortest interval, exclusion of non-working hours. The informer is also given either forms, Experience Sampling Forms (ESF), or a palm top computer for recording answers to questions about relevant actions: time, duration, type of action, social context, moods, emotions etc. Typically, a person takes part in an ESM study for one or two weeks, answering 5 to 10 beeps per day. Depending on the purpose, anything from 5 to 500 persons could participate in an ESM study (the largest studies can be found in US investigations).

**Representative data**

One of the unique and valuable features of ESM is that it in principle yields representative data, both with regard to frequency, duration and mean levels, for the person and – especially – for the cohort or setting. This is in contrast to other self-report techniques or diary techniques, and of course quite contrary to questionnaires. The later give data cognitively aggregated and thus systematically biased in a way most likely differing over persons.

**Actions and intentions**

Since ESM gives self-report data, it is well suited for yielding information on action (that is behaviour in a context of intentions) rather than observed behaviour.

**Participative approach**

However, the principle of representative data yielded by ESM could be violated by the participating persons. Personal or socially sensitive data could be withheld. Furthermore, infrequent occurring events might be missed although they might be vital for understanding the actions of the individual and the group.

All this makes ESM extremely demanding with respect to informing and motivation the participants, and agreeing on what kind are data are agreed to be withheld.

**Kinds of data**

The kinds of data normally gathered by means of an ESM investigation are:

- time for data collection (and if delay: amount of delay)
- action: behaviour and its intention
- social context (people present)
- social dimensions (for example team climate)
- mood (for example by means of scales reflecting anxiety and depression)
- emotions (for example anger, fear, shame)

**The basis of questions and scales**

The nominal data is normally based on previous research (for leadership behaviour in managerial studies etc.) or pilot studies. The scales are normally based on theoretical dimensions that have been operationalised in previous research and thus have known psychometric properties. Ideally, reliabilities and other scale properties, including factor structure, should be known in advance.

The large number of items frequently used in questionnaires has to be reduced in ESM studies for obvious reasons. Ideally, an ESF should be answered in less than two minutes (in some studies less than one minute) so as not to interfere with regular work.

**Data levels**

Data are on at least two levels, event level (usually called beep level) and person level. In some studies, one or two additional organisation levels are added (sublevels within organisation and organisation).

Usually several hundred or a thousand observations can be made at the event level. The number of people involved in the study may range from five or ten to several hundred. The number of organisations involved in any one study is usually small.

**Data analysis**

Event level. At this level, data are either used in its original form (raw scores) or after standardisation on person level (person standardised scores, for short called z-scores). The reason for using z-scores is to eliminate or reduce the effect of extreme single values or the effect of extreme individual scales (central value or variation). However, the routine use of z-
scores is problematic for both theoretical (the persons’ perceptions are arbitrarily changed) and other reasons (what if some persons have extreme experiences because of the context?).

Person level and organisational levels. In addition to event level data aggregated to person level data, there are usually some genuine person-level-data, such as demographic data. Instead of aggregating event level data, persons could be treated as dummy variables on event level. The same is relevant for organisational data.

Multilevel analysis or Hierarchical Analysis. By special programs, data on two or more levels could be treated simultaneously without transformations. This kind of analysis has since several years been applied to pupil-class-school-district data, and a continuous development of the appropriate programs are taking place.


Results of ESM studies
Results include representative frequencies of actions or sets of actions, the social context related to each action, and the mean levels (etc.) on social climate, mood and emotions for each action or set of action.

Conclusions re ESM in organisational research
ESM might well introduce new insights in organisational matters, resulting from alternative findings than what now emerges from the dominating questionnaire method. It will certainly not simplify organisational research – but perhaps make it richer, more relevant to actual working life and thus easier to apply.

References

A Presentation of the Diary-in-Group Method (Lindén and Torkelson)

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Background
The Diary-in-Group Method, developed by Lindén (1990) and Lindén and Torkelson (1991), is a method that combines principles from other methods, such as diaries (e.g., Elklit, 1986), focus groups and individual interviews. It is also influenced by the “research circle” approach (Lindström, Persson & Svenstam, 1989), which stems from a long tradition of cooperation between researchers at Lund University and various trade unions as a way of enhancing communication between experts and practitioners. In such a “research circle” practitioners are regarded as participating actively in the research process and in the development of work reforms.

The Diary-in-Group Method was developed in an attempt to meet the need for a method with both a theoretical orientation towards conceptualised knowledge and the goal to satisfying the practical demands of implementation. Traditional methods used to understand psychosocial issues in working life have often failed because of a lack of dialogue (Lindén, 1996). Lindén found a large gap between philosophically oriented debate concerning the tensions between various forms of knowledge and concrete implementations of them in research methodology.

Case Study
A study of theatre actors will be used to describe the Diary-in-Group Method (Lindén & Torkelson, 1991). The aim of this study was to elicit critical moments in the working life of actors that could play an important role in their health and psychological well-being. Five actors from a Swedish theatre participated in the study, which lasted for approximately six months.

Initially, three introductory meetings were held to discuss the interests both of the participants and of the researchers including methodological questions and the creation of a contract for assigning responsibilities. Each of the five
actors wrote a diary on a particular day concerning all the activities in which he/she was engaged during that day. Subjects also wrote about their thoughts and feelings in connection with these activities. It was up to them to decide what to include in the diary and what they found too private to share.

Five group sessions followed, one each month. Each session concerned the diary of one of the actors and lasted for at about two hours (including two five- to ten-minute breaks). The author of the diary considered during the session began by reading the text aloud while the others listened. Each group member was allowed to interrupt the reader whenever he or she wanted, such as to share one’s own associations with the others, relate one’s own experiences or memories, or ask questions. In this way, a very free and spontaneous discussion evolved.

Each session was tape-recorded and later transcribed into text. The data from the study consisted of text from the five discussions, along with the five diaries (Table 1). D1 to D5 denote the diaries of the five actors. Each diary can be seen as a unique phenomenon and at the same time be compared with the other actors’ diaries, revealing both similarities and differences. DD1-DD5 represent the discussions of each actor’s diary. The discussions concerning various central themes can also be compared. In addition, changes on an individual level across different sessions can be followed (i.e. a1 + a2 + … a5). This allows the interaction between the individual and the situation (either session or theme) to be studied.

The data were analysed at four different levels as described by Lindén (1996): that of an actor’s day as a lived experience, that of the diary involved, that of the group conversation as a lived experience, and that of the group conversation as it was registered. The diaries can be seen as separate narratives or small literary pieces that are open for interpretation. A group conversation as lived experience can be referred to as the speech or living communication in which the author and the other participants are involved in conversation, creating a new discourse connected with the discourse of the text. The last level of analysis, the group conversation as registered, comes about through the conversation within the group being converted into yet another text.

The recorded group discussions were transcribed into readable text. Expressions such as “Hm” and “Yes, yes” or “No, no” that did not contribute to the content of the discussion were omitted. Missing words were also added and put in brackets to make the text more readable. The transcribed texts from the discussions and the diaries were analysed using i) formal analysis and ii) an interpretative approach (Lindén, 1996).

The formal analysis starts with examination of the different themes found in the text. Themes from the study of the actors were ones such as “cooperation with other actors”, “working hours”, “being both an actor and a parent” etc. In a quantitative analysis, such aspects as numbers of words spoken by the different actors and what major themes were involved (across different sessions) can be studied. Forty-five different themes were found to have been taken up, those considered most being “rehearsal techniques: cooperation between musicians, producer and actors”, “costumes and masks: interfering with others”, “work and family life”, “different aims in one’s career” and “influencing the role one plays”. The formal analysis also included a temporal mapping of each actor’s physical activities. In mapping the actors’ lives, it became clear that they had worked long hours, starting in the morning, with some time off in the middle of the day and finishing work late in the evening.

The second part of the analysis, the interpretative approach, linked with the work of Ricoeur (1979), is described by Lindén as being “when the reader connects the text with his or her own world”. This interpretation is made when the text is linked with the reader’s self-interpretation in a way that leads to changes in self-understanding, it can be called a subjective form of reading (Lindén, 1996). The text as produced by the actors in the form of the diaries and of an adapted version of the group discussions was presented to the reader and also analysed by the researchers focusing on psychosocial work environment, health and well-being. Central concepts in the interpretation were those of work organization, demands, social support, participation and influence, and meaning of work.

Recently, a replication of the study using the Diary-in-Group Method with a group of actors was carried out in the Czech Republic (Cermak & Lindénová, 2000).
Table 1. Design for use of the Diary-in-Group Method (Lindén, 1996)

<table>
<thead>
<tr>
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<td>DD2</td>
<td>DD3</td>
<td>DD4</td>
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</tr>
</tbody>
</table>

References


Applied Occupational Health Psychology – future changes, challenges and chances”

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Context
The context for the Professional Practice Forum is that there is no connecting or binding approach to the practice of occupational health psychology in Europe. Across Europe, there are totally different working-conditions, regulations and future changes, challenges and chances. For example, in Austria it has been proposed that a minimum time for the prevention of workplace hazards will be introduced according to the 2002 health and safety regulations. This will enable the workforce to spend up to 25% of the minimum working time with occupational psychologists and other experts (ergonomists, toxicologists and chemists).

In light of these exciting developments and the distinct differences between European culture and Health and Safety legislation, the preparing group - Kaj B. Andersen, Einar Baldursson, Heinrich Geissler supported by Karen Brask and Bendt T. Pedersen - decided during their second meeting held in Denmark in April that an open forum during the Professional Practice Forum at the Barcelona Congress would provide a good grounding for the development of practice in occupational health psychology. This will
enable all the participants to create their own agenda according to the European differences in the practice OHP and
enable the development of an agenda and actions to be taken forward by the coordination group of the practice forum.

The roots of the occupational health psychology are variously embedded in different European perspectives. Whilst the history of occupational health psychology is of great importance, it is the future direction of occupational health psychology that provides the greatest opportunity for practitioners. To drive forward a European approach to the practice of occupational health psychology an ‘Open Space’ discussion has been proposed. During this open space session, practitioners can together share understanding and experiences to identify the future changes, challenges and chances of applied OHP.

The Open Space Method
The open space method is often used for simultaneous change in (larger) groups in which the participants themselves determine the agenda. The method was developed by Harrison Owen in the mid-80’s in the United States who noted that discussions during coffee breaks ~ in between meetings and presentations~ are very productive for generating ideas. This approach is widely used throughout the world engaging groups from 10 to 1000 people. The open space method has a few simple rules to support the communication. It is an effective method that enables participants to express their interests, it stimulates discussion and provides an excellent opportunity for networking and the development of ongoing working groups etc.

At the beginning of the Professional Practice Forum participants will identify various issues facing the practice of occupational health psychology that would benefit from further discussion. This active discussion will generate ideas for interest-workshops, which will then form the basis of the agenda~ thus the participants create their own agenda. Participants then join interest-workshops. A plenary session will draw together the discussions of each group. This method will act as an orientation process for the Practice Forum, helping to define the way forward for the practice of occupational health psychology.

We invite You to find Your "place" in an open space!

References

Occupational Health Psychology and E-learning

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Background
As an emerging discipline, there is increasing demand for postgraduate taught courses specialising Occupational Health Psychology (OHP). Many of the people interested in taking such a course are already working in a related field (such as nursing, physiotherapy, health and safety, workplace health promotion). This can make it difficult for them to attend traditional courses which tend to be delivered over a 12 month period and require full-time dedication to the course both in terms of time and location. Therefore, there is an increasing need to support part-time and distance-learning in order to make taught courses in OHP accessible to such professionals. One of the methods of supporting this type of learning that has emerged over the last few years is through information technology (IT) and the internet - increasingly known as e-learning. This paper describes some of the practical and pedagogical implications of teaching OHP using e-learning techniques.

E-learning: Advantages and Disadvantages
E-learning is the use of internet-based technologies to support and deliver teaching, learning and assessment. The last decade has seen a huge growth in the development of e-learning techniques, and, more recently, there has been an increasing use of these tools in the higher education sector. These developments have led educators to re-think the very nature of teaching and learning at all levels of the education system (Owston, 1997).
There are a wide variety of different ways in which internet-based technology can be used to provide powerful learning aids to students (Doughty, 1996). Tutorial exercises seem to be most commonly and easily transferred onto the internet. During an internet-based tutorial, students are usually presented with some text and graphics describing a theory, concept or methodological technique, and then they are asked to answer questions or solve problems using this information. An example is the Internal Validity Tutorial by David Polson on the Athabasca University website (Polson, 1998). First, this tutorial describes and illustrates the various sources of threat to internal validity. It then gets the student to interact with it by presenting a series of hypothetical experiments in which the student has to identify any threats to internal validity. Another example is the Stanford Prison Experiment website (Zimbardo, 1999) which consists of pictures and text describing the various stages of the social psychology experiment, with discussion points and video clips throughout.

There are a wide variety of internet-based teaching tools already available for use and a vast potential for the design of other learning aids. However, does the use of e-learning techniques show any real advantage over the traditional methods of teaching the same material? One of the major claims made by the proponents of e-learning is that it provides access to learning for those who are unable to attend classes at a university due to temporal, geographical and other barriers. Distance learning universities, such as the Open University in the UK, have provided such opportunities for some time. Although these institutions have in the past used correspondence, printed materials, and television, they are increasingly using the internet and email to support learning.

It has also been argued that the use of information technologies can promote improved learning. Owston (1997) suggests three advantages of e-learning strategies that may lead to more effective learning:

- it appeals to the way students learn, i.e. computer-based, visually stimulating, interactive
- it enables a variety of learning of skills such as critical thinking, problem-solving, communication
- it provides for flexible and autonomous learning, accessed at the learner’s convenience and pace

It is the flexibility and independence of e-learning that is thought to be the key to its potential for improved learning. E-learning promotes a new educational paradigm where the learner has an active role in constructing his or her knowledge, and the teacher provides a learning experience for students - not the traditional, dependent model in which the student is viewed as a vessel to be filled at regular intervals with knowledge (Ruth, 1997).

E-learning has also been widely promoted as the saviour of teaching quality in the face of diminishing resources (Brailsford, et al, 1998). However, the costs of developing and supporting e-learning can be high. They include the provision of hardware, software and technical support, development time, course administration and maintenance. As the initial set-up costs are likely to be large, it has been suggested that the most effective strategy is to concentrate development efforts on those courses that generate the greatest enrolment (Owston, 1997).

However, there are also disadvantages associated with e-learning. Technology must be applied carefully and thoughtfully to achieve the potential of improved learning and access that has been claimed. Although, temporal and geographical barriers are removed through e-learning, they can be replaced by technological barriers. Not only does the learner need to have access to a computer and the internet, but they may also experience technological difficulties that hinder their learning experience, such as hardware malfunctions, software incompatibility, unreliable internet links, heavy on-line traffic and slow servers. The costs of internet access can also vary widely and is dependent on the speed and tariffs of local internet service providers.

Given the advantages and disadvantages of e-learning techniques, it is clear that their use must be accompanied by careful planning and implementation. More specifically, there are a number of practical and pedagogical issues that we need to consider if we are to use e-learning in the teaching of OHP.

**E-learning and Occupational Health Psychology: What lessons can we learn?**

If we want to adopt e-learning techniques in the teaching of OHP, we need to ensure that we adopt it using best educational practice. Although this will require spending sufficient time in planning, testing and implementing e-learning, we should remember that there is no need to ‘reinvent the wheel’ in our use of the internet in teaching. There are many existing on-line tutorials and materials which we can easily bring into our own teaching, rather than design a new set of materials ourselves. The internet is about sharing information and materials, and we need to be open to using and referencing other people’s e-learning materials in our teaching - just as we would use a textbook written by someone else. We need to evaluate the e-learning tools that are available to see whether they meet the criteria for our own teaching. There are also many lessons we can learn from other educators who have designed and implemented e-learning tools. There are a number of e-learning websites, journals, and discussion boards which have a vast number of reviews and accounts of the practical and pedagogical pros and cons of various e-learning tools.

There are a vast number of practical issues that need to be considered in both the design of new e-learning tools and the use of existing tools. Some of these include:

- the design and content of web-pages – is there too much or too little text, is it easy to read, does it retain attention, does it provide sufficient instructions?
- the usability of the tools – this involves a thorough testing of all the options on a website and the ease of navigation through the site
However, the implementation of e-learning is not just about web design and functionality. There are also pedagogical issues to address such as:

- the provision of adequate learning support to students - it has been shown to be important that students working in an interactive environment should have clear pointers to routes by which they can find answers to their questions regarding the material being covered (Doughty, 1996). This avoids a feeling that the interactive environment is closed and that all questions must be found within it
- the content of teaching materials for e-learning – are the aims and objectives clear, are the materials consistent and accurate, and are the assessment methods clear?
- methods of engaging and motivating students – do they have to use the material in some way, possibly with other students? The value of e-learning is thought to be greatly enhanced by working in student learning groups, rather than working alone (Doughty, 1996)

Whilst E-learning can clearly be used to support part of the learning process, questions have been asked as to whether it can it support all of it? Mayes has suggested that the three main phases to the learning process can all be reproduced in e-learning materials and tools (Mayes, 1993; Mayes & Neilson, 1995). The first phase is the initial conceptualisation of the subject material from declarative sources such as lectures and books. This is followed by the phases of construction, through essay-writing or problem-solving, and of dialogue, through tutorial-type discussions. However, if we are to use e-learning packages and materials to deliver teaching then we need to ensure that all of the phases of the learning process are achieved.

Doughty (1996) also raises the issue of teachers ability to adopt e-learning themselves. Some of the difficulties that teachers may face in this regard include lack of time, lack of support staff, lack of information and lack of suitable materials. There are also a number of common objections to the use of IT that teachers often air, such as the feeling that the main priority is cost-cutting, that they must do whatever attracts the most new students, and that computers can be more effective than lectures. In planning and implementing e-learning we must accommodate the many views that are held on what is important in the teaching and learning process.

The effective use of e-learning clearly requires careful planning, design and implementation. The practical and pedagogical issues described above and already learned by those implementing these techniques should be used to assist this process.

Conclusion

Technology have provided educators and students with a wide range of new media and tools to deliver teaching and learning. These tools can help remove barriers and boundaries that may have prevented students from learning and they may improve learning through their flexibility and independence. However, it is vital that educators assess the appropriate use of the technologies and the needs of students in their adoption. For the growing area of OHP education, we need to look closely at who our clients are. If they are mostly working professionals who cannot stop working for 12 months and move close to the university then they will need a learning experience that provides them with the flexibility and control that e-learning may offer. If we then adopt e-learning techniques, we must ensure that they are appropriately used and do offer the teacher and learner the potential that is claimed: accessibility, improved learning, cost-effectiveness.

References


Technostress And Burnout Among Spanish Workers: Gender Differences

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Theoretical background

A substantial number of people express serious concerns about living in a society which increasingly introduces Information and Communication Technology (ICT) at all of the life spheres. Moreover, negative attitudes towards computers are more likely to lead to both the slower learning of computer tasks and increased errors and, may even result in a total avoidance or minimal involvement in computing activity (McIlroy, Bunting, Tierney, & Gordon, 2001). According to Brosnan and Davidson (1994), between one quarter and one third of the population could be characterised as suffering from those concerns which could lead to develop a defined syndrome, named Technostress.

Whilst different labels are used in the literature to describe this syndrome (see Brosnan, 1998), Technostress refers to a three-dimensional syndrome of high negative attitude towards ICT (evaluative dimension), high computer anxiety (emotional dimension) and low ICT self-efficacy (cognitive dimension). Therefore, individuals who are technostressed hold negative global attitudes about computers, their operation or their societal impact (Rosen & Weil, 1990), hence they resist talking or thinking about computers and avoid any technological change (Brosnan, 1998). Further, they feel anxious about current or future interactions with computers or computer-related technology and even have specific negative cognitions about their capability use computers efficiently at the present or when contemplating the future (Rosen & Weil, 1990). Moreover, some empirical studies show that the incidence of this syndrome varies in males and females. Women have less positive computing attitudes (McIlroy et al. 2001; Ogletree & Williams, 1990) and feel less competent in computing than men (Brosnan, 1998; Makrakis, 1993; McIlroy et al. 2001; Schumacher & Morahan-Martin, 2001).

Furthermore, in the last decade research has shown that the exposure to technology even influences users' health and well-being. To explore this relationship, instead of using context-free measures (i.e., somatic anxiety or psychosomatic complaints), recent studies include more reliable work-related indicators of workers' well-being, such as Burnout (e.g., Salanova & Schaufeli, 2000). Burnout is a syndrome composed of three dimensions: exhaustion (i.e., the draining of energy due to excessive efforts spent at work), cynicism (i.e., an indifferent detached, and distant attitude towards one's work) and professional efficacy (i.e., a sense of accomplishment and job competence). High levels of exhaustion, cynicism and low level of professional efficacy are indicative for burnout (Schaufeli & Enzmann, 1998). Further, gender differences in the prevalence of Burnout have appeared in some empirical work (e.g., Greenglass & Burke, 1988, Hakanen, 1999). However, according to Maslach, Schaufeli and Leiter's review (2001), the one small but consistent difference is that males often score higher on cynicism, while women score slightly higher on exhaustion. Technostress is thought to be related to Burnout. Specifically, it is predicted that Technostress is positively linked to exhaustion and cynicism, and related to professional efficacy in a negative way. The research in this area is in its initial stages. This paper tries to overcome this gap.

In the present study the cognitive-evaluative dimensions of Technostress will be analysed (i.e., high negative attitude towards ICT and low ICT self-efficacy). We expect that people with high Technostress will show low scores in positive attitudes towards ICT, high resistance to technological change, and low technological self-efficacy. The aim of this study is twofold. 1) To analyse gender differences in Technostress (i.e., low positive attitude towards ICT, high resistance to technological change and low ICT self-efficacy) and Burnout (i.e., exhaustion, cynicism and professional efficacy). 2) To study the relationship between Technostress and Burnout.

Method

Participants and procedure

The sample consisted of 606 Spanish workers (320 males and 286 females) The average age was 32 years (S.D.=8.3). They were working in various jobs and occupational fields, such as clerical jobs (39%), technical and support staff (26%), sales (7%), management (8%), human services (8%), laboratory settings (7%) and operators (5%). Employees were asked to complete self-report questionnaires. Officials from the Human Resource Department were responsible for the distribution of the questionnaires, which were voluntary and confidential.

Measures

Technostress was operationalized using a 15-item scale consisting of three subscales: (1) Positive Attitude towards ICT (ATT-7 items) (e.g., "To learn how to use ICT is interesting"); (2) Resistance to technological change (RES-5 items) (e.g., "I consider technological changes a threat") and (3) ICT self-efficacy (SELF-3 items) (e.g., I feel capable of using ICT accurately"). All items were scored on a seven-point rating scale, ranging from (1) "Totally disagree" to (7) "Totally agree". High level of resistance to technological change and low levels of positive attitude towards ICT and ICT self-efficacy indicate Technostress.
Burnout was measured by 16-items MBI-GS (Schaufeli, Leiter, Maslach, & Jackson, 1996) that consists of three subscales: (1) Exhaustion (EXH-5 items) (e.g., "I feel used up at the end of the workday"), (2) Cynicism (CYN-5 items) ("I have become more cynical about whether my work contributes anything") and (3) Professional Efficacy (PEF-6 items) (e.g., "I have accomplished many worthwhile things in this job"). All items were scored on a seven-point rating scale, ranging from (0) "never" to (6) "every day". High levels of exhaustion and cynicism and a low level of professional efficacy indicate Burnout.

Data analysis
Data analysis was completed using SPSS statistics computer program. Descriptive analysis, correlations (Pearson r), internal consistencies (Cronbach's $\alpha$) and General Lineal Model (GLM) were completed to achieve objective 1. A lineal regression analysis was carried out to fulfil objective 2.

Results

Preliminary analysis
In order to test whether or not employees who used new technologies (83%) and used traditional technology (17%) differed on the study variables, a MANOVA was carried out that compared scores of those who worked with New Technologies (n =514) with scores of those who worked with Traditional Technologies (n =105). All of the six dependent study variables were included: Positive Attitude towards ICT, Resistance to technological change, ICT self-efficacy, Exhaustion, Cynicism and Professional efficacy. Multivariate results indicated that both groups did not differ significantly on these six study variables (F(6, 591) = 1.73; p=.11). Therefore, it was decided that the entire sample could be for further analysis.

Descriptive analysis
Table 1 shows the means, standard deviations, internal consistencies (Cronbach's $\alpha$) and the correlations (Pearson r) (n=606).

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<td>-</td>
<td>-</td>
<td>-75**</td>
<td>-50**</td>
<td>-</td>
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<tr>
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<td>1.24</td>
<td>.85</td>
<td>-16**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>1.35</td>
<td>.82</td>
<td>-22**</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>PEF</td>
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<td>.87</td>
<td>.72</td>
<td>-31**</td>
<td>-25**</td>
<td>.30**</td>
<td>-21**</td>
<td>.45**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>.08*</td>
<td>-.03</td>
<td>.08*</td>
<td>.06</td>
<td>-.04</td>
<td>-</td>
</tr>
</tbody>
</table>

p<.05; ** p<.01
ATT=Positive Attitude towards ICT, RES=Resistance to techn. change, SELF=ICT self-efficacy, EXH=Exhaustion, CYN=Cynicism, PEF=Professional efficacy.

Table 1: Means, standard deviations, internal consistencies (Cronbach's $\alpha$) and correlation (Pearson r) (n=606)

Gender differences in Technostress and Burnout
In order to assess whether males and females differed on the study variables, a GLM was carried out. Whilst this multivariate analysis of variance was not significant (Wilks' Lambda, F(6, 560)=1.45; p=.19, n.s.), two variance analysis were significant: exhaustion (F(1, 585)=4.00; p=.04) and resistance to technological change (F(1,585)=4.67; p=.03). Women scored higher in exhaustion (M=2.34) and resistance to technological change (M=2.49) than men (EXH M=2.14 and RES M=2.31). The p value in positive attitude towards ICT (F(1, 585)=3.13; p=.07) is near the conventional significance level of 0.05. Here women hold less positive attitudes towards ICT (M=5.50) than men (M=5.62).

Relationship between Technostress and Burnout
Table 2 displays the fitting of the data to a lineal model for Exhaustion. When gender is controlled, the independent variables account for 5% of the variance in Exhaustion. Only positive attitude towards ICT is significantly associated with exhaustion in a negative way, and in the expected direction.
Models | B  | $R^2_{\text{change}}$
---|---|---
1. Gender | .08 | .007

2. Gender | .06 | .039***
  Positive Attitude towards ICT | -.08* | -.07
  Resistance to tech. change | .07 | .21
  ICT self-efficacy | -.07 | .07
  Multiple $R$ | .21 | 
  $R^2$ | .05 | 
  $F$ | 7.0*** |

*p=.052; ***p≤.001

| Models | B  | $R^2_{\text{change}}$
---|---|---
1. Gender | .06 | .004

2. Gender | .04 | .074***
  Positive Attitude towards ICT | -.11* | -.11*
  Resistance to tech. change | .10* | .27
  ICT self-efficacy | -.11* | 
  Multiple $R$ | .27 | 
  $R^2$ | .078 | 
  $F$ | 12.3*** |

*\(p\leq.05; \ ***p\leq.001

| Models | B  | $R^2_{\text{change}}$
---|---|---
1. Gender | -.04 | .002

2. Gender | -.02 | .12***
  Positive Attitude towards ICT | .16*** | .16***
  Resistance to tech. change | -.08 | .34
  ICT self-efficacy | .16*** | 
  Multiple $R$ | .34 | 
  $R^2$ | .12 | 
  $F$ | 20.1*** |

*\(p\leq.05; \ ***p\leq.001

Table 2. Multiple regression analyses of Gender and Technostress on EXH (n=589)

With regard to cynicism, Table 3 indicates that the data fit the regression model. When gender is controlled, Technostress explains 7.8% of the variance in Cynicism. According to expectations, a positive attitude towards ICT and ICT self-efficacy are negatively associated with cynicism, while resistance to technological change is linked to cynicism in a positive way.

| Models | B  | $R^2_{\text{change}}$
---|---|---
1. Gender | -.04 | .002

2. Gender | -.02 | .12***
  Positive Attitude towards ICT | .16*** | .16***
  Resistance to tech. change | -.08 | .34
  ICT self-efficacy | .16*** | 
  Multiple $R$ | .34 | 
  $R^2$ | .12 | 
  $F$ | 20.1*** |

*\(p\leq.05; \ ***p\leq.001

Table 3. Multiple regression analyses of Gender and Technostress on CYN (n=586)

As summarised in Table 4 the third dimension of Burnout satisfactorily fits the regression model. Technostress explains 12% of the variance in professional efficacy, when gender is controlled. Positive attitude towards ICT and ICT self-efficacy are significantly and positively associated with professional efficacy as hypothesised.

Table 4. Multiple regression analyses of Gender and Technostress on PEF (n=588)
Conclusion and discussion

This study had two objectives. The first aim was to analyse gender differences in Technostress (i.e., low positive attitude towards ICT, high resistance to technological change and low ICT self-efficacy) and Burnout (i.e., exhaustion, cynicism and professional efficacy). It was found that females suffered from more exhaustion and resistance to technological change than males and hold less positive attitudes towards ICT than men. Such results coincide with previous studies, which also indicate that women score more highly on exhaustion (Greenglass & Burke, 1988) and display less positive attitudes towards computing (McIlroy, et al. 2001; Ogletree & Williams, 1990) than men.

However, it is important to note that there are no gender differences in the dimensions referred to ICT efficacy. These results contradict the conclusions of previous research that indicate that women traditionally feel less capable than men when using any technology (e.g., Brosnan, 1998; Makrakis, 1993; McIlroy, et al. 2001; Schumacher & Morahan-Martin, 2001). A possible explanation for the absence of gender differences in ICT efficacy could be that both women and men received training in the use of new technologies (51% of the sample individuals who were trained are men and 49% are women). Indeed, self-efficacy has been found to be related to training effectiveness. For instance, Rousseau, Jamieson, Rogers, Mead and Sit (1998) conclude that through training, users may become both more proficient and efficient in computer use. In this vein, technological training effectiveness was also associated with a decrement of Burnout levels (i.e., exhaustion and cynicism), when trainees showed high levels of technology self-efficacy in pre-training (Salanova, Grau, Cifre & Llorens, 2000). Finally, Arch and Cummins (1989) and Pope-Davis and Vispel (1993) conclude that training in new technologies plays a relevant role in eliminating gender differences in computing attitude and use.

The second objective of the study was to explore the relationship between Technostress and Burnout. When gender is controlled, it is thought that Technostress may predict Burnout. The present results indicate that a positive attitude towards ICT is negatively linked to exhaustion and cynicism and positively associated with professional efficacy. Resistance to technological change is related to cynicism in a positively way. ICT self-efficacy predicts professional efficacy and cynicism, positive and negatively respectively. These results support the findings of Salanova and Schaufeli (2000), where the exposure to technology (in terms of time and frequency of use of computer aided technology) impacts on Burnout. Further, it was found that this relationship is mediated by the appraisal of technology (value of the experience of using technological innovation at work).

The results of this study indicate a consistent relationship between Technostress and specific measures of employees' well-being, such as Burnout. Therefore, when introducing any ICT at work consideration should be given not only to organisational and work factors, but also the psychosocial variables (attitude towards ICT or ICT self-efficacy) as it is these psychosocial variables that play a role in the relationship between ICT and impaired well-being. Moreover, and against expectations, gender does not play a core role in either Technostress nor Burnout. This suggests that the traditional sex role stereotypes, which consider ICT to be more linked to men, may be disappearing.

Finally some limitations and suggestions for future research could be exposed. Since the present study has placed an emphasis on the cognitive-evaluative dimensions of Technostress rather than its emotional component, future research could incorporate this three-dimensional approach. Second, as this study is cross-sectional in nature, no causal inferences could be made. Therefore, future longitudinal research should corroborate the findings of this study. Furthermore, as this study has not analysed the mediating effect of other factors, in future research the possible mediating role of variables, such as training in new technologies and other sociodemographic aspects (age and educational level) could be explored.

References

A Survey of Mental Health Problems in Employees who Receive Counselling from Employee Assistance Programmes

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Introduction

There is considerable concern about the effects of stress on UK employees; yet the concept of stress is controversial, poorly defined and measured, and attempts to help employees are often not properly evaluated (Arthur, 2000). The UK Health and Safety Executive report *Mental Well-being in the Workplace* quotes a variety of national statistics concerning the human and financial costs of stress related sickness and mental ill-health problems; including 91 million days lost due to stress related illness at a cost of £3.7 billion (Doherty and Tyson, 1998).

One attempt to tackle this problem is through Employee Assistance Programmes (EAPs). These are an employer benefit offering free and confidential counselling to stressed employees. By 1999 UK EAPs probably covered over 1,695,000 workers from 775 organisations (Arthur, 2001) and currently this figure is significantly higher. These programmes provide an opportunity to study the nature of stress but when studies are conducted they are usually poorly designed, and employ ad-hoc and non-standardised measures (e.g. Macdonald *et. al.*, 1997; Rogers *et. al.*, 1995; Sloboda *et. al.*, 1993).

Clinical reports from one major UK EAP provider suggested that employees using these programmes experienced significant and serious mental health problems. Although considered by themselves and their employers as ‘stressed’, their presenting problems often suggested the presence of clinical anxiety and depression. To investigate the hypothesis that a significant proportion of employees who complain of stress in the workplace are in fact experiencing mental health problems, employees who attended EAP counsellors were invited to complete a standardised and well-respected questionnaire that measures mental health status.

The study

**Measures**

The General Health Questionnaire (GHQ12) (Goldberg and Williams, 1991) was selected to measure psychological disturbance and a separate checklist constructed to provide information about service users. The GHQ12 is a widely used self-administered screening test aimed at detecting psychiatric disorders in non-clinical groups and consists of twelve questions requiring a response on a four point Likert type scale. A supplementary questionnaire (Table 2) was also constructed to gather information about participants’ employment, gender, age, chronicity and severity of problem, and any disturbance of work performance.

**Data collection and participants**

The author of the study used his position with an EAP provider to secure participation from 33 of the 47 organisations that used its services. Of the 33 participating organisations 17 (51.5%) were public sector and 16 (48.5%) private, which broadly matched the distribution of the whole sample; 21 (45%) public sector and 26 (55%) private (n = 47). A letter inviting participation was sent to each organisation explaining that the purpose of the study was to investigate the presence and extent of any psychological disorder in employees who came for counselling. It was explained that
participation in the study was entirely voluntary, confidential and anonymous for both the counsellor and client that it would not affect their entitlement to counselling, and the employer, counsellor or EAP provider would not be informed about the decision to participate.

Subsequently, counsellors who received referrals for employees from the 33 participating organisations were sent a research pack with each new referral explaining the study and asked to dispense questionnaire materials at the end of the first interview. The employee’s pack contained information about the study, the two questionnaires and an accompanying letter requesting participation. To emphasise confidentiality, no check was made on whether counsellors actually passed out questionnaires to employees; but this later presented a problem because it was not possible to determine how many of the packs sent to counsellors they actually passed out to employees.

Over a nine-month period during 1999/2000, 466 questionnaires packs were sent to counsellors as referrals were received from 293 (63%) public and 173 (37%) private sector employees. Overall 111 (24%) useable questionnaires were returned; 76 (68.5%) male, 35 (31.5%) female, with a mean age of 41.31 years (s.d. = 10.37, range 20 – 62 years). As mentioned previously, however, the research design did not allow confirmation of the number of research packs actually given to employees.

Results

Results from the GHQ are presented in Table 1 and the supplementary employee questionnaire in Table 2.

<table>
<thead>
<tr>
<th>GHQ Score</th>
<th>Number of Employees</th>
<th>Percent</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
<td>7.2</td>
<td>7.2</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>2.7</td>
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</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1.8</td>
<td>14.4</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>3.6</td>
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<tr>
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</tr>
<tr>
<td>8</td>
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<td>11.7</td>
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</tr>
<tr>
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</tr>
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<td>9.9</td>
<td>57.7</td>
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<td>15.3</td>
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</tr>
<tr>
<td>12</td>
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<td>Totals</td>
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</tr>
</tbody>
</table>

The standard ‘GHQ score’ method was employed in this study and in keeping with contemporary practice a threshold score of four or above was selected to suggest the presence of ‘caseness’ (the probability that a participant would be found symptomatic of psychiatric problems on a follow-up psychiatric assessment). This score was chosen after reference to GHQ12 research showed cut-off scores of two (e.g. Banks, et. al., 1980) and four (e.g. Weinberg & Creed, 2000) typically employed. It was considered that the higher and more conservative score (≥4) would reduce misclassification of false positives (i.e. employees who are classified as a ‘case’ but are symptom free). Results from the GHQ (Table1) show 95 of 111 (86.6%) participants score at or above the threshold score of four and, indeed, 47 (43.3%) score very high at 11 or 12 (the maximum GHQ12 score is 12).

Responses to the supplementary questionnaire (Table 2) show most employees reported experiencing their problem for several months or longer (86.4%), and indeed over one-third for several years or more (35.5%).

| 1. Are you female? 35(31.5%) | Are you male? 76(68.5%) |
| 2. An employee? 107(96.4%) | A dependent 3(2.7%) |
| 3. How long have you experienced this problem?  |  
| Over the past few weeks 15(13.6%) | For several months 42(38.2%) |
| One year 14(12.7%) | For several years  
| 32(29.1%) |  
| Most of my life 7(6.4%) |
| 4. How serious would you rate your problem?  |  
| Mild 9(8.3%) | Moderate 61(56.5%) |
| Serious 38(35.2%) |
| 5. Has the problem affected your performance at work?  |  
| Yes 85(76.6%) | No 26(23.4%) |
A very high percentage (92%) indicated their problem was moderate to serious, over three-quarters admitted it affected work performance, and almost two-thirds thought their problem was primarily personal and that they would have taken time off work if counselling were not available. The majority of respondents (72.7%) describe themselves as public sector employees. Those in professional/technical (37.4%) positions represent the largest group, followed by management (14%), administrative (13.1%), and care-support staff (14%). A minority are sales/marketing (5.6%), production/manual (2.8%), senior manager/director (0.9%) and ‘other support staff’ (12.1%).

**Discussion**

An extremely high percentage of responders (86.6%) scored at or above the GHQ cut-off (≥4) suggesting there is a significant presence of psychiatric disturbance among this group of employees who self-referred to their organisation’s EAP for counselling. Forty-three percent of participants in this study scored 11 or 12 out of the maximum score (12) suggesting a high probability that follow-up psychiatric assessment would confirm the presence of problems. The GHQ authors note “…with an increasing GHQ score there is a very sharp increase in probability that a ‘diagnosis’ will be made at independent interview with a research psychiatrist” (Goldberg & Williams, 1991; p8). Further, results from the supplementary questionnaire (Table 2) showed a high percentage of participants perceived their distress as moderate or serious, indicated it has lasted longer than a few weeks, was primarily personal, affected their performance at work, and would have taken time off work if counselling were not available.

Analysis of the GHQ survey data shows in general and occupational normative groups ‘caseness’ rates range from 13% (Banks et. al., 1980) to 31% (Cox et. al., 1987). When utilisation rates for EAPs are taken into account; reported to vary between 4% to 8% (Berridge, et. al., 1997), 3.6% to 4.3% (Blaze-Temple & Howat, 1997) and 6% (McClellan, 1989), then it is possible to hypothesise that the 4% to 8% of employees who come for EAP counselling are a subset of the troubled employees detected in these general surveys. Furthermore, according to the principal components analysis of GHQ, this group probably suffer psychiatric symptoms of depression, anxiety, sleep disturbance, somatic complaints, and problems with social function (Goldberg & Williams, 1991). There is evidence that GHQ ‘caseness’ has steadily increased over the last decade in the working population, suggesting more employees are experiencing mental health problems (Oswald, 2001).

However, the relatively low response rate does not allow firm conclusions to be reached and alternative explanations also need to be considered. If more employees had completed and returned questionnaires it is possible there may have been a reduction in the overall ‘caseness’ rate and therefore employees in this study may be a smaller and more troubled sub-set of a much larger, and less disturbed group (i.e. not representative of most employees who come for counselling) motivated to answer questionnaires about their problems. Nevertheless GHQ studies of non-responders show; responders and initial non-responders similar in terms of increased GHQ score (Wall et.al., 1997); no difference to responders in GHQ score (Ballinger, 1975); or even having a higher level of disorder (Cox, et. al., 1977). Because a record was not kept of counsellors’ questionnaire distribution, the degree to which any bias or non-participation may have affected results cannot be investigated. Finally, it has been noted that attempts to screen for psychiatric conditions with only self-reporting questionnaire measures is ‘necessarily hazardous’ (Surtees, 1987) and the derived estimated rates of psychiatric disorder are not always reliable (Weinberg & Creed, 2000).

**Conclusion**

This study raises the possibility that a significant proportion of employees who come for EAP counselling may experience psychological distress to such a degree that if they received a psychiatric assessment they would probably be considered suffering from a psychiatric disorder. This suggests employees who receive EAP counselling require psychological help and experience significant mental health problems. To confirm these findings further research with higher participation rates is required.
Clinical Occupational Health Psychology

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Occupational health psychology (OHP) is a field within applied psychology. As such, it is defined by the aims of the educators and practitioners within that field, as well as by what practitioners actually do. All field of applied psychology tend to overlap. In OHP this overlap primarily concerns health psychology (HP) and clinical psychology (CP).

OHP shares with HP a general commitment to health and prevention of mental illness. OHP differs from HP mainly in its specific focus on working conditions and organisational relations. While OHP appears to be quite different from HP, this is due to the fact that the role of working conditions and organisational relations for well being and mental illness raises questions that require specific knowledge and applications of methods quite characteristic for OPH (Cox & Baldursson, 2000).

Occupational health psychology is linked to clinical psychology in a quite different manner. In order to illuminate the character of this link, we have to look at the ongoing debate within OHP on individual vs. environmental prevention programmes. Most intervention programmes within the workplace tend to fall into one of these two categories.
An environmental approach deals with prevention. The basic assumption is that if stressors at work cause illness or reduced well-being, the correct approach is to determine the character of these stressors and envisage methods through which these stressors can be abolished or at least reduce the negative influence of these on health and well-being².

The individualistic approach does not necessarily reject the assumption that conditions at work, or work related stressors might be responsible for the health problems. But strategies oriented towards individual workers primarily try to increase the threshold of tolerance so that people react in a less malevolent manner to stressors in the work environment. Such strategies often focus on individual coping and are based on one of two different approaches. Either they try to change how individuals go about their primary evaluation of a potential stressor, or they try to change the manner in which individual cope with conditions that through primary evaluation have been identified as a threat.

There are two types of justification for the individualistic approach. The true individualists argue much in the manner of Lazarus, that stressors are all in the head³. More pragmatic psychologists tend to focus on the difficulties inherent in a strategy that focuses on working conditions. Employers often argue that the cost of changing working conditions is prohibitive and that the success of alternative organisational structures and organisation of work is uncertain. The pragmatists then argue that if the organisation and working conditions cannot be changed, individuals can be desensitised to stressors at work through special training programmes. The scientific grounds for this approach are at best quite shaky.

The environmental approach tends to dominate the approach to OHP in Europe, whereas the individualistic approach has a stronghold in the USA. The argument is that this debate has overshadowed another debate of considerable importance to OHP. This is the debate on environmentalist diagnosis of individual reactions to stressors at work, and the development of adequate therapeutic strategies to be applied when individuals are suffering from the causes of stressors at or in relation to work.

It is our view that such a debate can enrich OHP by equipping the practitioners within this field with tools of diagnosis through which the symptoms of individuals can be viewed as reactions to specific stressors at work. It is our view that such an approach also can become the basis of more effective therapeutic strategies in relation to individual suffering from the consequences of such stressors. This means that there are two different tasks that have to be dealt with. First the development of stringent diagnoses specifically related to the causes of such reactions and involving clearly identifiable psychological reactions⁴. Second, using such diagnoses as the basis of better therapeutic strategies.

The question of diagnosis of specific reactions has not been high on the agenda of OHP so far. This does not mean that there have not been offered suggestions of such "structured" reactions. Stress, chronic stress, acute stress, chronic fatigue, the dot.com syndrome, burnout are all examples of such suggestions⁵. None of these qualify as true diagnoses. Are these labels indicative of a response whose internal dynamics merit the application of the label "diagnosis"? The answer is negative. There is no diagnosis manual, no commonly accepted system of symptoms and causes. What this entitles is especially obvious in relation to burnout. Here we have a well defined, mostly emotional response to well established external causes, with a clear assumption of how this response will affect the personality of those suffering from burnout. But instead of clarifying the role of emotional reactions in burnout, or establishing a consistent and clear system of diagnosis involving methods of establishing the changes in personality, we have witnessed increasing confusion as to what burnout really is. To add to the confusion one of the recent debates has revolved around the question of whether burnout can arise from work with the lack of interpersonal relations (Kristensen & Borritz, 1998). As a result, even the symptomatology itself has become progressively more confused through the years. This has partly to do with the confusing role of the concept of stress. Originally Maslach (1982) suggested that burnout was really just a certain type of stress. Maslach simultaneously stressed the role of emotional reactions in the development of burnout.

Following that argument, surely burnout is at best a stress-induced reaction. But the true dynamics of burnout has to do with the character of the emotional reactions to specific conditions at work, emotional reactions with specific consequences for the individual so affected. Following this line of argument, a clear diagnostic system for burnout should and could be established. Furthermore following this type of work, developing specific therapeutic strategies would be the next step. We have selected burnout as an example because it has illustrated the character of the work that needs to be done within OHP.

Those who suffer from burnout are not "ill" in the same sense that this concept is used within clinical psychology. The victims can continue with their life and are not in acute need of therapeutic treatment. From the viewpoint of OHP though there is a problem that needs to be addressed. Everything seems to indicate that people suffering from burnout lose some of the interpersonal abilities, with at least the consequence that they become ill equipped to work in human services.

² It is one of the contradictions of research in Occupational Health Psychology, that in spite of the fact that most researchers argue along these lines, more often than not the unit of analysis is the individual.

³ Individualism also occurs in a form more akin to biopsychology. In that case the argument is about individual vulnerability and ultimately - genes.

⁴ It is an open question if CHOP will ever develop "proper" diagnostic system in the sense this concept is used in psychiatry. But there is a growing understanding in the field of psychiatry for the need to develop a diagnostic approach to adverse psychological reactions that can not be classified as a disease or disorder in the classical sense (see Ebert, Loosen & Nurcombe, 2000).

⁵ The recent research on how stress affects the brain and contributes to depression is a very recent example.
So, from the viewpoint of OHP, even if they are not ill, they at least are not well. Therefore OHP has to deal with questions such as: is it possible to treat full-blown burnout and how? Is it possible to establish a clear diagnostic system, allowing the identification of early stages of burnout?6

Last but not least, such a diagnostic system is not only key to early treatment of individuals, but also a system that diagnoses not only the state of affected individuals, but also, the organisational and working environment where such reactions can arise7. Resolving these questions could also be the basis of more accurate and effective intervention in organisations. A similar case can be made in relation to the problems characteristic, but not limited to workplaces and companies based on knowledge intensive work. As a consultant for the Union of Computer Professionals (PROSA) the author has worked with a number of people suffering from the consequences of work-overload, organisational conflicts and problems in the organisation of work. It is characteristic for those who work in this branch and other similar branches that the distinction between "who I am" and "what I do" is at best blurry. When these people become involved in a problem that touches on job-identity, the personality as a whole becomes affected. Therefore the psychological consequences of conflicts and problems at work can be fairly grave. A number of these people had previously undergone treatment by a clinical psychologist. In all those cases it was obvious that the clinical psychologist in question had found it very difficult to understand the character of the problem so obviously affecting these persons. When the client wanted to talk about his or her work experiences, the psychologist tended to ask about their childhood. This is in a sense an understandable and sound professional approach. When people experience an identity crisis previous problems tend to be reactivated. But it is almost impossible to deal with these previous problems before the client has had the chance of working through the current - job-related crisis.

As a Clinical Occupational Health Psychologist, the professional can help the client to deal with the work-related problem. Also, the diagnostic work this requires marks the beginning of understanding the character of the problem within the organisation that contributed to or created the individual crisis. After undergoing such treatment, the client is ready (if needed) for a more traditional form of treatment offered by clinical psychology.

We are now in the position of clarifying the interrelation between OHP and clinical psychology. First OHP needs to draw upon the traditions of clinical psychology in the process through which OHP establishes diagnostic systems for central psychological syndromes that arise primarily as reactions to specific stressors in the organisational and working environment. Second OHP has a necessary contribution to make to the development of adequate therapeutic strategies in relation to such syndromes.

The second point requires some elaboration. The basic assumption behind the majority of therapeutic strategies in the field of clinical psychology is that notwithstanding the cause of psychological illness, the treatment applied primarily addresses the internal dynamics of the illness in question. Knowing causes are important, but having the ability and the methods to deal with consequences are the alpha and omega of the treatment. In negative psychological reactions to stressors at work, the dynamics are much less an attribute of the internal reactions of the affected individual than a reflection of the character, structure and exposure to these external factors. A therapeutic strategy based on the manifest reactions of the individual that does not take into account the stressors that the individual is exposed to in the organisational and work environment, is in considerable danger of misinterpretation of the problem that needs to be dealt with. The risk is considerable in applying a therapeutic strategy that at best is sub-optimal, and as we have experienced in our work, sometimes affects the client in a negative manner.

In short, OHP needs to draw upon the experience and expertise of clinical psychology in establishing and improving diagnostic systems involving the type of syndromes that occupational health psychologists meet in their practice. But clinical psychologists that want to involve themselves in the treatment of individuals suffering from the consequences of stressors in the organisational and working environment also need to draw on the expertise and experience of OHP.

This perspective supersedes the individualism of those whose approach to stressors in the organisational and work environment is limited to individual evaluation and coping. In this manner OHP can offer an approach that links the problems of individuals with specific stressors in the organisational and work environment. Such is an approach that offers the hope of more effective therapeutic strategies, linked with a preventive strategy involving development and change of organisational and working conditions.

References

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6 This presentation of the questions that have to be answered in relation to burn-out bypasses the potentially beneficial contribution of current neuropsychological research into emotions (LeDoux, 1998; Damasio, 1995)
7 The resent attempts to draw on the insights of social psychology heralded by Schaufeli (1999) are an important contribution to this.
Social Exclusion and Age Related Changes in the Perception of Work

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Background

Millions of European citizen and immigrants are the victims of social exclusion. This problem is now a subject of increasing debate. So far the question has mainly been framed in relation to social politics. In several countries there are now special organisations within the social services that deal with this problem (UK, France, Germany etc.) Research on social exclusion is increasing. For instance the Economic and Social Research Councils (ESRC) defined this question as one of the key questions in social research and a thematic priority in 1996 (Byrne, 1999). There are several reasons for this. The economical upturn and decreasing unemployment has made the problem more visible than before. Several authors suggest that one of the characteristics of the "knowledge society" is increasing social exclusion (Madanipour et. al. 1998; Nelson, 1995; Rifkin, 1995; Beck, 2000). The problem with this discussion is that it tends to focus more on the situation of the social excluded and on those factors that prevent entry into the labour market and to neglect those processes in the labour market that contribute to social exclusion through marginalisation. One result is a tendency to ignore the problems of senior-workers.

Only in the Nordic countries is there a tradition of connecting marginalisation and social exclusion to processes in the labour market. (Geertsen, 1998). On the basis of such approach social exclusion can be comprehended, not only as a general social problem, but also and to considerable degree as a problem in and with the labour market. One of the advantages of such an approach is the possibility of focusing on the problems of senior-workers. Millions of senior-workers en the European countries are either excluded from the labour market, marginalised in the labour market or voluntarily choose to leave the labour market by retiring at the earliest possible opportunity.

This is an increasing problem for the European welfare societies. The younger generations entering the labour market are becoming progressively smaller, and the large generations of the 50’s will become eligible for early retirement or pension in the next decade or so.

Social exclusion and marginalisation of senior workers is therefore an important problem, but one that so far has been subject to little research.

Marginalisation, discrimination and social exclusion

To understand the character of this problem focusing primarily on those barriers that prevent people to gain foothold in the labour market is not sufficient. It is also important to understand those processes on the labour market that make it difficult for groups of workers to maintain the foothold in the labour market. Processes that place large groups in a secondary position from which they can be recruited in periods of economic upturn. A part of this problem is the discrimination against groups of workers, for instance immigrant workers and workers with ethnical background. To some extent the labour market also discriminates against senior-workers. Having a foreign name, or being over 50 means that when applying for a job there is a high risk that one will be sorted out without any prior evaluation of skills and experience.

But there are other processes on the labour market that contribute to social exclusion. Marginalisation is a concept designed in order to capture such processes. Marginalisation is about the fact that a large number of people are brought into a situation where they have less opportunity to develop their skills, and subsequently get the worst jobs. These are exactly the jobs that are eliminated when new technology or new forms of work-organisation are introduced.

It is necessary to distinguish between latent and manifest marginalisation. Latent marginalisation is about a process in which an employee becomes less valuable for the company, a process of de-qualification. Manifest marginalisation means that the company, ones supervisors or ones colleagues identify an employee as being less valuable, less able than others, and as a consequence often as dispensable. Latent marginalisation often changes into manifest marginalisation in a situation when the company goes through changes such as a new form of work-organisation, new technology, or new products (Thaulow & Friche 2000). The advantage of thinking about social exclusion in these terms is twofold. This approach encompasses not only those situations in which individuals or groups of workers are forced to leave the labour market, but also those situations in which individuals or groups voluntarily choose to leave the labour market (early retirement).

This approach also makes it possible to look beyond the sociological question towards the psychology of social exclusion. When senior workers decide to leave the labour market this decision is a product of a prolonged process, both external and internal. The internal process involves psychological changes that when the opportunity arises contribute to the decision to go for early retirement. This is especially the case for senior-workers, but it is likely that similar processes affect immigrant workers, workers with health problems and other workers at a disadvantage. A theory about these processes could contribute to understanding, why attempts to reintegrate people who have been excluded from the labour market rarely are successful.
Early retirement

Early retirement is a considerable problem in most of the countries in the European Union. Millions of workers leave the labour market at the earliest possible opportunity. In Denmark one becomes eligible for social-pension at the age of 65. But one can choose early-retirement from the age of 60. In 2000 there were 349,998 people in the age group 60-66. Of those 93,238 had a job (27%). 151.617 received early-retirement benefits (43%). 92.764 were on pension (24%).

In 1981 there were about 30,000 people on early retirement benefits, in 1992 and 50.000 on early retirement. The increase is especially large in the years 1997 (123.957), 1998 (130.532), 1999 (142.045), 2000 (151.617) with a record high almost 160.000 in 2001 (44% of the age group). It is noteworthy that in 1999 a new law was passed with the explicit aim of reducing the number of new applicants for early retirement. So far to no avail.

The early-retirement system was introduced in 1979 by a Social-democratic government in a period with high unemployment. The aim was to encourage senior-workers to leave the labour market in order to make it easier for young workers to get a job. In this the early retirement system has been enormously successful. So far all attempts to change this have been unsuccessful.

The increasing demand for early retirement is surprising considering the fact that the benefits have been reduced. In most cases (excluding those - fairly few - who have been unemployed for a prolonged period) leaving the labour market implies a considerable drop in income levels. The social network at work is lost. And even if a few trade unions organise activities for member who are on early retirement, there are little possibilities of remaining active in the trade union, when on pension or in early retirement. Leaving the labour market therefore almost inevitably means not only lower income, but also a loss of social networks and even social isolation. Add to this the fact that the overburdened public health system gives higher priority to treating patients in a job, than patients that are out of work. In spite of this thousands of senior-workers opt for early retirement. Why? The first part of the answer requires a closer look at marginalisation and exclusion on the labour market.

The research programme

Marginalisation and social exclusion is the main theme of 5-year study (1996-2001) carried out by the Institute of Social Research and the Department of Environmental and Occupational Medicine, Hospital of Skive, Denmark. The programme includes a number of studies, based on qualitative and quantitative methods. The programme includes a cross-sectional study, a follow up study involving workers from 12 companies with monotonous-repetitive work, a longitudinal study involving 2 companies that have introduces new forms of work organisation, and one qualitative study of a company that has introduced work-groups.

The cross-sectional study

The study involves 6000 persons, a sample of all wage earners in 1990 with a follow up in 1995. The analysis presented only includes the participants that in 1990 were between 18 and 53 years of age and had at least 15 hours of paid work every week. Marginalisation is defined in relation to the amount of time in which the individual worker has been out of work. Individuals who have been employed less than two months each year (based on the period from 1995 to and with 1997) are defined as marginalised. The main results are as following.

1. On the basis of these criteria 7% are marginalised.
2. The risk of marginalisation is higher for female workers (10%) than male workers (4%).
3. The risk of marginalisation is highest for workers that in 1990 were employed in work characterised by "traditional" forms of work organisation (17%).
4. Age is an important factor. Amongst those who in 1990 were between 18-24, 8% are marginalised. The number of marginalised drops to 5% for the age group 25-45. In the group of 46-53 the number increases to 14%.
5. In all cases the number of marginalised is highest among those who were employed in "traditional" jobs in 1990. Among the 18-24 16% of those employed in such jobs have become marginalised. For the age group of 25-35 and 36-45 13% have become marginalised. Among the group of 46-53 29% have become marginalised.
6. Lack of education is in important risk factor. Among those with no schooling beyond primary school 11% are marginalised compared to only 4% of those with some level of further schooling.
7. Health is important. Among those who in 1990 reported that they had suffered from at least two diagnosed illnesses, 15% became marginalised compared to 6% for those who did not reported any diagnosed illnesses in 1990.

Because the rate of unemployment was increasing from 1990-93 the study includes a larger number of people who have lost their jobs than would be the case in a more stable period. But as the employment rate has been on a steady increase in the period from 1993-1997 the unemployed workers have had a better chance of reemployment than otherwise would be the case. In a sense this study gives a "cleaner" picture of the actual level and dynamics of exclusion from the labour market.

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8 This number includes both those who receive social pension and disability pension.
9 These data are from Statistics Denmark.
10 Companies characterised by a "traditional work-organisation", assembly line work etc.
11 This mean that the part of the sample that in 1997 were 60 years or older are excluded (or older than 53 in 1990).
There is not doubt that the Danish labour market is biased against elder workers, there are few possibilities for workers with health problems and that those with no or little education are in a difficult position. Problems with health and little or no formal education are also most widespread among elder workers. It is proper not only to characterise this bias as an expression of a systematic discrimination against senior-workers, but also at an integrated part of a culture that at best ignores senior-workers and what they represent.

It is very likely that the way in which senior-workers experience these processes affects the group as a whole. It is very likely that the knowledge of this influences the attitudes of senior-workers to work, the labour market and society as such. The decision to leave the labour market to some degree is an expression of how senior-workers experience the hostility toward or at best ignorance of elder workers. This is most obvious in the case of the many workers who "voluntarily" choose to leave the labour market at the first opportunity. The question is what psychologically motivates workers to make such a choice or to abstain from actively seeking reemployment.

The qualitative study

The qualitative study was carried out in 1999 in a company that recently has introduced a group-based work organisation. This study shows that there are three important problems related to marginalisation in the transition from a traditional to new forms of work organisation. First such changes involve demands for new qualifications. Even if the company organised a number of courses and was aware of the need to involve senior-workers, there was a clear tendency that these courses mostly benefited middle age or younger workers. The new work groups had to maintain high productivity in the period of transition and had to handle internal problems by themselves. The consequence was that those who were less flexible and with lower social standing often became marginalised. This group consisted largely of senior-workers. Also the new requirements for social skills changed the former skill-hierarchy of the company. Senior-workers often found that their work-skills amounted to less than before, and therefore experienced social marginalisation. Some of them resisted being forced to submit to the will of the work-group. These workers were seen as a problem both by management and the fellow (younger) workers (Taulow & Friche 2000). There are reasons to believe that such processes are not limited to period of radical transformation, but are fairly widespread, partly because technological and organisational changes are to in increasing degree the norm, not the exception.

The "theory"

When interviewing senior-workers we often hear these workers telling that they feel that they are not valued, not wanted and not respected. When out of work senior-workers often feel that there is no hope of becoming reintegrated in the labour market, at least not as a respected employees and co-workers. When interviewing workers in early retirement the message is typically:

1. they did not feel valued by the company
2. their knowledge and expertise was not wanted
3. they did not feel secure in their job
4. they feel that they have earned the right to quit and quite often
5. they feel that by choosing early retirement, they have taken their fate into their own hands

This indicates that in order to understand these workers one has to look for psychological factors in relation to work, especially work motivation and work identity that predate the decision to seek early retirement.

It seems likely that many senior workers have gone through a prolonged process in which they internalised what they feel and experience to the dominant attitude in the labour market to elder workers especially when they have little formal education. The general theory is that expectations play an important role in the perception of how working conditions are perceived. Workers who believe that conditions can be improved, or that they can get another - potentially better - work, are more problem oriented in relation to their current work and working conditions (Baldursson & Pedersen, 1992). When expectations are lowered, the same working conditions are evaluated in an increasingly positive fashion. This "strategy" leads to an increasing distance between actual and perceived conditions. When workers who cope in this manner meet challenges, because of changes in the organisations of work and skill related demands, their perception is challenged with in implied threat of breakdown in work related social identity. The strong preference for early retirement can be explained as an attempt to avoid such a breakdown by leaving a situation that is perceived as potentially threatening.

The case

In order to approach this question we have analysed data collected from workers at a medium size plant in the electronic industry. The data were collected in 1996 and involved 400 workers, of which 348 participated in the study, corresponding to at participation rate of 87%. This is a company that treats its workers better than most. There have been no layoffs and the company has no track records of discriminating against senior-workers.

The following table shows some of the results.

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12 To this it must be added that the pattern of increasing demand for early retirement is reproduced in virtually all groups in the labour market, including functionaries, academics and professionals, albeit not to the same extent as is the case for skilled and manual labourers.
This little sample shows that in general workers tend to evaluate their working conditions in a more positive fashion with increasing age. This is especially clear in the case of workers 50 years or older. We also see that whereas a fair number of younger workers have contemplated to get a new job, less than one out of ten in the age group 40 and elder have considered this. More important is the result that with age increasingly fewer workers believe that they could get a new job. It is important to emphasise that this study was carried out in 1998 when Denmark was in the midst of an economic upturn. In this period a number of companies were beginning to experience difficulties in recruiting workers. The negative perception that is the case here, is not an expression of a realistic evaluation of the actual situation.

This underpins the idea that a more positive evaluation of work goes hand in hand with lowered expectation, the primary argument being the loss of belief that one has an alternative to the current job-position. The study also documents an important age-related contradiction in the perception of work. Age does not correlate with the evaluation of the social environment as such. Senior-workers are no less positive than their colleagues. But when asked if they can talk with colleagues about problems at work 30% says that this happens rarely, compared to 13% for the population as whole (p=0.05).

When asked if they can get help from colleagues if they have a work related problem, 25% the workers say that this rarely is the case. But 52% of the workers 50 years and older are in this situation (p=0.007).

The results for other measures of social integration and support are similar. These results are quite similar to the results from the qualitative study. In both cases the companies have gone through a fairly radical change in the organisation of work. It is likely that all types of marginalisation increases in such periods. But the argument is that these processes also occur under more stable conditions. They are just less visible.

References

Psychological acceptance and occupational stress

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Background
Most occupational health psychologists maintain that both work organisation characteristics (e.g., work load) and individual characteristics (e.g., locus of control) contribute to mental health and other stress-related outcomes (e.g., job satisfaction, work performance) (e.g., Cooper & Marshall, 1976; Hurrell & Murphy, 1992; Katz & Kahn, 1978; Quick, Quick, Nelson, & Hurrell, 1997). They are, of course, not the only ones. Psychopathologists also posit and test theories of how mental health is promoted, protected, and improved. Unfortunately, however,
this clinically-related knowledge base has not appeared to inform recently the major models of stress at work. For example, Cooper et al. (1988) maintain that the individual characteristics, Type A behaviour pattern (Type A) and locus of control contribute to stress-related outcomes, in their very influential work stress model. This is unsurprising, as these two variables, discussed below, have received considerable empirical attention in the occupational stress literature (see Cohen & Edwards, 1989 and Jex, 1988). They have also featured prominently, in the past, amongst empirically-based theories of psychopathology (e.g., Barlow, 1988). Over the past 20 years, however, other such theories have posited and tested the importance of other personality, or individual, characteristics in determining psychological well-being (e.g., Hayes, 1987).

The present two-wave panel study examines call centre workers in a United Kingdom (UK) financial institution, so as to begin to explore the value that some of these newer theories of psychological health may have for models of occupational health. To this end, it examines ‘psychological acceptance’, which is the most important individual determinant of mental health, as hypothesised by an empirically-based, comprehensive theory of psychopathology. Our primary goal for this longitudinal study is to establish the extent to which this variable, also referred to as ‘acceptance’, predicts, one year on, stress-related outcomes that are both performance-related (i.e., computer input errors) and health-related (i.e., mental health and job satisfaction). We (i.e., Bond & Bunce, submitted) wish to do so, after controlling for the predictive contribution provided by work stressors and the individual characteristics that are traditionally favoured by occupational health psychology (i.e., Type A and locus of control). The secondary goal of this study is to determine the nature of any relationship that is found between acceptance and the stress-related outcomes; that is, do the data suggest that acceptance is influencing stress-related outcomes, as would be hypothesised by theories of psychopathology, or is the reverse occurring? Finally, we wish to examine the extent to which acceptance is related to stress-related outcomes (1) directly, or (2) as a moderator of the relationship between stressors and the outcomes. From these analyses, we can begin to examine the potential benefit to occupational health psychology, of using a more recent, psychopathology-based conceptualisation of mental health and other stress-related outcomes.

**Psychopathology theories and the role of psychological acceptance**

Psychological acceptance denotes a willingness to experience unpleasant psychological events (i.e., thoughts, feelings, and sensations), without changing, avoiding, or otherwise controlling them (Hayes, 1987). Acceptance-based theories of psychopathology maintain that if people are willing to accept psychological events, they can prevent or alleviate mental health problems such as depression and anxiety. Thus, these theories hypothesise that negative thoughts, feelings, and sensations do not necessarily produce emotional disturbance, but an unwillingness to experience them can (Hayes, 1987).

There is now a large literature that shows an association between psychological acceptance and positive outcome in psychotherapy (see Hayes, Wilson, Gifford, Follette, & Strosahl, 1996, for a review). It may not be surprising, therefore, that acceptance-based treatments are now used in relation to many types of psychological problems (e.g., Hayes, Jacobson, Follette & Dougher, 1994). Despite its growing popularity in theories of psychopathology, the concept of acceptance has yet to inform models of occupational stress. This is unfortunate, as there has been one recent outcome study that successfully employed an acceptance-based worksite stress management intervention (SMI), called Acceptance and Commitment Therapy (ACT; Hayes et al., 1999).

This randomised, controlled experiment by Bond and Bunce (2000) showed that ACT improved overall mental health (General Health Questionnaire), depression (Beck Depression Inventory), and attitudes towards innovation (Propensity to Innovate), amongst employees in a large media organisation. Moreover, results indicated that ACT produced these improvements, because it led people to accept their unwanted thoughts, feelings, and physical sensations. That is, acceptance was the mechanism, or mediator, by which ACT affected levels of overall mental health, depression, and propensity to innovate. This suggests that psychological acceptance is very much associated with not only mental-health related variables (e.g., depression), but a performance-related variable (propensity to innovate), as well.

**Occupational stress models, Type A behaviour, and locus of control**

There are several comprehensive models of occupational stress, which describe relationships between stressors, stress-related outcomes, and moderators (e.g., Cooper & Marshall, 1976; Hurrell & Murphy, 1992; Katz & Kahn, 1978; Quick et al., 1997). In these models, stressors are work-related factors (e.g., role ambiguity) that have the potential to lead to mental ill-health, job dissatisfaction, and poor work performance. This potential, however, is affected by moderators, which are variables that can alter the strength of the stressor-outcome relationship. It is hypothesised that these variables not only function as moderators, but they can have a direct effect on stress-related outcomes, as well.

Various categories of stressor-strain relationship moderators have been examined (e.g., cognitive appraisal and demographics); however, personality traits, or individual characteristics, is the type that has received the greatest empirical attention (Jex, 1998). Of these traits, Type A, has been studied most (Jex), and locus of control appears to moderate the stressor-strain relationship most strongly (Cohen & Edwards, 1989). Type A refers to people who chronically and relentlessly strive to great levels of achievement (Friedman & Rosenman, 1974). More recently, anger and hostility have also been identified as defining (and unhealthy)
components of Type A (Wright, 1988). Locus of control describes the extent to which people believe that they control events in their lives. Those with an internal locus of control perceive that they can manage situations through their decisions and behaviours, whilst those with an external locus of control believe that what happens to them is beyond their influence. People with the latter orientation are thought to be most at risk for experiencing mental ill-health and other undesirable stress-related outcomes (Quick et al., 1997).

**The present study**

Based upon Hayes et al. (1994), Bond and Bunce (2000) and Bond and Hayes (in press), we hypothesised that acceptance will significantly predict, one year on, overall mental health, job satisfaction and computer input errors, after controlling for Type A, locus of control, and work stressors. Furthermore, consistent with Hayes et al. (1994), we hypothesised that any cross-lagged effects for acceptance would be significantly greater than any reversed cross-lagged effects for this variable (i.e., Time 1 stress-related outcomes predicting acceptance at Time 2). Occupational stress theorists (e.g., Cooper & Marshall, 1976; Jex, 1998; Quick et al., 1997), maintain that individual characteristics variables (i.e., Type A, acceptance) can have a direct effect on stress-related outcomes, as well as moderate the relationship between stressors and these outcomes. We predicted, therefore, that acceptance will demonstrate such a dual effect, in the present study.

**Method**

**Design and participants**

This study constituted a two-wave, autoregressive cross-lagged panel design in which participants completed the same set of questionnaires on two occasions, one year apart. Participants worked at call centres for a financial services institution in the UK. Questionnaires, in the first wave, were distributed to 900 randomly selected employees who were non-managerial workers, based in centres in England and Scotland. The number of people who completed the first set of questionnaires at Time 1 was 647, or 72% of the initial sample. At the second wave (i.e., Time 2), one year on, 412 people, or 64% of respondents, who completed the first set of questionnaires, also returned the second set. Of this final sample, 68% were women, the mean age was 30.87 (SD = 9.58) years, 66% worked part-time, and they had worked for the organisation for a mean average of 4.23 (SD = 3.31) years.

Chi-square and ANOVA analyses revealed no significant Time 1 differences on any measured variable between participants who dropped-out after Time 1 and those who completed both waves of questionnaires. Furthermore, structural equation analyses (through LISREL 8.30, Jöreskog & Sörbom, 1996) indicated that the causal relationships, at Time 1, were statistically similar between those who dropped out after the first wave and those who participated in both of the waves. It is unlikely, therefore, that the relationships amongst the variables under consideration differ between survivors and dropouts.

**Measures**

**Acceptance and Action Questionnaire (AAQ; Hayes et al., submitted).** This variable assesses people’s ability to accept their undesirable thoughts and feelings, whilst still pursuing the goals that they wish to achieve. Higher scores indicate less psychological acceptance.

**Computer input errors.** The financial organisation keeps records on the number of ‘critical’ errors that call centre personnel make when working with client accounts. Critical errors are defined as those that may directly affect monetary movements or balances of client accounts (e.g., inputting, and not correcting, a wrong amount of money for transfer, or mismatching a client name and account number).

**General Health Questionnaire-12 (GHQ; Goldberg, 1978).** This scale is typically used as a measure of general, or overall, mental health (McDowell & Newell, 1996). Higher scores suggest worse mental health.

**Job Satisfaction** (Warr et al., 1979). With this measure, higher scores indicate greater satisfaction.

**Pressure Management Indicator** (Williams & Cooper, 1998). Scales from this measure were used to assess sources of stress, Type A behaviour pattern, and locus of control.

**Data analysis**

The hypotheses of this study were tested using autoregressive cross-lagged structural equation modelling (SEM) procedures (with LISREL 8.30), recommended by Curran and Bollen (2001), Jöreskog (1979), Rogosa (1979), and Zapf, Dormann, and Frese (1996). The demographic characteristics of age, gender, and job tenure were considered potential confounds and treated as exogenous variables in the SEM equations. Here, a path related them directly to the Time 1 variables and, through them, indirectly to the Time 2 variables. All other variables, that is predictors and stress-related outcomes, were entered into the equations as latent variables.

**Results and Discussion**

Results indicated that the autoregressive cross-lagged model, in which the Time 1 independent variables predicted the Time 2 stress-related outcome variables, fitted the observed data well. This model also had a significantly better fit than a stability model that included all of the measured variables, with autoregressions (i.e., Time 1 variables predicting their respective Time 2 variables), but without cross-lags.
It appeared that acceptance was important to the good fit of this cross-lagged model. To elaborate, the estimated structural coefficients (i.e., the partial regression coefficients) showed that lower psychological acceptance at Time 1 predicted higher input errors and worse mental health at Time 2. High Type A at Time 1 also significantly predicted greater input errors at Time 2, but not to the extent that acceptance did. High Type A at Time 1 also significantly predicted lower job satisfaction at Time 2. There was no such significant effect, however, for Time 1 acceptance and Time 2 job satisfaction, which is, in fact, consistent with the findings of Bond and Bunce (2000). They found that a stress management intervention that successfully increased participants’ acceptance was not able to increase their job satisfaction, even though it improved their mental health and propensity to innovate at work. Locus of control and sources of stress at Time 1 did not significantly predict any of the Time 2 outcome variables. Finally, the importance of acceptance to the good fit of the cross-lagged model was also demonstrated, when this model was altered to restrict (or remove) the influence of acceptance. When this restriction occurred, the revised model’s fit reduced significantly; thus, highlighting the importance of acceptance in predicting mental health and computer input errors, above and beyond the contributions of Type A, locus of control, and sources of stress.

Results did not find evidence for reverse causation. Specifically, the goodness of fit for a model in which Time 1 acceptance predicted the three Time 2 stress-related outcomes was significantly better than the reversed causal model that predicted Time 2 acceptance from the three Time 1 outcomes. Consistent with these findings, results showed that Time 1 acceptance significantly predicted Time 2 mental health and input errors; but, in the reversed model, none of the Time 1 stress-related outcomes predicted Time 2 acceptance. Finally, as noted above, many occupational stress models (e.g., Cooper & Marshall, 1976; Jex, 1998; Quick et al., 1997) hypothesise that individual characteristics can have both direct and moderating effects on stress-related outcomes. This study indicates that the effects of Time 1 acceptance on the Time 2 outcomes are the result of direct (or main) effects of acceptance, and not of acceptance moderating the relationship between stressors and stress-related outcomes.

There appear to be two primary implications of these findings to occupational health psychology. First, psychological acceptance would seem to be an important longitudinal predictor of both mental health and computer input errors, even when accounting for Type A, locus of control, and sources of stress. This suggests that, if these findings are replicated in other industries, acceptance may be an individual characteristic that would be usefully integrated into models of occupational health psychology. Secondly, as acceptance predicted mental health and input errors better than did Type A, locus of control, and sources of stress, it may be helpful to assess and increase this individual characteristic, when trying to find ways to improve mental health and productivity at work. Indeed, this implication is consistent with the findings of Bond and Bunce (2000) who showed that acceptance was the mechanism by which an SMI improved mental health and propensity to innovate, in a media organisation. Thus, there is now both a longitudinal panel study and a longitudinal, experimental outcome study that indicate the importance of psychological acceptance to health- and performance-related outcomes in organisations. Further research, of similarly positive findings, may suggest that this individual characteristic is useful, both theoretically and practically, to occupational health psychology.

References
The research is based on curiosity about the common empirical findings of lacking consistency between values (attitudes) and actual behaviour. A group of 20 nursing students with health psychology education participated in Repertory Grid Interviews (RG), about Health Related Behaviour, followed by an Experience Sampling Method study (ESM) concerned with Health Related Behaviour. Afterwards, short follow-up interviews were undertaken, to discuss the findings of all methods. The choice of actual activities seemed to be determined by a mixture of health-related values and hedonistic values: striving to have a nice time, relaxing, enjoying an alcoholic drink etc! However, as indicated by the follow-up interviews, some students tended to change the values rather than the behaviour when confronted with lacking consistency between values of behaviour.

Introduction
The research is based on curiosity about the common empirical findings of lacking consistency between values (attitudes) and actual behaviour, especially in relation to socially valued or desirably behaviour, for example as is the case with health related behaviour.

Sample
A group of 20 nursing students with a recently completed 20 week course in health psychology was selected. The group of students were selected to ascertain recent and thorough knowledge of health-related behaviour.

Repertory Grid Study
The Repertory Grid Technique allows informants to elicit and compare elements (in this case health-related behaviour) and by means of the comparisons arrives at constructs (personal concepts) discriminating between the elements (Kelly, 1955). The elements and constructs were in this study free to be elicited by the students. The main purpose of the RGs were to
Experience Sampling Study

The Experience Sampling Method study (ESM) was concerned with Health Related Behaviour, based on a technique developed by Csikszentmihalyi and Larson (1987). The ESM meant answering forms with open questions and scales about health related behaviour at randomly given signals for one week (all seven days), with about 10 signals per day. The results indicated, as expected, extremely positive values of or attitudes towards health related behaviour.

The health-related activities were dominated by a few categories, namely Socialising, TV/Radio watching and Outdoor Activities. Exercising was less frequent than Smoking and Alcoholic Drinks! (See Figure 1). It is likely that sleeping is so infrequent due to not hearing or not bothering to answer the signal when asleep (they were allowed to skip answering signals if too bothering).

As seen in Figure 2 and 3, the variation in level is much bigger for Healthy than for Relaxed. All activities seem to be relaxed… However, it is interesting to note that potentially harmful activities such as Alcoholic drinks is seen as rather high in Healthy. The only activities clearly low in Healthy are Unhealthy Food, Coffee/Tea, TV/Radio (Csikszentmihalyi would have like that!) and Smoking.
Follow-up interviews

Afterwards, short follow-up interviews were undertaken, to discuss the findings of all methods. The RG’s took about 2 hours per student and gave information on health-related behaviour and their relationships. The behaviour showed that the choice of actual activities was determined by a mixture of health-related values and hedonistic values: striving to socialise, enjoy an alcoholic drink and a smoke etc rather than exercising! However, as indicated by the follow-up interviews, some students tended to change the values rather than the behaviour when confronted with lacking consistency between values of behaviour. An exception was smoking, which although a habit for some was seen as unhealthy by all.
Work-family interface under telework. A challenge for Occupational Health Psychology

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Introduction

Work and family life represent important life roles for most employees. Today employees are increasingly grappling with conflicts experienced in meeting the demands and responsibilities of their work and family roles. These conflicts tend to grow under the profound changes in the nature of work from the mid-1990s. Besides traditional health risks at the workplace work-family as well as family-work conflicts can be considered new challenges particularly associated with atypical forms of work such as highly flexible working time, subcontracting, decentralization and distribution of work. In addition, boundaries between work and non-work time have become more blurred as organizations become increasingly virtual and more people work at or from home for all or part of the week using information and communication (IC) technologies. Among the new forms of work organisations which are based on the new IC-technologies telework is the most prominent one (Büssing, 2001).

Work and family interface under telework

The penetration of telework is rapidly growing world-wide (e.g. ECaTT, 2000). However, despite the fact that telework has become part of the normal working life very little is known about its impact on the quality of life away from work (Konradt, Schmook & Mälecke, 2000).

The study by Glaser and Glaser (1995) with teleworkers at IBM Germany shows that teleworkers did not spend more time with their families, partners or their private lives as a whole. However, they were able to choose the "right" time for attending to their families and to take part in family life in a better way. The majority of the teleworkers in their study clearly state that they can participate better in the lives of their children. At the same time they complain about being increasingly involved into rows among the children and about the need to educate the children not to address them permanently. The more time-intensive participation in family life is, the more it was, associated with a negative aspect, e.g. teleworkers miss recreation from family and partnership in the company, they report problems with relaxing from work when they were at home and they report that they were disturbed or interrupted by family members e.g. by "Oh-could-you-quickly-tasks".

The study of Büssing, Kunst and Michel (1996) on two pilot telework projects in the insurance business focusing on women during and after parental leave found that teleworking for working women may present a favourable alternative for harmonising work and family demands. The female teleworkers were able to establish a temporal fit between household, family demands and job demands more easily than women re-entering the office job. The female teleworkers often designed their working times complementing those of their husbands, and adapted to circumstances in their families by flexible teleworking times, so that multiple loads could be avoided more effectively. Moreover, as expected work contacts decrease in teleworking.

With regard to work-family and family-work conflicts we refer to Greenhaus and Beutell (1985, p. 77) who state: "participation in the work (family) role is made more difficult by virtue of participation in the family (work) role". According to Greenhaus and Beutell (1985) conflicts are role conflicts in the sense of psychological role theory. That is, demands of one role make performance of the other role more difficult. Netemeyer, Boles and McMurrian (1996) regard conditions and situations in the different areas of life as responsible for conflicts. Accordingly they conceptualise such conflicts between work and family roles in terms of contradictory or competing demands. Work-family conflict is defined by Netemeyer et al. (1996, p. 401) as "a form of inter-role conflict in which general demands of, time devoted to, and strain

References


created by the job interfere with performing family-related responsibilities”, this holds true for family-work conflict vice versa.

The influence of work stress in general and conflicts between areas of life in particular are to some extent dependent upon the possibilities for coping (Lazarus & Launier, 1978). Research on work and stress calls the attention to a number of different types of coping resources like work related, professional, social and personal resources. Among those only a few like social support and autonomy at work gained special attention. For social support as well as for autonomy at work the results of many empirical studies indicate that they largely support the coping with demands and stressors from work (e.g. Terry & Jimmieson, 1999; Winnubst & Schabracq, 1996).

With regard to telework social support and autonomy at work not only take over a resource function, they themselves can become a source of conflict or can add to conflicts. That is, reduced social support can contribute via increasing social isolation and restricted possibilities for social comparison to role conflicts. And increasing autonomy at work can add to conflicts via increasing self-responsibility for job tasks, goal setting, time allocation etc. because these responsibilities might interfere with demands from other areas of life like family, partnership or leisure.

Against this background work-family and family-work conflicts are investigated in comparison between tele- and office workers by asking three research questions:
1. Do we find differences between tele- and office workers with respect to conflicts between work-family and family-work?
2. Do tele- and office workers have different resources (i.e. social support, latitudes) available to manage work-family and family-work conflicts?
3. Are differences in work-family and family-work conflicts between tele and office workers due to differences in their social support and latitudes?

Methods

Subjects

Tele- and office workers from three companies participated in the research project "Telework and quality of working life (AQUATEL)" (e.g. Büs sig, 1998; Büs sig & Drodofsky, 2000). The three companies are from different lines of business (chemical industry, banking computer centre, public administration), however, in all three companies the work tasks of tele- and office workers are at a high professional level (i.e. programming, computer service, organisation and planning, consulting and qualified office work) and dependant upon the use of electronic data processing.

Tele- and office workers are comparable in important respects, e.g. level of education, work tasks, sex, age, seniority (see table 1), i.e. no statistical significant differences between the samples were found.

Table 1 shows that the majority of the subjects are female; this is in accordance with the figures we know from the group of alternating telework (Godehardt, 1997).13 Age as well as seniority are in line with the demand on teleworkers for longer work experience. Slightly more than 80% of the participants are married and have one or two children in their household.

Table 1: Sample characteristics

<table>
<thead>
<tr>
<th></th>
<th>Teleworker</th>
<th>Office worker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UG</td>
<td>KG</td>
<td></td>
</tr>
<tr>
<td>Female 1</td>
<td>37</td>
<td>20</td>
<td>57</td>
</tr>
<tr>
<td>Male 1</td>
<td>18</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Missing 1</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Age in years 2</td>
<td>38.9</td>
<td>40.0</td>
<td>39.3</td>
</tr>
<tr>
<td>(29-53)</td>
<td>(22-52)</td>
<td>(22-53)</td>
<td></td>
</tr>
<tr>
<td>Total seniority in years</td>
<td>17.5</td>
<td>17.8</td>
<td>17.6</td>
</tr>
<tr>
<td>(2-28)</td>
<td>(3.5-29)</td>
<td>(2-29)</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1 Absolute frequencies. 2 mean and range (in parentheses).

Table 1: Sample characteristics

Measures

The employed measures are part of a large number of instruments applied for purposes of a formative evaluation in the project AQUATEL (e.g. Büsing & Drodofsky, 2000). Both, teleworker and office worker filled in equivalent questionnaires. Moreover, the teleworkers were interviewed at their homes.

Conflict between work-family and family-work. The scales of Netemeyer, Boles and McMurrian (1996) cover a total of 10 items (five items for each scale); they were translated into German by the author. The original version reaches an internal consistency of .83 and .89. The original wording of the items is given in table 3.

13 To avoid any misunderstanding it should be mentioned that the vast majority of teleworkers is male because of the large number of mobile and supplementary teleworker in most countries (ECaTT, 2000).
Social support was measured in line with the modelling by House and Kahn (1985), i.e. with respect to contents (i.e. emotional, appraisal, informational, instrumental) and four sources (work supervisor, colleagues, spouse/partner, friends). Each of the four scales on social support from work supervisor, colleagues, spouse/partner, and friends consists of five items.

Activity latitudes cover three facets of latitudes according to Ulich (1984): action latitudes (i.e. possibilities for different ways of task related action with regard to choice of means, organisation of time etc.), design latitudes (i.e. independent design of procedures of task fulfilment according to own decisions) and decision latitudes (i.e. degree of independent decisions with respect to tasks and goals). The range of these latitudes increases from action over design to decision latitudes. The instrument by Büssing and Glaser (1991) consists of a total of 18 items and a five-point Likert scale (1='not at all'; 5='yes, indeed')

Statistical analyses
Reliability of the scales was estimated by internal consistency according to Cronbach’s alpha. The research questions were investigated by multivariate analyses of variance (MANOVA) and covariance (MANCOVA). As independent variable we compared teleworkers with office workers. All analyses were performed against an error rate of .10 because of the explorative character of the research questions.

Results

Reliability of the measures
The reliability estimation (Cronbach’s alpha) of the scales in the total sample are presented in table 2. Results confirm a good reliability except for the scale ”decision latitude” which still reaches a sufficient reliability with an alpha of .66.

First research question.
Three separate MANOVA were calculated with regard to the first research question because of three multivariate sets of dependent variables (see tables 2 and 3). The results in table 2 indicate a low level of work-family and family-work conflict for teleworkers and office workers whereby family-work conflicts are reported even less often. For both directions of conflict we find a lower level under teleworking whereby teleworkers report significantly less work-family conflicts in case of component-wise statistical analyses. These differences become more apparent calculating multivariate comparisons between teleworkers and office workers at the item level (see table 3).

<table>
<thead>
<tr>
<th></th>
<th>Tele–worker (N ≤ 56)</th>
<th>Office–worker (N ≤ 32)</th>
<th>p-value</th>
<th># items</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-Family Conflict (W-F)*</td>
<td>2.09</td>
<td>2.39</td>
<td>.098</td>
<td>5</td>
<td>.91</td>
</tr>
<tr>
<td>Family-Work Conflict (F-W)</td>
<td>1.75</td>
<td>1.94</td>
<td>.11</td>
<td>5</td>
<td>.81</td>
</tr>
<tr>
<td>Action latitude **</td>
<td>3.94</td>
<td>3.58</td>
<td>.009</td>
<td>8</td>
<td>.86</td>
</tr>
<tr>
<td>Design latitude</td>
<td>3.81</td>
<td>3.17</td>
<td>≈ 0</td>
<td>5</td>
<td>.88</td>
</tr>
<tr>
<td>Decision latitude</td>
<td>3.37</td>
<td>3.20</td>
<td>.30</td>
<td>4</td>
<td>.66</td>
</tr>
<tr>
<td>Social support: Supervisor ***</td>
<td>3.52</td>
<td>3.55</td>
<td>.90</td>
<td>5</td>
<td>.91</td>
</tr>
<tr>
<td>Social support: Colleagues</td>
<td>3.87</td>
<td>4.02</td>
<td>.28</td>
<td>5</td>
<td>.91</td>
</tr>
<tr>
<td>Social support: Friends</td>
<td>2.39</td>
<td>3.11</td>
<td>.005</td>
<td>5</td>
<td>.92</td>
</tr>
<tr>
<td>Social support: Partner</td>
<td>3.43</td>
<td>3.74</td>
<td>.24</td>
<td>5</td>
<td>.93</td>
</tr>
</tbody>
</table>

Note: Range of scales: [1,5]. MANOVA: p-value of Wilks λ for * = .22, ** = 0, *** = .056.

Table 2: Work-family and family-work conflicts, activity latitudes and social support in comparison between tele- and office workers (MANOVA).

At the item level it becomes clear that there are two major aspects of less work-family and family-work conflict for teleworkers. First, we find less conflicts with regard to demands from one sphere of life colliding with responsibilities of the other sphere. Second, demands from one area of life do not lead to situations where things don’t get done in the other area. Apparently these two types of basic interference between work-family and family-work occur very rarely doing telework.
In two other areas of conflict strong differences between teleworkers and office workers were found, too. For teleworkers strain from work does not impede life at home as much as for office workers, and life at home does not interfere with responsibilities at work.

<table>
<thead>
<tr>
<th>Work-Family Conflict*</th>
<th>Tele-worker</th>
<th>Office-worker</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-F: The demands of my work interfere with my home and family life</td>
<td>2.00</td>
<td>2.34</td>
<td>.087</td>
</tr>
<tr>
<td>W-F: The amount of time my job takes up makes it difficult to fulfil family responsibilities</td>
<td>2.05</td>
<td>2.28</td>
<td>.26</td>
</tr>
<tr>
<td>W-F: Things I want to do at home do not get done because of the demands my job puts on me</td>
<td>2.25</td>
<td>2.66</td>
<td>.063</td>
</tr>
<tr>
<td>W-F: My job produces strain that makes it difficult to fulfil family duties</td>
<td>1.89</td>
<td>2.34</td>
<td>.021</td>
</tr>
<tr>
<td>W-F: Due to work-related duties, I have to make changes to my plans for family activities</td>
<td>2.27</td>
<td>2.31</td>
<td>.84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family-Work Conflict**</th>
<th>Tele-worker</th>
<th>Office-worker</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-W: The demands of my family or spouse / partner interfere with work-related activities</td>
<td>1.84</td>
<td>2.16</td>
<td>.079</td>
</tr>
<tr>
<td>F-W: I have to put off doing things at work because of demands on my time at home</td>
<td>1.95</td>
<td>2.06</td>
<td>.51</td>
</tr>
<tr>
<td>F-W: Things I want to do at work don’t get done because of the demands of my family or spouse / partner</td>
<td>1.55</td>
<td>1.78</td>
<td>.092</td>
</tr>
<tr>
<td>F-W: Family related strain interferes with my ability to perform job-related duties</td>
<td>1.79</td>
<td>1.78</td>
<td>.98</td>
</tr>
<tr>
<td>F-W: My home life interferes with my responsibilities at work such as accomplishing daily tasks, and working overtime</td>
<td>1.61</td>
<td>1.94</td>
<td>.043</td>
</tr>
</tbody>
</table>

Note: Netemeyer et al. (1996); Range of items: [1,5]. MANOVA: p-value of Wilks λ for * = .039, ** = .11.

Table 3: Items of work-family and family-work conflicts in comparison between tele- and office workers (MANOVA).

Second research question.
The results are clear in this question. With respect to both groups of resources we find multivariate statistical differences. Activity latitudes are much higher for teleworkers than for office workers while social support is stronger on the office workers’ side. A detailed inspection at the component-wise level for both resources reveals that there are specific aspects of latitudes and social support which are responsible for these overall differences.

Among the three facets of latitudes the action and design latitudes are higher under teleworking while we cannot find any difference for the far-reaching decision latitudes. Looking at the social support in table 2 it is obviously the higher support office workers get from friends which is responsible for differences between the two groups.

Third research question.
With respect to the third research question we calculated two multivariate analyses of covariance (MANCOVA) with activity latitudes and social support as covariates and work-family and family-work conflict as dependent variables. The results, which will be only reported briefly, indicate that neither latitudes nor social support can exert an influence as covariates which is statistically significant (p-values range between .19 and .74); that is, action, design and decision latitudes as well as the different facets of social support show similar function with respect to work-family and family-work-conflict. Their introduction as covariates does not lead to significant changes in differences between teleworkers and office workers in those conflicts.
Discussion

Our results confirm the overall findings from other studies and for other areas of work (e.g. Burke & Greenglass, 1999; Kelloway, Gottlieb & Barham, 1999) that work-family conflicts are stronger than family-work conflicts. While this holds true for teleworkers as well as for office workers, teleworkers in our study experience comparatively less conflicts than office workers in both respects. Obviously alternating telework is a form of decentralised work organisation which influences the balance between the areas of life in a positive way (e.g. Hill, Miller, Weiner & Colihan, 1998).

There are not only less conflicts between work-family and family-work we also find higher latitudes for the teleworkers. Except for the far-reaching decision latitudes – which are still up to the management - the results could indicate that reduced external control over the alternating teleworkers is compensated by a higher degree of self-control or better to say self-administered latitudes in their working life at home. Teleworkers obviously have more possibilities to plan, organise and process their work at home.

In contrast to the latitudes the results on social support indicate less support for teleworkers in general and in particular from friends. This latter result can be interpreted in two ways. First, less social support from friends can to some extent mean less communication with and help from friendly colleagues at work. Second, however, we also know that friendships outside work get under pressure, especially time pressure, because work, family and leisure are much more intertwined and less separated under telework (e.g. Sullivan & Lewis, 2001; Büssing, Kunst & Michel, 1996) and it takes a lot of effort and time to deal with these interferences.

In a way the results on social support point to a often debated risk of teleworking, namely the risk of loosened social integration and social isolation (e.g. Büssing, 1998). Even if one cannot conclude such an interpretation from the results presented here, problems with social support under telework like the ones found in this study should be taken seriously and should be a reason for further investigation.

Looking at conflicts between work-family and family-work the questions arises if latitudes and social support do exert an influence on these conflicts and if this influence is different for teleworkers and office workers (e.g. Adams & Jex, 1999; Carlson & Perrewé, 1999). To what extent do these resources determine the conflicts between work-family and family-work, are they relieving for both groups in a similar manner? A first answer to this question was given through analyses of covariance. The results confirm that both latitudes and social support have a similar relieving function for teleworkers as well as for office workers. It seems that the alternating teleworkers do not profit from these resources in a particular way.

According to the recent review by Konradt et al. (2000) telework research based on empirical data, tested methods, a mix of methods with different validity, an adequate design including a control group and/or a longitudinal measurement is very rare. The study presented here fulfills many of these criteria. Particularly the control group of matched office workers assures internal validity. However, one should clearly state that our results are restricted with regard to their external validity, i.e. to alternating telework and not to telework and its multiple forms in general. In further analyses we will use additional longitudinal as well as qualitative data to strengthen the internal validity and to enhance the spectrum of questions to the area of multiple influences and outcomes of telework and of its associated work-family and family-work conflicts.

References


Job strain and blood pressure. A pooled analysis of several general population samples

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Background
The extent to which psychosocial stress concurs to raise blood pressure is still uncertain: The major hypothesis is sympathetic: overactivity interacting with genetic susceptibility and other lifestyle determinants of hypertension (Pickering, 1997). Epidemiological studies have shown that the prevalence of hypertension is dependent on social and cultural factors, in particular urbanization and education (Dressler, 1999). Through the analysis of job strain, by the Karasek (1979) demand-control paradigm other "adaptative" aspects of blood pressure have emerged.

Several studies using the Karasek model have shown a positive relationship with ambulatory blood pressure level, in men but not in women (Schnall & Landsbergis, 1996). Other studies using more 'subjective' measures of occupational stress and office blood pressure as an outcome measure have found little/no relationship or even inverse associations (Pieper et al. 1989; Suter et al., 1997; Melamed et al, 1997).

In a previous study we have provided the first evidence of an association between job strain and ambulatory systolic blood pressure in a male general population sample (Cesana et al., 1996). The association was unexpectedly confirmed also for clinic blood pressure. This led us to extend the analysis of the relationship between job strain and blood pressure to the four general population samples recruited for the WHO-MONICA Project in our geographical area - "Brianza" - during the ten years from 1985 to 1994. Here results are presented as a contribute to assess how a simple measure, like clinic blood pressure, can be utilized as an index of adaptative difficulties to work.
Methods

Area Brianza is located between Milan and the Swiss border. It is characterized by a high level of industrialization and urbanization, with about 1 million inhabitants. Three population surveys were conducted in 1986-87, 1989-90 and 1993-94 to assess coronary risk factors changes over time. In 1991-92 an extension of the second population survey was carried out to investigate the relationships between clinic and ambulatory blood pressure measurements at population level.

Ten-year age and gender stratified random samples were selected from electoral rolls among 25-64 year old residents. Each age-sex stratum was composed of about 200 subjects with a participation that resulted constantly around 70% of the invited people. People selected in previous surveys were not included in the subsequent ones, therefore surveys were independent. Data analysis was restricted to employed men and women 25-54 year old, due to the high retirement rates in the last investigated decade. Hypertensive subjects under treatment were also excluded because of the effect of treatment on the blood pressure values.

The methods adopted to measure risk factors prevalence strictly adhered to the WHO MONICA project procedures, which are extensively described elsewhere (1998). Briefly, trained technicians took blood pressure and results underwent satisfactory internal and external quality control assessment (Hense et al., 1995). Measurements were taken twice, 5 minutes apart on subjects in the sitting position, after 10 minutes of rest. Standard and periodically calibrated sphygmomanometers were used, recording the first and fifth phase of the Korotkoff sounds for systolic and diastolic blood pressure, respectively. The average of the two measurements was used as the study variable.

Height and weight were measured on subjects without shoes and wearing light clothing. Body mass index (BMI) was computed as weight in kilograms divided by height in squared meters. The gender-specific fourth quintile of BMI was adopted as a cutoff point for obesity.

Information on full time years of school education, smoking habits, alcohol consumption, leisure time physical activity and antihypertensive drug treatments was collected through a standardized interview.

Each employed participants was asked to fill in the MONICA Psychosocial (MOPSY) Questionnaire, in which a short job strain scale derived from the Karasek questionnaire was included. The scale (set up at the WHO Regional Office for Europe, 1988) was composed of 11 items, of which six dealt with decision latitude and five with job demand. Job strain evaluation was obtained through the traditional quadrant term approach (Landsbergis et al., 1994), using as cutoff points the overall gender-specific sample medians of the two considered scores (decision latitude and psychological job demand) and categorizing subjects into one of four categories. In the high strain group were classified individuals who scored above the sample median of the demand scale and equal or below the median of the decision latitude scale. Similarly, the passive condition was determined by demand and decision scores equal or below the correspondent sample medians; the active condition by scores above the median for both dimensions; and the low strain condition by levels of job demand equal or below the median and decision latitude above the median. In addition, according to the levels of each job strain score, subjects were classified into tertiles levels of perceived job demand and decision latitude.

Separated analyses were performed for men and women, and for normotensive (BP < 140/90 mmHg), high normotensive (130/80 < BP < 140/90) and hypertensive (BP >= 140/90 mmHg) subjects. The systolic and the diastolic blood pressure values were considered as dependent variables in the analysis of covariance, using the SAS general linear model procedure (1991), and the perceived job stress scores (job strain - quadrant term, tertiles of job demand and tertiles of decision latitude) were considered as explanatory variables in separate models. In each model these covariates were included as fixed effects: age (as a continuous variable), BMI, alcohol intake, smoking status, level of education, prevalence of leisure time physical activity (one dummy variable each) and year of survey (three dummy variables). The occupational level was not included as a covariate because its statistical contribution was irrelevant after education was included. Year of survey was included as a covariate, because of possible undetected differences in measurements and because of evidence of decrements in blood pressure mean levels during the observation period.

Results

Table 1 shows the characteristics of the general population MONICA samples, 25-54 year old, and the final sample sizes of the study after exclusion of unemployed subjects and those for whom questionnaire and employment information were not available. Missing data were low, with the exception of the first survey due to some organization problems at the start of screening activities. Final sample sizes were 1799 men and 1010 women, corresponding to 87% and 78% of the employed participants, with age means of 39.9 (SD 8.28) and 37.1 (SD 7.77) respectively.

In Table 2 the age-adjusted prevalence of major blood pressure covariates in job strain categories are reported. No differences in both sexes were observed for prevalence of current smokers, excess of alcohol intake and the index of obesity among job strain groups. Prevalence of regular leisure time physical activity was found higher in active and low strain men and women. Hypertension resulted more prevalent in passive men, but no differences were found in women among job strain categories. Percentages of hypertension treatment corresponded to what is commonly observed in northern Italy (Mancia et al., 1997) and did not show relevant differences among perceived job stress groupings in both sexes.

Table 3 reports blood pressure means in job strain categories and tertile groupings of decision latitude and psychological job demand, resulting from the pooled analysis, adjusted for age, BMI, alcohol intake, smoking status, education level, regular leisure time physical activity and survey. Among men there was a significant progressive increasing gradient of 3 mm Hg (p<0.001) of systolic blood pressure mean values from the low strain to the high strain job category. This increase was associated with a statistically significant decrease of systolic blood pressure values for tertiles of job control. Similar differences were not observed in women and for the demand dimension in both sexes. Job strain categories
did not show any significant relationship with diastolic blood pressure. These results did not change when the analysis was carried out on hypertensive and high normotensive subjects separately.

Discussion

The study has the advantage that several surveys were performed over a rather long time span. Furthermore, the procedures through which data were collected were sound: a) the blood pressure measurements were accurate because of adoption of a meticulous internal and external quality control; b) a 70% participation in each surveyed sample and age-sex stratum is satisfactory for subjects randomly extracted from general population (Shasar et al, 1996); c) with the exception of the first survey, in males missing data were only 1-2% on employment status and about 10% on job strain (however the analysis of the first survey gave results that were similar to those of the subsequent surveys).

The results of the study show that in males systolic blood pressure was greater in the passive and high job strain groups, i.e. in the groups characterized by a decreased control of the jobs. They confirm previous findings obtained by ambulatory blood pressure in more restricted samples of population or patients (Pickering, 1997), and offer a large data base to the conclusion that in the population job strain is accompanied by an increase in blood pressure. Several other findings of our study deserve to be mentioned.

One, no association between stressful jobs and blood pressure was seen in women. This finding, although uncertain and possibly influenced by a greater number of missing data, is common to other studies (Lindquist et al, 1997). It may suggest that women have a work perception not as stressful as that of men (Rose et al, 1999), possibly because they feel it as a promotion from homework, the value of which is strongly decreased in our society.

Two, smoking, excess food and alcohol consumption did not evidence a different distribution among job strain groups, in spite of the common opinion that they are dangerous behaviors induced by environmental stress. Instead regular leisure time physical activity was more frequent among low strained and active individuals, enforcing the recognized importance of its coping effect, which is probably better understood by more educated people. Noticeable is the higher prevalence of hypertension among high strain and particularly passive males, heralding the association between stress perception and increase in blood pressure in this gender.

Three, in our study there was no relationship between job strain and diastolic blood pressure. In the male component of our population there was a 3 mmHg difference in systolic blood pressure between the best work condition, i.e. low strain, and the worst, i.e. high strain. This may appear to be a small difference, difficult to replicate and to evaluate for the prediction of unhealthy outcomes. It should be emphasized, however, that in general population samples, including those of the MONICA, a 3 mmHg difference in systolic blood pressure allows to clearly discriminate between favourable or unfavourable trends (Wolf et al, 1997). Furthermore, systolic blood pressure is directly and continuously related to the risk of stroke or coronary event, even when values are below the limit conventionally established for hypertension. Our results suggest that the study of systolic blood pressure should be promoted, at least in males, as a biological index of the perception of emotional and organizational troubles: a kind of biological exposure index, using a typical terminology of occupational toxicology. This is the case also when only office values are collected, provided that measurements are accurate as in the MONICA Project. Further research is needed to clarify the relationship between perceived work stress and blood pressure in women. This is the case also for hypertensive individuals in whom more complex psychophysiological mechanisms may be operative (Nyklicek et al, 1996).

References


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**Appendix**

**Table 1 - Sample characteristics and restrictions of participants in the study, 25-54 year old**

<table>
<thead>
<tr>
<th></th>
<th>MONICA 1st survey</th>
<th>MONICA 2nd survey</th>
<th>PAMELA</th>
<th>MONICA 3rd survey</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MEN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>604</td>
<td>580</td>
<td>616</td>
<td>564</td>
<td>2364</td>
</tr>
<tr>
<td>No employment</td>
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<td>62</td>
<td>228</td>
<td>75</td>
<td>333</td>
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56
Table 2 - Distribution (%) of major BP covariates among job strain categories and chi squared age adjusted

<table>
<thead>
<tr>
<th></th>
<th>Men (no. 1799)</th>
<th>Women (no. 1010)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Low strain</td>
<td>Active</td>
</tr>
<tr>
<td>Prevalence</td>
<td>19.90</td>
<td>17.94</td>
</tr>
<tr>
<td>Age &gt; 40 years</td>
<td>50.56</td>
<td>43.30</td>
</tr>
<tr>
<td>Education &gt; compulsory 8 years</td>
<td>56.98</td>
<td>73.83</td>
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<tr>
<td>Current smoker</td>
<td>39.22</td>
<td>36.14</td>
</tr>
<tr>
<td>BMI &gt; fourth quintile (28.09)</td>
<td>17.70</td>
<td>19.43</td>
</tr>
<tr>
<td>Consumption &gt; 2 alcoholic drinks per day</td>
<td>32.86</td>
<td>30.60</td>
</tr>
<tr>
<td>Regular leisure time physical activity</td>
<td>21.41</td>
<td>22.08</td>
</tr>
<tr>
<td>Hypertension°</td>
<td>26.84</td>
<td>26.65</td>
</tr>
<tr>
<td>Hypertension drug treatment</td>
<td>5.35</td>
<td>2.83</td>
</tr>
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</table>

* Chi-square test for equal proportions
° SBP >140 or DBP > 90 or drug treatment

Tab. 3 - Mean clinical blood pressure in pooled MONICA-Brianza samples of currently employed men (1799) and women (1010), 25-54 year old, classified by job strain categories and job strain dimensions. Means are adjusted for age, BMI, alcohol intake, smoking, education, leisure time physical activity and year of survey.

<table>
<thead>
<tr>
<th></th>
<th>MEN</th>
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<th>WOMEN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clinic BP</td>
<td>Values of F</td>
<td>Clinic BP</td>
<td>Values of F</td>
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<td>Stress perception</td>
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<td></td>
<td></td>
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<tr>
<td>Low strain</td>
<td>X</td>
<td>SE</td>
<td>X</td>
<td>SE</td>
</tr>
<tr>
<td>Active</td>
<td>124.1</td>
<td>0.904</td>
<td>123.3</td>
<td>1.442</td>
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<tr>
<td>Passive</td>
<td>127.5</td>
<td>0.720</td>
<td>p &lt; 0.02</td>
<td>122.0</td>
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<tr>
<td>High strain</td>
<td>127.4</td>
<td>0865</td>
<td>122.3</td>
<td>1.475</td>
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<tr>
<td>Job demand</td>
<td></td>
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<td></td>
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<tr>
<td>Low</td>
<td>X</td>
<td>SE</td>
<td>X</td>
<td>SE</td>
</tr>
<tr>
<td>Medium</td>
<td>125.7</td>
<td>0.796</td>
<td>2.73</td>
<td>123.2</td>
</tr>
<tr>
<td>High</td>
<td>127.6</td>
<td>0.718</td>
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<td>121.9</td>
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<td>Job control</td>
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<td>High</td>
<td>X</td>
<td>SE</td>
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<td>SE</td>
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<td>Medium</td>
<td>126.0</td>
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<tr>
<td>Low</td>
<td>127.6</td>
<td>0690</td>
<td>p &lt; 0.01</td>
<td>122.4</td>
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Time Pressure, Subjective Well-Being and Task Performance among Electronic Work Groups

E. CIFRE, M. SALANOVA, S. LLORENS and I. MARTÍNEZ
Department of Psychology, Jaume I University, Castellón, Spain.

Introduction

Two major changes may be observed in today’s organizations: on the one hand, employees are working more and more in groups rather than individually and, on the other hand, Information and Communication Technologies (ICTs) are rapidly implemented in companies, which help to develop a new way of communication between the members of the group. According to Cascio (1999), the new paradigm of work anytime-anywhere, in real space or in cyberspace represents a dramatic change in how we work. Thus, the success of virtual teams, composed of geographically dispersed organizational members who communicate and carry out their activities using technologies such as e-mail and videoconferencing, depend upon effective collaborations (Cohen & Mankin, 1999). Some of the important changes that these technologies may produce are related to the way in which individuals communicate with each other. This new way to organize the work (i.e. so-called ‘electronic work groups’ or ‘e-groups’) may have negative or positive effects task performance. For example, although such technologies may make collaboration between dispersed group members more convenient, electronic groups are also exposed to job demands such as time pressure. At the same time, the group performance will be influenced by variables which are present in the rest of the groups, as the subjective well-being.

Typically, research on e-groups is cross-sectional and non-experimental so that no causal inferences can be made (Salanova, Llorens, Cifre, Martinez & Schaufeli, 2001). Besides this shortcoming, the current study was designed to overcome three main shortcomings. Firstly, despite the relevance of time pressure as a main job demand, its effects on task performance are usually not considered. Secondly, subjective well-being is usually exclusively studied at the individual level and not at the group level. Thirdly, the relationships between subjective well-being and task performance are biased mainly on negative aspects (i.e. job strain), thereby neglecting positive aspects such as job engagement (i.e. vigor and dedication). Thus, the current study was designed to study the relationship between a specific job demand (job pressure) and the emotional state (subjective wellbeing) over the task performance, overcoming these previous shortcomings by: (1) using time pressure as a predictor of task performance, (2) measuring group-level (i.e. collective) well-being; (3) including negative (i.e. collective anxiety and depression) as well positive (i.e. collective engagement) dimensions of well-being as predictors of task performance.

Subjective Well-being

The relationship between subjective well-being and task performance has been considered by a majority as something obvious. This was clearly described in the Happy-productive workers theory which postulates that a positive affective state might be related with a higher number of positive outcomes to organizational work behaviors (Wright & Staw, 1999).

A special kind of well-being study is one which relates this affective state with the use of technology. In this sense, research focuses not only at the individual level (i.e. user’s reactions) (Chua, Chen & Wong, 1999; Igharia & Chakrabarti, 1990; Jones & Wall, 1990; Kay, 1990; Todman & Managhan, 1994) but at the relationship between this reactions when using ICT and task performance.

Besides the “Happy-productive worker theory”, research on ICT and employee's well-being has almost exclusively focussed on its negative effects (i.e. job stress). However, there is an emerging trend towards a ‘positive psychology’ that focuses on human strengths and optimal functioning rather than on weaknesses and malfunctioning (Seligman & Csikszentmihalyi, 2000). For instance, recently, engagement has been identified as the opposite pole of burnout (Maslach, Schaufeli & Leiter, 2001). It is defined as a ‘positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption’ (Schaufeli, Salanova, González-Romá & Bakker, 2001). In this study we used the so called ‘core’ dimensions of engagement (i.e., vigor and dedication) (Salanova, Schaufeli, Llorens, Grau & Peiró, 2001). Thus, the present study focuses on both negative (i.e. collective anxiety and depression) as well as positive (i.e. collective engagement) aspects of collective well-being in work groups.

Time pressure

Despite the obvious importance of the effect of time pressure on the functioning of work groups, it has rarely been researched (e.g. Salanova et al, 2001; Svenson & Maule, 1993). Traditionally, time pressure is considered as a job demand with negative consequences on work and individual well-being (Garst, Frese & Molenaar, 2000). Results concerning the relationship between time pressure and performance are mixed. Both a positive linear relationship (McCann, Baranski, Thompson & Pigeau, 2000) and a negative linear relationship (Davis, 1969; Karau & Kelly, 1992; Kelly & McGrath, 1985; Yukl, Malone, Hayslip & Pamin, 1976) have been reported. In addition, other studies show a curvilinear relationship, i.e. high and low time pressure are associated with poor performance (Isenberg, 1981) or no significant relationship at all (Kelly & Karau, 1993; Sethi, 2000). Not surprisingly, research has shown that the relationship between time pressure and group performance is moderated by variables such as type of group task (i.e. innovative, intellective and negotiation task), technology system (i.e. face-to-face, email and videoconferencing) and individual characteristics (i.e. personality, well-
being) (Davis, 1969; Gracia, Arcos & Caballer, 2000; Heaton & Krublanski, 1991; Hollingstead & McGrath, 1993). For instance, in intellective tasks, the time pressure is negatively associated with task performance (Davis, 1969; Gracia, Arcos & Caballer, 2000). For example, a study by Gracia, Arcos & Caballer (2000), found groups working with e-mail demonstrated significantly poorer performance compared to face-to-face and videoconferencing groups when under time pressure.

**Objective and hypothesis**

This study explores the relationship between a specific job demand (time pressure/non time pressure) and the employees collective affective state (positive and negative well-being, i.e., anxiety-depression and engagement) to predict a behavior (task performance) in groups while using ICT (chat). More particularly, we expect:

**Hypothesis 1.** While performing an intellective task (experimental condition Time 2), the group with time pressure will perform poorer than the group without time pressure.

**Hypothesis 2.** Both the positive and the negative aspects of subjective well-being will be related to the task performance of the e-groups. Positive well-being (dedication and vigor) will be positively related to the task performance, while negative well-being (anxiety and depression) will be related to the poorer task performance.

**Method**

**Participants design and procedure**

Ninety-five students of Psychology at the University Jaume I, Spain, were randomly distributed to the study’s 2 X 2 repeated measures longitudinal design (time pressure Vs no time pressure; Time 1 Vs Time2). The last factor (time) was treated within subjects. Participation was voluntary and the experimental sessions were run in 18 groups of five students. Their mean age was 23.29 years (s.d. = 3.05); 88 women (92.6%) and 7 men (7.4%) were included.

The experimental sessions were performed in a test-room with an Intranet linking 5 work-stations at which the chat-internet ‘miRC32’ groupware was installed. Each member could only interact with another group member using the computer. Half of all groups performed the task without time pressure, and the remaining groups performed the task under time pressure. The time pressure was assessed as the average time used by the group “without time pressure” to solve the task. The first task (T1) was an idea generation task. This task was also used as training task. Participants were asked to come up with 5 best slogans to promote a house sale in a specific area. The task was first performed individually, followed by group discussion.

After three weeks the same groups met again (T2) in the second experimental session where they performed an intellective task: They were asked to associate the name, surname and job of four employees from a company. Each member had partial and complementary instructions to solve the task so that the group worked together in order to solve the task correctly.

After finishing each task, participants filled out a questionnaire.

**Measures**

**Collective Anxiety and Depression** were assessed by the Spanish version of the Anxiety-Contentment and Depression-Enthusiasm scales developed by Warr (1990). This was slightly adapted for use in work groups. Scores ranged from 1 (never) to 6 (all the time). High scores indicate high levels of job-related anxiety and depression. The α coefficient was .82 and .75 (T1) .85 and .77 (T2) for each scale (collective anxiety and depression), thus meeting the criterion of .70 (Nunnaly & Bernstein, 1994).

**Collective Engagement** was assessed with the Engagement Questionnaire (24-items version) by Schaufeli et al., (2001) slightly adapted for use in work groups (i.e. Collective Engagement). Collective Engagement consists of 11 items, ranged from 1 (‘never’) to 5 (‘most of the time’). They are scored on two scales: Vigor (7 items) and Dedication (4 items). The α coefficients for collective vigor were .76 at Time 1 and .80 in Time 2. The α coefficients for collective dedication were .75 at Time 1 and .78 in Time 2.

**Task Performance** was measured at Time 2 when groups performed the intellective task. Groups had to associate the name, surname and job for 4 employees in a company. This variable ranged from 0 (no any right answers), 1 (only 1 name-surname-job fitted), 2 (2 names-surnames-job fitted), 3 (3 -and as exclusion 4- names-surnames-job fitted).

**Results**

Descriptive statistics were computed. Table 1 shows mean values, standard deviations, and inter-correlation of the all scales used in this study.
Table 1: Means, Standard Deviations and zero order correlation (N=95)

<table>
<thead>
<tr>
<th>Variables</th>
<th>M (T1/T2)</th>
<th>SD (T1/T2)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collective Anxiety</td>
<td>4.55/4.16</td>
<td>.75/.95</td>
<td>(.54**)</td>
<td>.60**</td>
<td>-.41**</td>
<td>-.52**</td>
<td>-.16</td>
</tr>
<tr>
<td>2. Collective Depression</td>
<td>5.07/4.77</td>
<td>.59/6.7</td>
<td>.56**</td>
<td>(.41**)</td>
<td>-.55**</td>
<td>-.66**</td>
<td>-.32**</td>
</tr>
<tr>
<td>3. Collective Vigor</td>
<td>3.95/3.73</td>
<td>.53/59</td>
<td>-.29**</td>
<td>-.46**</td>
<td>(.43**)</td>
<td>.78**</td>
<td>.26**</td>
</tr>
<tr>
<td>4. Collective Dedication</td>
<td>4.19/3.97</td>
<td>.55/68</td>
<td>-.26*</td>
<td>-.45**</td>
<td>.81**</td>
<td>(.52**)</td>
<td>.28**</td>
</tr>
<tr>
<td>5. Task Performance (T2)</td>
<td>2.05</td>
<td>1.05</td>
<td>-.24*</td>
<td>-.30**</td>
<td>.24*</td>
<td>.33**</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

Notes:
* p < .05, ** p < .01, *** p < .001

Below the Diagonal (T1) and above the Diagonal (T2). Diagonal between brackets correlation T1-T2.

Both positive and negative well-being scores decrease in T2. As expected, the two collective engagement scales are positively interrelated in T1 and T2, and negatively interrelated with the negative well-being scales. This is the case as well for the negative well-being scales (positively interrelated between themselves). Also as expected, task performance was positively related to collective vigor and dedication (T1 and T2), while it was negatively related to collective anxiety and depression.

**Hypothesis testing (Task Performance)**
In order to test the hypothesis, we analysed both time pressure (time pressure vs. no time pressure) and collective wellbeing (anxiety-depression and engagement) to predict task performance by a regression model (see table 2).

Table 2. Hierarchical Multiple Regression Analysis of Time Pressure and Collective Well-being on Task Performance (N=95)

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>R² change</th>
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<tbody>
<tr>
<td>1. Time pressure</td>
<td>-.75***</td>
<td>.135***</td>
</tr>
<tr>
<td>2. Collective anxiety</td>
<td>-.15</td>
<td>.100**</td>
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<tr>
<td>Collective depression</td>
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<td></td>
</tr>
<tr>
<td>3. Collective vigor</td>
<td>-.41</td>
<td>.116</td>
</tr>
<tr>
<td>Collective dedication</td>
<td>.63*</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>6.50***</td>
<td></td>
</tr>
</tbody>
</table>

Note: the β values are the coefficients from the final stage of the regression analysis; due to rounding off, R² differs .01 from the sum of R² change

Overall, hypothesis 1 was supported while hypothesis 2 was only partially supported. In this sense, there was a significant negative relationship between time pressure and task performance (higher time pressure, lower task performance; β=.75***). Groups working without time pressure performed significantly better (M=2.5) than groups working under time pressure (M=1.73). On the other hand, and despite the fact that the model in general is not significant per se when adding the collective burnout variables (step 3 in the regression analysis), only one positive aspect of collective well-being (dedication) was positively related to task performance (β=.63*).

**Discussion**
This study explored the relationship between a main job characteristic (job pressure) and an affective state (subjective wellbeing) on a work behaviour (task performance) in e-groups using ICT (chat). Results show that both, the job demand (time pressure) and the affective well-being predict the group task performance, although in the latter, only one positive dimension of the collective well-being (dedication) showed enough power.

**Theoretical implications**
Our research contributes to the literature on time pressure as a powerful ‘demanding’ factor in electronic groups. The current study confirms the detrimental relationship of time pressure on electronic groups. An important relationship of time pressure with task performance was found. E-groups working under time pressure performed worse on their task compared
to groups working without time pressure. Similar results were found in other studies (see Davis, 1969; Karau & Kelly, 1992; Kelly & McGrath, 1985; Yukl et al., 1976). Besides, it is relevant to stress the main role of the positive aspect of collective well-being (i.e., dedication) when predicting task performance. This trend toward the positive psychology is reinforced, as well as the importance of collective measures when studying groups.

Practical implications
Research suggest some advantages when implementing group communication systems in the workplace, for example, these synchronous electronic systems make groups work with more flexibility and autonomy. However, we should keep in mind some troubles as well. A main conclusion of this study is that introducing new group communication systems in working groups may have detrimental effects on task performance, especially when groups are working under time pressure and show a low level of dedication at work.

Limitations and future research
In the current experimental study we used a longitudinal design with self-report (i.e. collective anxiety and depression, collective engagement) and objective measures (i.e. task performance) in order to test the hypothesis. However, there are limitations. For example, we used participants who were not ‘real’ employees in ‘real’ organisations. Also, it is important to keep in mind that there were only 18 groups in the study with the limitation of statistical power. In addition, participants were mainly young women. So far, results obtained in this study must be tested in future research with a larger ‘real’ employees' sample working in ‘real’ organizations, with other kinds of group communication systems (e.g. computer supported cooperative work –CSCW), including participants of both gender and from different age groups. Furthermore, the research design has not considered individual moderator effects. Previous research (e.g., Salanova et al., 2001) showed the key moderating role of perceived collective efficacy between group communication system (i.e., chat vs. face-to-face) and time pressure on collective well-being (i.e., anxiety and engagement) and task performance. More complex design experiments are then needed.

References
Garst, F., Frese & Molenaar, 2000
As a way of managing and obtaining a balanced communication pattern, the profession of public relations has a significant role in all areas in our lives. Beyond having differentiated definitions, Public Relations (PR) is being continuously divided into many specific branches and application areas day by day. While being directly contacted to public relations applications dealing with its communicative context, “Health Communications” is an emerging field of interest and also interdisciplinary study especially in Turkey. Furthermore it will be the right point of view that health communications is in fact one of the functional serving areas of both PR and social marketing.

As mentioned in the official web site of the Health Communication Division of the National Communication Association, the application of health communications addresses questions germane to interaction about human health. Public health campaigns, client-provider interactions as in the marketing mix function, social marketing perfectives and applications, cultural constructions, health journalism and Media, environmentally risk factors, insurance, and governmental health organizations are just few topics considered under the rubric of health communications.

As a rapidly developing country in Turkey, the role of public relations as in ‘Healthcare PR’ within the framework of social marketing issues, is to build a information bridge between any organization and its various target audiences such as patients, clients, healthcare personnel, suppliers, the public, stakeholders and the government in healthcare system in the Country. Furthermore PR is accepted as a way of managing media relations effectively and purposely. In this paper it is aimed at focusing PR’s ability of communication and also combining it with other related integrated marketing communication areas such as social marketing, crisis management healthcare communication activities within the Turkish perfective and recent applications and examples supported them in the same respect.
Cross-fertilization after a Merger? An Experience Sampling Study of Creative Experiences in Heterogeneous Interactions

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2 Department of Psychology, Lund University, Sweden

Introduction
A merger of two organizations implies a meeting between two organizational cultures. The cultures manifest themselves ‘in the way things get done in the organization’, the way in which people interact, the norms, dominant values espoused etc. (Cartwright & Cooper, 1996). During the integration process following a merger, work styles and different ideas that employees from the two original organizations have, come together. If handled in the right way, which often is not the case, this process may be creative and innovative potentially (Devine & Lammiman, 2000). The purpose of the present study was to examine activities, interactions and creative experiences as exemplified in a work group within a newly merged Social Insurance organization in Sweden

Flow model
The operationalization of creativity in this study is partly based on the flow model (Csikszentmihalyi & LeFevre, 1989; Moneta & Csikszentmihalyi, 1996). This model postulates that subjective experience is a function of two variables: (a) the perceived challenge or intrinsic demands of an activity; and (b) the perceived skills or self-perceived capacity to meet demands. The balance of those two variables defines four contexts: (1) the flow context, when both challenge and skills are perceived to be high; (2) the anxiety context, when challenges are perceived to be greater than skills; (3) the boredom context, when skills are perceived to be greater than challenges; and, (4) the apathy context, when both challenges and skills are perceived to be low. By employing a twofold dynamic people seek conditions under which they can experience flow (Moneta & Csikszentmihalyi, 1996). In an anxiety context where challenges are perceived greater than skills a person will try to balance by learning new skills. By contrast in the context of a boring situation a person may try to balance by seeking more challenging activities. When both challenges and skills are high, as in the flow context, the person will stretch his or her capabilities and increase personal complexity (Csikszentmihalyi & LeFevre, 1989).

Experience Sampling Method
The Experience Sampling Method (ESM) has been used to study flow by, for example, Csikszentmihalyi & LeFevre (1989) following adults at work and leisure. ESM has also been used in the work place to examine mood and task perception (Alliger & Williams, 1993), to investigate how peoples’ mood at work are linked to the mood of their teammates (Totterdell, Kellett, Teuchmann & Briner, 1998) and work-family conflict (Williams, Suls, Alliger, Learner & Wan, 1991). The general purpose of ESM is to study peoples’ subjective experiences and behavior in natural environments to ensure ecological validity (Csikszentmihalyi & Larson, 1987). ESM is especially useful for the study of person-situation interaction. Data are gathered randomly, using a signal device and a form that the participants fill out directly when signaled. The

References
http://www.healthcomm.com
http://www.basin.saglik.gov.tr (official website of Turkish Healthcare Ministry)
http://sla.purdue.edu/healthcomm
http://www.foundation.novartis.com
http://www.hcri.com
www.prsa.org (health division)
http://www.vscc.cc.tn.us/academic/humanities/com100
participants are asked to report both external dimensions as time, location, companionship, and activity and internal dimensions focusing on emotion, motivation, and cognitive efficiency (Kubey, Larson & Csikszentmihalyi, 1996).

Creative Experiences
Efforts have been made to relate the balance of challenge and skill to the quality of subjective experiences (Csikszentmihalyi & LeFevre, 1989; Moneta & Csikszentmihalyi, 1996). Four dimensions: affect, potency, cognitive efficiency, and motivations have been used to assess the quality of experience. The operationalizations of the dimensions, the number of variables used and the results differ in these studies. A second purpose of this study was to explore and test a scale that captures creative experiences in the situation. The scale should consist of as few variables as possible, in order to be quick to answer, but at the same time cover cognitive, affective, arousal and motivational aspects. The variables were chosen on the basis of the results from Moneta and Csikszentmihalyi (1996), from an experience sampling study of flow in police work (Brenner & Trued, 1998) and from a critical incidence study of job-related experience among managers in public dental service (Franzén & Brenner, 1999). To operationalize creative experiences in this study the variables concentrated, inventive, interested, imaginative and involved were used.

The questions addressed in the present study was: How frequent are heterogeneous interactions compared to homogeneous and to other interactions? Which activities are associated with heterogeneous interactions? How does the balance of challenge and skill and creative experiences in heterogeneous interactions compare to other activities and interactions and relate to organizational background?

Method
A work group in a merged regional organization within the Social Insurance Service in Sweden was studied nine month after a merger. 22 employees, 12 female and 10 male, worked in the group and one of them was coordinator of the group. The work was organized in a self-directed way with no head but three experts in different insurance areas associated with the group. The group was composed of 15 members from the Old(a)-organization and 7 members from the Old(b)-organization. The 22 members of the work group were between 42 and 61 years old (M = 49). Their length of employment in the organization varied from 9 to 38 years (M = 24). Most of the group members had some academic education, some of them having attained university degrees.

A two-week work period with as “normal” activities as possible was chosen for the study. Each participant was given a Casio DBC wristwatch programmed to send signals randomly five times a day with no two signals presented within 30 min of each other. The signal schedules were different for each participant for each day. The participants were also given response forms to fill out when signaled. The response form took less than one minute to fill out. The participants were signaled 1100 times during the two-weeks. 65 signals were not answered in agreement with the researcher, because of activities not suited for the purpose, mainly vacations and conferences. Of the remaining signals 82.1 per cent were answered within 30 minutes. Observations indicating that participants were engaged in activities not related to work (e.g. coffee break, lunch, transport, private conversation) were excluded.

The ESM form contained items measuring participants’ current activities, companionships, perceived challenges, perceived skills and creative experience. All analyses were carried out at an observational level using individual z score. Confirmatory Factor Analysis with LISREL was conducted with the purpose to develop a scale measuring creative experiences in the situation.

Results
The distribution of interactions among observations is, because of the randomly signal schedules, statistically representative of all interactions during the two study weeks. In total 14.2 per cent of the interactions were homogeneous, 14.3 per cent were heterogeneous, 25.9 per cent consisted of a single study-participant and external, and in 45.6 per cent of the time the study-participant was single.

The distribution of activities among heterogeneous interactions was: meeting 54.3 per cent, general discussion 31.9 per cent, inform/teach 5.3 per cent, case discussion 4.3 per cent, seeking information 3.2 per cent, and handle a case/comment 1.1 per cent.

Heterogeneous interactions had less proportion of time in flow context than all other categories of interaction, see Table 1.
Confirmatory Factor Analysis with LISREL was performed in two steps to explore and test a model of creative experiences in the situation. The results showed that the model that fitted data best included the variables concentrated, interested, imaginative and involved, with $X^2(2, n = 406) = .67, p = .71$ and RMSEA = .00, and that model was used for further analyses of creative experience. The Mean for creative experience (see Figure 1) was significantly lower in heterogeneous interactions compared to homogenous interactions and situations with single study-participant and external ($p < .001$).

Creative experiences were lowest in heterogeneous interactions for participants from both the Old(a)- and the Old(b)-organization and there were no significant differences between the two groups in any category of interaction. There was a significant mean difference in creative experience in meetings between the Old(a)- and the Old(b)-participants ($p<.05$). The Old(b)-participants had less creative experiences than the Old(a)-participants had. There was however, no significant mean difference in creative experiences between Old(a)- and Old(b)-participants in heterogeneous meetings. To examine if there also was any difference in balance of challenge and skill in meetings, differences between the Old(a)- and the Old(b)-participants were tested with chi-square. For heterogeneous meetings ($N = 50$) a significant difference ($X^2 = 4.39; df = 1, p < .05$) was found in the anxiety context. The Old(b)-participants spent a higher proportion of time in anxiety context than the Old(a)-participants.

**Conclusions**

Two conclusions could be drawn from these results. Firstly, the integration is incomplete nine months after the merger, which depends mainly on low interaction frequency between employees from the two original organizations. Even if a great
proportion of the heterogeneous interactions were spontaneous general discussions in daily work, they represent only one quarter of the total general discussions. The largest proportion of time Old(a)- and Old(b)-employees met was in formalized meetings. An explanation was that the group was organized in four function groups. In recruiting employees, the three experts had chosen people they knew previously from their old organization, this resulted in one-sided subgroups. This organization also implies a more traditional work style and less project work, where employees from different backgrounds have an opportunity to meet.

Secondly, there seems to be an imbalance in influence from the two original organizations in the new merged work group. The Old(a)-organization was bigger and it dominated in terms of number of employees in the new merged organization. The arena for this imbalance was formalized meetings where the Old(b)-employees had more of the anxiety context than the Old(a)-employees. Employees’ interpretation of the two organizational cultures before the merger could offer an explanation of this imbalance. The Old(a)-organization was interpreted, by employees from both organizations, as having a more cold, hard, individualistic and egoistic climate than the Old(b)-organization (Dackert, 2001). The Old(a)-organization was also interpreted to be more active and efficient than the Old(b)-organization.

To summarize the creative potential was not realized in the newly merged work group in this study. The heterogeneous interactions showed less flow contexts and less creative experiences, as compared to other interactions. One important reason for this is likely to be uncompleted integration of employees and the imbalance in numbers and the influence of organizational culture from the original organizations. An integration strategy focusing on integration in the daily work after the merger is needed in order to realize the creative potential.

References
Introduction

Computer technology and its applications within the industrial domain are constantly growing and sometimes generate problems. One of these problems concern the relationship between the user and the computer interactive systems, such as process control interfaces. Although computer-based workplaces tend to reduce physical workload, their cognitive requirements are more demanding. In control-focused and supervision-focused workplaces the changes in cognitive requirements becomes most evident - information interchange and decision making being the primary activities of such environments. These cognitive demands result in operator mental workload. The resulting mental strain produces fatigue and occasionally performance alterations that eventually result in system disturbances and accidents. Optimizing interaction would serve to improve operator well-being and system effectiveness.

There are two main difficulties in mental workload research in control processes. First, there is no one procedure that is generally accepted in cognitive workload assessments. Furthermore, it is assumed that mental workload has to be assessed through many indicators including those to do with subjective workload estimates.

The second problem source is the complexity of behavior with which we are concerned. Performance-based assessment procedures assume that mental workload has an assessable effect on execution, however such a general statement carries with it important restrictions/implications (Rubio and Díaz, 2000). Furthermore, dynamic systems control is a complex activity that can hardly be reduced to directly observable behavior (Díaz and Ponsa 2001).

It seems necessary to define procedures in mental workload assessment that complement the precision of laboratory experimentation with the representativeness in field research (Rassmussen, 1993). The simulated task in this experimental study that belongs to a broader research in work analysis (Díaz and Ponsa 2000; Díaz and Ponsa 2001), is the control of a dynamic interactive system called micro-world. The micro-world tends to reproduce the demands on perception, information processing and decision making operators meet when interacting with actual control interfaces (Howe and Vicente, 1998). The state of the system during execution simultaneously depends upon the subject's behavior and upon autonomous evolution in an object-event-action scheme (Brehmer et al, 1991).

Some conditions of control process workplace design are especially contributory to mental stress and its effects such as behavior alterations and fatigue. One of these conditions are instructions. The main issue of this paper is to explore how much demand different instructions exhibit upon operators' mental resources and how these different assignments affect mental workload. Another objective of this study is to neutralize the possible influence of the personality variables. It has been scientifically proved that differences in personality (according to the PEN system - psychoticism, extroversion, neuroticism-) result in different performances in perception, control and learning tasks (Eysenck and Eysenck, 1989).

Method

Essentially, this work consisted of analyzing the activity of 31 electronic engineering students in a simulated control process interface. Their age ranged from 20 to 30 years and consisted mostly men. Students were distributed randomly and equally in three groups which corresponded to the three experimental conditions. They all performed a series of 20 trials in a simulated control process interface (micro-world) and then answered the NASA-TLX questionnaire. Finally they answered de EPQ-A questionnaire in order to control for personality variability.

The current version of micro-world that we are working on is a hydraulic system with five open tanks connected by pipes of diverse diameters controlled by valves (on/off). Both upper and bottom tanks have the same capacity. In the initial state all the water is inside the uppermost tank and the other four are empty. The goal is to move water from the uppermost tank to the bottommost one. The valve’s state (closed or open) is represented by a red or green color. Subjects operate the binary valves with the mouse.

The three different instructions were:

1. Moving water from the uppermost tank to the bottommost without overflow and as quick as possible (Fast and carefully condition, “F&C”)
2. Moving water from the top tank to the bottom tank without overflow (Carefully condition, “C”)
3. Moving water from the top tank to the bottom tank as quick as possible (Fast condition, “F”)

The main hypothesis was that different exigencies would result in varying performance and in differences in assessable mental workload. We assumed that in general, individuals try to accomplish the explicit requirements by adjusting their
behavior to the stated goal or goals in the instructions. Therefore, subjects in the Fast condition would be speed-oriented and subjects in carefully condition, accuracy-oriented.

With regard to mental workload, we expected that individuals in the Fast and carefully group would report higher mental workload. In this case conflicting goals would make subjects make a trade off between speed and accuracy. In the micro-world the actions that could increase speed (i.e. opening paths, letting the water fill the tanks) contribute to system instability and the risk of failure (overflowing). On the other hand, trying to be accurate implies a sacrifice of effectiveness. It was expected that subjects in Fast and Fast and carefully groups experience greater time pressure and thus higher scores on the NASA-TLX temporal demand subscale.

Results

Instructions and performance

We obtained a graphic representation of the three experimental groups (F&C= *, C = +, and F = o) distribution in relation to execution. On axis x is Total time (in seconds), and on axis y Overflow (number of overflowing episodes along the whole task) (Figure 1).

![Figure 1: Execution distribution](image)

As we expected, the subset of subjects in the Fast group show low values on Total time –all of them under 400 seconds- but in turn show more episodes of overflowing (Table 1).

<table>
<thead>
<tr>
<th></th>
<th>Total time</th>
<th>Overflow</th>
<th>Best Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>F&amp;C</td>
<td>400-410 *</td>
<td>300-500 *</td>
<td>15.8-19.2 *</td>
</tr>
<tr>
<td>C</td>
<td>300-500+681*</td>
<td>3-16</td>
<td>14.8-18.3</td>
</tr>
<tr>
<td>F</td>
<td>335-396</td>
<td>5-19</td>
<td>15.8-20.7+28.7*</td>
</tr>
</tbody>
</table>

*Outer cases

Table 1: Performance measures ranges for groups

From the ANOVA conducted, it can be seen that the means of Total time are very close between subjects assigned to F&C (mean=412.5 s.) and C (mean=437.6 s.), and higher than the Fast subjects’ performance (mean=362.3 s.) (Table 2). This difference is not statistically significant (F= 2.74; p= 0.09).

In relation to efficacy, measured here by the number of overflow episodes, subjects assigned to the Fast condition show more episodes of overflowing (mean=13.13) in comparison with the other two groups (means about 9.5) This difference is not statistically significant (F= 1.52; p= 0.24) (Table 2).

To sum up, subjects assigned to the Fast condition present a performance characterized by speed and poor accuracy, as previously expected. Subjects assigned to F&C and to C do not differ in speed nor in accuracy.
<table>
<thead>
<tr>
<th></th>
<th>Tt</th>
<th>Overf</th>
<th>Best T</th>
</tr>
</thead>
<tbody>
<tr>
<td>F&amp;C</td>
<td>Mean = 412.5</td>
<td>Mean = 9.83</td>
<td>Mean = 412.5</td>
</tr>
<tr>
<td></td>
<td>Sd = 19.13</td>
<td>Sd = 2.14</td>
<td>Sd = 19.13</td>
</tr>
<tr>
<td>C</td>
<td>Mean = 437.56</td>
<td>Mean = 9.44</td>
<td>Mean = 437.56</td>
</tr>
<tr>
<td></td>
<td>Sd = 102.34</td>
<td>Sd = 4.13</td>
<td>Sd = 102.34</td>
</tr>
<tr>
<td>F</td>
<td>Mean = 362.32</td>
<td>Mean = 13.13</td>
<td>Mean = 362.32</td>
</tr>
<tr>
<td></td>
<td>Sd = 23.34</td>
<td>Sd = 6.20</td>
<td>Sd = 23.34</td>
</tr>
</tbody>
</table>

Table 2: Summary of performance measures descriptives

We also examined the variable \textit{Best trial}, which measures the time in seconds of the quickest execution in one trial without overflowing. We explored two questions: 1) at which moment in the series of trials does this best execution appear and 2) to what extent instructions affect this variable.

### Table 3: Ratings on \textit{Best trial} for groups

If one were to take note when these best trials occur, one will notice that they appear mostly in the last trials (more than the 50% grouped in the last five trials). Hence, one might be led to consider a clear and foreseeable manifestation of learning effect. More noticeable are the cases of best trials found in the beginning of the activity (more than 25% up to the 6th trial). The \textit{Fast} group shows a more premature appearance of best trial (mean of \textit{Order} = 9.8) respect \textit{Fast and carefully} (mean = 13.6) and \textit{Carefully} (mean = 15.3) groups (Table 3).

While it is quite simple to decide which is the best trial and to rank them, it is more difficult decide who is the more efficient subject. The subjects that performed the quickest best trials are not the same ones that performed the best tasks taken as a whole (using global measures such as \textit{Total time} or \textit{Overflow} referred to in 20 trials).

### Instructions and mental workload

Overall scores are remarkably similar in the three groups (F&C = 11.4; C = 11.5 and F = 11.6). Nevertheless, the profiles of mental demand pertaining to the four subscales selected are quite different especially in interaction dimensions (effort and frustration) (Figure 2).
In terms of mental demand and temporal demand there are no significant differences between groups assigned to the three instructions ($F=0.51$, $p=0.60$ and $F=0.42$, $p=0.66$ respectively), probably due to the shortness of the task. On the other hand, instructions seem to affect frustration ($F=4.95$, $p=0.01$) and effort ($F= 3.06$, $p=0.06$). The condition that shows a lower level of effort is Carefully. In frustration, the Fast group shows higher average scores. In mental demand and temporal demand there are no significant differences between groups (Table 4).

<table>
<thead>
<tr>
<th></th>
<th>Os</th>
<th>Men</th>
<th>Temp</th>
<th>Eff</th>
<th>Frus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>F&amp;C</td>
<td>11.43</td>
<td>52.50</td>
<td>53.20</td>
<td>33.20</td>
<td>3.40</td>
</tr>
<tr>
<td></td>
<td>2.54</td>
<td>24.12</td>
<td>22.70</td>
<td>16.15</td>
<td>5.23</td>
</tr>
<tr>
<td>C</td>
<td>11.55</td>
<td>57.44</td>
<td>58.66</td>
<td>15.11</td>
<td>6.88</td>
</tr>
<tr>
<td></td>
<td>2.91</td>
<td>24.18</td>
<td>31.29</td>
<td>13.96</td>
<td>11.03</td>
</tr>
<tr>
<td>F</td>
<td>11.62</td>
<td>45.72</td>
<td>47.27</td>
<td>25.72</td>
<td>25.63</td>
</tr>
<tr>
<td></td>
<td>3.22</td>
<td>28.67</td>
<td>28.40</td>
<td>17.19</td>
<td>26.41</td>
</tr>
</tbody>
</table>

Table 4: Summary of NASA ratings (weighted scores) descriptives

**Mental workload and performance**

In the correlation analyses Best trial is the performance measure that presents a higher correlation with mental workload scores. The relationship, as expected, is negative, the faster the best execution, the higher the workload reported in terms of overall score ($r = -.584$), mental demand ($r = -.448$), temporal demand ($r = -.423$) and effort ($r = -.310$). On the other hand, the relationship with frustration is positive ($r = .527$).

The other performance measure related to workload dimensions is Overflow. The relationship, as expected, is negative in terms of overall score ($r = -.336$), mental demand ($r = -.385$), temporal demand ($r = -.216$) and effort ($r = -.274$), and positive for frustration ($r = .331$). On the other hand, the relationship between overflow and frustration is a direct one, the more overflowing episodes, the higher frustration ratings are (Table 5).

We can say that subjects that managed to obtain a low level of failures in the overall task and short times in their best trial experience higher mental workload, especially in the mental demand subscale, compared to those that obtained poorer results.

<table>
<thead>
<tr>
<th></th>
<th>Tt</th>
<th>Overf</th>
<th>Best Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Os</td>
<td>.067</td>
<td>-.336</td>
<td>-.584</td>
</tr>
<tr>
<td>Men</td>
<td>.294</td>
<td>-.385</td>
<td>-.448</td>
</tr>
<tr>
<td>Temp</td>
<td>.065</td>
<td>-.216</td>
<td>-.423</td>
</tr>
<tr>
<td>Eff</td>
<td>-.073</td>
<td>-.274</td>
<td>-.310</td>
</tr>
<tr>
<td>Frus</td>
<td>-.301</td>
<td>.331</td>
<td>.258</td>
</tr>
</tbody>
</table>

Table 5: Pearson correlation coefficients between NASA ratings and performance measures

**Instructions and personality**

In this case the results show that the groups distributed themselves homogeneously. There were no significant differences in the distribution of students in the groups. Another remarkable point was the important correlation between the neuroticism dimension and the global score at NASA-TLX ($r = -.33$).

**Conclusions**

To sum up, instructions seem to affect performance and discriminate between requirement of speed on the one hand and requirement for speed and accuracy, and accuracy on the other. Subjects confronted with only time pressure have better results in terms of time and poorer results in terms of accuracy. Subjects required to act quickly and accurately do not differ from the group where the demand for accuracy seemed to be spontaneously engaged to an unstated time goal.

With regard to mental workload, instructions affect effort and frustration but do not affect the overall mental workload index nor the mental demand and temporal demand subscales.

On the other hand, it is probable that the particular task design and/or the time feedback provided after every trial should counteract the foreseeable instruction effect and homogenize performance between groups. Then the three conditions of instructions, though different in explicit content are similarly interpreted in task context.

In view of these results, it is thought that further experimental design in micro-world should stress the differences between instructions and to avoid the homogenizing effect of temporal feedback.
With regard to the particularly scarce differences between groups in NASA-TLX scores, we point to the limitations of this scale to capture the load during such a brief task. In the current version of micro-world in which we are working on, the main component of mental workload is complexity of decision-making processes, as influenced however slightly by fatigue.

In relation to performance analyses, we have not found a unique satisfactory measure to classify integrating successful execution on one trial and in the whole task. Probably a wide set of different measures should be explored and selected according to their relevance in suitting particular purposes (learning skills, concentration capability, resistance to fatigue, reliability, reaction time etc).

A complementary line of research that might help to explain these results might be that the speed orientation or accuracy orientation effect induced by instructions would become more visible in a qualitative analysis focused on activity rather than results of execution times or failures. Perhaps the operational mode approach would prove to be more pertinent in capturing differences in complex activities like dynamic systems control processes (Díaz and Ponsa 2000; Díaz and Ponsa 2001).

References


The Association Between Working Full Time Or Part Time And Negative Work-Family Interaction For Specific Groups Of Employees

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Background

During the last decades several major societal developments have taken place in the Netherlands. Among the most important ones are an increase in reported (mental) work pressure (Kompier & de Jonge, 1997), and a shift in the composition of the labour force. The latter is a result of the growing number of women who are participating in the labour market (CBS, 2000). As a result of these developments, more and more employees are experiencing conflict between the demands that are posed upon them by their work, and the demands that are posed upon them by their family lives. This work-home conflict can be defined as a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible (Greenhaus & Beutell, 1985). In research concerning work-home conflict, working full
time or part time has frequently been studied as a possible antecedent, that is, part time work has often been assumed to be associated with less work-family conflict than full time work (Geurts & Demerouti, in press; Higgins, Duxbury & Johnson, 2000; Kinnunen & Mauno, 1998). However, as Barnett (1998) suggests in her review of work-family research, this assumption receives little empirical support. Among other things, she ascribes these counterintuitive results to a number of covariates which are confounded with hours on the job (e.g., age and marital status). Barnett (1998) concludes that the effect of working hours on work-family conflict should be studied for different groups of people who live under special conditions. Hence, our study is innovative in studying the association between working times and work-family conflict (1) for different groups of employees, (2) under different working conditions, and (3) under different family conditions.

**Theoretical Framework and Research Questions**

The core question of the current study is: “What is the association between working full time or part time and work-family conflict?”. This question has been systematically answered for male and female employees from the Dutch police force, working under specific family conditions (i.e., marital status or cohabiting and having care-giving responsibilities), and specific job conditions (i.e., work pressure and autonomy). A schematic representation of the research variables is given in figure 1 below.

![Figure 1. Graphic representation of the research variables (the numbers correspond to the research questions)](image)

**Theoretical Framework**

The theoretical framework of the current research consists mainly of the Effort-Recovery (E-R) Model (Meijman & Mulder, 1998; Meijman, 1989). The core assumption of this model is that working under a high work load and having insufficient resources to deal with it, is associated with the development of mental or emotional strains during the working period. This is not necessarily unhealthy, as long as one can recover sufficiently during the nonworking hours. However, when limited time and energy resources are further depleted due to high family demands, serious conflicts in fulfilling both work and family roles are likely to occur. On the basis of the E-R Model, Geurts and her colleagues (Geurts & Demerouti, in press; Geurts et al., 1999; Wagena & Geurts, 2000) have defined work-home conflict in terms of a negative interaction between the work and family domains, that is, a process in which one’s functioning (and behaviour) in one domain is hampered by demands from the other domain. The theoretical framework of the current study very well fits the Job Demand-Control (JD-C) Model (Karasek, 1979) which proposes that working environments consisting of high demands (i.e., the job requirements) and low control (or decision latitude) will lead to stress reactions. Based on the JD-C Model, the job conditions that have been selected in the present study are work pressure and autonomy. The family conditions (i.e., marital status or cohabiting, and having care-giving responsibilities) have been selected following previous work-family research, showing that unmarried employees experience more negative influence of home on work than employees who are married (CBS, 2000; Cook & Rousseau, 1984; Greenhaus & Beutell, 1985; Grzywacz & Marks, 2000), and that workers who have to take care of children experience more negative influence of home on work than employed men and women without care-giving responsibilities (Cook & Rousseau; Frone, in press; Greenhaus & Beutell; Grzywacz & Marks).

**Research Questions and Hypotheses**
1. What is the prevalence of negative work-home interaction among full and part time working men and women?
2. What is the relation between job conditions and negative influence of work on home among full and part time working men and women?
3. What is the relation between family conditions and negative influence of home on work among full and part time working men and women?

No hypothesis about the prevalence of negative work-home interaction among full and part time working employees will be made in advance, because the empirical findings on this relationship are still inconsistent. With respect to gender differences in negative work-home interaction, most studies show that men and women do not differ in their experience (Burke, 1988; Demerouti et al., 2001; Eagle et al., 1997; Frone, in press; Frone et al., 1992; Geurts & Demerouti, in press; Grzywacz & Marks, 2000; Kinnunen & Mauno, 1998; Kirchmeyer, 1993). Accordingly, we hypothesize that there will not be differences between the sexes on negative work-home interaction [Hypothesis 1].

According to the JD-C Model (Karasick, 1979) and the E-R Model (Meijman & Mulder, 1998; Meijman, 1989), high job demands that require too much effort (e.g., work overload) and job resources that are insufficient to support the fulfillment of job requirements (e.g., lack of autonomy) are associated with negative load effects, that cross-over and hamper one’s functioning in the family domain (i.e., negative influence of work on home). It is thus assumed that high job demands and a lack of autonomy will be related to more negative influence of work on home [Hypothesis 2a]. Following the E-R Model and the JD-C Model it is supposed that when much time is being spent under negative job conditions, which is the case for full timers working under high pressure and low autonomy, negative load effects will build up, to a larger extent than for part timers working under the same conditions, affecting the functioning at home. In a similar vein, full timers can be expected to benefit more from the positive aspects in their job (e.g., high autonomy) than part timers. According to this ‘exposure-hypothesis’, it is expected that full time workers will display a stronger positive relation of work pressure and lack of autonomy with negative influence of work on home, than part time workers [Hypothesis 2b].

Following earlier mentioned previous research (CBS, 2000; Cook & Rousseau, 1984; Greenhaus & Beutell, 1985; Grzywacz & Marks, 2000), it is assumed that employees who do not have a partner will experience more negative influence of home on work than the ones who do [Hypothesis 3a]. Furthermore, it is hypothesized that employees who have the care of home-living children will experience more negative influence of home on work than employees who do not have caregiving responsibilities (Cook & Rousseau; Frone, in press; Greenhaus & Beutell; Grzywacz & Marks) [Hypothesis 3b]. Following the assumptions of the E-R Model (Meijman & Mulder; Meijman), it is supposed that if employees are exposed much time to negative aspects in the home domain (i.e., the lack of a spouse, and child care responsibilities), which is more the case for part time workers than for full time workers, their functioning in the work domain will be hampered. In a similar vein, part timers can be expected to benefit more from the positive aspects in their family situation (e.g., having a spouse) than full timers. In line with the previous ‘exposure-hypothesis’ for the work situation, our expectation for the family situation is that part time employees will display a stronger positive relation of not having a partner and having caregiving responsibilities with negative influence of home on work, than full time workers [Hypothesis 3c].

Method

Data and Sample
The data for the current study have been collected in a study that Houtman et al. (2000) have executed among employees of the Dutch police force. From this sample we selected a subgroup consisting of 1,024 employees in administrative functions. We have chosen for this particular subgroup, because male and female employees in this job are better comparable with respect to the nature and level of their work than men and women in executive police jobs. On the average these respondents were 42 years old, 58 % of the employees was male and 42 % female, and 74 % worked full time and 26 % part time.

Measures: Full Time and Part Time
We have divided this variable as follows: Having a full time job (working 36 hours per week or more), and having a part time job (working 10-35 hours per week).

Measures: Job Conditions
- Work pressure: This scale has been selected from the NOVA-WEB questionnaire (Dhondt & Houtman, 1992; Houtman, Bloemhoff, Dhondt & Terwee, 1994). The total score on work pressure was acquired by calculating the mean of the scores on the five items. An example item is: “Do you have to work fast?”.
- Autonomy: Control has been measured by a subscale from the NOVA-WEBA consisting of nine items. The total scale score was represented by the mean of item-scores. An item was: “Can you decide for yourself in which manner you carry out your work?”.

Measures: Family Conditions
- Marital status: Employees were asked if they had a partner.
- Having care–giving responsibilities: Employees were asked if they had any home-living children.
Negative work-home interaction has been measured with the Survey Work-home Interaction Nijmegen (SWING) (Wagena & Geurts, 2000). Nine items measured the negative influence of work on home (WHI-). The total score was calculated by taking the mean of scores on the items, which yielded scores ranging from zero (i.e., low WHI-) to three (i.e., high WHI-). An example question is: “How often does it occur that you are irritable at home because your work is demanding?”. The negative influence of home on work (HWI-) was measured by six items. The total score was represented by the mean of item-scores, and ranged from zero (i.e., low HWI-) to three (i.e., high HWI-). An example item is: “How often does it occur that you have difficulty concentrating at work because you are worrying about affairs at home?”.

**Analytic Sequence**

The first hypothesis was tested using independent t-tests. The latter seven hypotheses were tested through ANOVA’s. When testing the relation of working hours per week and of each job condition (e.g., work pressure) with work-home interaction, the job condition that was not directly entered as fixed factor (e.g., autonomy), was inserted as a covariate. In order to compare the relations between the different conditions and negative work-home interaction for men and women, we have split up the sample on the basis of gender.

**Results**

**Prevalence of Negative Work-Home Interaction**

The full time working employees experienced more WHI- than the part timers, that is, M = 1.8 against M = 1.5 (t (590) = -2.5, p < 0.05) for the men and M = 1.7 against M = 1.5 (t (422) = -4.0, p < 0.001) for the women. No gender differences in the prevalence of negative work-home interaction were found. This is in accordance with our hypothesis (1).

**Relation Between Job Conditions and Negative Work-Home Interaction**

**Men.**

- **Work pressure.** A main effect of work pressure has been found (F (1, 590) = 25.2, p < 0.001); men with higher work pressure experienced more WHI- than men with lower work pressure. This result supports our hypothesis (2a).

- **Autonomy.** An interaction effect of autonomy with working hours has been found (F (1, 590) = 8.1, p < 0.01); men who worked full time and experienced low autonomy reported more WHI- than full time working men who experienced high autonomy. For part time working men no significant difference in reported WHI- as a function of the level of autonomy, has been found. This supports our hypothesis (2b). An interaction effect of autonomy and working hours has also been found on WHI- (F (1, 589) = 4.5, p < 0.05); between full and part time working men with high autonomy, no difference in experienced HWI- has been found, but full timers with low autonomy reported more HWI- than part timers with low autonomy.

**Women.**

- **Work pressure.** A main effect of work pressure (F (1, 423) = 67.9, p < 0.001) on WHI- has been found for the women: The women who experienced more work pressure had higher WHI- than those with less work pressure. This result is in accordance with our hypothesis (2a).

- **Autonomy.** On HWI- a main effect of autonomy has been found (F (1, 423) = 5.4, p < 0.05). Women with low autonomy experienced more HWI- than women with high autonomy. Also, an interaction effect of autonomy with working hours on HWI- has been found (F (1, 423) = 8.9, p < 0.01); full time working women experienced more HWI- than part time working women at low autonomy (at high autonomy no substantial difference between full and part timers in experienced WHI- was found).

**Relation Between Family Conditions and Negative Home-Work Interaction**

**Men.**

- **Marital status.** No effects of marital status on HWI- have been found.

- **Care-giving responsibilities.** A main effect of the care for children on HWI- was found (F (1, 583) = 5.9, p < 0.05); men who had to take care of children experienced more HWI- than men without children. This supports our hypothesis (3b). Also, an interaction effect of having care-giving responsibilities with working hours has been found (F (1, 583) = 4.4, p < 0.05); Part time working men with children experienced more HWI- than part timers without children, while having care-giving responsibilities had no relation with HWI- for the full timers. This supports our hypothesis (3c). Furthermore, a main effect has been found of care-giving responsibilities (F (1, 584) = 5.8, p < 0.05) on negative influence in the other direction (WHI-). Men with care-giving responsibilities reported more WHI- than men without children. Finally, an interaction effect on WHI- has been found (F (1, 584) = 5.5, p < 0.05); while the reported WHI- did not differ in relation to care-giving responsibilities for the full timers, part time working men with children experienced more WHI- than part timers without children.

**Women.**
- Marital status. For the women a main effect of marital status on HWI- has been found (F (1, 421) = 7.2, p = 0.001); women who were not married experienced more HWI- than married women. This is in accordance with our hypothesis (3a).
- Care-giving responsibilities. No effects of the care for home-living children have been found.

Conclusions and Discussion

1. It became clear that the full timers of the current sample experienced more WHI- (negative influence of work on home) than the part timers. The most obvious explanation for this result is that the amount of time that is occupied by the job is one of the most salient ways in which working life can affect private life. No significant gender differences in the prevalence of negative work-home interaction have been found.
2. High work pressure was associated with high WHI-, for both men and women.
3. Only for men did working hours moderate the relationship between autonomy and negative work-home influence; men who worked full time and experienced low autonomy reported more WHI- than full time working men who experienced high autonomy, while part time working men displayed no significant difference in reported WHI- as a function of the level of autonomy. This finding is in line with our ‘exposure-hypothesis’ that full timers benefit more from high autonomy in their job than part timers. An explanation for the fact that this hypothesis was only supported for the men might be that among women of this sample the level of job autonomy is low for both the full and part timers. Thus, full time working women cannot benefit more from positive job conditions (e.g. high autonomy) than part time working women, since this condition is not there for them at all.
4. Not having a partner was, as was expected, related to high HWI-, but only for the women. And having care-giving responsibilities was positively associated with high HWI-, but only for the men. The former result could be explained by the fact that most of the women in this sample are working part time, while most of the men are working full time. The part timers (women) would, following our ‘exposure-hypothesis’, be expected to experience more HWI- than the full timers (men) when they do not have a partner, since they spend more time at home. The latter result could be explained by the observation that the men of this particular sample are on the average seven years older than the women and consequently have more children to take care of.
5. Working hours moderated the relationship between having care-giving responsibilities and negative work-home interaction for the men. Part time working men with children experienced more HWI- and more WHI- than part timers without children, while having care-giving responsibilities had no relation with HWI- and WHI- for the full timers. This finding is also in line with our ‘exposure-hypothesis’ that the effect of demanding family conditions (e.g., having high care responsibilities) is most unfavourable for those who spend most time at home, that is, part timers. An explanation for the fact that this hypothesis was only supported for the men might again be that, on average, the women of the current sample are younger and have less children than their older male colleagues. Thus, the childcare activities might be less demanding for (both part time and full time working) women than for men. Consequently, the ‘exposure-hypothesis’ is less valid for women than for men.

We believe the current research is innovative, because it attempted to measure the association between working hours and negative work-family interaction for different groups, under different working conditions, and under different family conditions. In general, the results show that the impact of (un)favourable job and home conditions on the work-home balance is quite similar for part timers and full timers, as well as for men and women. There are, however, two exceptions that support our ‘exposure-hypothesis’. First, full timers seem to benefit more from autonomy in their job in terms of their work-home balance than part timers (only supported for men). Second, part timers seem to be hampered more in their work-home balance by having care-giving responsibilities than full timers (only supported for men). In spite of these interesting results, this study should be replicated with samples from other professions, using a longitudinal design.

References

Assessment of coping flexibility of young adults in a population based study - the Flex-method revised

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Background
Modern workers are required to adapt quickly and creatively to new challenges. This is one reason why flexible coping constitutes an important aspect of work competence. Coping refers to the human ability to deal with situational demands by using personal, interpersonal and social resources (Lazarus & Folkman 1984, Latack 1986). But some controversy exists concerning the effectiveness of various coping strategies in occupational stress situations (Stone 1985). An active, problem-focused, strategy (attempting to alter the stressful situation directly) has been considered to be more effective in reducing stress than an emotion-focused strategy (attempting to regulate the emotional responses to stress). On the other hand, situational changeability and broad coping flexibility has also been found to be important (Sarason et al. 1990).

Earlier studies have focused on the coping strategies of individuals suffering from long-term illnesses or other life problems, such as unemployment. It is also important to investigate coping strategies for stress that benefit well-being in a normal young adult population.
**Objective of the present study**

In the North Finland birth cohort 1966 - study, the Flex-method (Lester et al. 1994) of measuring coping flexibility was revised and evaluated. The aim of the study was to evaluate the usefulness of the Flex-method for assessing coping flexibility as well as for assessing coping patterns in general.

The method was modified to fit conceptually to the framework presented by Folkman and Lazarus (1984). The Flex is a card sorting procedure in which subjects indicate how they would cope with specific situations by placing cards containing descriptions of various coping options into a matrix of categories ranging from “most like me” to “least like me” (numerical values range from -3 to 3). Flexibility of coping is determined by calculating the mean range of movement of each card across different situations.

**Material and Methods**

The Northern Finland birth cohort consists of all women and men born in 1966 in two northern provinces of Finland. The design of the cohort study and the cohort data have been described previously (Rantakallio 1969, 1988). The cohort members were followed up at 1, 14 and 31 years. The most recent follow-up, at 31 years when 11,637 subjects were alive, took place in 1997-1998 and included either a postal questionnaire or a clinical examination, or both. The present study is based on those who participated in postal inquiry, clinical examination and an interview concerning psychosocial resources at work at the age of 31 years.

A modification of Flex (Lester et al. 1994) was administered to 142 subjects. The study group consisted of 75 men and 67 women all aged 31 years. The Flex consists of 20 cards describing various ways in which people cope. In the previous version of the Flex subjects were provided with four common stress scenarios, two of which were social situations and the other two were unsocial situations. In the present study, the Flex was modified so that subjects responded to three common stress situations: 1) being out of money (a practical situation, where problem-oriented coping is expected), 2) depressed or sleepless (an inner state, which is expected to elicit emotion-focused coping), and 3) having an argument with a friend (a human relations problem, which is expected to elicit evaluative coping).

**Results**

Scores on the Flex ranged from 0.57 to 2.10 with a median range score of 1.37. No gender differences in flexibility were observed. Coping differed most markedly in situation 2) compared to the other two situations along the lines of hypothesis stated. Factor analysis of the 20 cards yielded no clear factor solution.

**Conclusions**

This instrument provides a dynamic method of assessing coping over several different situations. It could also be a valuable instrument in assessing coping in specific situations e.g. in clinical setting. For assessing overall coping patterns there seems to be more efficient methods available.

**References**


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**Working Hours and Health in Flexible Work Arrangements**

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**Introduction**

The objective of this paper, which is mainly explorative in nature, is to shed some light on the impact of flexible working conditions on well being and health. However, the term “flexibility” itself is ambiguous and needs conceptual clarification.
traditional, centralised workplaces (e.g. in
rest periods are important for wellbeing and health. Health risks of repeatedly occurring non predictable overtimes,
This may negatively impact on the workers´ total suppor ily support and support from colleagues) and thus
jeopardize their health.

They may often tend to work long hours without making regular breaks, particularly when there are deadlines to meet.
Moreover, there are no legal restrictions on working hours for freelance workers, who are paid for work accomplished and not for time spent. In terms of the demand-control-support model, many flexible workers “face increasingly excessive demands, with increasing work hours and demands to be available round the clock, often far from home “ (Theorell, 1997).
This may negatively impact on the workers’ total support system (i.e., family support and support from colleagues) and thus jeopardize their health.

Besides the duration of working time mainly the distribution of working time across the day including breaks and
rest periods are important for wellbeing and health. Health risks of repeatedly occurring non predictable overtimes,
uncontrolled time schedules of work during night or at weekends might be an effect of a market-driven flexibility. Outside
traditional, centralised workplaces (e.g. in the case of home-based teleworking) there is no control of workplace regulations
with the risk of overload due to long working hours without adequate breaks and recovery.

On the whole, the shift from “standard” working conditions to flexible working – often in the form of self-
employment - will be accompanied by a shift of responsibilities from the (former) employer to the worker himself. The
question of work-life balance is of specific importance in this context.

The present study was conducted in co-operation between the Federal Institute for Occupational Safety and Health
and the union of media workers in Germany. It is the first study of this kind in Germany and serves scientific and practical
purposes as well. On the other hand, we want to make contributions to the scientific discussion on “flexibility and health”, on
the other hand, the project aims at developing guidelines for “healthy working” under the conditions of flexibility.

Methods

The data were gathered on the basis of a modified version of the questionnaire “Health at the VDU workplace – Gesundheit
am Bildschirmarbeitsplatz” (GESBI) (Ertel, Junghanns & Ullsperger, 1994) which was specified in co-operation between
our research group and representatives of the union of media workers in Munich (Germany). The study has a longitudinal
design; the first wave of the data collection was completed in November 1998. The results presented in this paper were
derived from the first wave of the study.

The questionnaires were administered to freelancing teleworkers, who are members of that union. Two weeks
before the questionnaires were sent to the freelancers, preliminary information on the project was given in order to inform
the participants in advance. Nevertheless, the response rate amounted to only 15% which highlights the real “challenge”
researchers face when trying to access a “dispersed” workforce (with no central workplaces, no regulations of working
time). Of the 210 questionnaires returned, 52% were from women and 48% from men. 90% of the respondents had high
school or university diploma.

Taken from questionnaires, the data represent the self-assessment of the work situation and related issues by the
respondents. This approach certainly has limits but it is the only way of receiving a detailed description of this population in
an area where “expert ratings” are impossible to conduct.

Quantitative data were analysed by using bivariate and multivariate methods including the Chi-squared Automatic
Interaction Detector (CHAID). This method divides the sample into distinct groups based on categories of the „best“
predictor of a dependent variable. It splits each of these groups into smaller subgroups based on other predictor variables,
until no more statistically significant predictors can be found. The subgroups that CHAID derives are mutually exclusive
and exhaustive, that is, subgroups do not overlap, and each case is contained only in one subgroup (Magidson, 1993).

Results

One the one hand, the data demonstrated that the freelancers have a relatively high degree of control over their work process
(e.g., 91% task variety, 81% challenging job, 78% learning opportunities). There are, however, factors that constrain the
individual flexibility experienced by the freelancers (cp., Sennett's (1998) description of an employee's experience in an
advertising company: „She felt constantly on trial, yet she never knew exactly where she stood. There were no objective
measures which applied to doing a good job“). In particular, job or work ambiguity is a characteristic feature of their work
situation as performance criteria or criteria for client satisfaction of the products they deliver are not precisely defined (71%
fluctuations in the amount of work, 72% demands for high performance coupled with tight deadlines). Due to this high level of client-induced uncertainty concerning the desired output in conjunction with high competition on the media market for freelancing workers, we expected that freelancers would be working comparatively longer than the “standard values” of 40 hours per week. The average weekly working time of the freelancers amounted to 47 hours, with 63% of freelancers working over 40 hours and 25% of freelancers working over 60 hours per week. Quite remarkably, 75% of freelancers reported that they did not register their working time (before they were asked to do so for the questionnaire). In order to relate our findings to the discussion on the quality of work life (Karasek & Theorell, 1990), we analysed in a first step the relation of working time (i.e., weekly working hours) to the following indicators of work life quality:

- psychological demands
- work-life balance
- disturbed relaxation ability.

The indicator Disturbed Relaxation Ability relates working conditions and personality characteristics to health outcomes. It is a behaviour pattern that mediates between external stressors and individual symptoms of stress. Being correlated with elevated blood pressure and with delayed recovery of stress-related physiological parameters, Disturbed Relaxation Ability predicts severe long-term stress outcomes, e.g., coronary heart disease (Richter, 1994). The scale with 4 categories (I agree very much/I agree a little/ I disagree a little/ I disagree very much) was constructed from the following 6 items which were translated from the original German version (Rothweiler et. al., 1994).

1. My work sometimes gets me going to such an extent that I can’t bring myself to stop.
2. I often have trouble falling asleep because problems in my job keep going through my mind.
3. Time and time again I find it difficult to find the time for my personal needs (e.g., haircut)
4. Even on holiday I find myself spending time thinking about problems in my job.
5. I often put so much effort in my work that I feel I will never be able to carry on like that for the rest of my life.
6. I find it difficult to switch off after work.

Figure 1 shows the relative incidence of the three indicators of work life quality in relation to working hours per week. There are significant correlations between the duration of working hours per week and the incidence of high psychological demands (second column). Long working hours also negatively impact on the work-life balance (third column) and show a positive correlation with the occurrence of Disturbed Relaxation Ability (fourth column).

We now turn to the predictors of Disturbed Relaxation Ability (occurring in 34% of all respondents) in greater detail. The exploratory analysis performed by CHAID identifies the highest risk for disturbed relaxation ability (64%) among those freelancers whose work situation is characterised by long working hours (> 45 hours per week) in conjunction with constant pressure for high performance (taken as an indicator for high work intensity). Conversely, freelancers who work less than 45 hours per week and at the same time only occasionally experience pressure for high performance, have the lowest incidence of disturbed relaxation ability (7%).
The following analysis is based on the assumption that the freelancers have flexibility over the timing of their work activities and their work rhythm (including rest breaks and vacation). With respect to potential health effects (e.g., in the context of Disturbed Relaxation Ability) this autonomy might serve as a counteracting factor to stressors such as long working hours and high psychological demands. Therefore, we entered into the CHAID-model variables of short-term and long-term recreation, i.e., rest breaks, referring to the micro-structure of the work process and vacation, referring to the macro-structure of the work process. The results obtained show some interesting interactive effects between the duration of working hours and rest breaks and vacation (explaining the incidence of disturbed relaxation ability). There are cumulative effects of long working hours (> 45 hours) and insufficient rest breaks resulting in the highest incidence of disturbed relaxation ability (65%). On the other hand, for the subgroup with respectively shorter working hours (≤ 45 hours), the sufficiency of vacation represents an important differentiating factor with regard to the occurrence of work strain.

![Figure 2: Predictors of disturbed relaxation ability: Working hours per week and Pressure for high performance (significant separation of subgroups by CHAID; p < .05)](image)

Discussion and Conclusion

The intention of this paper was to contribute to the longstanding discussion on working time and health (e.g., Van der Hulst and Veldhoven, 2001). While rooted in that tradition, we tried to add some insights which may be of scientific interest as well as of practical use. It was demonstrated that it is a useful approach to differentiate between the quantitative and the
qualitative dimensions of working time (duration and intensity) and that the incidence of work strain is significantly influenced by the interaction between working hours, rest periods and vacation. Particularly the latter aspects seem to be underresearched: Harrington (1994) stated that virtually no work has been done on the influence of rest periods on health and that no substantive research has looked at holiday periods or work on Sundays. In terms of the mechanisms that explain the relationship between working hours and health, further research is needed. Van der Hulst and Veldhoven (2001) resume research results as follows:
- Duration of effort investment is prolonged and time left for recovery is shortened (insufficient recovery and accumulation of fatigue)
- Increased duration of exposure to negative work characteristics (e.g., poor ergonomic design of workplace, noise, vibration, etc.)
- Unhealthy coping behaviour: smoking, consumption of coffee and alcohol.

Stark et al. (1998) could show that in case of permanent long working hours of more than 48 hours per week the risk of myocardial infarction was significantly increased. Triemer and Rau (2001) described detrimental effects of long working hours on sleep and the nocturnal blood pressure regulation.

From a methodological point of view it must be conceded that because of the cross-sectional nature of this study and the low turnout, the present results have to be interpreted cautiously. However, as was pointed out by Rantanen (1999), it is a general problem of epidemiological research that due to the increasing flexibility and mobility in worklife, baselines such as stable workplaces and stable expositions, secure employment, the “regular monitoring of the work environment and health becomes discontinuous...”. For this purpose, appropriate indicators and appropriate methods are needed. Another important point must be added. As was mentioned in the debate on telework, the notion of working time itself becomes blurred. As is the case with teleworkers, the experience of freelancers (mostly home-based workers) may provide a challenge to traditional definitions of work. Whereas traditional work “has been defined in terms of the times within which it is done, rather than output” (Mirchandani, 1998), freelancers have to plan and measure their work by output than by presence in the workplace. This also means that the concept of “absenteeism” (e.g., due to illness) becomes vague. 75% of freelancers in our sample did not register their working time. With regard to work performance, this behaviour may seem desirable, but problems may arise when the loss of external temporal patterns, in conjunction with the assessment of work by output and strong competition leads to “boundaryless” work. To preserve health and work ability under flexible working conditions freelancers need support to achieve competence in setting own limits to their mental work load by individually structuring their work rhythm within a working time conform to objective standards.

References
Developments in Cognitive Behavioural Therapy (CBT): Implications for Worksite Stress Management Interventions (SMIs).

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Individual-focused worksite stress management interventions (SMIs) usually consist of cognitive-behavioural therapy (CBT) techniques, borrowed from the fields of clinical and counselling psychology. In a review of the SMI literature, Murphy (1996) concluded that a combination of such techniques (e.g., relaxation plus cognitive behavioural skills) was the most common, and most effective form of SMI. CBT theory and practice are, however, constantly developing. Recent theoretical and empirical work by Wells (e.g., 2000), regarding metacognition, has implications for the design of worksite SMIs.

Wells (e.g., Wells, 1995; 2000) suggests that negative metacognitive beliefs play an important role in the development and maintenance of problematic worry, which is an important characteristic of various anxiety disorders. These meta-beliefs tend to centre around the perceived uncontrollable and/or harmful nature of certain types of cognitions. Wells suggests that such beliefs can lead to ‘Type 2’ worry, which is, essentially, worry about worry (Wells, 1997).

The present study is an initial attempt to investigate the role of such metacognitive beliefs in occupational stress. To elaborate, we administered a measure of work & organisational characteristics, a measure of maladaptive cognitive content traditionally used in the CBT literature, and a relatively new measure of negative metacognitive beliefs, to employees in a variety of occupations. Hierarchical multiple regression analyses were used to assess whether metacognitive beliefs would predict strain above and beyond these two more traditional predictors. Initial results (N = 60) suggest that negative metacognitive beliefs predict workplace strain, once the variance attributable to both work & organisational characteristics and maladaptive cognitive content has been accounted for.

The finding that negative metacognitive beliefs predict workplace strain above and beyond both organisational characteristics, and a measure of cognitive content, suggests the importance of considering interventions designed to modify such beliefs. Thus, SMIs could be enhanced by incorporating metacognitive techniques, such as ‘detached mindfulness’ (e.g., Wells, 2000). The development of such techniques marks a transition in the general CBT literature away from purely challenging the content of cognitions, towards more ‘acceptance-based’ strategies (e.g., Hayes, Strosahl, & Wilson, 1999; Teasdale, 1999; Wells, 2000). The relevance of this transition for worksite SMIs was recently demonstrated in an outcome study conducted by Bond and Bunce (2000), who employed an acceptance-based intervention to improve employee mental health.

References
The “Secondary School” - an Organization under Increasing Pressure

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Background
In Denmark the educational system on all levels has been exposed to increased demands with regard to principles of economical steering and management. New challenges for the role of teachers include new forms of teaching, increasing number of pupils with a relative weak literary background and new individual systems of wages. As a consequence of this development the clinic of Occupational Medicine has been contacted by several secondary schools during the last two years. Some of the schools had implemented a survey of teachers experiences of the work situation themselves, however the schools often reported difficulties in translating the results from the survey into the development of actions to facilitate workplace change. In several cases the difficulties reflected shortcomings of the surveys. But these difficulties also indicated that first, the secondary schools had been very stable organizations for a long period of time, and second, that few working within the schools had any experience of managing demands for change. Due to little research within the educational system in Denmark the knowledge of consequences of these demands for change is also very limited.

A combined survey and intervention study at a Secondary School
A combined survey and intervention study was planned with the co-operation of one of the secondary schools. The purpose of the survey and the methods of investigation was developed in cooperation with a project group with representatives from management and teachers. The study had three main objectives:
1. Describing the teachers experience of the changes in the organization and the psychosocial work environment
2. Investigating the prevalence of symptoms of work load especially stress reactions.
3. Initiating a process in order to reduce the psychosocial workloads and develop the organization and the work environment.
A questionnaire with focus on the teachers work situation and the specific conditions at the school was developed through discussions in the project group and group interviews with male and female teachers and the management of the school. The questionnaire was answered by 80% of the teachers (58 persons).

Results
Psychosocial workloads
The psychosocial stressors can be described under three headings: increased work pressure, a more demanding teaching situation and increased demands for problem solving.

Increased work pressure.
The study documented that changes had put the school as organization and a number of the teachers under pressure. Many teachers had experienced greater workload through the last 5 years. Increasing workload was especially experienced in relation to participation in organizational tasks such as responding to demands outside the school and administrative tasks at the school. This situation was often combined with the experience of decreasing time available for planning teaching with colleagues and with increasing time pressure in relation to preparation and evaluation of written exercises.
Almost all teachers worked at evenings and weekends and they expressed no or very few possibilities to limit the number of tasks undertaken. Teachers indicated that they completed these tasks for two important reasons: first, a feeling of responsibility to the school as an organization and second, a feeling of responsibility for the pupils. Most teachers indicated that they held a basic positive evaluation of their job whilst other results also indicated that the majority of the teachers believed their job to be very important and meaningful.
Many of the teachers described that the possibilities for developing own qualifications and for participating in educational activities had been unsatisfactorily in recent years. This was linked to the increasing pressure at work. In the same time period a number of the teachers reported that they had not been able to participate in courses and conferences due to the increasing work pressure.

A more demanding teaching situation.
Several results indicated that teaching is becoming more demanding and conflictual than before. Consequences of increasing admission of pupils with a relatively weak literary background were reflected in a rather negative evaluation of the pupils among most teachers. At least one third of the pupils lacked basic knowledge, had too little experience with reading longer texts, lacked suitable working habits and discipline and had difficulties in abstract thinking. Two out of three teachers experienced psychological loads due to the lack of preparation among pupils. Furthermore this situation placed the teachers in a conflictual position in relation to their pedagogical strategies. On the one hand all teachers had the attitude that the second school should build a bridge between the different social groups and the higher educational system. On the other hand most teachers noted that pupils from the lower social groups often had difficulties in relation to learning.
Differentiation in teaching could be a solution to this dilemma. However, the number of pupils in each class prevented the implementation of this teaching strategy. The teachers reported that they are forced to make a choice with
regards to their teaching methods: most of the teachers choose to focus their energy on the best pupils while a minority tried to plan the teaching in relation to the needs of the weakest pupils. Such choices are difficult and many teachers differed in their attitudes towards pedagogical strategies and methods.

**Increased demands for problem solving.**

The teachers described the general social relations as accepting and relaxing. But several results also indicated a need among many teachers for a more effective process of problem solving and for a vitalization of the discussions among the teachers. The teachers were organized in professional groups. Almost all the teachers expressed that their group did not solve the tasks delegated. Lack of time and resources were the main explanations, but lack of vitality in group discussions was also mentioned. Two out of three teachers had experienced conflicts in relation to the distribution of teaching tasks. Furthermore the majority reported that some colleagues tried to avoid participation in some of the tasks. These results suggest that the social dynamics that may have developed in this stable organization are difficult to change. Subsequently, some teachers tried to cope with the change process by withdrawing from the increased demands. Further the interviews and observations of social interactions at meetings indicated that norms of modesty and non-interference in colleagues’ work did not match the demands and needs for more profound discussions and more effective problem solving methods.

Unresolved dilemmas of social nature was also reflected in evaluation of the possibilities of influencing the decision making process in the organization. The school had established a structure of committees over the last three years, which implied a widespread delegation of competence in decision-making. Furthermore the teachers had a high degree of confidence in the head of the school and a positive evaluation of the management style. However, many teachers did express the need for improved opportunities for influence and a relative low degree of confidence in the most important committees where colleagues had the decision competence.

**Prevalence of symptoms of high workload**

Three types of “symptoms” should be mentioned. Stress reactions, feelings of psychological exhaustion and considerations of job change.

**Stress reactions**

Three out of four teachers reported feelings of work stress. They mentioned two main reasons for this stress: high workload and participating in meetings. Analyses indicated that limited possibilities for professional development, perception of deficits in the social climate and of unresolved problems in the teaching situation played a role.

Compared to the prevalence of feelings of stress at work in other job types such as administrative work (Pedersen, 1999), elderly care (Friche et al, 1999) and work in the fishing industry (Baldusson, et al. 1994) the prevalence of stress among the teachers is very high. The only job group we have studied with the same level of prevalence is teachers at the technical schools (Friche, 1994), which support that teaching is a psychological demanding job.

As could be expected, the prevalence of general stress symptoms such as feelings of irritation and anger and difficulties with relaxing was high in the current sample of teachers. About one in five teachers had experienced anxiety reactions and had sometimes experienced feelings of nervousness and insecurity.

**Feelings of psychological exhaustion.**

There was also a high prevalence of symptoms of exhaustion. Almost all teachers needed rest after a workday. More than half of the teachers had feelings of exhaustion and “burn-out” after a working week and had experienced negative effects from work to leisure activities due to difficulties to get rid of thoughts about work and tiredness. One out of four sometimes worried about unsolvable problems at work and reported that they lacked motivation to go to work. Further analysis indicated that most of the teachers had relative mild symptoms of a high work load while around one out of ten seemed to be in risk for developing a chronic stress condition.

**Considerations of job change.**

The most astonishing single result from this study was that more than half of the teachers had seriously considered job change during the last year. This is astonishing because traditionally in Denmark teachers stay at the same school throughout their career. Difficulties with separating work and leisure time played a major role for such considerations. Other relevant factors included the need for a more challenging job, higher wages, difficulties in reaching the weakest pupils and lack of job motivation. Whilst it is unlikely that half of the teachers in the school will leave in the near future it does indicate that many of the teachers were in a process of psychological withdrawal from both the school and the teaching profession.

**Conclusions and Perspectives**

The overall conclusion is that an increasing number of teachers seemed to experience difficulties in maintaining a high level of job motivation. The gradual but increasing imbalance between the perceived demands and the resources available to fulfil these demands in a way that is satisfactory is thought to be the main contributor to this decreased job motivation. The existence of a negative process is supported further by answers on a question regarding the actual status of the job as teacher compared with the situation five years ago. More than half of the teachers indicated that they thought that the status of the teaching profession had declined whilst the remainder of the group thought it had stayed the same. Not one teacher indicated that they thought that the job status of teaching had increased.
Consequently, there seems to be an increased risk for a decline in the quality of teaching and further difficulties in maintaining job motivation. Other probable consequences exist. Some of the most strained teachers could be forced to withdraw from work which could increase general feelings of insecurity. Some of the most active and resourceful teachers will may leave the school preferring more challenging and stimulating jobs. It is probable that such schools may face increasing problems with both recruitment and turnover in the future - a problem that until recently has been virtually unknown.

Possibilities of generalization and documentation of cause-effect relationships are very limited. This study has nevertheless had two important implications: First, the results have been disseminated within the schools and have stimulated discussions and problem solving activities. Second, the results have been discussed in the union of the teachers and between the heads of the Secondary Schools. At the moment it seems probable that a broader investigation of the teachers work situation will be encouraged. In this respect the study seems to have been an effective intervention. Further interventions at the school will focus on a more detailed analysis of selected teachers perception of causes and consequences of high workload. The intervention will be designed in such a way that further openness in relation to these issues will be secured.

At the theoretical level important aspects of the experienced development might be interpreted as changes in social exchange processes both at the organizational and interpersonal level (Schaufeli & Enzmann, 1999). At the organizational level many teachers seem to experience the development as an increasing violation of the psychological contract in form of higher workload, fewer possibilities for planning and preparation of teaching and lowered esteem and dignity caused by top-down initiatives which are perceived as increased “external” control. At the interpersonal level increasing loads due to lack of preparation among the pupils. But it also seems important to combine such a general model with specific theories of the dynamics between age, tenure and conditions for maintaining a high job motivation (Griffiths, 1997). For elderly teachers with a high tenure difficulties with coping with new demands of teaching and problem solving might be seen in relation to established routines and tacit knowledge.

At the organizational and work group level the secondary schools seems well suited for further investigation of functional and dysfunctional strategies for managing increased demands for change. Furthermore a psychodynamics perspective on organizational life might be relevant in order to obtain a more profound understanding of some factors that prohibit effective problem solving (Hirshhorn, 1988). Concepts of social defences focus on the social and emotional dynamics behind organizational routines and rituals in relation to external demands for change could be an example of the relevant of psychodynamics theories.

References

Stress, Strain and Demands of Traffic Control Operators in Public Urban Transportation

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Background
The risk-assessment at work (according to the European Law, e.g. Framework-Directive 89/391/EWG) has been recommended for many years. However the risk assessment outlined by law often refers to that which is more technical.. The psycho-mental and psycho-social dimensions of working conditions are decisive for occupational health and safety but have often been faded out in documentation. There is no risk assessment framework for psychosocial and psycho-mental

**Aim and population**

The Management of a medium sized public urban transport enterprise asked for interpretation of supposed and alarming stress-symptoms of 4 out of 6 control operators: 2 with skin-diseases (no toxic-chemical reasons - controlled by the occupational physician), 1 with kidney colic, 1 with asthmatic complaints at the same time.

The management called for proposals of new work organisation due to the increasing sick leave within the organisation and the concentrated symptoms amongst staff. The management supported our interpretation of symptoms as the second- or third-best solution of the problems within the organisation.

**Methods**

We used a method based on the action regulation theory (Handlungsregulations-Theorie), developed by Hacker and Volpert (see Oesterreich) in East- and West-Germany in the 70th. The method places an emphasis on the "objective" analysis of strain and demands and is called VERA/RHIA (method for recording regulation demands and regulations hindrances, Leitner 1993).

The results of VERA/RHIA-task-analyses are containing
- a clear picture and description of the working place,
- the organisational and technical work environment and
- the description of the most important (time consuming) single tasks.

The method enables interventions and improvements to be made based on the analyses and the description of working conditions, the quantitative valuation of the working conditions and their explanation.

For example: Missing information may be a possible obstacle and a psycho-social stressor. The VERA/RHIA process enables the identification of and a clear description about the missing information. This will identify which information is required about which concrete step of the analysed single task and therefore which correctional measure could be taken to solve the problem.

The method is based on participating observation. The observation procedure brings single tasks/job orders into the focus of the observer. These single tasks will be analysed in respect to challenges and obstacles (see below) in a stepwise algorithmic procedure to find out
- work contents with or without effects for the development of personality
- obstacles and / or work overload and - as a consequence - risky behaviour

<table>
<thead>
<tr>
<th>Demands</th>
<th>Obstacles</th>
<th>Hindrances</th>
<th>Overload</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Difficulties/ Handicaps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Decision latitude</td>
<td>• Informatory</td>
<td>• Monotonous work</td>
<td>• Noise,</td>
</tr>
<tr>
<td>• Communication</td>
<td>• Persons</td>
<td></td>
<td>• Climate,</td>
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<tr>
<td>• Co-operation</td>
<td>• Motorial</td>
<td>• Time pressure</td>
<td>• toxic hazards,</td>
</tr>
<tr>
<td></td>
<td>• Technol. Functions</td>
<td></td>
<td>• poor ergonomics</td>
</tr>
<tr>
<td></td>
<td>• Blockings (no material, to few printers ...)</td>
<td></td>
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</tbody>
</table>

**Table 1. Demands and Hindrances**

Before the observation we did semi structured interviews to identify demands and hindrances.

**Results**

*The system "operators work"

The system is to describe on three dimensions:
Identity-problems
We found contradictions as follows:
- The operators see themselves as the "heart of the services".
- The drivers believe the operators to be "sometimes arrogant".
- The management want the operators to support them because "the drivers are the interface to the customers and we and the operators have to deliver our services to them".
Therefore all operators have to present themselves as busy and under pressure every time. They show this in different ways including
  - Lunch in the operating tower nearby the telephone and the transmitter
  - No breaks for relaxation
  - Sharp communication

Interface-problems
In the co-operation with other professions in the enterprise e.g. the repair-shop the question is: Who has to announce/ask if busses are ready after repair? Until correctional measures were taken the procedure was as follows:
A driver has to use Bus No 510. 510 is in repair. The driver walks to the repair shop (and looses time). The craftsman found new problems and the bus is not ready. The consequences are:
- The driver has a good deal of trouble with the craftsman and the operator and he is almost late
- The operator has immediately to find a new bus for the driver
All parties are under time pressure. The whole system is stress producing and unhealthy and non-productive.

The operating work tasks
The operators are working around the clock in an eight-hours shift schedule with changes at 4.00 am, 12.00 am and 8 pm. From Monday to Friday in the morning and afternoon shift two people are working. During the night and weekend shifts only one person is working. The main single tasks/job orders are as follows:
- Key and time table hand over and taking back
- Dispatching the busses
- Dispatching the accident car
- Troubleshooting and Information of drivers because of new traffic jam, accidents ...
- Support of drivers in case of questions of passengers or also unskilled drivers
- Information for customers
- Information for drivers about future schedules
- Seeking substitute drivers for short-term drop outs of drivers
The operating tower is also a
- Lost property office
- Telephone exchange

In the case of a bus/car accident for example, almost both operators are busy on the telephone or transmitter at the same time. In this case the drivers have to wait for the keys and time tables. Further, as the drivers are waiting they are conversing and joking with each other, subsequently adding to the noise levels. This noise is an additional stressor for the operators especially if sometimes the quality of the transmitter poor and the operator is unable to understand the message.

Description of "Key and time table hand over and taking back"
The operators have to hand over or to take back keys and time tables about 200 times. It is about 15% to 25% of the whole working time of one operator. This is an unsatisfying task for single person especially under time pressure because of urgent operating activities. This is usually a task given to more junior operators, as senior operators are trouble shooting. Therefore junior operators face a double burden, not only do they have to accomplish complete less demanding tasks but they are not involved in those tasks that are more challenging i.e. troubleshooting.

**Correctional Measures**

The results of a longitudinal study of the Berlin school of "action regulation theory" show no significant correlation between improving challenging demands and a decrease in psycho-somatic or other symptoms. Less symptoms are shown as effect of lower strain; higher demands are strongly correlated with more active behaviour in the leisure time (AIDA-study, Leitner, 1999). These findings require a double strategy for health promoting interventions - to both increase the demands of the job and to reduce or eliminate the stressors. We tried to translate this orientation into action in the current study:

1. **New organisation of work and division of labour (obligatory rules), two examples:**
   "Key and time table hand over and taking back":
   This job will be sourced out to the drivers. Each driver can take or take back his key and time table in combination with a touch screen system. Only troubleshooting - substitute drivers, late busses are left behind in the operators duty.
   Instead of the old job the operators shall organise breaks for relaxing and for reflecting the day or single occurrences with regard to improvements of the own job and the whole system. (see 3.)

   "Interface-problem: repair-shop":
   The craftsmen are the only ones who know if and when the bus is ready for action. They have to deal with the problem of late detection of damage or defects themselves. Only in the case of no substitute for the broken bus are they allowed to inform an operator. They also have to inform the operators in advance of the scheduled departure time of the bus if it is not going to be ready for action. This will provide the operator with enough time to deal with the unexpected situation. The drivers will no longer have anything to do with the repair shop under the new system.

2. **TRT (Team-Resources-Training)**
   Above we wrote about the unsatisfying division of labour in the operators’ team and the lack of breaks. In our workshop we collected the different wishes for and considerations about improvements in work organisation and working conditions. The most urgent needs for action included:
   - Division of labour and co-operation with the transport officers
   - Time for planning new projects
   - Compensation for gaps in knowledge (especially data processing)
   - Uncertainty relating to the future of the operators tower (deregulation in the public transport sector)
   - Information for the following shift-team

   We could not implement a system for breaks as a consequence of the workshop. Therefore during each shift on the job training will be available.

3. **Breaks and new ergonomic environment**
   The outsourcing of the former single task "Key and time table hand over and taking back" saves time and enables the following changes in work organisation:
   - Participative planned and trained short breaks in and with the concrete team to support high alertness
   - Time for reflection belonging the whole system (e.g. improvements and requirements for information, acknowledgement for single or all drivers)
   - New workroom for the operators with ergonomic working conditions.
   The outsourcing of the "Key and time table hand over and taking back" was also the solution of the problem of noise outside the hatch during key and timetable collection.

**Conclusions**

The VERA/RHIA-method proved very helpful in analysing complex working conditions and gave hints for the new design of the operating work, e.g. to decrease single low demanding tasks. However, the VERA/RHIA is a time consuming method due to the level of detail required during the task analysis. The analysis of each task requires about 6 to 8 hours including documentation and interpretation.

The VERA/RHIA method has not been used to analyse jobs within which communication is key until now. But there are further developments available for participating observation in classes and for observation of information and communication tasks. The work of operators is mainly men-to-men-interaction and primarily one that requires communication rather than technical or management. Therefore it would be beneficial to discuss the risk of burnout for these and comparable professions.

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Background
Information regarding sick leave may be developed into a tool for the identification of work related problems if absence can be described in terms of properties for the individual company. This information is currently described in terms of short- and long duration based on legislative requirements. Studying situations associated with high frequency, short duration sick leave may help the identification of sub optimal work environments, and subsequent interventions. Analysis of changes in sick leave patterns may in turn serve as a tool for evaluating interventions aimed at improving working conditions.

Aim of the study
In a pilot study we are reanalysing sick leave in an airline company during year 2000 to uncover possible absence peaks. Patterns of absence are attended to: Are there absence peaks at the start, in middle or end of a working period? On one-day trips compared to those of two or more nights? On European flights compared to intercontinental flights? On or after certain destinations? In weekends or school holidays compared to weekdays? Do subgroups of employees have special needs, due to age, distance from work, children?

Participants.
1345 cabin attendants, 1123 women (average age 39.0 years), and 222 men (40.9 years) are included in the analysis. All employees are working shifts. The sick leave analysis covers the period January-December 2000.

Preliminary results
161 persons report leaves of absence. Only 98 people presently working have not been absent from work. 63% of the employees constitute a possible target group for intervention, as this group has primarily absence of short duration, less than 7 days: 173 employees have a total of 1-3 days absence. 356 persons have an average length of each period of absence of 1-3 days, and additional 319, 4-7 days. Altogether 675 people have an average length of each period of absence from 1-7 days January-December 2000. Out of a total of 4.631 absence periods during year 2000, 2.792 (60.4%) has 1-3 days duration, and in addition 840 (18.2%) has 4-7 days duration. Consequently, our situational analysis will be based on a total of 3,632 absence periods (78.6%). Sick absenteeism during the period January-September 2000 could neither be related to distance from home to work, to part-time as opposed to full-time workers, or to age, more than in the general population. The project is presently being analysed to relate absenteeism to both specific destinations, and properties of shift work for the whole year.

The health perspective: Should absenteeism be reduced?
Sick leave is generally regarded an unwanted phenomenon both by companies and the society. It causes organisational problems: Planning and organising production becomes complicated, and the outcome unpredictable. Sick leave has increased in recent years. This causes economical worries both for the individual companies and for society in general. In
A reinterpretation of the sick-leave concept

The common view of sick leave is that it is individual behaviour, (Torvæ & Vedi, 2000) basically due to illness or disease, but also to other factors, such as illegitimate absence. It is regarded partly modifiable by interventions aimed at increasing each individual’s threshold for remaining at home when they don’t feel in shape by motivating campaigns or by making the individuals share the expenses of remaining at home, or by establish more firm control procedures to ensure that absenteeism is due to legitimate causes. Both these approaches regard absenteeism wholly or partly a question of individual moral, suspecting that it is not sufficiently developed to be left alone. Emphasising control strategies to reduce absence from work, implies the belief that absence is illegitimate, and that job motivation is poor.

Interventions in the work environment tends to be general, with the aim of preventing later development of chronic occupational diseases, or of motivating employees and increase well-being at work. The idea is that absence will be reduced in the long run. The development of the general level of sick-leave indicates failure or success of interventions within this approach. However, applying sick leave as an intervention effect measure in this context is problematic: General sick leave level is influenced by several factors, where many of them are independent of what is being done in each company.

A different approach is necessary if sick leave analysis shall be developed into a useful tool for evaluating occupational health interventions. First: Our approach is a group-approach. We focus on common aspects of behaviour within the group, searching situational, environmental, rather than individual, correlates of absence behaviour. Since people in different ages or distances from home to work may face different situations leading to absence, we must characterise each absence period in terms of some characteristics of the person who exhibit the absence-behaviour. However, once this is done, the connection between the single individual and her absence is not necessary or very interesting any more. The database may be anonymised, and the absence period rather than the individual becomes the study unit. Frequency of absence will be connected to properties of the company, and the perceived cause, and eventually the intervention may be proposed by the employees.

Not all absence-types suits the idea of company diagnosis and group analysis: Work related problems may primarily be identified by analysing sickness absence of short duration. Long term absence is less likely to become a useful tool for identifying single situations causing problems/stress, as it is often associated with illness or disease developed over a long period, reflected by the fact that long term absence is often preceded by several absence periods of short duration. Based on this observation situational group analysis, searching situations associated to the highest frequency of short-term sickness absence, becomes most relevant in preventive work, while the individual approach becomes most relevant in rehabilitation.

Reinforcement and punishment strategies

There are good reasons to focus on group behaviour, leaving the question of individual moral alone, if absence reduction shall be achieved. Thinking within a behavioural theoretical framework (Skinner, 1969), focusing on responses to behaviour in terms of positive reinforcement or punishment, the advantages of the situational approach become visible. Behaviour may be shaped by its consequences (operant conditioning): Wanted, but too low-frequent behaviour (job presence) may be reinforced, or unwanted but too frequent behaviour (job absence) may be ignored to extinguish, or punished to be suppressed.
We assume that for most people job motivation is high: A job provides you with a position in society, meaningful activity, with colleagues and friends, and income. In our company, most cabin crew members have been working hard to qualify for the job, and are proud of it. In general, most people prefer to work unless they have a meaningful alternative.

If employees don't go to work, there is a reason for it. Being met with suspicion and negative interventions like firm control, or even selection strategies, may be experienced as punishing response, contingent on returning to work. The theoretical result of punishment strategies is development of avoidance behaviour like reduced frequency of going to work, and of coping behaviour like hiding information or doing things behind ones back (giving false reasons to absence), more often than to real behaviour change (going to work more often).

The more practical statement is that employees who would prefer to work if they could, will feel mistrusted and may eventually become increasingly de-motivated. Thus such a company approach may increase the threshold for returning to work, contributing to development of a self fulfilling prophecy of a high level of absenteeism.

Since only a minority of the employees have genuine illegitimate absences, choosing a control strategy is very inefficient to decrease sick leave: In addition to the risk of increasing absence among he majority, the minority who could "benefit" from such strategy will hardly influence the absence-level in the wanted direction.

Positive interventions, on the contrary, may reduce the conditions making absence necessary for the many highly motivated employees, making them feel confident and taken care of by a company offering solutions to experienced problems. In addition to the direct effect of the problem-solving interventions on the absenteeism, this approach may lead to increased motivation and loyalty towards the company.

As a general rule, if high level of job presence is wanted, reinforcing job presence, rather than punishing job absence, is the most efficient strategy.

When applying selection strategies excluding those prone to job-absence, the active intervention is punishing those prone to sick leave, with no positive interventions rewarding job presence. Through observation, or vicarious learning this strategy may in the long run create a punishing work environment, increasing sick leave also among those with high job presence (Bandura, 1977).

**Application of the sick leave analysis approach**

Application of this situational approach based on statistical analysis of absenteeism, does not apply to all kinds of enterprises: The company that can benefit most from this strategy will probably be of a certain size and diversity, perhaps with shift-work or irregular work hours, so that absence can be analysed in absence subgroups of a size sufficient to spot time-trends and changes which are not likely to be incidental (airlines, hospitals, etc).

Our airline company meets these criteria, and the system being developed in this project will be integrated into the company's systematic occupational health and safety work. Achieved information will be considered both during planning of work schedules, during monitoring of the working conditions, and in planning of interventions aimed at improving working conditions.

**Intervention and evaluation**

In interventions, this group strategy for analysing sick leave will be the first step in a three-step intervention strategy combining quantitative and qualitative methods.

If peaks in absence are identified in the quantitative absence analysis, a questionnaire describing a peak may be distributed to employees as a second step, asking for assumed cause for the peak, and suggestions for interventions to reduce peaks (Aslaksen & Hanssen-Bauer, 1991). This procedure is chosen because employees can probably contribute with valuable information when workload causes visible absence peaks. Involving employees directly in the intervention process is also regarded important to succeed in reducing sickness absence (Torvatn & Vedi, 2000).

Our experience is, however, that the method applied is important: Simply asking employees what is causing absence in general, and to suggest solutions, is not satisfactory. Employees’ interpretation may be based on rumours, myths or false beliefs, and proposed interventions may suffer from this. Knowing the realistic figures may discourage proposal of interventions based upon such information among the employees. The preceding quantitative analysis may thus improve information from the second step qualitative questionnaire, making response more precise.

The third step is goal directed interventions based on proposals in the questionnaires. If the observed absence peak is reduced compared to the remaining absence, or if the intervention is regarded positive by the employees after a certain period, an intervention may become permanent.

Intervention evaluation in terms of reduced peaks in sick leave alone may be too optimistic: Observed peaks may be incidental rather than contingent upon the proposed explanation to the problem. However, systematic improvement of working conditions may also reduce job stress in the long run, rather than acute situational stress, making employees subjectice evaluation and use of the intervention an additional effect measure when deciding to make an intervention become permanent or not.

**Concluding remarks**

While traditional approaches to sick leave analysis have concentrated on detailed characterisation of individuals prone to high level of absence due to sickness, and on how individuals shall be rehabilitated back to productive work, our approach concentrates on the workplace, and improvement of working conditions. This approach is more compatible with a primary
preventive orientation than the traditional approach, which seem more compatible with a secondary preventive, or curative orientation. Application of both approaches may complete each other by focusing on absence periods of short and long duration, respectively.

A problem-solving, non-moralising attitude to sick-leave, seeking causes in the work environment rather than in attitudes of the individuals seems to be a prerequisite for succeeding in reaching an optimal level of sickness absence.

References

To what Extent are Coping Patterns Related to Job Stress, Health and Sick Leave in Different Business Environments.

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Introduction
In Norway the sick leave rates have increased throughout the nineties, reaching the highest level ever with an average rate at about 8% in 2000 (Rikstrygdeverket 2001). This has resulted in a major focus on health and productivity, were several studies and interventions have been accomplished with the aim of improving health in working life. A surprisingly large number of projects, however, show lack of effects (Eriksen et al 1995). One reason might be that health, sick leave and productivity are complex and multidimensional concepts, with no single cause or behavioural patterns.

Coping style and coping patterns are crucial for dealing with difficult situations and reducing physiological activation. Successful coping has been associated with low levels of subjective health complaints (Olff, Brosschot & Godaert, 1993). Lazarus and Folkman, (1984) defined coping as the process to adapt to different internal and external demands. They defined coping reactions within a continuum ranging from active coping, trying to make direct interventions to solve the problem, to passive coping. The latter category includes strategies which change individual perceptions or feelings connected to the problem, including psychological defence mechanisms (Knardahl 1998). Recent research has shown that there might be other coping patterns as well. Eriksen et al (1997) have described two coping factors (Instrumental mastery oriented coping and Emotional focused coping) and two defence factors (Defensive hostility and Cognitive defence), showing that Instrumental mastery oriented coping is negatively correlated to health complaints in students and back pain patients. They also showed that back pain patients used less coping and more defensive strategies (passive/emotional coping).

In this paper we have focused on three different occupations with different demands concerning work control and competence. According to Levine and Ursin (1991) we would expect high report of health complaints and high sick leave for individuals experiencing high workloads and job stress over time. We want to investigate if coping style relate to health, job stress and sick leave and if there are differences between the different occupations.
Methods

Sample
This study is based on 469 employees from three different organisations (see table 1):

<table>
<thead>
<tr>
<th></th>
<th>1. Public school teachers</th>
<th>2. Bank Employees</th>
<th>3. Industrial workers</th>
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<tbody>
<tr>
<td>Sample</td>
<td>103 (77.1%)</td>
<td>228 (78.1%)</td>
<td>138 (87.3%)</td>
</tr>
<tr>
<td>Sex: women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>89 (86%)</td>
<td>182 (79.8%)</td>
<td>21 (15%)</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>mean 44.8 yrs</td>
<td>mean 44.7 yrs</td>
<td>mean 32.3 yrs</td>
</tr>
<tr>
<td>Work experience (yrs)</td>
<td>17.9 yrs</td>
<td>24.2 yrs</td>
<td>11.7 yrs</td>
</tr>
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</table>

Table 1 Demographic data

Sample 1 and 2 are rather similar concerning gender distribution, but the bank employees have significantly longer work experience. Sample 3 are totally different from the other two samples. While the teachers and bank employees are mostly women, the industrial workers are male dominated, significantly younger and with less work experience.

Instruments
In this study we have developed short-form scales concerning psychological and physical work load, subjective health complaints (Ursin, Endresen & Ursin, 1988) and coping style, all rating from 0-5. Information about demographics, sick leave days and live style are collected by single item questions.

Job stress (17 items rating four sources of job stress (psychological workload, physical work environment, work climate and policy) on a 6-point scale (0-5), where 5 is “to a large extent”). In this paper we present the five most frequently reported causes of job stress in the three organizations.

Subjective health complaints the last 30 days. (17 symptoms, 6 point scale, (0-5), where 5 is “serious affected”). In this paper only complaints related to muscle skeletal pain and tiredness are reported.

Sick leave: subjective report of amount of sick leave days the last 6 months.

Productivity loss due to health problems: the subjects were asked if their health problems (rated above) affected their work capacity (yes/no). Then they were asked to estimate the total productivity loss due to health complaints (0% = health problems do not effect work capacity at all, 100% = not able to work at all).

Productivity loss due to job stress: the registration follows the same procedure as above. The subjects were asked if the job stress factors (rated above) affected their work capacity (yes/no), and to estimate the total productivity loss due to job stress.

Coping with job stress was measured with a shortened, rewritten version of the Utrecht Coping List (UCL) (47 items)(Schreurs et al. (1988). We have used 23 items concerning habitual coping styles. Each statement is rated on a six point scale (0=never, 5=very often). Factor analysis gave three factors: Active coping (7 items) \( \alpha = .7128 \), (2) Emotional coping (5 items) \( \alpha = .6332 \), (3) Passive coping (8 items) \( \alpha = .8043 \). Life style; included questions about physical activity/fitness (rated on a 6 point scale), smoke and coffee consumption.

Procedure
The implementation process were standardised and followed in all three organisations. Formal permission was obtained from the management and the employee representatives. All employees were invited to participate in a Health Environment Survey. Information about aim and procedures were given all the employees in general terms. Each subject signed a statement of willingness to participate before they filled out the questionnaires. This was done during work hours.

Ethics
The participants were guaranteed confidentiality as required by Norwegian laws. All the questionnaires were coded with an identification number.

Statistical methods
The data are analysed using programmes from the SPSS–X package. The results are expressed as means and standard deviations, and as frequencies based on the individuals scoring “moderate to high” (3-5) on the 0-5 scale. Pairs of groups were compared using One-way-ANOVA. Correlation analysis were carried out with Pearsons \( r \). Reliability was tested with Cronbach’s \( \alpha \) test.
Results

Job stress
The main job stress complaints for all three companies were related to total workload, time pressure, noise, lack of internal communication and lack of internal training/follow up education. The school teachers reported significantly higher job stress than both the bank employees and the industrial workers, except for lack of communication where the industrial workers had the highest report (see table 2).

<table>
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<tr>
<th></th>
<th>Work load Mean (SD)</th>
<th>Time pressure Mean (SD)</th>
<th>Noise Mean (SD)</th>
<th>Lack of communication Mean (SD)</th>
<th>Lack of internal training Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School teachers (n=103)</td>
<td>3.0 (1.36)*</td>
<td>2.8 (1.31)*</td>
<td>3.0 (1.52)*</td>
<td>1.7 (1.40)</td>
<td>2.0 (1.45)*</td>
</tr>
<tr>
<td>Bank employees (n=228)</td>
<td>2.5 (1.62)</td>
<td>2.1 (1.57)</td>
<td>1.2 (1.55)</td>
<td>1.6 (1.38)</td>
<td>1.2 (1.42)</td>
</tr>
<tr>
<td>Industrial workers (n=138)</td>
<td>2.0 (1.65)</td>
<td>1.6 (1.63)</td>
<td>1.8 (1.81)</td>
<td>2.0 (1.85)*</td>
<td>1.5 (1.48)</td>
</tr>
<tr>
<td>ANOVA F&amp;p-values</td>
<td>F(2,469)=12.7, P&lt; .000</td>
<td>F(2,469)=16.3, P&lt; .000</td>
<td>F(2,469)=39.7, P&lt; .000</td>
<td>F(2,469)=3.3, P&lt; .05</td>
<td>F(2,469)=11.1, P&lt; .000</td>
</tr>
</tbody>
</table>

* indicates the highest group reports

Table 2. Job Stress factors in three different occupations. Means and standard deviations (SD)

Health Complaints
The school teachers reported low muscle skeletal pain, but high tiredness. The bank employees scored significantly higher than the other two groups both on neck- and arm/shoulder pains (see table 3).

<table>
<thead>
<tr>
<th></th>
<th>Neck Mean (SD)</th>
<th>Arm/shoulder Mean (SD)</th>
<th>Low back Mean (SD)</th>
<th>Headache Mean (SD)</th>
<th>Tiredness Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School teachers (n=103)</td>
<td>1.3 (1.58)</td>
<td>1.2 (1.51)</td>
<td>1.3 (1.60)</td>
<td>1.5 (1.47)</td>
<td>2.0 (1.52)*</td>
</tr>
<tr>
<td>Bank employees (n=228)</td>
<td>1.9 (1.62)*</td>
<td>1.7 (1.65)*</td>
<td>1.2 (1.55)</td>
<td>1.2 (1.46)</td>
<td>1.5 (1.42)</td>
</tr>
<tr>
<td>Industrial workers (n=138)</td>
<td>1.0 (1.46)</td>
<td>1.3 (1.69)</td>
<td>1.3 (1.68)</td>
<td>1.1 (1.48)</td>
<td>1.2 (1.48)</td>
</tr>
<tr>
<td>ANOVA F&amp;p-values</td>
<td>F(2,469)=14.19, P&lt; .000</td>
<td>F(2,469)=4.50, P&lt; .01</td>
<td>F(2,469)=0.2 ns</td>
<td>F(2,469)=2.12 ns</td>
<td>(F(2,469)=8.4, P&lt; .001</td>
</tr>
</tbody>
</table>

* indicates the highest group reports

Table 3. Subjective report of Health Complaints in three different occupations. Means and standard deviations (SD)

Life style
The bank employees reported the most negative lifestyle, with low physical fitness, high smoking and coffee consumption. The teachers are the most healthy sample.

Sick leave and productivity loss
The bank employees reported significantly higher sick leave than both the teachers and the industrial workers (see table 4). Both the bank employees and the industrial workers reported a productivity loss due to health complaints within the same range as their sick leave. The school teachers are significant higher than both the other two groups on productivity loss due to health. They report a productivity loss which is more than 3 times their own sick leave, indicating they feel ill but stay on working.

<table>
<thead>
<tr>
<th></th>
<th>Sick leave %</th>
<th>Productivity loss due to health complaints</th>
<th>Productivity loss due to job stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>School teachers (n=103)</td>
<td>4.1%</td>
<td>14.2%*</td>
<td>18.2%*</td>
</tr>
<tr>
<td>Bank employees (n=228)</td>
<td>9.2%*</td>
<td>9.1%</td>
<td>18.5%*</td>
</tr>
<tr>
<td>Industrial workers (n=138)</td>
<td>5.7%</td>
<td>6.4%</td>
<td>11.0%</td>
</tr>
<tr>
<td>ANOVA F&amp;p-values</td>
<td>F(2,463)=10.4, P&lt; .000</td>
<td>F(2,363)=8.9, P&lt; .000</td>
<td>F(2,436)=6.5, P&lt; .001</td>
</tr>
</tbody>
</table>

* indicates the highest report
The productivity loss due to high job stress is significantly higher for the teachers and bank employees, compared to the industrial workers.

**Coping styles**

The industrial workers were significant lower on all three coping styles. The school teachers and the bank employees were high both on active- and emotional coping, while the bank employees were significantly higher on passive coping as well (see table 5).

<table>
<thead>
<tr>
<th></th>
<th>Active coping style</th>
<th>Emotional coping style</th>
<th>Passive coping style</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>School teachers</td>
<td>3.20*</td>
<td>1.91*</td>
<td>1.31</td>
</tr>
<tr>
<td>(n=103)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank employees</td>
<td>3.12*</td>
<td>1.96*</td>
<td>1.74*</td>
</tr>
<tr>
<td>(n=228)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial workers</td>
<td>2.73</td>
<td>1.16</td>
<td>1.21</td>
</tr>
<tr>
<td>(n=138)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-way ANOVA</td>
<td>F(2,402)=14.2</td>
<td>F(2,401)=48.1</td>
<td>F(2,401)=19.6</td>
</tr>
<tr>
<td>F&amp; p-values</td>
<td>P&lt;.000</td>
<td>P&lt;.000</td>
<td>P&lt;.000</td>
</tr>
</tbody>
</table>

* indicates the highest reports

**Coping and sick leave**

The total material showed a significant negative correlation between active coping and sick leave (r= -.10, p=.05), indicating that employees using active coping style when facing job problems have less sick leave. This connection is most pronounced for the industrial workers (r=.18, p<.05).

For the total material we also found a significant positive correlation between passive coping and sick leave (r=.10, p<.05). There were no relations between sick leave and emotional coping. In the separate analysis there were no significant relations between emotional- and passive coping and sick leave.

**Coping and health complaints**

There was no significant relationship between active coping and health complaints neither for the total material, nor for the separate analysis.

Emotional coping, however, showed significant relations with tiredness (r=.12, p<.01), headache (r=.10, p<.05) and low back pain (r=.19, p<.000) for the total material, and for all three occupations.

Passive coping correlated significantly with tiredness (r=.13, p<.01), neck pain (r=.19, p<.000) and headache (r=.15, p<.01) for the total sample. The separate analysis showed most consistent results for the school teachers were we found strong significant correlations between passive coping and tiredness (r=.43, p<.000), headache (r=.23, p<.05), low back- (r=.32, p<.01) and neck pain (r=.20, p<.05).

**Coping and job stress**

There were no significant relations between active coping and job stress for the total sample. For the teacher sample active coping correlated negatively with stress related to noise (r= -.25, p<.01).

Emotional coping correlated significantly with stress caused by lack of communication (r=.10, p=.05), noise (r=.10, p<.05) and time pressure (r=.14, p<.01) for the total sample. Employees high on emotional coping also scored high on productivity loss due to job stress (r=.14, p<.01). For the industrial workers emotional coping correlated significantly with job stress related to time pressure, lack of communication, lack of internal training and noise (r=.19/21, p<.05). For the bank employees the only significant correlation was found between emotional coping and lack of communication (r=.18, p<.05).

Passive coping was only related to stress caused by high time pressure (r=.10, p<.05) for the total material. For the industrial workers high passive coping strongly related to noise (r=.33, p<.000) and lack of internal training (r=.17, p<.05). For the teachers passive coping related to work load (r=.29, p<.01).

**Coping and life style**

When controlling for gender there were no significant correlations between active coping and life style factors (physical fitness, smoke and coffee consumption).

Both emotional and passive coping showed negative significant relations with physical fitness (r= -.17, p<.000) and smoking (r= .13, p<.01)(r=.10, p=.05). This indicates that non-smokers in good physical shape are less emotional and passive in their coping style. This pattern is also found for the teachers, but not for the other two occupational groups.
Discussion

The results in this study are based on a survey of 469 employees in public schools, banks and industry. There were significant differences between the three occupational groups on job stress, health complaints, sick leave and coping. The public school teachers (n = 103) reported significantly higher job stress, but less somatic health complaints except for headache, and less sick leave than the two other groups. On the other hand they reported high productivity loss due to health complaints and stress, but good coping.

The bank employees (n = 228) reported moderate job stress, but significantly higher muscle skeletal pain and sick leave than the teachers and the production workers. They reported moderate productivity loss due to health complaints, and high loss due to stress. The bank employees reported highly on all three coping styles.

The industrial workers (n = 138) experienced higher stress related to noise and lack of communication than the two other groups. They all reported few on health complaints, and reported low productivity loss due to health and job stress. They had moderate sick leave, and reported low coping, both positive and negative styles. Contrary to the other two groups the industrial workers are mostly young men, with low work experience.

The results show interesting pictures, reflecting different occupational demands and cultures. Some of the results may be explained by focusing on different personality, motivational- and intellectual requirements in the recruiting process for the three occupations. However, we found significant differences within the teacher sample when splitting the material into the four different schools that took part (Grønningsæter-Staubo 2001). Teachers employed in large, old schools reported significantly higher job stress, health complaints and sick leave. This indicates that work climate/culture (i.e. social support, conflicts, values) and work policy (i.e. management, internal communication, influence) are important factors when analysing sick leave rates and its causes.

All three occupations are going through extensive occupational changes. The teachers experience an increase in work tasks and competence demands, including rapidly changing work methods. This may in part explain the high stress report and the high score on mental tiredness. The teacher role reflects a traditional female role. The teachers have high standards, are highly educated and “clever girls”. They report high active-, but also high emotional coping. A high percentage is married and their lifestyle is very positive. This could explain the low report of sick leave days, but also the low productivity. They stay on working even if they feel ill.

In contrast the bank employees have a more predictable and sedentary work. They experience high job stress concerning work load and time pressure, but less than the teachers. Their report of neck and arm/shoulder pain is however very high, which also results in a high sick leave rate. The results are similar with earlier findings in insurance companies in Norway (Grønningsæter et al. 1991). The bank employees report high coping, especially passive coping, which is significantly related to high neck complaints and in agreement with Eriksen et al. (1997). This is a female dominated computerised work environment. Lack of activity seems to be an obvious explanation for the muscle-skeletal pains.

The industrial workers have little health complaints compared to the other groups. Taken into consideration their young age, the sick leave is pretty high. It is closely related to health problems and in particular low back pain. The workers report low overall coping, probably reflecting their low educational status and low work experience. Active coping and high physical fitness are related to low sick leave. Emotional and passive coping, however, are significantly related to health problems, high overall job stress and smoking, as shown by Eriksen et al 1998.

In conclusion, despite significant differences in the three occupations, which might reflect differences in i.e. work culture, management style, educational level and job demands, the correlational analysis showed rather consistent patterns. Active coping, including a positive life style, filters the stress experience and the physiological activation or stress response (Levine and Ursin 1991). This may lead to positive health and wellbeing. Both emotional and passive coping contributes to sustained physiological activation following the stress situation. This may lead to health complaints and sick leave. Interventions aiming at sick leave reduction have to focus on increasing active coping and reducing emotional and passive coping. This includes a variety of techniques and methods, both on organisational- and individual level. Recommendations of interventions need careful discussions with the management, the employees and the medical (or human resource) department.

References


Branch Profiles and Working Conditions: Secondary Analyses on the Third European Survey

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Introduction
The aim was to perform a secondary analysis on the surveys produced by the European Foundation in representative samples of workers in the member states of the European Union in order to:
1. identify branch (industry sector) profiles in working conditions. The most recent ‘Third European Survey’ (2000) provides the possibility for a breakdown at NACE-2-digit level, thus enabling a reasonably detailed branch analysis at EU level. For some branches, groupings will have to be made.
2. present the development of working conditions within and amongst branches, using the previous European Surveys. Additional groupings probably have to be made, and
3. compare the Survey results on branch level with other data sources (e.g. national surveys, Labour Force Surveys, etc.). This information could guide the discussions by politicians with regard to the prioritisation of efforts to enhance working conditions and herewith help employees particularly in specific branches at risk. It may also guide discussions regarding the prioritisation of risk factors in order to maximise the benefits of actions.

Methods
The Survey was administered to randomly selected workers in all European Member States. In 1990 the branch identification system was different to that used in 1995 and 2000, therefore the present report only utilises data gathered in the period 1995 and 2000. In 1995 the sample size of every member state was n = 1000 (except for Luxemburg; n = 500; and both former East- and West Germany; separate samples of n=1000). In 2000, the sample size was increased to n= 1500 per member state (n=750 for Luxemburg, only one sample was drawn in Germany).

Utilities to n = 3966 for The variable indicating branch in 2000 contained 26 different branches. For 18 branches at least 100 workers were available, and working conditions could be described and tested. For the comparison of results between 1995 and 2000 it is possible to distinguish 11 branches, indicating that some branches had to be presented at a higher aggregation level. The number of employees per branch ranged from n=187 for public the health and social branches. When possible, scales were constructed on the basis of different items, referring to the same working condition. The following working conditions were identified:

Physical environment:
• ambient conditions
• ergonomic conditions
Time:
• non-standard hours
• working hours
Organizational environment:
• psychological job demands
• job control
• skilled work
• task flexibility
Social environment
• social support
• discrimination and intimidation
Additional contextual conditions
• computer use
• telework
• work at home
Working conditions by branch in 2000

On the basis of the analyses on the most recent, 2000 EF-survey data the results show that:

1. Some working conditions, like long working hours, are highly prevalent in many branches, whereas non-standard hours, and discrimination are highly prevalent in only a few branches. Non-standardized hours are specific for catering, hotels and restaurants, agriculture, and transportation. Particularly the first two branches, i.e. catering, hotels and restaurants and agriculture, show extremely high number of workers reporting non-standard hours. Discrimination is also specific for catering, hotels and restaurants and transport, but also for the public and social sectors.

2. Transport and catering, hotels and restaurants are branches within which the greatest numbers of unfavourable working conditions are reported. Profit services e.g. ‘finance’, and the public and social sectors at the European level show the highest number of positive responses with regard to the working conditions identified in this report. Sale and retail branches demonstrated the most balanced responses with regard to favourable and unfavourable working conditions.

3. Those branches within which the report of musculoskeletal problems are high also score relatively unfavourable on measures of ambient and ergonomic risk factors, with the exception of the social sector. Branches with work related stress problems are branches with low control, high discrimination and sometimes also high job demands.

For illustration, we present some rankings of branches on indicators for long working hours, non-standard hours, psychological job demands, and discrimination & intimidation in figures 1 to 4.

Figure 1. Ranking of branches on working hours

Figure 2. Ranking of branches on psychological job demands
Figure 3. Ranking of branches according to ‘non-standard hours’

Figure 4. Ranking of branches on discrimination and intimidation

The reported classification of the working conditions have been outlined below in the branch profiles (scales; Z-scores) in Figures 5 to 8.
Figure 5. Branch profile of the transport branch

Figure 6. Branch profile of the catering branch
In general, the most negative changes found within many branches include lack of job control, unskilled work, and discrimination. A significant increase in unfavourable ergonomic conditions only took place in manufacturing or industry and construction branches. These two branches were however characterized as having unfavourable ergonomic conditions. It was also shown that a significant increase in high job demands took place in the catering, real estate and to a lesser extent in sale or retail branches. It should be noted that the increase in job demands in catering and sale or retail is accompanied by
an increase in lack of control and unskilled work. This combination of risks strongly increases the risk for job strain and other negative consequences from work stress. It should also be noted that in almost all branches an increase in working with computers at the work floor was reported, whereas customer contacts decreased in almost all branches.

**EF Survey by branch as compared to several national data bases**

To corroborate the findings of the third European Survey, data from this survey were compared to data from national sources for five countries. For Finland, Germany, The United Kingdom, The Netherlands and Spain, branch rankings on noise, speed, and lifting or carrying heavy loads from recent national surveys are compared to the branch rankings in the 2000 EF-survey. Since, particularly within the EF-data set, the number of employees per country tends to be rather small, we only highlighted a difference in two or more ranking positions per branch. Looking at the rankings in that way, we can conclude that:

1. the branch rankings are not very consistent between the EF-Survey data and the Spanish national data. There was much more consistency between the EF-Survey data and the other national data sets
2. the branch rankings are highly consistent for ‘noise’, but less consistent for ‘speed’
3. some branches appear to be particularly inconsistent: the ‘social’ sector, and to some minor extent the ‘public sector’ were the most inconsistent branches in the Survey for the countries and risk factors studies. These branches were, however, also quite large and heterogenous, which may explain the inconsistency in findings.

**Conclusions**

The conclusions of this study can be summarized as follows:

- comparison with the national data sets reveals that inconsistencies in ranking were particularly related to (1) one specific national data set (out of five comparisons with national data sets), (2) the ‘organizational setting’ concept of work pace as compared to items concerning ambient and ergonomic risks, and (3) heterogeneity of some branches across countries. The most ‘inconsistent branches’ were the social and public sector.

- With respect to the working conditions, one can conclude that some of the unfavourable working conditions are highly specific for several branches, like for instance non-standard hours and discrimination. Non-standard hours are found in agriculture, catering, hotels and restaurants and transport. Discrimination is also found in catering, transport, but in the public and social sectors as well.

- Considering the branch profiles, employees working in the ‘catering, hotels and restaurants’ and ‘transport’ are confronted with the highest amount of the unfavourable working conditions, and score significantly more favourable regarding only very few working conditions.

- Employees working in finance, the public or social sectors and real estate are confronted with relatively few unfavourable working conditions.

- Branches with many work related musculoskeletal problems are branches that score relatively unfavourable on ambient and ergonomic risk factors, with the exception of the social sector. Branches with work related stress problems are branches with low control, high discrimination and sometimes also high job demands.

- Considering the changes in working conditions over the last five years, we see that particularly for the two branches that are most at risk at 2000 – i.e. ‘catering, hotels and restaurants’ and ‘transport’ negative psychosocial working conditions (high demands –only in the catering-, low control and unskilled work) are increasing. This can be interpreted as a further intensification of the work in these two branches. The same unfavourable change in psychosocial risks can be seen to a somewhat lesser extent in sale and retail, a branch that is at average risk in 2000.

- For the branches of building & construction, and manufacturing or industry it is remarkable, and even worrying that the ergonomic risk factors which are already unfavourable in these kind of branches, have increased over the last five years.

- Unfavourable changes in discrimination across the last five years can be seen in the overall ‘high risk’ branches of catering, hotels and restaurants and in transport, as well as in the ‘average risk’ branch ‘sale and retail’, and in the ‘low risk’ branches of public utilities and the social sector.

- A relative stable situation with respect to working conditions can be seen in agriculture, public utilities and finance. Hardly any unfavourable change in the risks related to working times could be identified for a specific branch.

- The changes in working conditions by branch as reported above are (specifically in the case of discrimination) not consistent with a tendency of a ‘regression towards the mean’.

- Particularly since the differences by branch can only be studied over two measurements in time, the significant differences may be the result of a minor change. We need more trends, as well as comparisons with national data sets. This statement does not mean that when a change is found to be significant this should be doubted. But it does mean that these changes should be treated as highly suspect of indicating stable trends. They have to be proven consistent next time.
Antecedents and Consequences of Extended Working Hours: the Role of Workaholism and Several Motives for Working Overtime

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Department of Work and Organizational Psychology, University of Nijmegen, The Netherlands

Introduction
Long working hours and overtime are, at least in some circumstances, associated with reduced well-being (Sparks et al., 1997). This paper will focus on the relationship between overtime and a specific class of outcome variables, namely those concerning the quality of recovery. Long working hours imply that the time that is available for recovery and relaxation is relatively short. Frequent overtime has been shown to be associated with work-related fatigue and work-related worrying after working hours (Van der Hulst & Van Veldhoven, submitted). Fatigue complaints and worrying about work are likely to affect the quality of family life or private life in general. Several studies have shown that long working hours can have an impact on the involvement in family life and the well-being of spouses and children (e.g. Alexander et al., 1996; Bonney et al., 1999; Crouter et al., 2001; Geurts et al., 1999). Several studies have shown that long working hours are associated with work–home conflict and dissatisfaction with the time available for family life (Grzywacz & Marks, 2000; Murray et al., 2000). However, extended working hours are not consistently associated with the experience of work-home conflict (e.g. Wallace, 1999). A possible explanation for the absence of such a relationship that is given in the aforementioned article is that control over the scheduling of working hours allows workers to deal with potentially conflicting demands in the work and home situation. Furthermore, Barnett et al. (1999) have found that the fit between preferred and actual working hours plays a moderating role in the relationship between extended working hours and well-being. Employees who work more (or less) hours than they prefer have higher burnout scores.

As was pointed out above, the scheduling of extended working hours and the personal choice to work extended hours is likely to determine whether or not overtime is associated with reduced well-being. It can be hypothesised that it makes a large difference whether employees can decide for themselves if they want to work overtime, or whether they are explicitly or implicitly forced to do so. In practice, however, it is difficult to distinguish between voluntary and involuntary overtime, because many factors may affect the decision to work overtime simultaneously. The present study will focus on three motives for working overtime. Firstly, employees may work overtime because of a high workload. Earlier studies (Kawakami & Fujigaki, 1996; Van der Hulst & Van Veldhoven, submitted) have shown that working overtime is positively related with several indicators of job demands. Secondly, overtime-related rewards may be an important motivator. Workers may receive financial rewards for working overtime, but there may also be less tangible rewards in terms of esteem and career opportunities. Thirdly, employees may work overtime because it is part of the organisational culture to work long hours. Workers may comply to this normative pressure in order to avoid conflicts with their colleagues and superiors. Motives for working overtime may not only affect the decision to work overtime, they may also act as moderators in the relationship between overtime and well-being. Earlier research (Van der Hulst & Geurts, in press) has shown that the combination of external pressure to work overtime (expectations of the direct supervisor) and low job rewards is associated with elevated risks of health complaints, burnout and work-home conflict in employees who work overtime.

In addition to the specific motives mentioned above, the decision to work overtime may be related to the worker’s attitude towards the job in general. Workers who do their jobs with pleasure and are highly committed to their jobs work overtime relatively frequently (Van der Hulst & Van Veldhoven, submitted). Furthermore, Paterson and O’Driscoll (1990) found that job involvement was positively associated with the number of regular hours worked and unpaid overtime. The current study focuses on workaholism as an indicator of general work-related attitude. Workaholism can be defined as an addiction to work and is thought to be associated with long working hours and reduced well-being (Burke, 1999, 2000; Scott et al., 1997; Spence & Robbins, 1992).

The current study was designed to explore the role of workaholism and several motives for working overtime in more detail. The following three research questions guided the analyses:
1. To what extent can workload-related motives, reward-related motives, social norm-related motives, and workaholism predict overtime hours?
2. Is overtime associated with reduced quality of recovery (in terms of negative work-home interference, work-related fatigue and work-related worrying after controlling for motives for working overtime and workaholism?)
3. Do motives for working overtime and workaholism moderate the relationship between overtime and quality of recovery?
Method

Sample and procedure
Questionnaire data were collected for 108 full-time white-collar employees of a building contractor (house building) company. The majority of the respondents were male (82.4%). The mean age of the sample was 37.9 years (SD 11.2) and 57.9% was in an executive position.

Measures
Overtime hours was measured by means of the following question: “On average, how many hours per week do you work overtime (at home and at work)?”. The mean number of hours of overtime per week was 6.9 hours (SD = 5.0).

Negative work-home interference was measured with a subscale of the ‘SWING’-questionnaire (Survey Work-home Interference Nijmegen; Wagena & Geurts, 2000; Geurts, 2000). This scale consists of ten items (e.g. ‘How often does it happen that you are irritable at home because your work is demanding’) that were scored on a four-point scale ranging from ‘never’ (1) to ‘always’ (4). The internal consistency of the work-home interference scale was good (α = .88, M = 1.68, SD = 0.52).

Work-related fatigue and work-related worrying were measured by means of two scales from the Dutch Questionnaire on the Experience and Evaluation of Work (see Sluiter &et al., 1999). The fatigue-scale consists of eleven dichotomous (yes/no) items, the worrying-scale had four dichotomous items. The scale scores were the sum of the item scores, higher scores indicate a higher number of complaints (work-related fatigue: α = .85, M = 3.88, SD = 3.29; work-related worrying: α = .82, M = 1.21, SD = 1.44).

Workaholism was measured by means of 10 items (Taris & Schaufeli, in preparation) that were scored on a 5-point scale ranging from totally disagree (1) to totally agree (5). The scale score was computed as the mean of the item scores. The internal consistency of the scale was good (α = .86, M = 3.35, SD = 0.78).

All three types of motives for working overtime were measured by means of items that were scored on a 5-point scale ranging from ‘does not apply at all to my situation’ (1) to ‘applies completely’ (5). The three scales did not correlate.

Reward-related motives were measured by means of 3 items (‘My direct superior appreciates it when I work overtime’, ‘My colleagues appreciate it when I work overtime’, and ‘If I work overtime my career opportunities increase’). The items measure different types of reward, and therefore the internal consistency of this scale was rather low (α = .55, M = 2.87, SD = 0.80).

Workload-related motives were measured by means of two statements (‘If I wouldn’t work overtime, I wouldn’t be able to finish my work’ and ‘If I wouldn’t work overtime, all kinds of things at my job would go wrong’) (inter-item correlation = .85, α = .92, M = 3.48, SD = 1.11).

Social pressure-related motives were measured by means of 4 items regarding conflicts with one’s superior and colleagues (e.g. ‘I think I would get a conflict with my colleagues if I wouldn’t want to work overtime’) (α = .67, M = 2.17, SD = 0.75).

Analysis
In order to answer the first research question, linear regression analyses were carried out with overtime hours as the dependent variable. Predictors were entered in three steps (background variables in step 1, motives for working overtime in step 2, workaholism in step 3) by means of the ENTER method. In order to answer the second and the third research question, linear regression analyses were carried out with negative work-home interference, work-related fatigue, and work-related worrying as dependent variables. Predictors were entered in five steps (background variables in step 1, overtime hours in step 2, motives for working overtime in step 3, workaholism in step 4, and interaction terms in step 5). Four interaction term variables were calculated by multiplying overtime hours by the three motives and workaholism. In the first four steps in the regression analysis predictors were entered by means of the ENTER procedure, but in the fifth step the STEPWISE procedure was used, in order to restrict the total number of predictors in the model.

Results
Table 1 shows the results of a regression analysis with overtime hours as the dependent variable. The only two significant predictors of overtime hours per week in the final model were executive position and workload-related motives for working overtime. Other motives and workaholism were not associated with an increased number of overtime hours.

<table>
<thead>
<tr>
<th></th>
<th>Overtime hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-.10</td>
</tr>
<tr>
<td>Age</td>
<td>.03</td>
</tr>
<tr>
<td>Executive position</td>
<td>.43**</td>
</tr>
<tr>
<td>Workload-related motives</td>
<td>.40**</td>
</tr>
<tr>
<td>Reward-related</td>
<td>-.06</td>
</tr>
</tbody>
</table>
Table 2 shows the results of regression analyses with indicators of quality of recovery as dependent variables. The final regression model for negative work-home interference included six significant predictors. Employees who work longer number of hours of overtime report more negative work-home interference. Higher scores on the three motives for working overtime and on workaholism were also associated with negative work-home interference. The significant interaction term indicates that reward-related motives act as a moderator in the relationship between overtime and work-home interference. Post-hoc regression analyses for two separate groups (based on a median split) were carried out in order to facilitate the interpretation of this effect. These analyses revealed that for the group that reported low rewards for working overtime, there was a significant relationship between overtime hours and negative work-home interference, whereas for the group that reported high rewards for overtime, this relationship was not significant. Work-related fatigue and work-related worrying had three significant predictors in the final model. The regression coefficients show that a higher number of hours of overtime is associated with decreased work-related fatigue and decreased work-related worrying. Higher scores on workload-related motives for working overtime and workaholism were also associated with higher levels of fatigue and worrying.

**Table 2.** Results of regression analyses with indicators of well-being and dependent variables. Beta coefficients from the final step (all predictors) are reported.

<table>
<thead>
<tr>
<th></th>
<th>Negative work-home interference</th>
<th>Work-related fatigue</th>
<th>Work-related worrying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.03</td>
<td>.01</td>
<td>.07</td>
</tr>
<tr>
<td>Age</td>
<td>.08</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>Executive position</td>
<td>.17</td>
<td>-.17</td>
<td>-.02</td>
</tr>
<tr>
<td>Overtime hours</td>
<td>* .73</td>
<td>* -.30</td>
<td>* -.28</td>
</tr>
<tr>
<td>Workload-related motives</td>
<td>* .24</td>
<td>** .33</td>
<td>* .26</td>
</tr>
<tr>
<td>Reward-related motives</td>
<td>* .39</td>
<td>-.16</td>
<td>-.19</td>
</tr>
<tr>
<td>Social norm-related motives</td>
<td>* .19</td>
<td>.06</td>
<td>.05</td>
</tr>
<tr>
<td>Workaholism</td>
<td>** .47</td>
<td>** .46</td>
<td>** .44</td>
</tr>
<tr>
<td>Overtime hours x reward-related motives</td>
<td>** -.88</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>R²</td>
<td>** .55</td>
<td>** .44</td>
<td>** .31</td>
</tr>
</tbody>
</table>

*p < .05; ** p < .01

**Discussion**

The first research question in this study concerned workaholism and several motives for working overtime as predictors for actually reported overtime hours. The results show workload-related motives are the best predictors of overtime hours. Persons who claim that they need to work overtime in order to finish their work or prevent things going wrong work more overtime hours. Motives related to rewards and social norms did not predict overtime. It can be concluded that, at least in this sample, the most important antecedent of working overtime is related to work involvement, rather than the desire to be appreciated by others or avoid conflicts. Workaholism could not explain any variance in addition to what was explained by workload-related motives.

The second research question concerned the relationship between overtime hours and the quality of recovery. Regression analyses showed that, after controlling for possibly confounding background variables, overtime-related motives and workaholism, overtime hours significantly predicted all three outcome variables. A larger number of overtime hours was associated with more negative work-home interference, but (surprisingly) also with reduced work-related fatigue and work-related worrying. An earlier study (Van der Hulst & Van Veldhoven, submitted) has shown a positive relationship between working overtime on the one hand and work-related fatigue and work-related worrying on the other, although the relationship was rather weak and depended on the type of job. However, that study concerned the frequency of working
over long working hours rather than the number of hours. Moreover, the current study included different confounders (such as workaholism), which may have affected the results. Additional research will have to be conducted in order to investigate the stability of the findings of this study.

The third research question addressed possible moderating effects of workaholism and the three motives for working overtime and the relationship between overtime hours and indicators of reduced quality of recovery. The analyses showed that there was only one significant moderator. For employees who report low rewards for working overtime there was a positive relationship between overtime hours and negative work-home interference, whereas for employees who report high rewards there was no such relationship. Thus, long hours are not necessarily associated with negative work-home interference. If colleagues and superiors appreciate it if an employee works overtime and it increases his or her career opportunities, working overtime does not have negative consequences. An earlier study (Van der Hulst & Geurts, in press) has shown a similar relationship for job rewards in general. In high reward jobs, overtime was not associated with decreased well-being. High rewards for working overtime might be related with high job rewards in general. An alternative explanation could be that employees who report high rewards (for working overtime or high job rewards in general) give more priority to their work life than to their private life. It might be that they simply do not mind not having time or energy to do other things in their leisure time because their job is so fulfilling.

References
The Demand-Control-Support model as a theoretical framework to predict return-to-work after long-term sick leave

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Introduction

Sickness absence is a complex phenomenon as its occurrence and course is influenced by social factors (e.g., social security system, health care, culture), work-related or organisation-specific factors (e.g., work content, work environment, work conditions, organisational policy) and individual factors (e.g., personality, health, physical condition, attitude towards work) (e.g., Kristensen, 1991; Niedhammer et al., 1998). Furthermore, the strength of the effects of (certain categories of) these risk factors might differ for specific outcome measures in the course of the sickness absence (cf. Zapf et al., 1996). For example, Smulders (1980) and Kristensen (1991) have observed that it is important to distinguish between risk factors in long-term and short-term absence. Thirdly, the strength of the effects of these factors on the duration of the sickness absence might differ by diagnosis groups because of differences in risk factors in the aetiology and in the natural course of different health complaints.

The Demand-Control-Support (DCS) model (Karasek & Theorell, 1990) postulates that high job demands, low decision latitude and low job support predict a high level of strain (‘strain’ hypothesis). Furthermore, high decision latitude together with high job demands would lead to job related well-being in terms of increased work motivation and learning opportunities (‘learning’ hypothesis). Because sickness absence and the related outcome measure that is used in this study namely return to work, is seen as a stress-related health outcome, the strain hypothesis seems to be most applicable in this study. With regard to this hypothesis, to date there is ample empirical evidence on the additive effects of these variables on a wide range of health outcomes. Less evidence does exist on the postulated interaction terms. Investigated outcomes include mental health complaints like psychological distress and burnout (Schaufeli and Enzmann, 1998; Van der Doef & Maes, 1998) as well as physical health outcomes like CVD (e.g., Theorell & Karasek, 1996; Schnall et al., 1994) and to a lesser extent, behavioural outcome measures like sickness absence (e.g., Smulders & Nijhuis, 1999).

In the Netherlands, the employer is legally bound to compensate for at least 70 percent of the income (100 percent in most companies) during the first year of sick leave. Considering the costs of sick leave for the employer in financial terms but also in social terms (e.g., worker’s compensation, productivity loss, replacement costs, social responsibility of the employer with regard to well-being at work) it is obvious that it is important to identify interventions that might induce early return to work among long-term sick-listed employees. Studies in the natural course of sickness absenteeism that include work characteristics as predictors, should be encouraged because these factors are more than any of the other risk factors that were mentioned before under the control of the employer. The results of these studies are important to deduce practical guidelines for prevention.

Research questions

We took the DCS model as a theoretical framework in this study because it is a well-known model which has proven to be valid with regard to several outcome measures. However, contrary to the majority of previous studies on the DCS model, we applied the model to sickness absenteeism. More specifically, in a population of long-term sick-listed employees (> 6 weeks), we investigated the effect of the DCS variables on return-to-work within 4 months after the onset of the sick leave. By using this particular outcome measure with its time limit, we were able to study the course of the absenteeism in a population with the same length of sick leave. Therefore we can draw conclusions on determinants of return-to-work in a particular phase of the sick leave. Furthermore, recall bias in long-term sick-listed employees, and work-relatedness of the sick leave might interfere with the perception of work. In this study, we were able to overcome this problem because our research population were participants of a large-scale cohort study. Consequently, we were able to measure the DCS variables before the onset of the sick leave.

The second research question was whether the effects from the DCS variables on return to work within 4 months after the onset of the sick leave differed by diagnosis groups. In this study we compared the diagnosis groups ‘mental’ and ‘musculoskeletal’. In the Netherlands, about thirty percent of all recipients of a work incapacity pension is assessed work incapacitated on mental grounds and another thirty percent on musculoskeletal grounds (CTSV, 1998). This means that in particular these two groups are at risk of long-term sick leave and permanent (partial) work disability. Early intervention in the work situation might induce recovery (i.e., early return to work) within these diagnosis groups. Therefore, these are important groups to focus on in research on the course of the sickness absenteeism.
Method

Maastricht cohort study
In 1998, the Maastricht cohort study (MCS) on fatigue at work was started (Kant et al. 2000). During three years, employees coming from 45 companies and organisations were followed by four-monthly self-administered questionnaires which were sent to the employee home addresses. Aim was to detect risk factors in the aetiology and the natural course of fatigue, and to investigate the effectiveness of different treatments of fatigue and fatigue-related syndromes. Exposure (e.g. work characteristics) was measured once a year in an extensive questionnaire version, outcome (e.g. fatigue) was measured every four months.

Subcohort
Between February 1999 and February 2000, long-term sick-listed employees were selected from the participants of the Maastricht cohort study. Aim was to get more information on the natural course of the health complaints, sociomedical guidance, health behaviour, reintegration activities and work status. Participants would in principle be followed until about one year after the onset of the sick leave in order to be able to study the risk factors for intake in the Dutch disability benefit arrangements.

The data on the sick listed employees were provided by the companies that participated in the Maastricht cohort study. Inclusion criteria were that the subjects had to be sick listed between 6 and 8 weeks, spoke Dutch well enough to answer the questions and that they were on the sick list because of health complaints. Pregnant women were excluded because of the interference of the pregnancy and maternity leave with the duration of the sick leave. After selection of long-term sick-listed employees, but before the first interview, the potential participants received an introductory letter. Participation was voluntary and confidential. For a period of two weeks we then tried to reach the subject for an interview.

The first (T1) and second (T2) structured telephone interview took place 6-10 weeks and 3-4 months after the onset of the sick leave respectively (table 1). All subjects who met the criteria received a follow-up interview every two months and a final interview about one year after reporting ill. Follow-up interviews were discontinued after refusal of the subject or when a subject reported having resumed work fully on two consecutive measurements. Except for the refusals all subjects received a final interview one year after reporting ill. In this study we only used the first interview (T1) which was held two months after reporting ill, and the second interview (T2) held four months after reporting ill (table 1).

Measures

DCS variables
The Demand Control Support variables (DCS) were measured with a Dutch translation of Karasek’s Job Content Questionnaire (Karasek, 1985, Houtman, 1995) that was included in the MCS on fatigue at work (table 1). For each subject the most recent MCS measurement of the JCQ prior to reporting ill was used for this study (May 1998 or May 1999).

Covariates
Demographics (age, education and gender) were measured in the baseline questionnaire of the MCS and included as potential confounders (table 1). The covariate ‘severity of sickness’ was included in order to control for the confounding effects of the objective and subjective health complaints which might distort the relationship between the psychosocial work characteristics and return to work. The concept of ‘severity of sickness’ was operationalized by the answer on the question ‘How would you describe your health at this moment? Is it good, average or bad?’ which was measured 6-10 week after the onset of the sick leave (T1; see table 1).

Return to work
Return to work (yes/no) was measured in the second telephone interview about four months after the onset of the sick leave (T2; table 1). Four months after the onset of the sick leave, 69.6 percent of the whole study population had returned to work.

<table>
<thead>
<tr>
<th>Administration, selection and loss-to-follow-up</th>
<th>Data used in the study</th>
<th>Subjects</th>
<th>Type of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1998</td>
<td>Demographics</td>
<td>12,140 employees</td>
<td>MCS Baseline: mailed questionnaires</td>
</tr>
<tr>
<td>May 1998 or May 199</td>
<td>Karasek’s Demand Control Support</td>
<td>Last extensive MCS questionnaire before onset sick leave episode</td>
<td></td>
</tr>
<tr>
<td>January 1999 - January 2000</td>
<td>Selection of long-term (6-8 weeks) work incapacitated</td>
<td>Sick lists provided by 45 employers</td>
<td></td>
</tr>
</tbody>
</table>
**Table 1.** Data collection

| T1 | ~2 months after T0 | Subjective health | n= 455 | Telephone interview |
| T2 | ~4 months after T0 | Return to work: Not working n=121 Working n=277 | n= 398 | Telephone interview |

**Table 2.** Work characteristics (M (sd)) and background characteristics for the whole study population and the subgroups ‘musculoskeletal’ and ‘mental’ in the second, third and fourth column respectively. In the fifth column the characteristics of the groups musculoskeletal and mental are compared.

**Statistical analyses**

First, univariate differences in work and background variables were investigated between the diagnosis groups ‘mental’ and ‘musculoskeletal’ by performing T-tests (table 2). Furthermore, logistic regressions with return to work as a dependent variable were performed for the whole study population as well as for the subgroups with diagnosis ‘mental’ and ‘musculoskeletal’. The logistic regressions were performed in two steps. First, the DCS variables were entered in the regression equation in order to examine the crude effect of the DCS model on return to work. In a second step, potential confounders were entered. These confounders included age, gender, education and severity of health complaints.

**Results**

**Univariate analyses**

In table 2, the work characteristics and background characteristics for the whole study population are shown, and for the subgroups ‘musculoskeletal’ and ‘mental’ respectively. Furthermore, the T-tests show that the last two subgroups differed in level of job demands (marginally significant), level of decision latitude, and level of co-worker support (marginally significant). With regard to the nature of the differences, the group ‘mental’ had a higher score on job demands, a higher score on decision latitude and a lower score on co-worker support compared to the group ‘musculoskeletal’. Furthermore, the group ‘mental’ consisted of more employees with a high education compared with the group ‘musculoskeletal’. Finally, a good subjective health status at T1 was more often found in the group ‘musculoskeletal’; the group ‘mental’ more often considered their health status at T1 as average or bad (table 2).
Multivariate analyses

In table 3, the results of the logistic regressions are shown. Severity of illness at T1 appeared to be an important predictor of return to work within four months after the onset of the sick leave in the whole study population for good compared to bad health (OR=7.02, p=.000) and for average compared to bad health (OR=2.33, p=.002). The DCS variables had no effect on return to work.

Furthermore, in the subgroup ‘musculoskeletal’ marginal significant effects were found for severity of illness and for supervisor support. Employees who reported a good health status at T1 compared to employees who reported a bad health status at T1 had a slightly bigger chance of return to work (OR=3.55, p=.079). Employees with a higher score on supervisor support had a slightly bigger chance of return to work (OR=1.70, p=.059).

Because of too little variation in scores on severity of illness in the subgroup ‘mental’ (i.e., there were too little cases in the category ‘good health’), we could only investigate the effect of one dummy variable (average compared to bad health status at T1). In the group ‘mental’ only the variable severity of illness was found significant. Employees who reported an average health status at T1 had a bigger chance of return to work compared to employees who reported a bad health status at T1 (OR=5.99, p=.003). The DCS variables had no effect on return to work in the group ‘mental’.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Working OR</th>
<th>95% CI</th>
<th>Working OR</th>
<th>95% CI</th>
<th>Working OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not working</td>
<td>Working</td>
<td>95% CI</td>
<td>Working</td>
<td>95% CI</td>
<td>Working</td>
<td>95% CI</td>
</tr>
<tr>
<td>Step 1</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job Demands</td>
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<td>.91-1.48</td>
<td>1.34</td>
<td>.86-2.10</td>
<td>.93</td>
<td>.55-1.57</td>
</tr>
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<td>Supervisor Support</td>
<td>1.07</td>
<td>.82-1.40</td>
<td>1.70</td>
<td>.98-2.94</td>
<td>.72</td>
<td>.42-1.23</td>
</tr>
<tr>
<td>Co-worker support</td>
<td>1.03</td>
<td>.80-1.33</td>
<td>.85</td>
<td>.56-1.30</td>
<td>1.56</td>
<td>.86-2.84</td>
</tr>
<tr>
<td>Decision Latitude</td>
<td>1.13</td>
<td>.87-1.48</td>
<td>1.30</td>
<td>.80-2.12</td>
<td>1.24</td>
<td>.69-2.23</td>
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<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender- Women</td>
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<td>.46</td>
<td>.16-1.28</td>
<td>.53</td>
<td>.16-1.80</td>
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<tr>
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<td>.93</td>
<td>.54-1.60</td>
<td>.88</td>
<td>.47-1.63</td>
</tr>
<tr>
<td>Education- Low</td>
<td>1.09</td>
<td>.51-2.35</td>
<td>1.42</td>
<td>.22-9.05</td>
<td>.32</td>
<td>.07-1.48</td>
</tr>
<tr>
<td>Education- Medium</td>
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<td>.44-1.76</td>
<td>1.16</td>
<td>.19-7.06</td>
<td>.48</td>
<td>.15-1.60</td>
</tr>
<tr>
<td>Health- Good</td>
<td>7.02</td>
<td>2.79-17.65</td>
<td>3.55</td>
<td>.86-14.60</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Health- Average</td>
<td>2.33</td>
<td>1.36-4.00</td>
<td>2.13</td>
<td>.72-6.32</td>
<td>.599</td>
<td>1.85-19.38</td>
</tr>
</tbody>
</table>

Muscul.= group ‘musculoskeletal’

a increase per standard deviation
b 10-point increase
c reference category
d reference category is education high
e reference category is bad health

Table 3. Prospective factors for working in comparison with not working at T2 for the whole study population (third and fourth column), the group ‘musculoskeletal’ (fifth and sixth column) and the group ‘mental’ (seventh and eight column) respectively: adjusted odds ratios and 95% confidence intervals.

Conclusions

The univariate analyses showed that the subgroups with diagnosis ‘mental’ and diagnosis ‘musculoskeletal’ differ in work characteristics as well as in background variables. These differences should be taken into account when interventions are planned in the work situation. The group ‘mental’ had a higher score on decision latitude and a slightly higher score on job demands prior to reporting ill. This result is consistent with the fact that the group ‘mental’ consisted of more highly educated employees; jobs for higher educated employees often go together with higher job demands and higher decision latitude compared to jobs in which low educated employees find themselves. Furthermore, the group ‘mental’ had a lower score on co-worker support.

In spite of these differences between the diagnosis groups there was enough variation within the groups to perform multivariate analyses and to compare the subgroups on the predictors of return to work. With regard to the multivariate analyses, it can be concluded that in a heterogeneous population, no effects were found for the DCS variables on return to work within four months after the onset of the sick leave. However, the results suggested also that this lack of effect might be due to the lack of differentiation in diagnoses. More specifically, when we compared the ‘musculoskeletal’ group with the ‘mental’ group we concluded a marginally significant effect was found for supervisor support in the musculoskeletal group. In order to stimulate early return to work in long-term sick-listed employees with musculoskeletal complaints, it might therefore be a beneficial to look at the amount of supervisor support and to ensure that the sick-listed employee is provided with a sufficient amount of this support.
Severity of illness was found to be an important predictor of return to work. However, crude OR’s did not differ very much from adjusted OR’s. Therefore, as a confounding variable it did not have much influence on the effects of the DCS variables.

References


Work Schedules as risk factors for Need for Recovery and Fatigue

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Background

To investigate whether different work schedules constitute risk factors in the onset of high levels of need for recovery and fatigue after one-year follow-up.

Design and data

The study is part of the prospective Maastricht Cohort Study on ‘Fatigue at Work’, in which 12,140 employees are followed for three years by means of self-administered questionnaires (Beurskens et al., 2000; Kant et al., 2000). In the present study four different work schedules were evaluated: day work (n=1,954), 3-shifts (n=379), 5-shifts (n=470) and irregular shifts (n=213). Need for recovery, representing short-term effects of a day of work, was measured by the scale Need for Recovery
Results and conclusions
After adjusting for demographic and health factors, need for recovery of those working irregular shifts was twice that of day workers after one year follow-up (OR=2.24, CI 1.48-3.39 respectively). Additional correction for work-related factors, however, resulted in nonsignificant associations between work schedules and need for recovery.

With regard to fatigue, logistic regression analysis indicated that three-shift workers had a significant higher risk for developing prolonged fatigue after one year compared to day workers (OR=1.83; CI 1.22-2.73), after adjusting for demographic and health factors. When additionally adjusting for work-related factors associations between work schedules and fatigue were nonsignificant. In conclusion, work schedules showed a clear effect on the onset of need for recovery and fatigue with differential effects for both concepts. The effects of work schedules, however, were interrelated with the effects of other work-related factors.

References
Van Veldhoven, M., & Meijman, T. F. (1994). *Het meten van psychosociale arbeidsbelasting met een vragenlijst: de vragenlijst beleving en beoordeling van de arbeid (VBBA) [The measurement of psychosocial job demands with a questionnaire (VBBA)].* Amsterdam: NIA.

Farmers' Working Conditions and Health

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During the last century the agricultural industry in Western countries has undergone radical changes. In industrialized countries less than 10% of the population are engaged in farming whereas in developing countries about 60-70% are so (NE, 1993). Small family farms have been amalgamated forming large estates. Peasants have more or less disappeared in the rural population in many Western countries and been replaced by agricultural businessmen working mostly alone or on very large farms as managers with engaged farm workers. This has drastically changed infrastructure and social networks in the countryside. During the 20th century agricultural work has continuously been mechanized. New production techniques, new agricultural implements, new crops and pesticides have been introduced. The industrialization of this industry has increased the productivity enormously. The productivity in cultivation of wheat (kg wheat/man, hour) increased in the USA from about 20 kg 1900 to about 300 kg 1970 (NE, 1993). Whilst these changes have resulted in increased load on the farmer...
and his family limited attention has been given to farmers and their working conditions in comparison to those working in other industries.

This paper aims to study the relationships between the farmers’ age, farming experience, working-hours, physical work environment factors, assessment of work, emotional reactions, worry, discomfort, important living and production conditions, medical complaints, health and days of illness.

**Method**

A questionnaire was administered to a stratified random sample of 1158 Swedish farmers corresponding to 1% of the farmer population in Sweden. The sample was stratified with respect to geographic localization, arable area, dairy cattle and farmer age. 791 questionnaires were returned giving an unweighted response rate of 68.3% and 625 questionnaires were included in the analysis. About 1/3 of the dropout was due to people who had left farming, 9% were sick or dead, 7% too old or passive joint-owners, 10% did not give any reason and the rest reported lack of time and interest or were negative to the survey.

Of the 91 questions in the questionnaire 13 were more thoroughly investigated and analyzed using LISREL. These variables included the farmers age, years of farming experience, working hours, stress due to physical work environment factors (1 index referring to the number of "high degree” answers on 22 items - [N_WRKENV]), work assessment (1 index referring to the number of positive assessments of farm work on 13 items - [N_WRKPOS] and 1 index referring to the number of negative assessments on the same items - [N_WRKNEG]), emotional reactions referring to social or external conditions (1 index referring to the number of positive reactions on 4 items - [N_SOCPOS] and 1 index referring to the number of negative reactions on 9 items - [N_SOCNEG]) and to psychological or internal conditions (1 index referring to 9 items - [N_PSYGEN]), worry (1 index referring to the number of "high degree” answers on 23 items - [N_WORRY]), discomfort (1 index referring to the number of "high degree” unpleasant answers on 16 items - [N_DISCOM]), important living and production conditions (1 index referring to the number of "very important” answers on 13 items - [N_MEAN], medical complaints (1 index referring to “daily or weekly” answers on 18 items - [N_MEDCOM]), reported health and days of illness.

Population means and answer proportions for single variables (questions and items) were estimated and weighted according to Cochran (1963), whereas LISREL analysis of relationships between variables and indices were based on unweighted estimates of variables and indices. LISREL model fit of data was calculated by $\chi^2$ goodness-of-fit and RMSEA.

**Results**

The typical farmer was a middle aged (50.7±0.57 yrs.) married man (71.6%), who had devoted more than 30 years (32.03±1.12) to farming without any formal training for his work. Even if about 2/3 of the wives regularly take part in the farm work most farmers (89.5%) work alone. The average site area is somewhat less than 200 acres or 80 hectares (77.7±4.02) divided into almost 80 acres or 30 hectares (31.2±1.31) of arable area, about 15 acres or 5 hectares (5.8±1.36) of pasture and somewhat more than 100 acres or 40 hectares (41.9±3.62) of woodland. Most farmers raise some crops and about 3/4 are animal breeders. Apart from the winter season the weekly working hours amount to more than 40 hours for about 60% of the farmers.

The physical work environment is characterized by the industrialization of farming and the fact that most of the job is performed outdoors. Noise, heavy lifting, inappropriate working postures, dust, draft and wind are the most stressful and annoying physical work environment factors bothering more than 2/3 of the farmers as illustrated in figure 1.
The farmers describe their job as active, free, varying, stimulating, interesting, meaningful, pleasant, independent, qualified, neither simple nor difficult, neither fraught with nor free of conflicts, and rather risky. More than 70% of the farmers report positive emotional reactions referring to social or external conditions. Even though almost half of the farmers felt they are in control of their work (48.7%) and about 1/3 felt they are underrated (35.7%) negative emotional reactions to social conditions are less frequent. Almost every other farmer felt that they are under press (47%) and about 1/3 felt alone at work, but negative psychological reactions are otherwise less common. The farmers are worried to a “high degree” about increase in prices or reduced access to fuel (53%) and machines (37.2%), increase in taxation (49.9%), unfavorable price trend for agricultural products (39.2%) and restrictions concerning transfer of business or assignment of lease (32.2%), but they are less worried about their own sickness or accidents (22.6%), failure of the crop (20.5%) or sickness in stock of animals (19.5%). The most frequently reported conditions evaluated unpleasant to a “high degree” are legislation (25.6%), weather (24.1%), county agricultural board and other authorities (20.8%), vacation possibilities (18.9%), interest groups and unions (10.5%).

Farming offers some highly appreciated living and production conditions to the farmers. They reported being able to see the result of their work (96.1%), work on their own (95.3%) and in a creative way (91.5%) seeing the crops grow ripe (90.8%) and living close to the countryside (88.2%) as “very important”. The most frequent medical complaints bothering the farmers at least once a week or daily are myalgia (25.1%), difficulties to fall asleep (14.8%), numbness in arms and legs (12.0%), persistent sense of fatigue (10.4%), heartburn and stomach complaint (10.3%). In spite of that the farmers felt happy and report they are in “rather good” (40.0%) or “very good” (33.7%) health. More than half of the farmers reported no days of illness during the last year (58.7%) and less than one tenth reported more than a month of illness. Path analysis by means of LISREL indicated that the data fitted the model illustrated in figure 2 very well, $\chi^2(6, n=556)=4.71$ and RMSEA=0.00.

**Figure 1.** Percentage of farmers troubled at work to a high degree or to some extent by the ten most stressful physical work environment factors.
Discussion and conclusion

The only variable directly related to days of illness - [DAYOFILL] is [N_PSYGEN], emotional reactions referring to psychological or internal conditions of the farmer such as irritation, aggression, depression, confusion. Age, stress due to physical work environment factors - [N_WRKENV], [N_PSYGEN], and important living and production conditions - [N_MEAN] are all directly related to both medical complaints - [N_MEDCOM] and reported health, whereas conditions evaluated unpleasant to a “high degree” - [N_DISCOM] is only directly related to [N_MEDCOM] but not to self reported health. It is also interesting to notice that days of illness are directly related to self reported health which in turn is directly related to [N_MEDCOM]. This indicates that days of illness are more affected by the farmers’ general sense of health and well-being than by pains they feel.

Other models tested using LISREL path analysis indicate that years of farming experience, working hours, number of positive and negative assessments of farm work - [N_WRKPOS] and [N_WRKNEG] respectively, number of positive and negative emotional reactions referring to social or external conditions - [N_SOCPOS] and [N_SOCNEG] respectively, and number of worrying conditions - [N_WORRY] fitted the tested models badly and did not add in explanation of self reported health and days of illness – [DAYOFILL].

References


Psycho-Emotional Dimensions Of Healthy Organizations

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Introduction

The purpose of the presentation is to outline the results of our research on psycho-emotional dimensions of organizations. Further, to present comparisons of the levels of these dimensions over a 3 year period according to process of transformation in different organizations. The current research is based on the concept of healthy organisation by Jahoda...
The data presentation were gathered using the following methods:

1) Work Balance Questionnaire (WBQ) - which is a diagnostic tool composed of 4 sections covering different sectors of organization functioning in the social and psychological area. The questionnaire was completed by 116 workers.

2) Set of psychological methods of our construction to describe psycho-emotional factors influencing workers’ functioning in organization completed by 116 workers.

Conclusions

The processes within the three Polish organizations differ with respect to the three dimensions outlined and represent different organizational health patterns. It is therefore proposed that an empirical index of organizational health is used. This index can be used by organizations to diagnose its’ psycho-emotional condition allowing the organisation to optimise its healthiness; offering employees better quality working conditions and subsequently, enhancing the care given to its’ human capital.

References


Stability and Change in the Exposure to Demands and Control: Results of the Longitudinal SMASH Study

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Background

In 1979 Robert Karasek introduced the job demand-control model (DC model). Through its simplicity and applicability this model has gained “substantial face value” in the theory and practice of occupational health psychology and epidemiology (e.g. De Jonge et al., 2000; Theorell, 2000). According to the DC model a psychosocial work environment can be characterized by a combination of demands and control. Demands can be described as psychological stressors in the work environment, such as having to complete much work and working under time pressure. Control consists of two components namely “decision authority” (opportunity to make decisions concerning the job) and “skill discretion” (amount of skills used
in the job). On the basis of different combinations of demands and control the model describes four types of work, namely high strain jobs, low strain jobs, active work and passive work. In the high strain situation, jobs are characterized by high demands and low control. Karasek and Theorell (1990) hypothesize that employees working in high strain jobs will have an increased risk of developing high blood pressure and reduced job satisfaction or health over time (Karasek, 1979; Karasek & Theorell, 1990; Theorell, 2000). In contrast, people working in low strain jobs, characterized by low demands and high control, will experience lower than average health complaints over time. Active jobs are characterized by high demands and high control. According to Karasek and Theorell (1990), these jobs result in an average amount of health complaints, but in more learning opportunities and motivation over time. On the other hand, passive jobs, characterized by low demands and low control, are associated with an average amount of health complaints, and with loss of skill and motivation over time (Karasek & Theorell, 1990).

The assumption that high strain jobs result in health complaints over time is known as the “Strain-hypothesis” of the DC model. The research examining this hypothesis has mainly been cross-sectional (i.e., based on one measurement), but the number of longitudinal studies examining this hypothesis is increasing (cf. Van der Doef & Maes, 1999; De Jonge & Kompier, 1997, Kristensen, 1999; De Lange et al., 2001). One weak aspect of most DC-studies is that they are based on a single point assessment of the employee’s perception of the work situation at the moment they filled out the questionnaire (Johnson & Stewart, 1993; Schnall et al., 1994). Due to single point assessment, researchers are usually unable to examine the effects of cumulative exposure to high strain over time, or changes in (perceptions of) demands and control over time. An exception to these studies is the study of Schnall et al. (1998), who used a longitudinal design of two measurements and examined the effects of “cumulative or stable exposure” to job strain over time, but also examined the effects of changed perceptions of demands and control over time. This method allows for examining effects of experiencing different demands and control over time. Schnall et al. (1998) found that people in the high strain situation on both measurements, also reported the highest levels of ambulatory blood-pressure. Furthermore, changes in exposure to demands and control over time partially predicted change in ambulatory blood pressure. Consequently, this study provided new evidence for the strain-hypothesis of the DC model.

The current study builds on and extends the work by Schnall et al. (1998) in at least three aspects. First, whereas Schnall et al. (1998) used a small sample of 195 men, the present research includes data from a representative sample of 1463 employees. Second, our study is a four-wave panel study, rather than a two-wave study. Third, the larger number of participants and waves allows us to examine and compare the effects of a relatively high number of different patterns in exposure to DC over time (i.e., different DC-histories) and therefore allows for a better understanding of the cumulative effects of exposure to various combinations of demands and control. In this paper two questions will be addressed:

1. Can Karasek’s predictions for the differences in strain among the four different job types (high strain, low strain, active and passive work) be replicated for stable exposure to demands and control on four measurements over time?
2. Do positive and negative changes in exposure to demands and control result in decreased or increased strain over time as presented by the DC model?

**Hypotheses**

These two questions lead to several hypotheses. Based on the theory of Karasek and Theorell (1990) four hypotheses were developed for “stable exposure groups” with respect to their reported strain:

1a. Employees with high demands and low control (high strain jobs) on all four measurements will report the highest level of strain compared to the other three stable groups over time.
1b. These employees will report a significant increase in strain over time.
2a. Employees with low demands and high control (low strain jobs) on all four measurements will report the lowest level of strain compared to the other three stable groups over time.
2b. These employees will report a stable level of strain over time.
3a. Employees with high demands and high control (active work) on all four measurements will report an average level of strain compared to the other three stable groups over time.
3b. These employees will report a stable level of strain over time.
4a. Employees with low demands and low control (passive work) on all four measurements will report an average level of strain compared to the other three stable groups over time.
4b. These employees will report a stable level of strain over time.

For the “changing exposure groups”, we hypothesized that:

5. Positive changes from high strain to “no-high strain groups” (i.e. low strain, active or passive work) will result in a significant decrease in strain over time.
6. Negative changes from “no-high strain groups” to high strain will result in a significant increase in strain over time.
7. Positive changes from active/passive work to low strain will result in a significant small decrease in strain over time.
8. Negative changes from low strain to active/passive work will result in a significant small increase in strain over time.
Method
The hypotheses have been tested using longitudinal data of the 3-year prospective cohort study called “SMASH” (Study on Musculoskeletal disorders, Absenteeism, Stress and Health). The study population consisted of 2064 employees working in 34 different companies, located throughout the Netherlands. These companies were not engaged in major reorganizations during the three years of examination. Further requisites for the companies were that the annual turnover rate of their workforce was lower than 15%, that the respondents had been working at least one year in the current job and worked for a minimum of 20 hours per week. Blue-collar jobs as well as white-collar jobs were selected (Hoogendoorn, 2001).

The data of this paper are based on annual questionnaires measuring psychosocial variables on four measurements (1994-1997). To ensure valid and reliable results, employees who had a temporary contract and employees receiving a benefit because of (partial) disability were excluded, meaning that 47 of the 1789 respondents were excluded. The responses to the questionnaires varied between 84% (N= 1742) at baseline to 85% (N=1473) at the third follow-up measurement. Drop-outs, as expected, tended to report more strain and less control over time. Of the respondents 70% were men and 30% women. Ages on baseline ranged from 18 to 59 (M=35.57, SD= 8.76) and the respondents were working on average 9.56 years (SD= 7.72).

Measures
DC dimensions. Job demands and job control were measured by means of a shortened Dutch version of the Job Content Questionnaire (see De Jonge et al. (2000) for the selection of these items; Karasek, 1985; Karasek et al., 1998). Job demands and skill discretion were measured by a five-item scale (cf. De Jonge et al., 2000) and decision authority by a three-item scale. The response scales of demands and control ranged from 1 (“strongly disagree”) to 4 (“strongly agree”). Mean item scores were computed (minimum= 1 and maximum= 4). Higher scores reflect higher demands and higher control. The reliability (Cronbach’s alpha’s) of job demands varied between .65 to .72 across time (median= .71) and the reliability of control between .81 to .83 across time (median= .82).

Strain outcomes. The current study included two strain outcomes. 1 Depression was measured with an 11-item Dutch version of the CES-D scale (Center for Epidemiological Studies Depression; Radloff, 1977). This scale tapped the degree to which the participants suffered from symptoms of depressive mood. A sample item: “The past two weeks I felt lonely”. The response categories ranged from 1 (“hardly ever or never”) to 3 (“much or most of the time”). Mean item scores were computed (minimum= 1 and maximum= 3). Higher scores reflect more symptoms of depression. The reliability (Cronbach's alpha) varied from .74 to .84 across time (median= .77). 2 Job satisfaction was measured by a single item (“Do you mostly enjoy your work?”; 1 = "strongly disagree", 4 = "strongly agree"). Mean item scores were computed (minimum= 1 and maximum= 4). Higher scores reflect more job satisfaction. A meta-analysis by Wanous et al. (1997) demonstrated that single-item measures of job satisfaction correlate high with multi-item scales measuring overall job satisfaction (average uncorrected correlation=.63, SD=.09).

DC-histories. Eleven groups were created on the basis of their exposure to different combinations of job demands and control. First, all variables tapping job demands and job control at each of the four occasions included in this study were dichotomised using the median-split. Within each occasion, four different combinations of job demands/job control were formed (i.e., active jobs, characterized by high demands/high control; passive jobs, characterized by low demands/low control; high strain jobs, characterized by high demands and low control; and low strain jobs, characterized by low job demands and high control).

As this study included four waves, we could distinguish among 4 (time points) to the fourth (4 demands/control combinations) power different combinations, resulting in 256 different DC-histories. Four of these consisted of stable histories, i.e., in which no transition from one quadrant to another was observed during the four measurements (Ns varying from 61 for the stable high strain group, to 108 for the stable low strain group, cf. Table 1).

Group 5-10 consisted of participants whose DC-histories included only one transition over time. The timing of that transition was deemed irrelevant. Group 5 included DC-histories in which the participants were initially in the low strain quadrant and moved at some point in time to the high strain quadrant (N = 8). A low incidence of this pattern was expected, as this transition presents a rather ‘dramatic’ change in the perception one’s job characteristics. Similarly, group 6 consisted of participants who moved from the high strain to the low strain quadrant (N = 12; again, another ‘dramatic’ change, coinciding with a low frequency of occurrence). Group 7 included participants who changed from the active/passive quadrants to the low strain quadrant (N = 71); group 8 included participants who changed from the low strain quadrant to the active/passive quadrants (N = 171). Group 9 consisted of participants who moved from active/passive work to the high strain quadrant (N = 76). Group 10 included those who moved from the high strain quadrant to the active/passive quadrants (N = 123).

The remaining 653 DC-histories (44%) included more than one transition. These relatively complex histories could not be classified theoretically and were accordingly omitted from further interpretation.
Table 1. Description of DC-histories

<table>
<thead>
<tr>
<th>group number</th>
<th>group label</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stable high strain group</td>
<td>61</td>
</tr>
<tr>
<td>2</td>
<td>Stable low strain group</td>
<td>108</td>
</tr>
<tr>
<td>3</td>
<td>Stable active group</td>
<td>97</td>
</tr>
<tr>
<td>4</td>
<td>Stable passive group</td>
<td>93</td>
</tr>
<tr>
<td>5</td>
<td>Low strain --&gt; high strain</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>High strain --&gt; low strain</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Active/passive work --&gt; low strain</td>
<td>71</td>
</tr>
<tr>
<td>8</td>
<td>Low strain --&gt; active/passive work</td>
<td>171</td>
</tr>
<tr>
<td>9</td>
<td>Active/passive work --&gt; high strain</td>
<td>76</td>
</tr>
<tr>
<td>10</td>
<td>High strain --&gt; active/passive work</td>
<td>123</td>
</tr>
<tr>
<td>11</td>
<td>Other (no clear DC-histories, omitted from further interpretation)</td>
<td>653</td>
</tr>
</tbody>
</table>

Results

The data were analysed using a group (the different DC-histories) x Time (four measures of depression and job satisfaction) ANOVA with Time as within-participants factor and Group as a between-participants factor. For simplicity the participants’ scores of depression and job satisfaction were analysed separately. Table 2 presents the significant overall results for depression and job satisfaction.

Table 2. Overall results for depression and job satisfaction

<table>
<thead>
<tr>
<th>Overall results</th>
<th>Depression</th>
<th>Job satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>F (3, 601) = 12.31 (p&lt; .01)</td>
<td>F (3, 489) = 2.68 (p&lt; .05)</td>
</tr>
<tr>
<td>Group</td>
<td>F (9, 603) = 7.89 (p&lt; .01)</td>
<td>F (9, 491) = 13.90 (p&lt; .01)</td>
</tr>
<tr>
<td>Group x Time</td>
<td>F (27, 1809) = 1.652 (p &lt; .05; linear effect)</td>
<td>F (27, 1473)= 1.785 (p &lt; .01; linear effect)</td>
</tr>
</tbody>
</table>

The results of table 2 show that the means of the 10 groups on the four measurements differ significantly for the dependent variables depression, F (27, 1809) = 1.652, p < .05, and job satisfaction, F (27, 1473)= 1.785, p < .01. Follow-up analysis revealed several significant Time effects for the separate groups (Table 3).
<table>
<thead>
<tr>
<th>Results per group</th>
<th>Depression</th>
<th>Job satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 (stable high strain)</td>
<td>$F(3, 57)= 2.92$ (p &lt; .05; linear effect)</td>
<td>$F(3, 48)= 5.16$ (p &lt; .01; linear effect)</td>
</tr>
<tr>
<td>Group 5 (from low strain to high strain)</td>
<td>$F(3, 5) = 9.32$ (p &lt; .05; linear effect)</td>
<td>NS</td>
</tr>
<tr>
<td>Group 7 (from active/passive to low strain)</td>
<td>$F(3, 57)= 3.77$ (p &lt; .05; cubic effect)</td>
<td>NS</td>
</tr>
<tr>
<td>Group 8 (from low strain to active/passive)</td>
<td>$F(3, 100)= 5.38$ (p &lt; .01; linear effect)</td>
<td>NS</td>
</tr>
<tr>
<td>Group 9 (from active/passive to high strain)</td>
<td>NS</td>
<td>$F(3, 48)= 6.46$ (p &lt; .01; linear effect)</td>
</tr>
<tr>
<td>Group 10 (from high strain to passive/active)</td>
<td>NS</td>
<td>$F(3, 35)= 3.22$ (p &lt; .05; quadratic effect)</td>
</tr>
</tbody>
</table>

Table 3. Results per group for depression and job satisfaction

Results stable exposure groups. In line with hypothesis 1a, the results show that respondents in the stable high strain group report the highest level of depression and lowest level of job satisfaction over time, compared to the other stable groups (see Figure 1 for depression and Figure 2 for job satisfaction). Furthermore, the respondents in the low strain group report the lowest depression and highest job satisfaction compared to the other stable groups and the active/passive workers present more or less average results (Hypotheses 1-4 supported). Furthermore, depression increases and job satisfaction decreases significantly for the high strain group (Hypothesis 1b supported). As expected for the other stable groups depression and job satisfaction remain on the same level (no time-effects; Hypotheses 2b, 3b and 4b supported).

![Depression](image)

Figure 1. Changes in depression for the four stable groups
Job satisfaction

Figure 2. Changes in job satisfaction for the four stable groups

Changing exposure groups. In Figure 3 the significant results are presented for the changing exposure groups and the stable high strain group as reference group when measuring depression. This figure shows that a change from low strain to high strain can result in more depression over time compared to the stable high strain group. In addition, from Figure 4 we can conclude that the stable high strain group reports the lowest job satisfaction over time compared to the significant changing exposure groups.

The changes from high strain to “no-high strain” were less clear (Hypothesis 5). Only the change from high strain to active/passive work over time was significant for the dependent variable job satisfaction. One explanation for this result is that respondents in the high strain group have experienced such a high level of strain over time that a positive change does not immediately result in less experienced strain. This kind of exposure to stress has been labelled as an “accumulation effect” (Frese & Zapf, 1988).

Furthermore, the results for the changing exposure groups provide partial support for Hypothesis 6. The change from low strain to high strain was associated with a significant decrease in depression, but not with a significant increase in job satisfaction over time. In addition, the change from active/passive work to high strain was associated with a significant increase in job satisfaction, but not with a significant decrease in depression over time. Finally, Hypothesis 7 and 8 were only supported for the dependent variable depression. For instance, the change from active/passive work to low strain was associated with a significant decrease in depression over time.

Overview results: Table 4 presents the results for each hypothesis.

Depression

Figure 3. Changes in depression for the stable high strain group and significant changing groups
Figure 4. Changes in job satisfaction for the stable high strain group and significant changing groups

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Support (+, - or +/-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a - 4b</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>+/-</td>
</tr>
<tr>
<td>6</td>
<td>+/-</td>
</tr>
<tr>
<td>7</td>
<td>+/-</td>
</tr>
<tr>
<td>8</td>
<td>+/-</td>
</tr>
</tbody>
</table>

Note: ‘+’= support for hypothesis, ‘-’= no support for hypothesis, ‘+/-’: partial support for hypothesis.

Table 4. Results for the eight hypotheses

Conclusion

This paper presents new evidence for the strain hypothesis of the DC model by looking at stability and change in perception of demands and control over time. A four-wave panel study was conducted among a sample of 1473 employees. Based on Karasek and Theorell's (1990) ideas, the respondents' scores on job demands and job control were first dichotomised using the median split. Then 10 groups were created, each corresponding with a distinct demand-control history (DCH). Four of these DCH's consisted of "stable" DC patterns (no change in terms of job demands or job control); the six remaining patterns represented DCH's in which a change occurred (e.g., from "low strain" to "high strain", etc.).

The results supported our formulated hypotheses for the stable exposure groups. We found that the differences in strain among the participants in the four stable DCH's were such, that the high strain group experienced the highest amount of strain at all four time points. As expected, the participants in the high strain DCH reported more strain across time, while there were no such time effects for the other three stable DCH's. Thus, the adverse effects of having a high strain job tend to become more pronounced across time.

Further, our results revealed that a change from the low strain condition to the high strain condition tended to result in elevated levels of strain. However, a change from the high strain condition to the low strain condition did not result in a correspondingly lower level of strain. This suggests that the adverse effects of having a high-strain job are such that they are not resolved immediately when a positive change occurs -- an "accumulation effect" in Frese and Zapf's (1988) terminology. One practical implication that may be derived from this finding is that positive changes in demands or control...
of employees experiencing much strain may not be sufficient to reduce feelings of strain immediately; additional measures (such as counselling) may prove beneficial for such employees.

References
Introduction
The use of music to influence behaviour in the workplace has a long precedent. The Second World War, for example, gave rise to a significant amount of research investigating the impact of music on factory workers’ productivity and morale (Hargreaves & North 1997). As Hargreaves & North (1997) summarise, the basic conclusion of this research effort was that music could reduce the boredom of performing monotonous tasks (see, for example, Kaplan & Nettel, 1948; Kirkpatrick, 1943; McGehee & Gardner, 1949). The extent to which music influenced productivity remained unclear, although some studies (e.g. Humes, 1941; Smith, 1947) did report a relationship between music and both increased piecework production and decreased scrapage rates.

The ability of music to reduce the boredom that often accompanies repetitive work points to a likely relationship between music and employee well-being. Theoretically, one plausible proposition is that music has a stimulating effect when there is an absence of such stimulation in the immediate task environment. This increased stimulation is then responsible both for any increased attention and vigilance shown at work and any simultaneous improvement in job satisfaction, mood and well-being (Fox, 1983).

Music is, of course, known to arouse deep and profound emotions within us (Hargreaves & North, 1997). Bruner (1990) points especially to the ability of music to generate four principal mood states: exhilaration and excitement; tranquillity, peacefulness and serenity; solemnity and seriousness; and sadness and mourning. There is considerable evidence, particularly in the field of consumer behaviour, that such music-induced mood can then, in turn, influence social behaviour, perhaps by influencing such cognitive processes as attention and perception. Milliman (1982), for example, found that shoppers walked more slowly and made more purchases when slower music was playing in the background.

Gorn (1982) reported perhaps the best-known example of music’s influence upon social behaviour. Here, subjects were shown slides of light blue or beige pens in the presence of liked or disliked music. At the end of the experiment, subjects were given a choice of either pen as a ‘thank you’ for taking part in the study. Some 79% of subjects chose the pen associated with the liked music. Classical conditioning processes are used to explain this effect. Specifically, if a product (conditioned stimulus) is paired with a piece of music (unconditioned stimulus) which is liked (unconditioned response), then an association is produced wherein liking for the music extends to liking for the product (conditioned response).

Importantly, this conditioned effect is not found either when subjects are told they can make a pen choice at the start of the experimental procedure - in which case pen choice is associated with the information given about the pen, e.g. that it doesn’t smudge - or when personal or controversial products are paired with liked and disliked music, e.g. condoms (Pitt & Abratt, 1988). These findings have led a number of researchers to conclude that any conditioning effects of music upon consumer behaviour are limited to ‘low involvement’ situations, i.e. where subjects are neither motivated to pay much attention to the product or cognitively elaborate upon its attributes.

The parallel between this conclusion and the likely influence of music in the workplace is straightforward. Specifically, the beneficial impact of background music being played in the workplace is likely to be greatest in those jobs where the task demands are low. Here, the positive (unconditioned) response to liked music (unconditioned stimulus) might well generalise to a variety of aspects of the work environment (conditioned responses) e.g. judgements of the physical environment of the workplace, of the social cohesion amongst one’s work colleagues, and of the task itself. It is these hypotheses that are tested in this study.

Specifically, it hypothesised that playing music in the work environment will have a positive effect on:
1. Self-reported mood;
2. Physiological indicators of well-being (blood pressure and pulse);
3. The perceived quality of the physical work environment;
4. The perceived difficulty of work task;
5. Employees’ judgements of the social cohesion amongst the work group.

Method
Setting
The study was conducted in the theatre surgical services department of a large teaching hospital in the U.K. The specific area where the data was collected is an area that cleans and packs instrumentation for surgical procedures. This area is a sealed unit and access is by a sterile dressing area. Although there are some windows in the building that give access to views of the hospital roof, people working in the area have little reference to the outside environment.

Subjects
32 employees working in the surgical services department took part in this study. The sample consisted of 27 females (84%) and 5 males (16%). The age of the subjects ranged from 24–64 years with a mean age of 43 years and a standard deviation of 10.6 years.

Procedure & measures
The work area in which the study was carried out did not have the facility for playing music. The researchers supplied a midi hi-fi compact disc player for the duration of the data collection. The hi-fi was placed on a table and in a central location in the work area so all workers could hear the music. Three experimental conditions were used in the study:

A. No music
B. Classical music
C. Pop music

Compilation compact discs were used for both the classical and pop music conditions in order to ensure that the music played was typical of each genre.

An Omron RX wrist type blood pressure/pulse monitor was used for the collection of the physiological data. Physiological readings of blood pressure (systolic and diastolic) and pulse were taken at the start and completion of an employee’s shift.

All the data was collected before the start of a shift and at the end of a shift. The shift patterns are staggered starting at 6.30 am, 8 am, 9am, 12 noon and 1 pm. Shifts ended at 1 pm, 2.30pm, 3.30 pm, 4.30 pm, 6 pm and 9 pm. The data collection period lasted for three weeks. The three music conditions were counterbalanced with respect to the day of the week. For example if pop music was played on the first Monday of data collection then either classical music or no music was used the following Monday in order to reduce bias. The music was started once all the subjects had completed their start of shift questionnaires. The volume was kept at a constant level during the data collection. Subjects did not always work a full shift of eight hours but all subjects worked for at least 5 hours within these staggered shift patterns.

Self-report data was gathered by means of questionnaires that subjects completed at the start and end of their shift. Common to both pre and post-shift questionnaires were the following measures:

- An abbreviated version of Cox and Mackay’s (1985) Stress Arousal Checklist (SACL). This checklist measures two distinct aspects of self-reported mood: ‘stress’ (hedonic tone) and ‘arousal’ (an individual’s level of energy). Six items were used to measure stress (e.g. “tense” and “calm”) and four to assess arousal (e.g. “tired” and “lively”). Scale scores ranged from 6 to 24 (stress) and 4 to 16 (arousal), with higher scores indicating higher levels of both factors. Coefficient alpha demonstrated adequate internal reliability for both scales both pre and post-shift (pre: $\alpha = .82$ [stress] and .80 [arousal]; post: $\alpha = .71$ [stress] and .82 [arousal]).

- A four item measure of the perceived quality of the work environment, e.g. the extent to which it is seen as being pleasant /unpleasant. High scores indicate a more positive assessment, with the scale range being from 4 to 28. Coefficient alpha for the scale was .80 both pre and post-shift.

- A single item measuring the anticipated and retrospective difficulty of the shift (lower scores indicate greater perceived difficulty).

Unique to the pre-shift questionnaire were a small number of biographical questions, i.e. age gender, mode of transport to work and distance travelled to work. Unique to the post-shift questionnaire was an eight-item measure of social cohesion within the workgroup. Example items include, “I always get on with my work colleagues” and “In Sterile Services we have an in it together attitude”. Scale scores ranged from 8 to 56. Coefficient alpha for the scale was .81.

Design
The study utilized a one sample repeated measures design with data being gathered from the same set of subjects under the three different music conditions (no music [control], classical, pop). With the exception of the biographical and social cohesion measures, all other variables were assessed pre and post shift.

Results
For the purposes of this paper, data analysis is confined to a series of one-way repeated measures analyses of variance. With the exception of the social cohesion variable, a separate ANOVA is computed at each time point (i.e. pre and post shift) for the comparison of dependent variable scores across musical conditions. Social cohesion was only measured – and therefore compared – post shift. Tables 1 to 8 summarize the results of these analyses as well as showing the relevant descriptive statistics.
Table 1: Levels of self-reported stress pre and post shift.

<table>
<thead>
<tr>
<th></th>
<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>12.66</td>
<td>2.29</td>
<td>13.13</td>
<td>2.54</td>
</tr>
<tr>
<td>Classical</td>
<td>13.09</td>
<td>2.18</td>
<td>13.09</td>
<td>2.05</td>
</tr>
<tr>
<td>Pop</td>
<td>11.88</td>
<td>3.85</td>
<td>10.88</td>
<td>2.80</td>
</tr>
<tr>
<td>Repeated measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td></td>
<td>Pre: F(2,64)=1.64, ns</td>
<td>Post: F(2,64)=9.52, p&lt;.001</td>
</tr>
</tbody>
</table>

Table 2: Levels of self-reported arousal pre and post shift.

<table>
<thead>
<tr>
<th></th>
<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>10.00</td>
<td>2.21</td>
<td>9.78</td>
<td>1.54</td>
</tr>
<tr>
<td>Classical</td>
<td>9.94</td>
<td>2.30</td>
<td>10.03</td>
<td>1.73</td>
</tr>
<tr>
<td>Pop</td>
<td>11.09</td>
<td>3.14</td>
<td>9.09</td>
<td>1.40</td>
</tr>
<tr>
<td>Repeated measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td></td>
<td>Pre: F(2,64)=2.12, ns</td>
<td>Post: F(2,64)=3.48, p&lt;.05</td>
</tr>
</tbody>
</table>

Table 3: Systolic blood pressure readings pre and post shift.

<table>
<thead>
<tr>
<th></th>
<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>133.88</td>
<td>16.91</td>
<td>136.91</td>
<td>15.80</td>
</tr>
<tr>
<td>Classical</td>
<td>134.97</td>
<td>17.00</td>
<td>132.00</td>
<td>14.35</td>
</tr>
<tr>
<td>Pop</td>
<td>135.13</td>
<td>17.72</td>
<td>134.94</td>
<td>17.97</td>
</tr>
<tr>
<td>Repeated measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td></td>
<td>Pre: F(2,64)=0.17, ns</td>
<td>Post: F(2,64)=2.55, p=.087</td>
</tr>
</tbody>
</table>

Table 4: Diastolic blood pressure readings pre and post shift.

<table>
<thead>
<tr>
<th></th>
<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>85.31</td>
<td>11.69</td>
<td>87.16</td>
<td>10.30</td>
</tr>
<tr>
<td>Classical</td>
<td>86.69</td>
<td>10.46</td>
<td>80.97</td>
<td>9.56</td>
</tr>
<tr>
<td>Pop</td>
<td>85.91</td>
<td>12.42</td>
<td>85.91</td>
<td>12.42</td>
</tr>
<tr>
<td>Repeated measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANOVA</td>
<td></td>
<td></td>
<td>Pre: F(2,64)=0.30, ns</td>
<td>Post: F(2,64)=6.98, p&lt;.01</td>
</tr>
</tbody>
</table>
Table 5: Pulse levels pre and post shift.

<table>
<thead>
<tr>
<th></th>
<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>71.19</td>
<td>10.78</td>
<td>74.25</td>
<td>9.54</td>
</tr>
<tr>
<td>Classical</td>
<td>67.75</td>
<td>7.57</td>
<td>69.88</td>
<td>7.90</td>
</tr>
<tr>
<td>Pop</td>
<td>71.44</td>
<td>9.95</td>
<td>71.53</td>
<td>10.25</td>
</tr>
<tr>
<td>Repeated measures ANOVA</td>
<td>Pre: F(2,64)=1.19, ns</td>
<td>Post: F(2,64)=3.23, p&lt;.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Perceived environmental quality pre and post shift.

<table>
<thead>
<tr>
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<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>17.44</td>
<td>3.03</td>
<td>16.03</td>
<td>4.69</td>
</tr>
<tr>
<td>Classical</td>
<td>17.66</td>
<td>4.29</td>
<td>18.00</td>
<td>3.72</td>
</tr>
<tr>
<td>Pop</td>
<td>18.56</td>
<td>3.93</td>
<td>19.41</td>
<td>3.93</td>
</tr>
<tr>
<td>Repeated measures ANOVA</td>
<td>Pre: F(2,64)=1.90, ns</td>
<td>Post: F(2,64)=9.53, p&lt;.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Perceived task difficulty pre and post shift.

<table>
<thead>
<tr>
<th></th>
<th>Pre-Shift</th>
<th></th>
<th>Post-Shift</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>5.03</td>
<td>1.43</td>
<td>5.03</td>
<td>1.43</td>
</tr>
<tr>
<td>Classical</td>
<td>5.09</td>
<td>1.47</td>
<td>5.22</td>
<td>1.66</td>
</tr>
<tr>
<td>Pop</td>
<td>5.44</td>
<td>1.37</td>
<td>5.94</td>
<td>1.13</td>
</tr>
<tr>
<td>Repeated measures ANOVA</td>
<td>Pre: F(2,64)=1.31, ns</td>
<td>Post: F(2,64)=5.12, p&lt;.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8: Levels of social cohesion measured post shift.

<table>
<thead>
<tr>
<th></th>
<th>Post-Shift Only</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>No Music</td>
<td>18.74</td>
<td>3.79</td>
</tr>
<tr>
<td>Classical</td>
<td>21.13</td>
<td>3.747</td>
</tr>
<tr>
<td>Pop</td>
<td>21.10</td>
<td>3.79</td>
</tr>
<tr>
<td>Between subjects ANOVA</td>
<td>Pre: F(2,64)=3.46, p&lt;.05</td>
<td></td>
</tr>
</tbody>
</table>
Discussion and Conclusion

In simple terms, the data reported here show a consistent and significant beneficial effect for music in the workplace. Compared to the no music control condition, pop and/or classical music had convergent positive effects on psychological, physiological and social outcomes. Specifically, while there were no statistically significant differences in any of the variables pre-shift, post-shift comparisons revealed one or other music condition to result in:

- Lower levels of self-reported stress;
- Lower levels of self-reported arousal;
- Lower systolic and diastolic blood pressure;
- Lower pulse;
- More positive environmental quality ratings;
- Perceptions of the shift as being ‘easier’;
- Higher levels of perceived social cohesion within the work group.

Curiously, it is the pop music condition that is generally associated with the greatest improvement in self-reported measures of well-being (stress, arousal, environmental quality and perceived shift difficulty) but the classical music condition that seems to be related to improved physiological indicators of well-being (lower pulse and blood pressure).

These results are consistent with those of Perrewe & Mizerski (1987) and Furnham et al (1999), both of whom also found that playing music in the work environment has a positive effect on the mood of workers. They are also in accord with previous research conducted in clinical environments. Maranto (1993), for example, found that playing music in hospital waiting rooms reduced autonomic responses or stress reactions in individuals waiting for a consultation with a clinician. He suggests that creating an ambient environmental condition using music can help an individual relax and experience lower levels of anxiety and fear.

Although not explicitly tested in this study, the fact that music induced both positive mood and changes in environmental, shift and work group perception suggests the possible existence of classical conditioning processes. That is, playing music generates a more positive mood (evidenced in both self-report and physiological indicators), which then generalizes to more positive evaluations of the job and both its social and physical environment. Such an argument is consistent with work by Donovan & Rossiter (1982) who suggest that approach-avoidance behaviours mediated by music can generate liking for the work environment, enjoyment of the workplace, positive attitudes to co-workers and positive attitudes when returning to the workplace.

To conclude, it is clear that while research into the effects of music on employee well-being is still in rather short supply, those studies that have been conducted in the area offer considerable support for the view that music might be a useful and effective way of improving the well-being of those employees working on boring or monotonous tasks. That is certainly the view supported by the data presented here. Further research is now needed both to determine the optimal combination of musical characteristics for any given work environment and to assess the contribution of musical preference in predicting behaviour and well being in the workplace.

References

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Promoting organizational health as part of the maintenance of work ability (MWA) activity in Finland

K. LINDESTRÖM
Department of Psychology, Finnish Institute of Occupational Health, Helsinki, Finland

Introduction
Occupational health services (OHS) in Finland have a rather long history of monitoring and intervening relating to psychosocial stressors at work. The organizational level has been taken into account in measuring job stressors, improving working conditions and promoting workers' health. The maintenance of work ability (MWA) development activity started in 1990. It covers individual and organizational health, well-being and competence, as well as physical working conditions and job and organizational factors. The MWA was originally based on a collective agreement between the labour market organizations and is now included in OHS legislation (Huuskonen et al, 1999).

Maintenance of the work ability model and process
The MWA intervention can focus to individuals' health and well-being, work and working conditions, work organization and individual and organizational competence.

Figure 1. General MWA model

The four intervening approaches of MWA are:
- job redesign and development of work environment
- organizational development
- promotion of individual health and resources
- promotion of professional and organizational competence
The MWA model is frequently used for various kinds of development activities in workplaces, because the term itself has become positively loaded in Finnish working life. MWA activities are participatory and initiatives are taken by employees, OHS personnel or by single work units. The employers usually actively participate in MWA projects or at least support them (Elo & Leppänen, 1999).

The developmental methods applied when implementing job redesign or organizational development activities have been:
- survey-feedback meetings
- optimizing work load
- conciser definition of responsibilities and work roles
- team building and improvement of team work
- increasing job discretion
- job and organizational redesign

Competence development has included:
- training in leadership and client-relations skills
- multiskilling of employees
- knowledge management
- promoting the learning organization and organizational learning (Lindström et al, 2000).

The MWA-process can be divided into three phases: the diagnostic phase, action phase and follow-up and evaluation phase. The diagnostic phase consists of a survey of the current situation and developmental needs, goal setting and making an action plan. The implementation of the various activities constitutes the second phase. The measurement methods of the initial diagnostic phase and the final evaluation/follow-up phase could be used at individual, group and organizational levels. The contents of the interventions vary in the projects, but they usually cover measures for various aspects of the MWA model. The evaluation of an intervention has been usually done internally by the participants or consultants themselves. Joint evaluations of several MWA projects have also been carried out by external evaluators. The evaluations have often consisted only of quantitative "before and after" measurements. However, a qualitative approach would help us understand what really happens during a process and how a process is dependent on the organizational context and actual working life situation (Griffiths, 1999).

Organizational health interventions in MWA
The content and methods of MWA interventions been highly influenced by the OHS, as the main actor, funding sources (ESF, national development programs, the financial compensatory system of the OHS), current societal needs (employability and pension policies and practices), the actors (e.g. the OHS, consultants) and, of course, by current needs at the workplace.

Although the physical health of individual has often been the main target of MWA activities when carried out by the OHS, organizational interventions and their evaluation have received increasing attention. Four types of organizational intervention activities can be mentioned, i.e. survey-feedback-intervention-evaluation processes, search conferences followed by participatory intervention programs and evaluation seminars, change management projects, and team development and innovating of work practices. This paper gives examples of how these organizational MWA processes have been planned, carried out, and evaluated, and also describes the roles of OHS personnel and external consultants. The monitoring of working conditions, planning and implementation of interventions, and their evaluation, use an approach marrying OHS practices and research.

Three organizational MWA intervention cases
Three present cases illustrate job redesign and organizational development oriented MWA activities. From the three case studies illustrating the MWA activity, one was from a hospital organization, one from SMEs, and one from an elderly care organization.

Case 1. MWA in a hospital ward
A maternity ward and an urology ward had separate MWA projects carried out in parallel with the same consultant being responsible for structuring and supporting of the process. This is a description of the case of the urology ward.

The starting point was an initial briefing meeting and a joint discussion with the representatives of the employers and employees. A search seminar was organized to find out in a participatory way any recent developmental needs and to create a basis for commitment and improvement on mutual collaboration. An MWA project group included representatives from various teams and professional groups from the ward. The group formulated the goals of MWA activity and prepared action plans with responsibilities and time schedules. The group met each month with the external consultant present. There were small-scale projects dealing with inner collaboration, employer-employee discussions, joint meeting practices, physicians’ rounds, physical exercise and leisure-time activities. A short questionnaire survey and an MWA Index were completed at the beginning and end of the project, and individual absence from work data were followed over a two-year period. Success factors were good commitment of management and employees. A new top manager was appointed during
At the end of the project, the other units of the department were closed, causing major frustrations among the personnel. The employees were, however, much better equipped with resources to cope with it because of the MWA project.

<table>
<thead>
<tr>
<th>Target</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital ward, n=43</td>
<td>Small IT company, n=39</td>
<td>Nursing home for elderly, n=600</td>
<td></td>
</tr>
<tr>
<td>Type of intervention</td>
<td>participatory project with multiple goals</td>
<td>promoting organizational learning by increasing organizational intervention with small local projects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• inner collaboration</td>
<td>- internal collaboration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• employer-employee discussion practices</td>
<td>- personnel participation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- physical exercise</td>
<td>- mentoring-tutoring system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- informal social events</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>all personnel</td>
<td>all employees</td>
<td>all personnel</td>
</tr>
<tr>
<td></td>
<td>management</td>
<td>manager/owner</td>
<td>management</td>
</tr>
<tr>
<td></td>
<td>OHS personnel</td>
<td>OHS personnel</td>
<td>OHS personnel</td>
</tr>
<tr>
<td>Consultation support</td>
<td>external consultant structured the process</td>
<td>outside consultants structured the process and gave feedback</td>
<td>outside consultant, full time</td>
</tr>
<tr>
<td></td>
<td>and participated in all meetings</td>
<td></td>
<td>- process consultation</td>
</tr>
<tr>
<td>Initiative/starting point</td>
<td>initiative from hospital personnel department</td>
<td>initiative from funding organization</td>
<td>- agreement between organization, employee</td>
</tr>
<tr>
<td></td>
<td>own interest of the hospital ward</td>
<td>own needs of the SME</td>
<td>representatives and consultants</td>
</tr>
<tr>
<td>Diagnostic phase</td>
<td>personnel survey</td>
<td>personnel survey</td>
<td>information meetings</td>
</tr>
<tr>
<td>Participatory planning</td>
<td>search seminar</td>
<td>client need survey</td>
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<td></td>
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<tr>
<td>Implementation of measures</td>
<td>miniprojects with</td>
<td>joint meetings</td>
<td>training program for whole personnel</td>
</tr>
<tr>
<td></td>
<td>• goals</td>
<td>- leisure time activities</td>
<td>- pilot projects at unit level</td>
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<td></td>
<td>• responsibilities</td>
<td>- access to joint meetings/information</td>
<td>participatory MWA groups at each unit</td>
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<td>• work plan</td>
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<td></td>
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<tr>
<td>Process support</td>
<td>regular monthly project group meeting</td>
<td>support to manager from consultant</td>
<td>consultative support</td>
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<tr>
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<td>- experience change seminars with other SMEs</td>
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<td></td>
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<td>support of leading group</td>
</tr>
<tr>
<td>Completing the process</td>
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<td>questionnaire survey</td>
<td>final evaluation meeting</td>
</tr>
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<td></td>
<td>- evaluation seminar</td>
<td></td>
<td>questionnaire survey</td>
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<tr>
<td>Evaluation</td>
<td>report based on before-after survey results</td>
<td>report based on process documentation, before and after survey</td>
<td>report based on before-after survey results and on evaluation seminar and documented data from process</td>
</tr>
<tr>
<td>Length</td>
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<td>2 years</td>
<td>2½ years</td>
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<tr>
<td>Success/failure factors</td>
<td>+ new manager</td>
<td>+ manager=owner</td>
<td>+ good managerial support</td>
</tr>
<tr>
<td></td>
<td>- restructuring, closing one unit</td>
<td>+ team building</td>
<td>- unexpected changes in organization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- participation possibilities difficult to organize</td>
<td>- insufficient personnel</td>
</tr>
<tr>
<td>Organizational context</td>
<td>- proud about their own competence</td>
<td>- polarization between older and younger employees with different competence</td>
<td>- external pressures dealing with quality of elderly care</td>
</tr>
<tr>
<td></td>
<td>- high inner cohesion</td>
<td></td>
<td>- pressures to reduce costs</td>
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<td></td>
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<td></td>
<td>- competing values</td>
</tr>
</tbody>
</table>
Case 2. A small IT company
This MWA intervention project was founded by the European Social Fund (ESF), with improvement of the innovativeness of SMEs as its main goal. This was operationalized by the intervention process to improve innovative climate and practices, organizational learning and team work. The project covered various SMEs wanting to improve their organization towards a learning organization.

A case of a small IT firm is described here. A questionnaire was completed at the beginning to survey needs for organizational innovation and training. The action plan was formulated in a search seminar where feedback from the initial questionnaire survey and client need survey was also given. All personnel and management participated in this feedback/search seminar. The consultants supported the management and personnel in going ahead with their plans, arranged training sessions and, eventually, an evaluation meeting. The miniprojects promoting organizational learning mainly dealt with two main issues: 1) how to improve the flow of information and collaboration between employees working in client companies 2) how to utilize older workers' tacit knowledge and younger workers' newer technological knowledge. The main responsibility for the project was held by the owner-manager and one or two employee representatives. The intervention processes concentrated on communication between employees to strengthen their social cohesion and interaction. Their success was mainly dependent on the active role of manager and a climate for participation safe from interpersonal conflicts.

Case 3. MWA in a nursing home for elderly people
The MWA in nursing homes concentrated on improvement of work and organizational issues and, to minor extent, on the physical work environment and ergonomics. One main goal was to better meet the needs of patients and to improve employee-patient interaction. Because the whole process was carried out in a large municipal organization for elderly care, training and lecturing constituted one part of the project. The developmental activities were tailored at the ward level and action plans were prepared for the ward level.

The external consultant helped to structure and support the whole process and the individual projects over a two-year period. Experience exchange seminars were organized each half-year in order to disseminate experiences from the various units and to motivate participants. Evaluation based on documentation produced during the project, using a "before-after" questionnaire survey, organizing an evaluation seminar and collecting evaluations from participants. The main improvements were found to have occurred in the personnel's competence in patient care and in collaboration. The main obstacles were insufficient time for joint discussions and training, and concurrent external changes like the renovation of one building, causing great difficulties for the wards situated there.

Discussion and conclusions
In a case study or intervention case, evaluations concentrate on changes occurring in a specific organizational context. Therefore, evaluations should utilize information from processes and outcomes on a multilevel basis: from organizations, groups, management/supervisors and individuals (Porras & Silver 1991). The multilevel approach and information flow require application of reasoning models used in case studies (Yin 1987).

All present interventions included a consultative process, which could also be evaluated from three different viewpoints:
- customer-consultant relationships
- planned and unplanned events
- change towards goals (Lippitt & Lippitt 1986).

Concluding the results and experiences from the three cases with organizational development activities in MWA, the success factors were:
- extensive participation of employers and employees
- the external consultant helping to structure the process, motivate the project group, help to evaluate and document the whole process
- establishment of a joint learning process
- no interfering concurrent changes in the organization

Small projects should be founded on an organizational context and take into account any earlier histories of development projects, otherwise their might counteract an MWA project.
The multiple goals and activities included in the MWA model may have been too ambitious and led to superficial interventions. Tailored small-scale projects at the group and unit levels are therefore necessary. The owner of the projects should be the work unit. Transformatory changes such as adopting the learning organization culture require a long-term process, a safe climate for participation and a continuous exchange of experiences between the various units.

References
Is Manager's View Of Co-Workers Leadership Potential A Determinant To The Succession To A Managerial Position?

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WHOLE (Centre for Work, Health and Organisational Learning), Kristianstad University, Sweden

Introduction

The possibilities for attaining managerial positions are different for women than for men. Although the factors that prevent women from reaching managerial positions have been reduced, Swedish working life today is still heavily sex segregated. Several factors that contribute to this segregation have been identified through extensive research. Personality related (internal) as well as social and structural related (external) variables have been investigated in order to predict women's career advancement. One fundamental explanation to why women have reduced possibilities to advance as a manager is that being a manager are by tradition related with male and maleness and that most managerial positions are already occupied by men. Thus they have an advantage. Therefore it is important to study the different processes of succession to managerial positions in order to discover mechanisms that maintain or reduce this advantage. In the seventies Lipman-Blumen (1976) and Kanter (1977) identified the term homosociality (referring to social preference for members of one's own gender) as being present in the promotion process to managerial positions. Homogenity promotes and enables communication and understanding, which could imply that managers tend to have better relations with employees that share commonalities with themselves (Marongiu Ivarsson, 2000). This might explain why women experience difficulties to reach managerial positions.

This study will mainly focus on existing managers and their impact on the process and selection of future managers-to-be. As a subordinate, having a good relation with your manager can be of high importance to your own career advancement. Identification is a basic thing for having a good manager-employee relation. This study was conducted in order to elicit information about the qualities that managers tend to observe among significant persons in his/her staff and organisation, and the relationship of these characteristics with regard to their own personal qualities and characteristics.

Method

The target organisation for this study was the Swedish Social Insurance Service of Scania, south Sweden. The organisation is one of the public administrations out of many in Sweden that by tradition are administered by women (eighty percent of the staff is women) but managed by men. However in recent years more women are found on mid level management positions. The organisation contains one central office (with a male top-level management) and 30 local offices of different sizes directed by an office manager (of which 50% are women).

Based on Kelly's Personal Construct Theory (Kelly, 1955, Bannister, 1990) person processes are psychologically channelled by the way in which individuals anticipate events. People differ in their construction of events. However a construct is convenient for the anticipation of a finite range of events only and creates meaning within these ranges. A construct could also work as a social construction as a result of the interaction between individuals. In this study the managers’ constructs of their own employees were investigated, further the extent to which these employees shared their personal constructs were studied.

12 local office managers (6 women and 6 men) took part in computer aided Rep-Grid interviews. The raw material in the grids (the elements) were the manager's own employees. The managers were provided with six different roles to be filled. Five of the elements were chosen to represent significant persons among the employees (See number 1-5) in the own local office and one person (number 6) to get a reference to the managers own (existing) role model in the whole organisation.
**Elements**

1. A close co-worker that I prefer/like to work with (named: "close co-worker").
2. A co-worker that I do not work very close with (named: "peripheral co-worker")
3. A good co-worker (named: "good co-worker")
4. An invisible co-worker (named: "invisible co-worker")
5. A co-worker that could be a good manager (named: "potential manager")
6. A model manager - within the whole organisation (named: "model manager")

Through a triadic process in which the informants had to judge the elements on a 9-point scale the informant elicited constructs. At the end of the interview, when no more comparisons could be made between elements, the informant was asked to rate all of the constructs in relation to him/herself. Focused grids interpreted the raw grid data. Each grid was compared with every other element in the grid and the ordering of elements in the grid was changed so that those most alike were clustered. A similar rearrangement was made in respect of each construct.

**Results**

*Comparisons between elements.* The Focused grids resulted in high correspondence across the 12 grids considering similarity between the informant, the role model manager, the potential manager and the close co-worker:

- In all of the grids the informant and the role model manager are included in the same cluster above the 80% level
- In 10 out of 12 grids the potential manager is also included in the cluster above
- In 9 out of 12 grids the close co-worker is also included in the cluster above

Considering gender tendencies the male informants have in 5 times of 6 a male as the role model manager within the organisation. For the female informants the case is fifty/fifty. For the male and the female managers 5 out of 6 close co-workers as well as potential managers are women.

*Categorising of constructs.* The eliciting of constructs resulted in 66 constructs. Since each informant elicited his/her own constructs a Focus grid comparison was not appropriate. Instead, all the constructs could be qualitatively categorised into four categories; (an inter judge reliability check was made with a correspondence of 67%)

1. Social orientation (15 constructs)
2. Holistic orientation (17 constructs)
3. Managerial orientation (12 constructs)
4. Action orientation (22 constructs)

The female and the male informants share equal number of constructs across the four categories. Generally the informant, the role model manager, the potential manager and the close co-worker are ranked high on the four categories.

**Conclusions**

The present results may be related to theories of homosociality (Lipman-Blumen, 1976, Kanter, 1977). Such have indicated that the succession to managerial position could be based on an individuals high similarity with former managers as well as the role model manager. However, whilst role model managers are mostly males, potential managers and the close co-workers are women. Thus, the homosociality does not seem to be gender-related in a traditional sense i.e. that male generally choose males. The result also suggests that whilst the selection may be method-related, the manager and co-worker relationship is based upon quite few conditions. These results serve to encourage further understanding of the manager-co-worker exchange as a determinant of management succession.

**References**

Is there any Relationship between Working Time Arrangements, Safety for Offshore Workers in the North Sea?

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Introduction
The number of mishaps and near accidents in the Norwegian offshore industry has increased over the years. In the same period there has been negotiations between the employers’ and employees’ unions about changing the working time arrangements. In symmetric rotation schedules, the offshore working period and the onshore recovery period are of equal length. In the Danish and British sector of North Sea oil production, the shifts rotate every 14 or 21 days (14:14 or 21:21 work shifts). Until July 2001, the most common rotation schedules in Norwegian oil and gas production was asymmetric, with 14 days on work offshore followed by a 21 or 28 day recovery period. In mid-2001, the asymmetric 14:28 schedule is about to become the norm. The new working time arrangement is symmetric with two weeks offshore and a four weeks free period each time. Our research question is whether four versus three weeks at home have any impact on the accident level offshore.

Occupational health, shift work and recovery periods
The international trend with respect to the length of the work period and shift work seems to be a move towards more than eight hours of work in each shift combined with longer recovery periods. Several studies have been published in which the effect of working for eight hours on overall levels of alertness has been compared with the effect on alertness of working for 12 hours. No systematic relationship has been established. This does not imply that work shifts rotations of seven or more consecutive twelve hours work shift have the same effects on safety and occupational health as a standard, compressed working week. It would seem probable that some work shift arrangements are more secure in this respect than others.

After a sequence of shift work, how long is the required recovery period and how long should an individual worker be recovered to be off following a shift of 12 hrs work for a fortnight?. Research is not unison on this matter, either. Some prior studies indicate that in offshore oil production, an individual requires three days to completely restore themselves to working capacity following a work shift. However, the recovery period is dependent on the working conditions, the physical constitution of the individual as well as the duration of the working period (Karlsen 1981).

The subjective benefits of working for longer hours have been noted for some time. Hodge and Tellier (1975) report that work shift of 12 hours remain popular in spite of the perceived fatigue accompanied by it. Worker satisfaction with various work shift schedules can be contrary to the recommendations designed to ensure individual safety and physiological well being. Shift workers tend to prefer rotations that maximise the quality of their time off work, irrespective of the effect the rotations has on health, alertness or mood. Parkes and Clark (1997) note that satisfaction with 14:14 shift work in the British offshore oil industry was highest for the 7-night, 7-days, 14-off pattern. This backward rotating schedule is the most physiologically strenuous, yet workers preferred it because it allowed them to go through two circadian changes while at work. When they returned home, they were fully adjusted to normal daytime hours and family social life. Beach (1999) note that there also is an economic side to such work schedules. Workers are attracted to the prospects of inflated earnings, yet fail to anticipate the accumulated fatigue that goes with it.

The European Foundation for the Improvement of Living and Working Conditions observes that while some workers might prefer shorter rotation in order to reduce fatigue, others may prefer longer rotation periods in order to reduce the strain of frequent helicopter flights, partings and reunions with family and next of kin (Eurofound 1996; 35-38).

The main impetus for moves towards longer offshore rotation periods (symmetric or asymmetric) is cost reductions. The late 1990s and early 2000s has seen an increased focus on initiatives to reduce costs in offshore oil production. In the process, Eurofound (1996:37) have argued that “careful consideration should be given to the merits of applying longer rotation patterns for the entire platform staff. Job demands are not equivalent across offshore occupations. Special safety critical positions such as Offshore Installation Managers (OIM) and control room operators may need to be evaluated independently.”

Our research issue is formulated as follows: Is the probability of work-related accidents offshore in any way related to the number of weeks off work? Three specific research questions will be addressed in this paper:

a) Is the number of work-related accidents for personnel coming from a three-week period at home compared to employees coming from a four-week period at home significant different? One hypothesise is that those with the longer period at home require somewhat longer time before falling into their daily routines and are thus more exposed to accidents. Alternatively, one might expect those coming off the shorter period off work not to be sufficiently recovered, so that they have a higher accident frequency.

b) Is there a significant difference in the severity of work related accidents for those coming from three weeks at home compared to those coming from four weeks?

c) Are there systematic longitudinal effects of alternative rotation periods? Are employees going on work after spending four weeks off more frequently experience work-related accidents or mishaps early in the work rotation period, whereas those starting work from a spell at home of three weeks experience the same incidents later in the working period due to fatigue?
Qualitative findings on work organisation, social life and safety

Several of the offshore workers insisted that there were only indirect relationships between number of weeks at home and safety. Some interviewees would, however, not rule out a relationship between the length of the recovery period and occupational health and safety. An assisting driller argued that “in isolation, a shorter recovery period is better for work safety. Longer spells away from work makes you a little rusty, I find that taking up work again is not all that easy. [I] remember once, after a sick leave of 9 weeks, that I really took a long time to adjust [to work] again”.

Several of the interviewees stressed the implications of altering the work shift arrangements from 2:3 to 2:4 week rotations on social life at home. A symmetric work rotation schedule with spells of 4 weeks at home would improve home life, they argued, not least for families with two breadwinners in need of co-ordinating leisure time, vacations and other social events. A driller succinctly put this as “You can’t come home to your family tired and in a sombre mood. Most would prefer the offshore night shift to be [physiologically] ready to face family life”.

In terms of offshore work organisation, swapping from an asymmetric to a symmetric rotation holds major implication for the organisation of work teams. Asymmetric rotation schemes such as 2:3/2:4 makes it much more difficult to organise stable crews than when the shifts are rotated in a symmetric manner (being it 2:2, 4:4 or 2:4). The impacts on social learning in groups are evident, with the potential for increased knowledge transfer and social support within crews going from asymmetric to symmetric rotation schedules.

On some oilrigs, the OIMs have other work rotation arrangements than the rest of the crew. One implication of this is that there may be quite some time between every time a work team faces the same work manager and low continuity and a lack of knowledge transfer may come as a result. Several of the interviewees explained that they didn’t necessarily require a work shift arrangement that provided them with a fixed OIM. What they did not want was a work rotation schedule that fixed them with an inadequate OIM. A mechanic was rather blunt about it: “We who are in a stable crew, are well acquainted and that will only improve if we go from a 2:3/2:4 to a 2:4/2:4 rotation schedule. But swapping management between shifts is only for the better, ‘cause there’s really great variation amongst them. The mere prospect of ending up with a mediocre manager on a regular basis makes us prefer a more irregular scheduling of OIM’s. But of course – if we could work with good offshore management on a regular basis we would go for that”.

Many of the interviewees indicated that as long as the work shifts remained the same, longer recovery periods necessarily would imply somewhat longer time to develop operational skills and accumulate work experience. Indirectly the change thus might have a negative safety effect. Interviewes in OIM positions were acutely aware that their tasks required a more continuous follow-up in order to function properly. Longer spells of work were by some managers deemed a factor that would complicate knowledge transfer between managers. Exploration drilling is not routine work, as the particular geophysical conditions of a single oilfield make every drilling job a unique experience. For drillers, drilling managers and chief platform managers frequent communication with the workplace is a requirement also when spending time off work. It was feared that handover procedures between drillers and managers would become more complex when information from four weeks of activities should be called for. An assistant platform manager pointed out that: “In platform management [we] fear that job satisfaction will deteriorate by introducing a 2:4/2:4 rotation. There’ll be a whole lot of handovers to do. When you’re gone for four weeks you really will have to get to know what has been going on in your absence in order to make the right decisions. That will be next to impossible, unless you’re able to stay updated by logging onto the system from home. In that way work intermingles with leisure time, and you don’t necessarily end up with more time off.”

In general all informants, irrespective of their hierarchical or functional position in the organisation regarded the handover routines as significant events.

Quantitative data on offshore incidents and accidents

Table 1 displays the number of personal injuries according to severity of injury and the duration weeks at home prior to the at-work incident. Both the total number of incidents, the number of incidents requiring medical treatment and the number of incidents requiring merely first-aid treatment are comparatively similar for those coming on work from three or four weeks at home.
<table>
<thead>
<tr>
<th>Degree of injury</th>
<th>Length of recovery period prior to incident</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3 weeks</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Medical treatment</td>
<td>54</td>
<td>51</td>
</tr>
<tr>
<td>First-aid treatment</td>
<td>183</td>
<td>193</td>
</tr>
<tr>
<td>TOTAL</td>
<td>237</td>
<td>244</td>
</tr>
</tbody>
</table>

**Table 1:** Number of individual injuries by degree of physical injury and length of recovery prior to work shift in which injury occurred

There is no systematic relationship between the length of spell of resting and the degree of injury experienced while on work ($\chi^2 = 0.62$, DF = 1; $p > 0.05$).

![Figure 1](image1.png)

**Figure 1:** Number of individual injuries by point in time when event took place

Figure 1 shows the development in injury rate relative to the number of days the injured person has been on work prior to the accident. There is a continuous increase in the number of accidental events as we move along the working period. The increase is statistically significant ($R^2 = 0.31$; $p > 0.05$). This would imply that there is a systematic increase in the number of incidents leading to personal injury as the shift commences.

In Figure 2 we take one step further from Figure 1 and we divide the number of events into those requiring medical treatment and those requiring mere first aid treatment:
There is a statistically significant increase in the number of incidents requiring first-aid treatment as the working period commences ($R^2 = 0.39; p > 0.05$). With respect to more serious injuries, these incidents are fewer and display a stable distribution throughout the 14-day shift period. The number of such events are unrelated to time of occurrence ($R^2 = 0.00; p > 0.05$).

In Figure 3, we continue the event analyses separating the individual incidents by prior spell of resting time before starting the scheduled working period. There is no systematic difference in total number of injuries for those going on work from three weeks off, from those going on work from four weeks off, and the point in time when the incident leading to injury took place.
Discussion
This study shows that the spell of individual restitution (period off-work) does not appear to have any influence on the probability that an individual offshore worker will experience an incident leading to physical injury (minor or major). There is a statistically significant increase in the probability that an individual will encounter a work-related incident leading to injury as on-shift number of days increases. This is, however, only valid for minor incidents requiring first-aid treatment. While on work rotation, it appears that the individual rate of injury is not significantly related to the individual’s spell of recovery (period off work) whether it is three weeks on land or four weeks on land.

Quantitative analyses of events leading to individual physical injury should be interpreted with great care. However, we would expect influential factors to emerge from analyses of a set of such events. The findings provided so far does not seem to indicate that the duration of the recovery period – being it three or four weeks – is in any significant way related to the incidence of individual injuries, the degree of individual injuries at work or the distribution of such events over the course of the offshore 14-day working period. This does in no way imply, however, that a change from an asymmetric (2:3/2:4) to a symmetric (2:4/2:4) rotation schedule will not be without effects with respect to overall work safety. The 2:4/2:4 will reduce the total time at work and it is possible that this will have consequences for the operational skills of the crew.

The most notable finding is the continuous increase in the number of incidents requiring first aid treatment during the whole working period. This may be taken as an indication at increased personnel fatigue in the working period, but it is not evident why increased fatigue should only lead to a higher frequency of minor injuries.

Alternatively, the emerging pattern may come as the outcome of a change in reporting practices. By reporting an inflated number of incidents towards the end of a work shift, oilfield operators and shipping companies may cater to expectations of a high overall level of reported events.

References

Opportunities for Skills Use and Employee Well-Being in Self-Managing Work Teams

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Introduction
In recent years, there has been an increasing interest in alternative ways of designing work in order to improve organisational performance and productivity (Sprigg & Parker, 1998; Wright & Edwards, 1998; Lawler, Mohrman & Ledford, 1992). One such way of organising work is self-managing work teams (SMWTs) (Cohen, Chang & Ledford, 1997; Becker-Reims, 1994; Cotton, 1993; Pearson, 1992). A recent European study indicated that 47% of organisations involved at least 50% of their largest occupational group in groupwork where ‘rights and responsibilities are granted to groups of employees to carry out their common tasks without constant reference back to managers’ (European Foundation for the Improvement of Living and Working Conditions, p. 9).

SMWTs have traditionally been perceived differently by the Human Resource Management (HRM) and occupational health psychology (OHP) research establishments. The majority of HRM research has focused on the organisational benefits of SMWTs and on individual effects in terms of organisational commitment and job satisfaction (Yeatts & Hyten, 1998). This body of literature tends to favour SMWTs because of the apparent benefits in these terms derived from increased use of employee skills, particularly those related to creativity and innovation (Moorhead, Neck & West, 1998).
In contrast, OHP research has primarily investigated the negative effects of SMWTs in terms of both psychological and physiological stress (Melin, Lundberg, Soderlund & Granqvist, 1999; Trist, Susman & Brown, 1977). Working in SMWTs has been often been associated with a higher incidence of stress (Cox, Griffiths & Rial-Gonzalez, 2000; Parker & Wall, 1998; Parker & Whybrow, 1998). However, there is evidence to suggest that correctly implemented SMWTs enhance not only commitment and job satisfaction but also decreases stress and improves organisational health (Sprigg, Jackson & Parker, 2000; Nielson, 2000). Increased opportunities for skill use have also been found to be positively related to job satisfaction (Nicholson & West, 1988). In an attempt to reconcile the HRM and OHP perspectives, further exploration of the possible benefits of SMWTs is required. One way in which to reconcile these approaches is by adopting a model in which there is no single dimension of well-being/satisfaction but where employees may concurrently experience job satisfaction while suffering from stress (Cox, Griffiths, Rial-Gonzalez & Thomson, 2000). There is evidence to support such a model. For example, Steijn (2000) reported that SMWT workers were more committed, experienced greater job satisfaction, and had greater opportunities for learning and using skills than employees working in tayloristically designed jobs. No differences were found for stress. However, overall, little has been done to examine the relationship between stress and commitment and job satisfaction in SMWTs. There is clearly a need to bring all the key variables together, exploring, for example, the relationships among employees’ perception of their opportunities to use skills, stress and commitment and job satisfaction.

Recent work conducted in teams indicated that team support for innovation was a strong moderator of poor management support on exhaustion (Nielson, Cox & Griffiths, 2001). However, it has been found that in order for a team to be innovative, support from management is crucial (King, 1990; King & Anderson, 1990). Thus, it may be that management support for innovation mediates the effects of opportunities for learning and innovation on both commitment and job satisfaction and exhaustion (stress). The literature has indicated that the negative relationship between learning and innovation, on one hand, and stress on the other may be even stronger in SMWTs, and that working in SMWTs may offer greater opportunities for team members to organise their work in a way that offers opportunities for learning and innovation (Melin et al., 1999; Wall, Jackson & Davids, 1992; Jackson & Wall, 1991; King, 1990).

The main aims of this study were therefore: (1) to investigate the relationship between opportunities for learning and innovation and employee well-being, (2) to examine the possible moderating effect of commitment and job satisfaction on the relationship between opportunities for learning and innovation, on one hand, and exhaustion on the other (Cox, 1990; Cox & Gotts, 1987), and finally, (3) to test whether supportive management has a mediating effect on the relationship between opportunities for learning and innovation and the key outcome variables.

Methods

This study draws from work conducted with SMWTs in the petro-chemical sector. The methods were based on the risk management approach to work stress developed at the Institute of Work, Health & Organisations at the University of Nottingham. Data were collected using interviews, followed by the development of a context-specific questionnaire reflecting the working conditions of the organisation in question (full details of the design process can be found in Cox, Griffiths, Barlow, Randall, Thomson & Rial-Gonzalez, 2000; Cox & Rial-Gonzalez, 2000). The sample consisted of 74 employees of one company working together in SMWTs.

The measures used included scales concerning opportunities for learning and innovation, supportive management, exhaustion, job commitment and job satisfaction. Opportunities for learning and innovation (OLI) was measured by a 7-item scale ($\alpha = .77$) (Brenner & Melén, 2000). Supportive management was measured on a 6-item scale ($\alpha = .86$) also developed by Brenner and Melén (2000). Exhaustion (stress) ($\alpha = .89$) was measured on a 12-item scale of the General Well-being Questionnaire that measures symptoms of tiredness, emotional lability and cognitive confusion (GWBQ) Cox, Thirlaway, Cox & Gotts (1983). Job commitment was measured by four items of a job involvement scale developed by Lawler & Hall (1970) ($\alpha = .74$). Also included was a single item measuring overall job satisfaction applied by the Institute of Work, Health and Organisations.

Analyses were carried out using SPSS version 9 (SPSS Inc., Chicago, IL). First, the means, standard deviations, and correlations of SUM, OLI, and commitment, job satisfaction and exhaustion were calculated. For correlational analyses, Pearson’s r (2-tailed) was applied. Second, the moderating effect of commitment and job satisfaction on the relationship between opportunities for learning and innovation and exhaustion was examined using hierarchical multiple regression analysis (Cohen & Cohen, 1983). Interaction effects were investigated by including in the analysis both OLI and commitment or job satisfaction and the cross-product term. The test for an interaction effect is based on the variance explained by the cross-product term over and above that accounted for the main effects. Finally, in order to investigate the possible mediating effects of SUM on the relationship between OLI on one hand and commitment and job satisfaction on the other, a series of hierarchical regressions were conducted separately for both exhaustion, job satisfaction and commitment (Baron & Kenny, 1986) regressing commitment, job satisfaction and exhaustion (stress) as outcome variables over opportunities for learning and supportive management. In the first, step, SUM, and OLI were introduced. In the second step, SUM and the outcome variable were introduced. Finally, the outcome variable was regressed over OLI (predictor) and supportive management (mediator). Mediation would be indicated if the regression coefficients for OLI and the outcome variables became non-significant or diminished following the introduction of SUM in the final step (Baron & Kenny, 1986).
### Table 1: Correlations Between Scales

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SUM (supp mgt)</td>
<td>17.13</td>
<td>4.87</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. OLI (opp learn + inno)</td>
<td>16.17</td>
<td>4.30</td>
<td>.34**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Commitment</td>
<td>12.59</td>
<td>3.67</td>
<td>.19</td>
<td>.35**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>4. Exhaustion</td>
<td>19.11</td>
<td>8.00</td>
<td>.21</td>
<td>.19</td>
<td>-.13</td>
<td>1.00</td>
</tr>
<tr>
<td>5. Job satisfaction</td>
<td>3.22</td>
<td>1.06</td>
<td>.36**</td>
<td>.44**</td>
<td>.05</td>
<td>.48**</td>
</tr>
</tbody>
</table>

**p < .01

In table 1, the relationships between job satisfaction, commitment and exhaustion, and OLI and SUM are described. The results of the Pearson’s correlation analysis suggests that OLI were significantly related to commitment (r = .35**, p < .01) and to SUM (r = .34**, p < .01). This indicates that employees who feel they have opportunities for learning and innovation are more committed and experience that management is supportive. Further, job satisfaction was positively related to supportive management and opportunities for learning and innovation. Interestingly, those who were satisfied with their jobs also reported a high level of exhaustion.

### Table 2: Multiple Hierarchical Regression Analysis Results for OLI as Independent Variable and Exhaustion as Outcome Variable and Commitment and Job Satisfaction as Moderators

<table>
<thead>
<tr>
<th></th>
<th>∆R²</th>
<th>F change</th>
<th>β</th>
<th>Significant F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1: OLI Commitment</td>
<td>.09</td>
<td>3.18</td>
<td>18.35</td>
<td>.05</td>
</tr>
<tr>
<td>Step 2: OLI * Commitment</td>
<td>.09</td>
<td>.18</td>
<td>21.95</td>
<td>.67</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1: OLI Job satisfaction</td>
<td>.23</td>
<td>10.06</td>
<td>31.77</td>
<td>.00</td>
</tr>
<tr>
<td>Step 2: OLI * Job satisfaction</td>
<td>.30</td>
<td>6.00</td>
<td>52.92</td>
<td>.02</td>
</tr>
</tbody>
</table>

The second hypothesis stated that commitment and job satisfaction would act as a moderator on the relationship between OLI and symptoms of stress - exhaustion. As can be seen in table 2, this hypothesis was only partially supported. Commitment was not found to interact in any way with OLI and exhaustion (ΔR² = .09, F change = .18, β = 21.95, p = .67). Job satisfaction on the other hand was found to moderate significantly the relationship between OLI and exhaustion (ΔR² = .30, F change = 6.00, β = 52.92, p = .02).

### Table 3: Regression Analyses Results for SUM as Mediator, Commitment and Job Satisfaction as Outcome Variable and OLI as Predictor

<table>
<thead>
<tr>
<th></th>
<th>∆R²</th>
<th>F change</th>
<th>β</th>
<th>Significant F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1: OLI SUM</td>
<td>.12</td>
<td>8.91</td>
<td>.34</td>
<td>.01</td>
</tr>
<tr>
<td>Step 2: SUM Commitment</td>
<td>.12</td>
<td>9.28</td>
<td>.35</td>
<td>.01</td>
</tr>
<tr>
<td>Step 3: OLI SUM Commitment</td>
<td>.04</td>
<td>2.40</td>
<td>.08</td>
<td>.13</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1: OLI SUM</td>
<td>.12</td>
<td>8.91</td>
<td>.34</td>
<td>.01</td>
</tr>
<tr>
<td>Step 2: SUM Job Satisfaction</td>
<td>.13</td>
<td>9.68</td>
<td>-.36</td>
<td>.01</td>
</tr>
<tr>
<td>Step 3: OLI SUM Job satisfaction</td>
<td>.13</td>
<td>9.68</td>
<td>-.24</td>
<td>.01</td>
</tr>
</tbody>
</table>
The regression analyses shown in table 3 describe the possible mediating effect of supportive management on the relationship between OLI and commitment. It was found that a) variations in OLI significantly accounted for variations in SUM (∆R² = .12, β = .34, p = .01); b) variations in SUM significantly accounted for variations in commitment (∆R² = .12, β = .35, p = .01) and job satisfaction (∆R² = .13, β = -.36, p = .01); and finally c) the relationship between OLI and commitment was not significant and the mediating variable SUM was significant at .01. The relationship between OLI and job satisfaction remained significant (∆R² = .13, β = -.24, p = .01) but when SUM was entered into the equation this relationship remained significant (∆R² = .11, β = -.35, p = .01). This implies a partial mediation of supportive management on the relationship between opportunities for learning and innovation and commitment. Entering the SUM scale increased the variance explained in commitment from 8.2% to 31.3%.

Table 1 indicates that no relationship between OLI and exhaustion was found, therefore regression analyses were not carried out for to investigate mediating effects. Further, analyses testing for suppression effects were carried out. However, such effects were not found.

Discussion

A complex model has emerged from this study, but it is one that confirms both the independence and interdependence of the key variables. Thus a single dimension of well-being and satisfaction is not supported. The results indicated employees reporting a supportive management are more likely to experience opportunities for learning and innovation in their job, and that the more such opportunities employees enjoy, the more committed they are. Employees reporting a supportive management structure and opportunities for learning were more likely to report being satisfied with their jobs but also more likely to report exhaustion (stress). Hart and Wearing (1995) similarly reported that employees who reported high levels of morale could concurrently experience high levels of stress. The implications of this for performance are interesting.

Job satisfaction, but not commitment, was found to moderate the relationship between opportunities for learning and innovation and stress/exhaustion. This study indicates that innovation and opportunities for learning are closely related to commitment and job satisfaction. Supportive management was found partially to mediate the relationship between opportunities for learning and innovation and commitment and job satisfaction, indicating that supportive management has an impact on commitment although no direct correlation were found. No such effect was found for exhaustion. This is in contrast with Nielsen, Cox & Griffiths (2001) whose findings indicated that innovation was indeed a very strong moderator of exhaustion (stress). There are several possible explanations for these findings. First, innovation as measured in this study is based on the individual’s perceived opportunities for learning and innovation in his/her job whereas the previous study examined team support for innovation. It may be that it is the team aspect of innovation that has an impact rather than individual innovation. Second, the teams in the earlier study had little or no autonomy whereas the teams in the present study had a high degree of autonomy. It has previously been suggested that the effects of traditional teamwork with little autonomy and SMWTs may have different effects on employees due to the discretion that team members in SMWTs possess (Murikami, 1997).

To conclude, the picture of the impact of SMWTs has on well-being is complex. SMWTs do seem to offer employees opportunities for learning, and it is clear that these impact on well-being. Relationships were found between job satisfaction, commitment, and opportunities for learning. It was also found that these relationships were partially mediated by supportive management thus indicating that a supportive management may be equally important in accounting for the positive effects of SMWTs. This study offers partial support to the HRM claims that employees benefit from working in teams in terms of opportunities for learning and that these are related to commitment and job satisfaction. On the other hand, OHP claims were also supported, stress may be experienced in SMWTs. A group of employees may both be very committed but at the same time also be at risk for experiencing symptoms of stress. This has implications for the design and management of work, indicating that committed and satisfied workers may still need a high degree of support in that they may concurrently suffer from stress. This will have implications for the detection and management of stress. Jobs may be designed such that they are challenging and nurture satisfied and committed employees, but at the same time one should attempt to minimise the experience of stress.

References


Work-life Balance: The Case for Policy Integration

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Background

Over recent years a substantial literature has developed addressing various aspects of ‘work-life balance’ (Lewis & Cooper, 1999; Westman & Piotrkowski, 1999). The potential benefits of adopting a healthy balance between work and life are well recognised among employees. For example, relationships have been documented between a healthy work-life balance and the following: health and well-being (Frone et al, 1997), job and life satisfaction (Perrewe et al, 1999), positive parent–child interactions, and healthy social and personal relationships i.e. marital (Almeida & Wetherington, 1999; Jones & Fletcher, 1996). Further, a strong business case for optimising employee work-life balance has been provided. Increases in productivity, performance, commitment and motivation, and reductions in absenteeism and turnover have been found following the successful introduction of work-life balance initiatives within organisations (Beven et al, 1999; Dex & Scheibl, 1999). To aid our understanding further, a number of work practices have been identified as antecedents to poor work-life balance including long working hours and presenteeism cultures (Stevens et al, 2000, Harrinton, 1996), lack of part- and flexi-time working opportunities (Hall & Richter, 1988) and the absence of child care facilities (Dex & Scheibl, 1999).

Such research and increased levels of public concern have undoubtedly contributed to the increase of family-friendly policies or work-life initiatives in many organisations and to the development of forums such as the National WorkLife Forum in the UK. However, concerns remain that work-life initiatives are not actively encouraged or properly integrated with organisational policy and practice (Coussey, 2000; Pitt-Catsouphes, 1999). In order to address this concern, there is need to attend to the process through which organisations facilitate a culture of work-life balance. Our understanding in this area may be benefited by identifying where and why some organisations struggle to facilitate a work-life balance culture despite the introduction of work-life initiatives based on best practice principles drawn from research.

Case Study

This paper draws on evidence from a case-study conducted in an international engineering company. 90 engineers (76% of the total population) from one autonomous section, were involved in a project to reduce work-related stress at source and to improve health and performance. This population was predominately male (84%) with an average age of 35 years. The project used a ‘risk management’ approach (Cox et al., 2000). A tailored questionnaire-based instrument, including measures of work design and management, and organisational and individual health, was distributed to whole population. In addition, a review of the existing employee support systems, organisational policies and practices was conducted. Analyses, using odds ratios, indicated that problems at the work-life interface were consistent and significant predictors of poor individual health. The results of the risk assessment are discussed with reference to organisational policy integration and application.

Conclusions

Against the background of organisational drivers and objectives many work-life initiatives may, at face value, appear misaligned. Returning to the concept of theory in action proposed by Argyris (1990), it is important to attend to the practice of work-life initiatives within the context of the wider organisational culture and working practices. Whilst organisations may have written (formal) policies and initiatives regarding work-life balance it is important to uncover the extent to which organisations are implementing and reinforcing these initiatives in practice. In order to drive forward research in this area we must address possible gaps between policy and practice. This paper concludes by calling for (i) a greater understanding of the process of implementation, (ii) a systematic evaluation of the effectiveness of work-life initiatives, and (iii) the integration and alignment of organisational policy and practice so as to optimise the benefits that can be elicited by encouraging a healthy balance between work and life.
Using the Uncontrolled Work Setting to Shape the Evaluation of Work Stress Interventions

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Introduction

The use of organisational interventions (improvements to the design, organisation and management of work) to tackle work stress is becoming increasingly widespread within organisations (Cox, Griffiths & Rial-Gonzalez, 2000). However, little is known about the effectiveness of such interventions, or the mechanisms by which they exert their effects. In part, this is because many intervention studies fail to meet the rigorous requirements of the experimental paradigm against which they are often evaluated (Parkes & Sparkes, 1998).

Evaluation in Organisations

This paper describes an approach to evaluation that complements the use of controlled quasi-experiments in the evaluation of such interventions. This approach proposes that evaluation can be shaped by organisational reality: it uses the real, natural and chaotic variations within intervention processes and their organisational setting to identify between participant variability intervention experience (Cox et al. 2000a). It is argued that this variability can be used as a design feature to
determine appropriate intervention and control groups, and to increase our understanding of the mechanisms by which these interventions exert their effects.

This approach to evaluation has been used in a number of organisational settings where the use of planned quasi-experiments has not been possible (see Cox et al., 2000a). This paper presents results drawn from one such study to illustrate the approach. Between participant variability in the awareness of the intervention was found to be important in determining the outcomes of the intervention. This study demonstrates the importance of assessing the reality of the organisational setting during the implementation of interventions. The results also show that the evaluation of organisational interventions can be carried out without using tightly controlled quasi-experiments, if an assessment of the reality of the intervention is made and used to inform the evaluation. This approach has the potential to yield rich data on both the intervention process and its outcomes.

Interventions in practice

Many authors have proposed that improvements to the design and management of work can have a positive impact on employee well-being. It is thought that these interventions work by tackling problems with work design that are linked to problems with employee well-being, perhaps by reducing the experience of work-related stress (Cox et al., 2000a; Jackson, 1983; Kompier et al., 2000). Many theories of work stress include control as a core construct. Interventions designed to improve control and participation have often been the focus of intervention research (e.g. Jackson, 1983; Landsbergis & Vivona-Vaughan, 1995).

However, there are few studies that adequately evaluate such interventions (van der Hek & Plomp, 1997; Parkes & Sparkes, 1998). This is because it is often difficult to carry out adequately designed and controlled evaluation studies in workplace settings: often researchers are not in the position to control the delivery of the intervention (Griffiths, 1999). A reliance on experimenter controlled quasi-experiments as the only method of evaluating interventions has led to limited progress. Opportunities to implement such study designs in organisations are rare.

This study had two objectives. First, it set out to explore the impact of a work re-design intervention (enhanced control over the management of equipment repair) on the working conditions and well-being of a group of railway station supervisors. However, and perhaps more importantly, it used the natural variability in the delivery of an intervention to explore its impact. It was not possible to control the delivery of the intervention so we used an alternative method of establishing an evaluation study design. We measured the extent to which staff were aware of the intervention. In this way we were able to draw upon natural, unintended variations in the delivery of the intervention to establish usable 'control' and 'intervention' groups.

Design

This study used a repeated measures design with one between subject variable ('exposed' to (aware of) the intervention or 'not exposed' to (not aware of) the intervention) and one within subject variable (time). Time 2 measures were taken 18 months after the time 1 measures. Dependent variables were self-reported well-being (symptoms of being 'worn out') and three measures of working conditions. This design was chosen in order to explore the impact of exposure to the intervention over time.

Methods

Sample

39 station supervisors from a railway transport company provided data at both time 1 and time 2. This represented a response rate of approximately 50% (based on the number of supervisors available to provide both time 1 and time 2 data). All were male with an average age of 40 years (SD=8.0) at time 1.

Measures

Working conditions were measured at time 1 and time 2 using a tailored, context specific measure. This was constructed using data gathered during a series of interviews with 20 station supervisors and with reference to the scientific literature on the sources of work stress (see Cox, Griffiths & Rial-Gonzalez, 2000; Cox et al., 2000). Supervisors were asked to use situational reasoning to judge the adequacy of their working conditions on a five point type scale (1 = very unsatisfactory, 5 = very satisfactory). This extended abstract focuses on three work design variables thought to be affected by the intervention described. These were: control over the allocation of tasks, participation in decisions and communications with senior management.

Work related well-being (a correlate of the experience of work stress) was measured at time 1 and time 2 using the 'worn out' scale of the General Well-Being Questionnaire (Cox et al., 1983). This 12-item scale measures symptoms of general malaise (e.g. feeling tired, emotional, confused etc.). It has been shown to be reliable, valid and sensitive to the effects of working conditions. Items are scaled on a five point frequency scale (0=never to 4=all the time, giving a range of 0-48). Normative data shows that for males in managerial posts in the UK the normative score on this measure is approximately 17. At time 1 station supervisors appeared more worn out than the normative group (mean = 20.3, SD = 8.7).

Awareness of the intervention was measured at time 2 by asking supervisors to indicate whether they were aware that responsibility for fault reporting had been returned to them (see below for a description of the intervention). All data was collected through a self-report survey.
**Intervention**

Some months before the data had been collected at time 1, a central part of the station supervisors role had changed. Because of budgetary constraints, their responsibility for managing the repair of faulty station equipment and (e.g. reporting faults and authorising repairs) had been removed. At time 1 senior managers, not supervisors, made these decisions. However, when the data collected at time 1 was fed back to the organisation a number of interventions were implemented as a response. One intervention was to hand back to station supervisors the responsibility for managing the repair of faulty station equipment. This change was communicated to supervisors through a number of levels of management.

The measure of awareness of the intervention showed that most (27 supervisors) reported that they had been made aware that they had control over fault reporting and repair authorisation. However a significant proportion (32%) were not aware of this. There were no significant differences between the ‘aware / exposed to the intervention’ and the ‘not aware / not exposed to the intervention’ group in terms of demographic details (e.g. age, length of service, size of station worked at).

**Results**

A repeated measures analysis of variance was used to examine the significance of one within-participants variable (time), one between-participants variable (awareness of the intervention) and one interaction effect (awareness X time) in the prediction of well-being (worn out scores). All analyses took into account unequal sample sizes in the aware and not aware groups. Random selection of cases from the ‘aware’ group to equalise sample sizes was also used and did not affect the results significantly. Table 1 summarises the observed changes in worn out scores.

<table>
<thead>
<tr>
<th>Group who were aware they had responsibility for managing the repair of faulty station equipment (n=27)</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group who were not aware they had responsibility for managing the repair of faulty station equipment (n=12)</td>
<td>19.3</td>
<td>16.3</td>
</tr>
<tr>
<td>Time 1</td>
<td>22.8</td>
<td>25.3</td>
</tr>
</tbody>
</table>

Repeated measures analysis of variance revealed a main effect for awareness group (aware vs. not aware) (F(1,37) = 5.85, p<.05) but no main effect for time. The group X time interaction approached significance (F(1,37) = 3.81, p<.06). Post-hoc analysis of time 1 data revealed no significant differences between worn out scores at time 1, but significant differences at time 2. The interaction effect and the main effect for group were bought about by the decrease in worn out scores in the intervention group, which was accompanied by an increase in worn out scores in the group not aware of the intervention. In contrast, when awareness was not taken into account there was no significant difference between time 1 and time 2 worn out scores. These results suggested that awareness of the intervention was an important factor in determining the well-being of supervisors over time.

In an attempt to understand the reasons behind these changes in well-being, changes in supervisors’ judgements of their working conditions were examined. Working conditions were relatively stable for those exposed to the intervention. However, for those not aware of the intervention two aspects of control and participation and one of communication had worsened (see Table 2).

Table 2: Changes in working conditions

<table>
<thead>
<tr>
<th>Participation in decisions that affect your job (range 1-5)</th>
<th>Group aware they had responsibility for managing the repair of faulty station equipment (n=27)</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group who were not aware they had responsibility for managing the repair of faulty station equipment (n=12)</td>
<td>1.9</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Communication with senior management (range 1-5)</td>
<td>1.8</td>
<td>1.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Control over the allocation of tasks (range 1-5)</td>
<td>2.6</td>
<td>2.5</td>
<td>2.4</td>
</tr>
</tbody>
</table>
MANOVA analysis of this data did not produce a clear-cut pattern of results. There were a number of effects that approached significance. There was an effect for time for participation in decisions ($F(1,37) = 3.68, p=.06$). There was also some evidence of a group effect ($F(1,37)=2.71, p=.10$) for control over allocation of tasks. The group X time interaction approached significance for communication with senior management ($F(1,37)=2.66, p=.11$), and there was an effect for time ($F(1,37)=3.71, p=.06$). However, post-hoc ANOVAS showed that at time 2 for control over the allocation of tasks and participation in decisions the 'aware' group was more satisfied than the 'not aware' group ($p<.08$). Such differences were not evident at time 1. Although approaching significance, these differences were not large enough to produce interaction effects in the MANOVA analyses. The drop in communication with senior management was significant for the 'not aware group', but was not for the 'aware group'. These results provided limited support for our hypothesis.

Conclusions

There was some evidence that interventions designed to improve control can impact upon employee well-being. The pattern of change in well-being was clear. Exposure to the intervention was associated with a small improvement in well-being. At the same time, the well-being of the group not exposed to the intervention had worsened. At time 2, the well-being of the two groups was significantly different.

The associated changes in working conditions were more challenging to interpret and followed a more complex pattern. At time 1 there was little difference between the 'aware' and the 'not aware' group in terms of the working conditions measured. However, some clear differences had emerged at time 2. The differences reflected a worsening of the situation for the 'not aware' group. It was interesting that the stability of working conditions in the 'aware' group was associated with a slight improvement in well-being.

It may be that the intervention 'protected' supervisors from the effects of problems associated with not being able to report faults. This potentially important 'protective effect' has rarely been explored in intervention work: it has usually been assumed interventions should improve work and well-being. It may have been that the intervention arrested a decline that was started by the removal of control over fault reporting. The well-being of the intervention group may well have exhibited regression to the normative level, while for those not aware of the intervention, well-being continued to worsen.

It was not surprising that the results of the analyses of changes in working conditions did not precisely mirror those of the analyses of changes in well-being. Links between changes in working conditions and changes in well-being are complex. The relationship is unlikely to be linear (Kristensen, 1996) and changes in well-being are driven by much more than just changes in working conditions. Further, interventions take place against the evolving and shifting backdrop of functioning organisations can impact on both work and well-being (Griffiths, 1999). The organisation involved in this study was going through a particularly turbulent and uncertain time during this study. However, this study showed that interventions that at least help to maintain levels of control and participation in such circumstances can be worthwhile. Control over the allocation of tasks appeared to be particularly crucial: post-hoc analysis showed it to be significantly correlated with worn out scores ($r > .35, p<.05$) at both time 1 and time 2.

Our study showed that the reality of the organisational setting introduces variability into the implementation of interventions. In this study, the intervention was intended to reach all supervisors. However, it did not. There were some problems in moving information around in the organisation, and many other changes occurred in the organisation during the intervention period that might have 'masked' the intervention described here. Crucially, awareness was mediated the impact of the intervention. If we had assumed that all supervisors were aware of the intervention, the lack of change over time would have led us to some very different conclusions about its impact on work and well-being. With some recent exceptions (e.g. Mikkelsen, 2000) few evaluation studies have considered the impact of this variability in implementation. Nevertheless, this variability in awareness proved useful in helping us to design our study to isolate the likely impact of the intervention. Using the 'organisational penetration' (Cox et al., 2000a) of an intervention to shape its evaluation has the potential to help us to evaluate the effectiveness of interventions where the researcher has little or no control over the delivery of the intervention.

In our current work we are exploring the importance of variability within a group that is aware of an intervention. There are at least three potential sources of variability that might be important. 'Microlevel changes' (Tetrick, 1999) may exhibit between-worker variability. For example, subtle heterogeneity in working conditions may introduce between-participant variability in the relevance of an intervention. Second, there are contextual influences on the intervention experience, such as socioeconomic factors, political, technological and demographic influences at a local or international level as well as 'macrolevel changes' (Tetrick, 1999) that occur within an industry or a company. A third important source of variability may be found in the way the intervention is designed, implemented and maintained i.e. its 'macroprocesses' (Griffiths, 1999). Macroprocesses include intervention design factors such as the level of employee participation, negotiation and involvement in intervention design, and the appropriate targeting of interventions (Jackson, 1983; Kompier et al., 2000; Mikkelsen et al., 2000). If there is little variability within the 'aware' group in terms of these factors, then it is logical to use awareness as means of partitioning the group. The differences in well-being that were evident in this study suggest that such an approach would be suitable in this case. However, where there is variability within the aware group other factors pertinent to the delivery of the intervention may have to be taken into account when the group is ‘partitioned’ during evaluation.

Clearly organisations should take steps to monitor the implementation of interventions. Potentially effective interventions may fail if they are not properly implemented. Research should not be so quick to conclude an intervention
has failed until its implementation has been properly examined. Logically, this evaluation of the process should gather the views of those on the receiving end of the intervention. Much more research is needed to explore the processes by which interventions are implemented and maintained (Griffiths, 1999; Kompier et al., 2000). Our study shows that the evaluation of workplace stress reduction interventions needs to recognise, and work within complex reality of the organisational setting. Indeed, much can be learned about the effectiveness of interventions by drawing on the features of these ‘chaotic’ environments.

References

The Application of Behavioral Principles to Promote Safety Practices and Reduce Injuries: An Interdisciplinary Model.

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Introduction
Behavioral approaches to occupational injury prevention are increasingly investigated. By its very nature however, behavioral safety requires that its practitioners collaborate with other safety disciplines if their methods are to succeed. For example, epidemiologists help set reasonable priorities; safety professionals are expert in the special risks of given jobs and how those can best be avoided; while ergonomists attempt to improve working conditions by designing better equipment, and through identifying and reducing safety and health hazards.

Objectives
This paper presents the results of a psychological and ergonomic team effort aimed at identifying effective ways to promote safety behaviors and postural awareness among six healthcare workers. The approach combines direct observation, behavior modification, feedback, education, and training.

Methods
A questionnaire was used to gather demographic data. Observational recording checklists were designed and used to assess participants’ task performance. Surface recording of muscle activity (electromyography, EMG) was used to document the effects of safe / unsafe behaviors on lumbar paraspinals muscle tension. An across-subjects multiple-baseline experimental design was employed, and phase averages also were statistically analyzed. Safety training consisted of introducing safety practices within simulated lifting / carrying tasks. Feedback and goal setting were included to promote and maintain safe practices.
Results
The average percentage of safe behaviors observed were 42% at baseline, 85% after safety training and goal setting alone, 94.3% during goal setting + feedback, 96.2% during the goal setting and incentive condition, and 95.2% at follow up. Following the training program, surface EMG measures showed significant improvement in the participants’ ability to maintain proper posture, reduce muscle tension, and achieve symmetry during muscle activity.

Conclusions
Findings supported the hypothesis that when safety training programmes are systematically supported by scientifically derived behavioral procedures, such as feedback and goal setting, learned safe behaviors improve and can be maintained overtime.

References
A Comprehensive Approach to the Psychosocial Work Environment

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Introduction

Increasing attention has been paid to the psychosocial work environment in both research and practice in the industrialized countries of the Western world. This is due to both the increasing complexity of the modern working life and the decreasing threat posted to health from the physical work environment (e.g. asbestosis). Unfortunately, for both research and practice, there is no agreed upon definition of the psychosocial work environment, which means that a large number of studies are undertaken with different models and measurement instruments.

The concept “psychosocial work environment” is often loosely defined as the psychological and social conditions people experience in the workplace (e.g., Johnson & Hall, 1994; 1996; Johnson & Johansson, 1991; Kasl, 1998; Theorell & Karasek, 1996), which could be as broad or as narrow a definition as one cares to make it. Kasl (1998) has argued that the most commonly used definition of the psychosocial work environment provided by Karasek and Theorell’s (1990) model of job demands, control over work, and social support, is too narrow (underdetermined) and should be expanded to include individual characteristics, work process variables, and social and economic environmental factors. We agree that the concept should be expanded and find support for this in many recent studies (e.g. de Rijk, Le Blanc, Schaufeli & de Jonge, 1998; Kristensen, 1995: Van der Doef & Maes, 1999). However, we find that the dimension we believe should be the core of the psychosocial work environment, the social relational dimension, has rarely been explicated in recent studies. We hold that the nature and quality of social relations in the workplace are particularly important contributors to the psychological and physical well-being of employees, and should therefore be included in studies of the effects of the work environment on stress, strain, and other health indicators. This paper aims to test the expansion of the traditional Karasek and Theorell model that includes social relations that exists inside the workplace, in the form of workplace norms, and those that have an external link, in the form of external relations of the work-family interface.

Today the most frequently used measure of the psychosocial work environment is the Job Content Questionnaire (JCQ) (Karasek et al., 1998), building on the original job demand – decision latitude model of Karasek (1979), often labeled the demand-control model. The demand-control model was augmented by including social interaction at work, labeled social support (Karasek and Theorell, 1990). Social support has been, essentially, the only relational component found in psychosocial factor research. It is a significant component, however, as studies on cardiovascular disease and absenteeism have shown that social support is one of the most important factors that may reduce stress and strain, either directly or indirectly, in the workplace (Karasek and Theorell, 1990; Shumaker and Czajkowski, 1994).

Despite its frequent use, criticisms of the demand-control model have come from several quarters. One concern is that control is quite narrowly defined and measured in present questionnaires. The original measure of decision latitude has also been criticized for being a mix of job control, skill variety and job complexity (e.g. Frese, 1989; Ganster, 1989), measuring primarily task-level latitude (Jonge and Kompier, 1997), and being individual- and “here and now” oriented (Landsbergsis et al., 2000). It has been suggested that an inclusion of higher-level control may generate better predictive validity. In a Swedish study it was found that a substantial part of the variation in strain variables utilized in the demand-control-model was explained from by an organizational level analysis (Soderfelt et al., 1997). Jones, Bright, Searle and Cooper (1998) suggested that the success of the demand-control model in driving research has led to a neglect of a range of other psychosocial factors and that more complex psychosocial models that take into account the work context and the changing nature of work are needed.

With regard to social support, assistance and positive regard from colleagues or the supervisor (i.e. the major operationalization of social support) may be only one aspect of the social dimension. A review of the literature (Le Blanch, de Jonge & Schaufeli, 2000) showed that there is an agreement about the existence of four dimensions of social support: social integration, satisfying relationships, perceived available support, and actually received support (p. 168). In the present study, we have included, in addition to the Karasek model variables, both internal and external social relations as predictors of stress and subjective health.

The objective of this research was therefore to expand the Karasek & Theorell model in two directions based on the suggestion presented above from recent studies. In line with Jones, Bright, Searle and Cooper (1998) and Kasl (1998), we wanted to see work in a broader relational context and especially study the work-family interface which is seen as an impending stressor in recent studies (e.g. Kirchmeyer and Cohen, 1999) and in textbooks (e.g. Keita and Hurrell, 1994; Lewis and Lewis, 1996). One of the more important reasons for this development may be that we have an increasing number of two-income families in the modern working life. Our second objective was to expand the control concept from the present individual task level to a higher level in the organization, as the study undertaken by Soderfelt et al. (1997) suggested. In our study workplace norms represented the collective perceptions of existing values and attitudes about social interaction and relationships operating in the workplace.
Method

Sample and procedure for collecting data
The present study was undertaken in the food and beverage industry in Norway. 1343 employees from a representative sample (for the industry) of 56 enterprises completed a questionnaire. The response rate varied between 12 to 100% in the participating enterprises with a mean of 58%. The number of employees responding in the selected enterprises varied between 1-61 with a mean of 28. The questionnaires were distributed and collected by local labor inspectors from The Norwegian Labour Inspection. All inspectors knew the enterprises well and had received information about the use of a standardized procedure for survey distribution and collection from the researchers. All questionnaires were sent directly to the researchers, not to The Norwegian Labour Inspection. This was done because The Norwegian Labour Inspection traditionally also have a controlling function in the enterprises and the employer could have refused to participate if not a neutral party had taken care of the questionnaires from the employees. Representatives for the employers were also interviewed as part of the research, and they made statistics from the enterprise available to the researchers. In this study we used only information about the size of the enterprise from this source.

The questionnaire
The measurement of the psychosocial work environment was expanded above standard demand-control-support questions and included scales for measuring the relational aspects mentioned above. The scales used in this study are described below. The questionnaire also included questions about other aspects of the working environment, but these aspects are not considered here.

Measurement scales
The demands-control-support dimensions were measured by, or based on, items from the “Job Content Questionnaire (JCQ)” (Karasek., 1985) and a short version of the Quality of Employment Survey (QES) (Theorell et al. 1991). Items for this study were partly selected based on a study where the validity and reliability of JCQ were investigated (Landsbergis et al., 2000), i.e. we chose the items that functioned best in this study. JCQ and QES cover the demands dimension (e.g. work fast, work hard) (5 items, α=.74) and the control dimension (e.g. keep learning new things, freedom to make decisions) (4 items, α=.78). Eight items from the JCQ scale cover social support, but we selected two items representing the core of these questions; “My supervisor helps and support me in getting the job done” and “People I work with help and support me in getting the job done” (2 items, α=.58).

Work-Family Conflict items was based on items from the Whitehall II study questionnaire (Stansfeld, Personal communication). The scale consisted of questions like “Problems at work makes me irritable at home” (4 items, α=.67).

Workplace social relations were measured with two scales, developed from a factor analysis of items describing the norms of conduct that operate in the workplace. The measures used 5-point scales with response alternatives ranging from “strongly agree” to “strongly disagree.”

Respect for individuals was measured with four items (α=.77): “Everyone – high and low—is treated with respect in this company,” “In this company, we feel we are valued,” “There is mutual respect between management and employees,” and “Backstabbing and slander is commonplace in this company” (reversed scored).

Survival-of-the-fittest or a “Dog-eat-dog” type of workplace relations was measured with a 12-item scale (α=.80). Examples of items are: “Here, only the strongest ones survive,” “In this company, a person’s productivity is the only thing that counts,” “This company owns you, skin and all,” and “Who you know around here is more important than how competent you are.”

Stress was measured by a translated version of Cooper’s Job Stress Scale (Cooper, 1981) which consisted of 22 questions each rated on a six-point scale ranging from zero to five. A high score indicates high experience of stress in the work situation. The instrument consists of 4 sub-scales; work, communication, leadership and relocation. A summed scale of all the 22 items, “Job Stress”, showed a Cronbach’s alpha of .92.

Subjective health was measured by an index used in the The Second European Survey on Working Conditions (European Foundation, 1997). This index consists of 20 questions regarding frequent somatic and psychological complaints experienced during the last 30 days. Response options to this inventory were on a 4-point scale ranging from “Not troubled” to “Serious troubled”. (α=.87).

Data analyses
A regression model was established controlling for standard demographic variables in the first step. Then traditional individual demands-control-support variables were entered in the second step. In the third step we added the scale measuring the family-job relation. Finally, we entered the factors describing the workplace social relations. Dependent variables were stress and subjective health.

Results
Table 1 shows that highest stress was reported among those with highest education, highest perceived demands, most work-family conflict and workplace norms expressing low respect and high pressure for survival. The total model explained 46% of the variance in stress and must be considered a relatively strong model. All steps in the model explained a significant
variance increase. The single highest t-value among the variables in the model was work-family conflict. Much of the same picture appeared with subjective health as the dependent variable. There was a relatively high correlation (.49) between the two dependent variables and, thus, the regression equations showed a very similar pattern. However, those with subjective health problems had significantly lower education. They reported high demands, but also high control. They also reported a high level of work-family conflict and norms expressing low respect and high pressure for survival at their workplace. This model was not as strong as the previous one. 31% of the variance was explained. The single highest t-value was the same - work-family conflict. All steps in the model explained a significant variance increase.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Stress</th>
<th>Subjective health problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Age</td>
<td>0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>Years of education</td>
<td>0.06</td>
<td>-0.16</td>
</tr>
<tr>
<td>Tenure</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Size of enterprise</td>
<td>-0.03</td>
<td>-0.01</td>
</tr>
<tr>
<td>Block 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demands</td>
<td>0.24</td>
<td>0.20</td>
</tr>
<tr>
<td>Control</td>
<td>-0.05</td>
<td>0.19</td>
</tr>
<tr>
<td>Support</td>
<td>-0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Block 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-family conflict</td>
<td>0.36</td>
<td>0.29</td>
</tr>
<tr>
<td>Block 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respect</td>
<td>-0.23</td>
<td>-0.09</td>
</tr>
<tr>
<td>Survive</td>
<td>0.15</td>
<td>0.10</td>
</tr>
<tr>
<td>Block 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum R² adj., block 1-4</td>
<td>0.07**</td>
<td>0.02**</td>
</tr>
<tr>
<td>Number of cases</td>
<td>1215</td>
<td>1221</td>
</tr>
</tbody>
</table>

* p< .01.  ** p< .001

Table 1. Stress and Subjective health problems according to demographic variables, demands, control, social support, work-family conflict and norms for survival and respect. (N=1215-1222). (Regression results, Method blockwise enter)

Discussion

Our study confirms that aspects of the psychosocial work environment in addition to the traditional individual and task-oriented variables that dominates the field must be considered. Our inclusion of two relational dimensions, workplace norms and work-family conflicts, contributed significantly to both the perception of stress and to experiencing subjective health problems. Still, demands from the work itself are of importance in the sector the study was undertaken, which is characterized by monotonous and repetitive work with little work autonomy for the majority of the employees. The two dependent variables showed much of the same picture, but for stress the education among those perceiving stress was higher and for those reporting subjective health problems education was lower. Control was also reported to be higher amongst those employees reporting subjective health problems. One reason for this variation may be that it is some differences between the work tasks undertaken by those reporting stress and subjective health problems. The difference in education indicates that those with subjective health problems may have work tasks of a more uncomplicated character, thus giving high control in the actual job situation, but nevertheless with high demands and pressure. Those perceiving stress may have work requiring higher qualifications, with less predictability and therefore lower control. Based on the Demand-control model those perceiving stress have the most difficult work situation with high demands, low control, a high degree of family conflict and negative norms. Since they have more years of education, however, this may indicate better opportunities for individual stress coping strategies.

We conclude that it is important to measure relational components in future studies of the psychosocial working environment. Whilst individual perceptions related to the present work are of importance, there remains the need to consider aspects core of the concept ‘psychosocial’ factors; the internal relations at the shop floor level and the external family relations.

References


Stress and Injuries among Finnish Hospital Workers

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Introduction

Stress and burnout are among the main problems in modern work life. For example, in England one out of four general practitioners was classified as having mental distress (Calnan, Wainwright, Forsythe, Wall, & Almond, 2001). Because stress may also have negative effects on information processing at work (Kolich & Wong-Reiger, 1999), it is a likely source of injuries. A review of 20 selected studies (Johnston, 1995) showed that they all reported a significant relationship between stress and injury. Life events and financial problems were the most frequently mentioned stress factors.

After this review, time pressure and time-binding have been shown to predict occupational accidents of municipal railway workers in San Francisco (Greiner, Krause, Ragland, & Fisher, 1998). High job strain, high physical demands, and low support from co-workers predicted work injuries for women, but only high physical demands for men in Canada (Wilkins & Beaudet, 1998). Japanese female blue-collar workers involved in work injuries experienced more job demands and strain and less co-worker support than accident-free workers, whereas there were no significant differences among male workers (Murata, Kawakami, & Amari, 2000).

Two studies have focussed on the relationship between stress and injuries among agriculture workers. Stress increased risk of serious occupational injury for farmers in Iowa, USA (Thu et al., 1997). Perceived stress was also one of the predictors of injuries among Australian farmers (Low, Griffith, & Alston, 1996).

In the British oil and drilling platforms in the North Sea, workers with Type A predisposition, lower mental health, and more depression, were more often involved in occupational injuries than other offshore workers (Cooper & Sutherland, 1987; Sutherland & Cooper, 1991). A significant correlation between job stress and injuries was also found among oil and gas workers on the Norwegian Continental Shelf (Rundmo, 1995). Very often repeated stress and stronger stress reactions increased the risk of occupational injury among petrochemical workers in Taiwan (Li, Chen, Wu, & Sung, 2001).

Four studies on the relationship between stress and injury have been carried out among health care workers. Occupational stressors like role ambiguity and the death of patients predicted injuries of Canadian nurses (Hemingway & Smith, 1999). Job-related stress was one of the predictors of occupational accidents of German medical staff (Kirkcaldy, Trimpop, & Cooper, 1997). Stress also predicted work-related accidents of German veterinary surgeons (Trimpop, Austin, & Kirkcaldy, 2000; Trimpop, Kirkcaldy, Athanasou, & Cooper, 2000).

Previous studies have confirmed the relationship between stress and occupational injuries. They are also in line with the job strain model indicating that high job strain and high physical demands and low support from co-workers were predictors of injuries at work. The aim of the present study is to analyze the relationships between different stress factors and injuries with a large data set from hospital workers.

Methods

As a part of a larger project "Work and health in Finnish hospital personnel" (Kivimäki, Elovainio, & Vahtera, 2000) 7375 employees (1156 men, 6219 women) participated in this study. They worked in one university teaching hospital, one central hospital, and eight regional hospitals. The subjects were distributed in the different occupations as follows: 7% physicians, 50% nurses, 4% other professionals, 13% laboratory and X-ray staff, 12% administrative staff, and 14% worked in maintenance, cleaning, and other activities.

Psychological distress was measured with the 12-item version of Goldberg's (1972) General Health Questionnaire (GHQ-12), which has produced results that correspond to the longer version of the GHQ (El-Rufaie & Daradkeh, 1996; Goldberg et al., 1997). The respondent rates each of the 12 items on symptoms of psychological distress according to whether she or he has experienced it (0 = not at all, 1 = the same as usual, 2 = rather more than usual, 3 = much more than usual) in the past few weeks. In the present study, GHQ-12 was used as a mean score (Cronbach's alpha = .90).

The indicators of work characteristics included perceived overload, overtime (average hours per week), being on call (average days per month), job control, and teamwork. Overload was measured by the Harris (1989) scale (5 items, Cronbach's alpha coefficient .76). Job control was measured by the relevant scale from the Job Content Questionnaire including two scales: skill discretion and decision latitude (Karasek, 1985) (9 items, Cronbach's alpha coefficient .73).

In accordance with the guidelines of the local ethics committee, all subjects gave their informed consent to participate in the study. Information about injuries was collected from the employers' records only for the subjects who gave their permission for this. The injuries were ones which were certified by a physician. The injuries of 1997 were used as a measure of baseline injury. The injuries in 1998-1999 were used as a dependent variable.
The rates of injury involvement for high and low values of stressors, and the corresponding rate ratios (95% confidence intervals (95% CIs)) were calculated by Poisson regression analysis (SAS, 1993). The dispersion of the medically certified injuries followed the assumptions for Poisson models. It was assumed that for each subject the occurrence of each injury followed a Poisson distribution. A considerable residual variation in excess of the Poisson distribution (overdispersion) does not affect the rate ratio estimates, but in such cases 95% confidence intervals and P values should be adjusted for overdispersion. In the present study, no overdispersion was detected for injuries. We adjusted the rate ratios for gender, age, and marital status at the baseline. Interaction terms were applied to test whether the association between stress and injury was dependent on sex, age, and marital status (Cohen & Cohen, 1983).

Results
During the baseline period (year 1997) 213 injuries were certified by a physician, causing over 3 days of absence for 187 workers. During the follow-up period (1998-1999) 443 injuries happened to 341 workers. 267 workers were involved in one injury, 55 in two injuries, and 19 in three or more injuries.

Table 1 shows the characteristics of the subjects at the baseline, and the rate ratios for injuries in 1998-1999 compared to injuries in 1997 by baseline characteristics. Although men were in a minority among hospital workers, their risk for injury was 20% higher than that of women. Workers over 50 years of age were 31% more likely to be involved in injuries than middle-aged workers, whereas workers under 30 years of age did not have an elevated injury risk. Hospital workers living alone had a 40% higher injury risk than those co-habiting with another adult. Temporary workers had a 15% lower injury risk than permanent workers. Workers with lower wages were 52% more often involved in injuries than workers with higher wages. Inexperienced workers were 27% more often involved in injuries than experienced workers who had been in work life for one year or more. Workers who abused alcohol to such an extent that they passed out had an 18% higher risk of injury. Injury-repeaters were over five times more often involved in injuries than first-time victims.

Table 2 gives the risk ratios of injuries for the follow-up period by different stress factors. The table shows first the crude risk ratio and then the adjusted ratio for background factors, work-related factors, alcohol abuse, and lastly, for injuries at the baseline period. Stress measured by GHQ caseness was not significantly related to injuries. Workers with a low decision latitude had 27% more injuries than those with high decision latitude, and adjustments did not affect this relationship. Men with low skill discretion were two and a half times more often involved in injuries than men with high skill discretion. Adjusting the background factors raised this effect over three-fold. Skill discretion had no effect on the injuries of women. The effect of work load was totally different for men and women. Those men with low work load had more injuries, whereas high work load increased, though not significantly, the risk of injury for women. Hospital workers with many interpersonal problems were involved 43% more often in injuries than those with less problems. Conflicts with colleagues increased the risk of injury by 40%. Highly monotonous work increased the risk of injury by 26%.

Discussion
There are at least three strengths in this study compared to previous studies. The data set in this study is broader, stress was measured using several measures, and the effect of background factors was controlled. Finally, only injuries certified by a physician were included. The major weakness of this study was the relatively small number of injuries. Whilst the data set was large, the limited number of injuries at work, in traffic and during leisure time could not be analysed separately due to the limited numbers of injuries within the dataset.

The General Health Questionnaire is one of the most often used measures of stress. The stress measured by it increased slightly, though not significantly, the risk of injury in this study. One possible explanation for this failure is that the stressed workers in hospitals (physicians and nurses) did not have the highest risk of injury, whereas those occupational groups with the highest risk of occupational injury, e.g. maintenance workers (Väyrynen, Pekkarinen, & Tornberg, 1994) did not experience the highest stress.

Previous studies (Wilkins & Beaudet, 1998; Murata, Kawakami, & Amari, 2000) have supported the job strain model that high job strain and high physical demands and low support from co-workers predicted occupational injuries. It was possible to test this model only partly by our data set. High work load increased the risk of injury only for women, not for men. Both problems in interpersonal relationships and conflicts in occupational collaboration increased the risk of injury by about 40%. Conflicts with colleagues implies also low co-worker support. High physical strain may not be an important factor in hospital work. Thus our results partly confirmed the job strain model as a predictor of injuries at work.

Men who experienced low possibilities of using their skills and knowledge, and making decision related to their work, were involved in injuries more often than men with high skill discretion. For women, there is no significant difference with regard to high and low skill discretion. Perhaps the distinct distribution of male workers on skill discretion into high (physicians) and low (maintenance workers) groups explained the difference in injury rates. The majority of female workers were nurses who were in the middle on the skill discretion scale.

The mechanism of how stress influences accidents has not been scientifically identified. Kolich and Wong-Reiger (1999) suggested two possible cognitive-based processes. First, stress disturbs information processing and causes information overload, which increases the risk of injury. Second, stress interrupts the information processing sequence, which also increases the risk of injury. The mechanism between stress and injury warrants more detailed studies.

References
case of general practice in the UK. *Social Science and Medicine, 52*, 499-507.


**Appendix**

<table>
<thead>
<tr>
<th>Table 1 Rate ratios (RR) and their 95% confidence intervals (CI) for injuries at follow-up by baseline characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Women</td>
</tr>
<tr>
<td>Men</td>
</tr>
<tr>
<td><strong>Age (y)</strong></td>
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<td>30 or under</td>
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157
<table>
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<tr>
<th>Work characteristics*</th>
<th>Crude</th>
<th>Adjusted for</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Age, sex marital status</td>
</tr>
<tr>
<td>GHQ caseness</td>
<td>1.17 (0.93 to 1.47)</td>
<td>1.14 (0.90 to 1.43)</td>
</tr>
<tr>
<td>Decision latitude (low vs high)</td>
<td>1.27 (1.04 to 1.54)</td>
<td>1.28 (1.05 to 1.56)</td>
</tr>
<tr>
<td>Skill discretion (low vs high)†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>2.76 (1.78 to 4.30)</td>
<td>3.20 (2.02 to 5.07)</td>
</tr>
<tr>
<td>Women</td>
<td>1.07 (0.87 to 1.32)</td>
<td>1.04 (0.84 to 1.28)</td>
</tr>
<tr>
<td>Work load (high vs low) †</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>0.62 (0.37 to 1.05)</td>
<td>0.59 (0.34 to 1.00)</td>
</tr>
<tr>
<td>Women</td>
<td>1.23 (0.99 to 1.54)</td>
<td>1.25 (1.01 to 1.56)</td>
</tr>
</tbody>
</table>

Table 2 Rate ratios of injuries by levels of work characteristics (95% confidence intervals in parentheses). In all cases the rate ratio for reference was 1.00.
Problems in interpersonal relationships (much vs few)  
1.43 (1.18 to 1.73) 1.43 (1.18 to 1.73) 1.37 (1.13 to 1.67) 1.39 (1.14 to 1.69) 1.30 (1.06 to 1.58)

Conflicts in collaboration at work (much vs few)  
1.40 (1.15 to 1.71) 1.39 (1.14 to 1.70) 1.34 (1.10 to 1.63) 1.34 (1.10 to 1.64) 1.27 (1.04 to 1.54)

Monotony (high vs low)  
1.26 (1.02 to 1.55) 1.24 (1.01 to 1.53) 1.16 (0.94 to 1.44) 1.16 (0.94 to 1.44) 1.10 (0.90 to 1.36)

*Cut-offs for low and high levels were –1 standard deviation and +1 standard deviation, respectively.
†Significant (p<.05) difference in rate ratios between men and women.

The Comparative Effects of 'Offender-initiated' and 'Colleague-initiated' Violence upon Employee Well-being in the Police Force

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Introduction

Work-related violence is an occupational health issue of significant proportions. Mounting evidence attests to the negative impact of exposure to such violence upon the physical and psychological health and well-being of individuals, as well as organisational functioning and healthiness (Leather et al., 1998; Barling, 1996). In an effort to encompass all of the circumstances in which violence may present itself, together with its various manifestations, work-related violence is defined as "any incident where a person is abused, threatened or assaulted in circumstances related to their work, involving an explicit or implicit challenge to their safety, well-being or health" (Wynne, Clarkin, Cox & Griffiths, 1997).

According Jenkins (1996), law enforcement is one of three occupations that are most prone to work-related violence (retail and transport industries being the other two). It comes as no surprise therefore that police work has long been considered a stressful occupation (Graf, 1986), and that police officers and employees are constantly faced with a range of occupational stressors such as the threat of violence, lack of respect from members of the public, confrontational and negative interactions, and the militaristic police culture, among others (Jermier et al., 1989).

Drawing from occupational stress research (Cox and Leather, 1994; Barling, 1996) exposure to violence constitutes an acute stressor, while the threat of exposure serves as a chronic stressor. Work-related violence may also lead to the development of post-trauma reactions/symptoms or in extreme circumstances, full-blown post-traumatic stress disorder (PTSD). The primary aim of this study therefore is to determine the differential effects between ‘offender-initiated’ violence (i.e. that from suspects, witnesses, and/or offenders) and ‘colleague-initiated violence’ and their impact upon individual health, specifically well-being and post-traumatic stress.

The role of the social context in the appraisal of violence and aggression

The social-interactionist model of violence and aggression places emphasis on the participants’ understandings and perceptions on both the interaction itself and the context in which the interaction takes place (Lawrence & Leather, 1999). The interpretation or the individual’s appraisal of an aggressive episode therefore entails complex social judgments about the perpetrators’ intentions and motives set within the norms and expectations relevant to the particular social situation (Leather & Lawrence, 1995). In the Police, as in any organization, attitudes and beliefs about violence and aggression and the job itself generate certain expectations about the job and interactions with individuals that have to do with the job itself. Few studies however have examined how such attitudes may possibly impact upon individual health and well-being.
Another aim of this study therefore is to explore how certain attitudes toward violence and aggression and policing in general may impact upon general well-being and post-traumatic stress symptomatology.

**Method**

**Procedure and subjects**

The data obtained and utilised in this study is part of a larger research survey examining the effects of violence and aggression upon a broad range of individual and organisational variables. A questionnaire tailored for use in the Police was employed to obtain, amongst other things, measures of exposure, attitudes, stress and well-being and post traumatic stress symptomatology. These measures of exposure and attitudes were developed following a series of pilot interviews with police officers, civilian support staff and the Force Occupational Health Unit. Distribution and collection of the questionnaire were conducted internally, through the Force Occupational Health Unit. A total of 3,360 questionnaires were distributed to all police officers and civilian support staff in an English police force, of which 979 (29%) were returned. Of the 979 police employees who participated in the study, 761 (77.7%) were serving police officers, 212 (21.7%) were civilian support staff, and 6 (0.6%) failed to indicate to which category they belonged.

**Predictors and moderators: frequency of exposure and attitudes**

Exposure to violence and aggression on the job was measured by asking the respondent to rate how often each incident of violence and aggression occurred from individuals both outside (suspects, victims and/or witnesses) and inside (other members of the Force) the Force. Items pertaining to both groups asked the respondent to rate the frequency of the following incidents: i) verbal abuse; ii) intimidation; iii) violence to property or nearby objects; iv) physical assault aimed directly at you; and v) indirect physical assault (police officers only). The frequency of each item was measured by means of a seven point likert scale ranging from 0 (never) to 6 (everyday). A total of 17 attitudes toward violence and aggression on-the-job were obtained from initial interviews with police officers and civilian support staff used to develop the questionnaire. The degree of agreement with each attitudinal statement was measured by means of a five-point likert scale ranging from 0 (strongly disagree) to 4 (strongly agree).

**Outcomes of individual health**

Well-being was measured using Cox et al.’s (1983) General Well-being Questionnaire. The questionnaire was developed as a measure of two indices of sub-optimum health; ‘worn-out’ symptoms relating to tiredness, emotional lability and cognitive confusion, and ‘up-tight and tense’ relating to worry, fear, tension and physical signs of anxiety. Each item was scored in terms of the frequency of each symptom by mean of a five-point likert scale ranging from 0 (never) to 4 (all the time). Scores on each factor could range from 0 to 48. The occurrence of PTSD symptoms was measured using the 15-item Impact of Events Scale (Horowitz et al., 1979) consisting of two response sets, intrusion and avoidance. Each item was scored in terms of the frequency of each symptom within a seven-day time window ranging from 0 (not at all) to 5 (often). Scores for the intrusion subset could range from 0 to 35, while scores on the avoidance subset could range from 0 to 38.

**Results**

**Exposure groupings**

In order to facilitate data analysis and obtain a reliable measure of violence and aggression exposure items were divided into two main types: 1) Violence and Aggression from outside (i.e. suspects, witnesses and offenders) and 2) Violence and Aggression from within (i.e. other members of the Force); where both indices attempt to incorporate the entire range of aggressive/violent situations ranging from verbal abuse to physical assault.

**Factor analysis of attitudinal measures**

A factor analysis with orthogonal rotation was carried out to determine any underpinning structure to the attitude statements. A six-factor solution resulted, two of which were deleted because they constituted single items. The four remaining factors were labelled 1) The inherent nature of violence and aggression in Police work; 2) The justifiability of using violence and aggression in self-defence; 3) Excessive public expectations of the Police; and 4) The Police as a public-service oriented organisation.

**Descriptive statistics for predictors, outcomes and potential moderators**

Descriptive statistics for the study sample as a whole are outlined in Table 1. Coefficient alpha is the reliability estimate given for all variables, except those of short-length where the mean-inter-item correlation is used as a substitute. Where scale-length is low, the mean ‘r’ should be between .2 to .4 (Cox and Ferguson, 1994). As table 1 shows, all the variables showed good reliability.
Table 1. Means, ranges, standard deviations and reliability coefficients for predictor, outcome and potential moderator variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Max/Min range</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predictors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V &amp; A from outside</td>
<td>10.67</td>
<td>0 to 30</td>
<td>6.34</td>
<td>.90*</td>
</tr>
<tr>
<td>V &amp; A from within</td>
<td>2.11</td>
<td>0 to 17</td>
<td>2.77</td>
<td>.68*</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'Up-tight'</td>
<td>10.71</td>
<td>0 to 41</td>
<td>6.89</td>
<td>.85*</td>
</tr>
<tr>
<td>'Worn-out'</td>
<td>19.25</td>
<td>0 to 43</td>
<td>7.24</td>
<td>.86*</td>
</tr>
<tr>
<td>Intrusion</td>
<td>5.86</td>
<td>0 to 40</td>
<td>8.76</td>
<td>.93*</td>
</tr>
<tr>
<td>Avoidance</td>
<td>4.60</td>
<td>0 to 35</td>
<td>7.15</td>
<td>.89*</td>
</tr>
<tr>
<td><strong>Potential moderators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'V &amp; A are inherent to working in the Police''</td>
<td>7.60</td>
<td>0 to 16</td>
<td>3.50</td>
<td>.32**</td>
</tr>
<tr>
<td>'The use of V &amp; A are justifiable in defending oneself'</td>
<td>1.91</td>
<td>0 to 8</td>
<td>1.43</td>
<td>.69***</td>
</tr>
<tr>
<td>'The public have too many expectations from us'</td>
<td>8.81</td>
<td>0 to 12</td>
<td>2.14</td>
<td>.22**</td>
</tr>
<tr>
<td>'The police is a public-service oriented organisation'</td>
<td>5.94</td>
<td>0 to 8</td>
<td>1.50</td>
<td>.63**</td>
</tr>
</tbody>
</table>

* Cronbach's alpha
** Mean inter-item correlation
*** Product moment correlation (only two items)

Main effects of exposure and attitudes upon outcome measures

The multiple regression analyses (main effects) of exposure upon health outcomes consistently show that both violence and aggression from outside and violence and aggression from within have a negative impact upon both 'up-tight' and 'worn-out' symptoms among police officers than civilian support staff. For violence from within the Force however the opposite was true, and civilian support staff were more strongly related to 'worn-out' than were police officers. In terms of post-traumatic stress symptomatology however, violence from outside more strongly predicted both intrusion and avoidance symptoms among police officers than civilian support staff. Violence from within the Force however exhibited a similar trend to the appearance of stress symptoms, where such violence more strongly predicted the occurrence of both intrusion and avoidance symptoms among civilian support staff than in police

The regression analyses also emphasised the differential effects of certain attitudes upon individual health among police officers and civilian support staff. Attitudes that predicted symptoms of feeling 'up-tight' among police officers were 'The justifiability of using violence and aggression in self-defence' and the view of 'The police as a public-service organisation', whilst among civilian support staff it was only 'The inherent nature of violence and aggression in police work'. Symptoms of feeling 'worn-out' were only predicted by the attitude 'Excessive public expectations of the Police' among police officers. In the case of PTSD symptoms the attitude 'The inherent nature of violence and aggression in police work' moderately predicted the occurrence of intrusion symptoms among police officers and also among civilian support staff. The view that violence and aggression are inherent in police work also predicted avoidance symptoms among civilian support staff, whilst the belief that public expectations are excessive slightly predicted avoidance symptoms among police officers.

Table 2. Main effects of exposure and attitudes upon outcome variables for police officers (POs) and civilian support staff (CSSs).

<table>
<thead>
<tr>
<th>Outcome measure</th>
<th>β for POs</th>
<th>t for POs</th>
<th>sig.</th>
<th>β for CSSs</th>
<th>t for CSSs</th>
<th>sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Up-tight' score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Violence and aggression from outside</td>
<td>.110</td>
<td>3.007</td>
<td>.003</td>
<td>.100</td>
<td>1.325</td>
<td>ns</td>
</tr>
<tr>
<td>Violence and aggression from within</td>
<td>.207</td>
<td>5.642</td>
<td>.001</td>
<td>.335</td>
<td>4.435</td>
<td>.001</td>
</tr>
<tr>
<td>Summary for exposure</td>
<td>(R^2=.248; \ R^2*=.061)</td>
<td>(F= 23.203, p&lt;.001)</td>
<td>(R^2=.385; \ R^2*=.148)</td>
<td>(F=15.099, p&lt;.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudinal factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The inherent nature of V &amp; A in Police work</td>
<td>-.012</td>
<td>-.321</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The justifiability of using V &amp; A in self-defence</td>
<td>.068</td>
<td>1.767</td>
<td>.078</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excessive public expectations of the Police</td>
<td>.031</td>
<td>.802</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Police as a public-service organisation</td>
<td>.075</td>
<td>1.982</td>
<td>.048</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary for attitudinal factors</td>
<td>(R=.098; \ R^2=.010)</td>
<td>(F=1.729, ns)</td>
<td>(R=.163; \ R^2=.027)</td>
<td>(F=1.192, ns)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 'Worn-out' score

**Type of exposure**
- Violence and aggression from outside: $R=0.267; R^2=0.071$
- Violence and aggression from within: $R=0.378; R^2=0.143$

**Summary for exposure**
- $F=27.463, p<0.001$
- $F=14.983, p<0.001$

**Attitudinal factors**
- The inherent nature of V & A in Police work: $R=0.008, R^2=0.001$
- The justifiability of using V & A in self-defence: $R=0.047, R^2=0.002$
- Excessive public expectations of the Police: $R=0.094, R^2=0.009$
- The Police as a public-service organisation: $R=0.001, R^2=0.000$

**Summary for attitudinal factors**
- $R=0.111; R^2=0.012$
- $F=2.207, p<0.067$
- $R=0.122; R^2=0.015$
- $F=0.683, ns$

### Intrusion symptoms

**Type of exposure**
- Violence and aggression from outside: $R=0.216, R^2=0.058$
- Violence and aggression from within: $R=0.079, R^2=0.015$

**Summary for exposure**
- $F=21.793, p<0.001$
- $F=8.362, p<0.001$

**Attitudinal factors**
- The inherent nature of V & A in Police work: $R=0.089, R^2=0.020$
- The justifiability of using V & A in self-defence: $R=0.018, R^2=0.003$
- Excessive public expectations of the Police: $R=0.066, R^2=0.011$
- The Police as a public-service organisation: $R=0.039, R^2=0.008$

**Summary for attitudinal factors**
- $R=0.128; R^2=0.016$
- $F=2.937, p<0.020$
- $R=0.222; R^2=0.049$
- $F=2.113, ns$

### Avoidance symptoms

**Type of exposure**
- Violence and aggression from outside: $R=0.199, R^2=0.053$
- Violence and aggression from within: $R=0.090, R^2=0.015$

**Summary for exposure**
- $F=19.798, p<0.001$
- $F=7.677, p<0.001$

**Attitudinal factors**
- The inherent nature of V & A in Police work: $R=0.043, R^2=0.012$
- The justifiability of using V & A in self-defence: $R=0.023, R^2=0.005$
- Excessive public expectations of the Police: $R=0.079, R^2=0.009$
- The Police as a public-service organisation: $R=0.025, R^2=0.006$

**Summary for attitudinal factors**
- $R=0.103; R^2=0.011$
- $F=1.892, ns$
- $R=0.241; R^2=0.058$
- $F=2.594, p<0.038$

---

**Table 3. Hierarchical Regression analyses for police officers**

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Predictors</th>
<th>$\beta$</th>
<th>$t$</th>
<th>sig.</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Up-tight'</td>
<td>Step 1: V &amp; A from outside</td>
<td>.133</td>
<td>3.553</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Step 2: The justifiability of using V &amp; A in self-defence</td>
<td>.045</td>
<td>1.215</td>
<td>ns</td>
<td>.021</td>
<td></td>
</tr>
<tr>
<td>'Up-tight'</td>
<td>Step 1: V &amp; A from outside</td>
<td>.145</td>
<td>3.896</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Step 2: The Police as a public-service organisation</td>
<td>.084</td>
<td>2.253</td>
<td>.025</td>
<td>.027</td>
<td></td>
</tr>
<tr>
<td>'Up-tight'</td>
<td>Step 1: V &amp; A from within</td>
<td>.217</td>
<td>5.901</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Step 2: The inherent nature of V &amp; A in Police work</td>
<td>-.006</td>
<td>-.172</td>
<td>ns</td>
<td>.047</td>
<td></td>
</tr>
<tr>
<td>Intrusion</td>
<td>Step 1: V &amp; A from within</td>
<td>.103</td>
<td>2.756</td>
<td>.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Step 2: The inherent nature of V &amp; A in Police work</td>
<td>.078</td>
<td>2.057</td>
<td>.040</td>
<td>.053</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>Step 2: The inherent nature of V &amp; A in Police work</td>
<td>.096</td>
<td>2.571</td>
<td>.010</td>
<td>.021</td>
<td></td>
</tr>
</tbody>
</table>

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Moderating effects of attitudes upon outcome measures

In order to determine whether attitudes act as a buffer between exposure and health outcomes hierarchical multiple regression analyses were conducted on the variables where exposure and attitudes elicited main effects. Although it is impossible to show hierarchical regression analyses conducted, only those attitudes that exhibited significant moderating effects will be discussed. It was found that two types of attitudes moderated the relationship between exposure to violence and aggression from outside and symptoms of feeling 'up-tight' among police officers. The belief that violence and aggression are justified in defending oneself had the strongest moderating effect upon exposure to violence and aggression from outside and feeling 'up-tight'. Similarly, the stronger the view that the Police is a public-service organisation also moderated such a relationship. The view that violence and aggression inherent to working in the Police however moderated the relationship between exposure to violence from within the Force and symptoms of being 'up-tight' and to a lesser extent, intrusion symptoms of PTSD. No moderating effects were found for civilian support staff.

Conclusions

The sources of violence and aggression described in this study focused on two distinct types, 'offender-initiated' violence and 'colleague-initiated' violence. The principal aim of this study therefore was to examine the different effects of these two sources of violence upon individual health and well-being. The study found that violence and aggression from outside (i.e. that stemming from witnesses, suspects, and offenders) was a stronger predictor of stress symptoms (i.e. 'up-tight' and 'worn-out') among police officers than civilian support staff. Similarly, such violence did not have an effect upon the experience of stress among civilian support staff. Violence from outside more strongly predicted the prevalence of post-traumatic stress symptoms among police officers than civilian support staff. The latter may be attributed to the possibility that police officers are more likely to encounter violent and/or aggressive confrontations with offenders, suspects or witnesses while at the 'front-line'. In short, police officers expect to have to deal with violence in their jobs. Evidence has shown that two of the most salient operational stressors appear to involve the arresting of violent individuals and the use of force (Biggam et al., 1997).

Violence from within the Force however served as the stronger predictor of stress symptoms than did violence from outside in both police officers and civilian support staff. It can be seen therefore that violence from within exhibited the greatest impact upon employee health in the Police, and was the strongest predictor of stress symptoms across the board. Violence from within however also served as a stronger predictor of post-traumatic stress symptoms among civilian support staff than police officers. The fact that violence from within was a greater predictor of employee stress in general highlights the importance of the social context in the appraisal of a violent situation/event. Although the overall mean for violence and aggression from within (2.11) was significantly lower than the mean for violence and aggression from outside (10.67), despite having to account for the unequal number of items per scale, the effects of 'colleague-initiated' violence are more detrimental to employee health and well-being. It was surmised therefore that the predictability or expectation of violence intrinsic to the job might play a role upon individual health outcomes. The latter brings us to the second aim of the study, which sought to determine whether certain attitudes toward violence and aggression as well as the nature of the Police might moderate the relationship between exposure and health.

Following multiple hierarchical regression analyses buffering effects by certain attitudes were found among police officers but none among civilian support staff. The interaction between violence and aggression from outside with the attitudes 'The use of violence and aggression are justifiable in defending oneself' and 'The Police is a public-service oriented organisation' yielded significant buffering effects upon the prevalence of 'up-tight' symptoms. The interaction between violence and aggression from within and the attitude 'Violence and aggression are inherent to working in the Police' also yielded significant buffering effects upon the prevalence of 'up-tight' symptoms and intrusion symptoms of post-traumatic stress. It can be seen therefore that attitudes that contain elements of expectations of meeting violence on-the-job can buffer against the negative effects of violence and aggression one may be forced to deal with as part of the job. Although there are no studies conducted in this area, there have been studies that have looked into attitudes of people who are most likely to suffer PTSD from violent/aggressive encounters. Findings have been limited and caution should be taken in generalising such research. Brown et al. (1999) for example have found that male police officers with strong beliefs in a just world were less likely to experience distress following a traumatic incident, however such was not the case in women. Similarly, other studies have found that negative interpretations were predictive of PTSD (Clohessy & Ehlers, 1999).

In conclusion, this study has offered considerable evidence to the argument that 'offender-initiated' and 'colleague-initiated' violence and aggression are indeed two distinct typologies that elicit qualitatively different effects. This study also strengthens on-going debate that work-related violence, whether psychological or physical in nature, is a serious problem with potentially harmful consequences (Leather et al., 1999, 1998; VandenBos & Bulatao, 1996). Limitations of the study rest on its cross-sectional design and measurement of exposure in terms of frequency. In order to assess the long term consequences of violence, future research should ideally be longitudinal in nature and consider other dimensions such as severity and duration of exposure to violence and aggression. Further research that deals with attitudes toward aggression and violence and the nature of their job would pave the way in ascertaining whether certain attitudes have direct or moderating effects upon employee health. The reality that police employees are at-risk not only to violence and aggression from the public, but as well as colleagues, attenuates the urgent need for organisations to address the problem of violence and aggression by means of a problem-solving framework that calls for prudent assessments, planned interventions, continuous evaluation and proactive prevention strategies.
C. SCHOBER¹, S. FELGOISE¹, R. DITOMASSO¹ and P. BRODY²
¹ Philadelphia College of Osteopathic Medicine, Department of Psychology
² Penn-Friends Behavioral Network

This study assesses the relationships among depression, burnout, and social problem-solving skills in a sample of administrative assistants using a cross-sectional, correlational design. The findings will augment the existing research on burnout and work-related stress by examining the relationship between reported burnout symptoms and participants’ use of effective problem-solving strategies.

Burnout, a loss of motivation and commitment accompanied by emotional depletion, is observed in a “normal” adult as a specific response to chronic, work-related stress (Freudenberger, 1974; Maslach, 1994). Work-related stress is linked to a variety of physical ailments and to depression (Buunk, et al., 1998, Grossi, Theorell, Jurison & Sutterland, 1999, and Toomingsas, Theorell, Michelsen & Nordemar, 1997). Excessive or prolonged work-related stress can disrupt effective problem solving (D’Zurilla & Nezu, 1999). According to the relational/problem-solving model, social problem solving is a key process for understanding and responding to stress (Nezu, Nezu, & Perri, 1989). This model suggests that distress develops from a discordant relationship between a stressful event and an individual’s emotional response when there is a lack of effective problem-solving coping (D’Zurilla, Chang, Nottingham, & Faccini, 1998; D’Zurilla & Sheedy, 1991). Effective problem-solving serves as a protective factor (Nezu, 1986; Cannon et al., 1999; Priester & Clum, 1993; Dixon, 2000; Whatley, Foreman, & Richards, 1998) and has been linked to reducing stress and depression (Nezu, Nezu, Friedman, Faddis & Houts, 1998; Nezu, Nezu, Saraydarian, Kalmar, & Ronan, 1986; Nezu & Ronan, 1985, 1988).
Administrative assistants were the population selected for this study because their work can be demanding with frequent role shifting (Bailey-Hughes, 1998). They also experience stress-related illnesses (National Institute of Occupational Safety and Health, 2000). The study draws approximately 125 subjects from the membership of the International Association of Administrative Professionals of a major U.S. metropolitan area. Participation was voluntary and anonymous and included employed adults over age 18, competent in written English. The only exclusion was refusal to participate. The instruments (described below) were given to participants at their association meeting.

This study tests the following hypotheses in order to explore the relationships among work-related burnout, depression, and problem-solving: 1. There is a positive correlation between measures of positive problem orientation on the Social Problem-Solving Inventory-Revised (SPSI-R) and a quality of life measure; 2. There is a negative correlation between measures of positive problem orientation on the SPSI-R and measures of exhaustion and cynicism on the Maslach Burnout Inventory-General Survey (MBI-GS); 3: There is a positive correlation between measures of positive problem orientation on the SPSI-R and report of personal efficacy on the MBI-GS; 4: There is a positive correlation between scores on the Job Stress Survey (JSS) overall Job Stress Index and measures of exhaustion and cynicism on the MBI-GS; 5: There is a negative correlation between scores on the (JSS) overall Job Stress Index and measures of personal accomplishment on the MBI-GS; 6: There is a positive correlation between scores on the Center for Epidemiological Studies Depression Scale (CES-D) and measures of exhaustion and cynicism on the MBI-GS; 7: There is a negative correlation between scores of depression, exhaustion, and cynicism, even when their working conditions are stressful. They also experience stress-related illnesses (National Institute of Occupational Safety and Health, 2000). The study draws approximately 125 subjects from the membership of the International Association of Administrative Professionals of a major U.S. metropolitan area. Participation was voluntary and anonymous and included employed adults over age 18, competent in written English. The only exclusion was refusal to participate. The instruments (described below) were given to participants at their association meeting.

If the hypotheses are supported, the major finding will be that administrative assistants subjected to chronic, work related stress, and who do not exhibit symptoms of burnout, employ effective social problem-solving skills as a method of coping. It is expected that those who employ effective problem-solving strategies will demonstrate low levels of depression, exhaustion, and cynicism, even when their working conditions are stressful.

References

Health and Safety in Call Centres: An Occupational Health Psychology Perspective

C. SPRIGG, P. SMITH, C. PHELPS, J. BESWICK and K. TRAVIS
Health and Safety Laboratory (HSL), Sheffield, United Kingdom.

Introduction

During the last five years, the call centre industry has experienced huge growth (CCA, 2001). Estimates of the overall numbers employed in the industry vary from around 225,000 to over 420,000 (IDS, 2000). The total number of call centres is estimated at between 4,000 and 5,000 (IDS, 2000). Figures are approximate because of the rapid growth of industry and the lack of an agreed definition of what constitutes a call centre.

As there is no agreed definition of a call centre, we have adopted the following working definitions for call centres and call handlers. We define a call centre as a work environment in which the main business is conducted via a telephone whilst simultaneously using display screen equipment (DSE). The term call centre includes parts of companies dedicated to this activity such as internal helplines as well as whole companies. We define a call handler as an employee whose job requires them to spend a significant proportion of their working time responding to calls on the telephone whilst simultaneously using DSE.

The call centre industry has attracted much negative comment in the media. Newspaper, radio and television features refer to call centres as “telephone sweatshops”, with the term “battery hens” used to illustrate the suggested intensive and stressful nature of being a call handler.

Academic interest in call centres has increased, yet few studies have explicitly examined psychosocial health risks (e.g., stress) and examined such risks from an applied Occupational Health Psychology (OHP) perspective. Instead, academic publications on call centres are concerned with, for example, forms of management control (Callaghan & Thompson, 2001), high commitment management (Hutchinson, Purcell & Kinnie (2000), industrial relations and unionism (Bain & Taylor, 2000), payment systems (Fernie & Metcalf, 1998), and emotion work (Zapf, Vogt, Seifert, Mertini, & Isic, 1999). This list is not intended to be exhaustive, but rather to give a flavour of the current academic output.

Health and safety stakeholders have proposed that call centres are a unique work environment, and, as such, guidance specific to call centres may be necessary. In response to this, the Local Authority Unit (LAU) of the UK Health and Safety Executive (HSE) contacted the Health and Safety Laboratory (HSL).

HSL is Britain’s leading industrial health and safety facility. HSL operates as an Agency of the UK Health and Safety Executive (HSE). For further details on HSL see www.hsl.gov.uk

The Human Factors Group of HSL employs 58 scientists, with 12 staff who have specialist knowledge of applied psychology. In 1998, LAU commissioned HSL psychologists to conduct an exploratory study of call centre working practices.

Study 1. Exploratory Study

Background

The aims of the exploratory study were to examine call centre working practices, highlight examples of good and poor working practices, and identify issues warranting further research. Although the remit of the study was broad, our research was constrained by resources.

From an initial discussion with our LAU customer, we considered that, from our OHP perspective, job design theory was relevant to an evaluation of call centre working practices. Job design is concerned with the nature of jobs (e.g., the degree of autonomy someone has over their work) and the effect of this design on employee performance and well-being, rather than the particular content (e.g., being an accountant as opposed to a tool-maker) of the job. Thus, job design principles can be applied to the examination of any job (Chmiel, 1998).

When we began our research, we were unaware of any previous studies that had examined job design in relation to employee well-being in call centres.

Method

First, we had to familiarise ourselves with the call centre work context. As part of our familiarisation process, we visited two Local Authority (LA) health and safety enforcement officers who had carried out inspections in a number of call

centres. The officers spoke of the concerns raised by employees and employees’ representatives working in some call centres. The officers gave us a valuable insight into the perspective taken by those at the ‘sharp end’ of the daily enforcement of UK health and safety laws in call centres.

We gained further information by discussing call centre working practices with officers from seven unions who represented call centre employees. Some unions had previously carried out their own research in specific sectors of the call centre industry.

To gather our own data, we conducted semi-structured interviews and observed call-handlers at work in six call centres. We designed an interview schedule which focused on the core job design elements (e.g., job autonomy, task variety, etc) but also included questions on the physical work environment (e.g., temperature, lighting etc), and organisational features (e.g., Electronic Performance Monitoring, display screen equipment training).

We interviewed 22 call centre employees who held a variety of roles including managers, team leaders, occupational health nurses, and call-handlers. Employers selected participants for interview prior to our arrival at a site. Three participant call centres were operated by banks/building societies, two were home shopping, and one was in an HSE Regional Office. Interviews were thirty minutes to an hour long and were conducted with two researchers present. All interviews were tape-recorded and participant confidentiality assured.

We used content and thematic analysis to examine the interview data. The researchers responsible for the interviews conducted the analysis.

Throughout the exploratory study, we continued to consult and discuss call centre working practices with stakeholders. These have included unions, industry professional bodies e.g., The Call Centre Association (CCA), and technical specialists within HSL and HSE, e.g., ergonomists, noise experts.

Results

By using the methods described we obtained a rapid insight into call centre working practices and identified issues warranting further, more rigorous, research. Within the confines of this extended abstract, it is not feasible to describe, in any detail, the qualitative findings from our exploratory study. We refer you to the HELA Local Authority Circular (LAC 94/1) ‘Initial Advice Regarding Call Centre Working Practices’ which reports our findings. However, some brief and selective findings follow.

Display Screen Equipment (DSE) Working Practices

The Health and Safety (Display Screen Equipment) Regulations 1992 are one of most pertinent sets of regulations for call centres. We found that call centres varied in their interpretation and implementation of the current DSE Regulations. Good DSE working practices are essential in call centres, as call-handling can be a particularly static task.

A further issue in call centres related to the DSE Regulations is hotdesking (individuals are not allocated their own desks but sit at any available desk). We found hotdesking to be common practice in call centres. DSE assessments carried out on individuals must take into consideration the requirement to hotdesk. The DSE assessment requirements for call centres, and other hotdesking environments, may require clarification to limit health risks associated with poor DSE working practices.

Call-handlers spoke of the monotony of their jobs and reported jobs that, we considered, were of a relatively poor job design. For example, a call-handler can have little discretion over when, and how, work is done, repeats the same tasks over and over again, and has a constant, demanding pace of work dictated by the Automatic Call Distribution (ACD) systems. We note that elements of job design are included in the DSE Regulations and are termed ‘Daily work routine of users’. Hence our inclusion of these findings here.

Organisational Working Practices

Electronic Performance Monitoring (EPM) was used in the majority of call centres we visited. EPM includes the computerised, minute-by-minute collection of productivity data (e.g., duration of calls, number of calls answered, or made, and time taken in post-call administration). The majority of call handlers did not raise EPM as a particularly negative working practice. However, some were uncomfortable with the degree of surveillance they experienced daily.

Work-Related Stress

Call handlers described their jobs as monotonous rather than stressful per se. However, as psychologists, we appreciate that boring, repetitive work, can lead to employees’ feeling dissatisfied and under-utilised.

Managers thought that call-handling was a stressful, “pressurised” job and acknowledged that the nature of the job, itself, was the source of the stress experienced. Managers believed that little could be done to improve the job of call-handling and, thus, reduce the stress at source.

Discussion

As a result of the exploratory study, we wrote the HELA Local Authority Circular (LAC 94/1) ‘Initial Advice Regarding Call Centre Working Practices’.

The exploratory study and the contents of the LAC fulfil the study aims. The LAC discusses call centre working practices and illustrates the range of features that can potentially impact on call centre employee health and safety.
Limitations of the Study
The exploratory study had 22 participants, who were selected by employers, and the study was conducted in six call centres. With this small sample, we cannot be sure that this picture of call centres is accurate and free from bias.

With these limitations in mind, and the continued global interest in call centres, LAU commissioned further research from HSL. We discuss our second and ongoing study next.

Study 2. Main Study

Background
The exploratory study was purely qualitative, making use of semi-structured interviews and information gathered in discussions. In the main study, we have used a mix of qualitative (semi-structured interviews and discussion with the industry) and quantitative techniques (development of questionnaire).

As with the exploratory study, the theoretical basis for our main study was job design. Typically, job design research uses respondents’ ratings of their own job properties to describe their work rather than objective or independent ratings. From a theoretical perspective, using self-ratings is sensible, as it is the personal meaning of a job that is expected to influence well-being (Warr, 1999).

Most job design research has focused on the five characteristics of work identified in The Job Characteristics Model (Hackman & Oldham, 1975). The five core job characteristic are skill variety, task identity, task significance, autonomy and feedback. We have used an expanded range of work characteristics to investigate job features that could affect employees’ self-reported well-being and satisfaction. These additional work characteristic variables include the physical work environment, social support, workload and role properties. Parker & Wall (1998) have suggested such extensions to traditional job design.

Method

Questionnaire Development
We compiled a self-report questionnaire tailored to call centre employees. In addition to questions based on an elaborated model of job design, we asked questions on DSE good practice. We included self-reported affective reaction measures of job satisfaction, mental health and job-related well-being. We also included measures of self-reported vocal, optical, auditory and musculoskeletal health.

We adapted pre-existing core job characteristic measures, e.g., the measures of job control developed by Jackson, Wall, Martin & Davids (1993). We have developed new questionnaire items on EPM based on research literature, and we have used, where possible, other measures that are considered psychometrically robust, e.g., the General Health Questionnaire (GHQ-12) (Goldberg, 1972).

In collaboration with LA enforcement officers and internal HSE experts, we developed additional questions e.g., on auditory health and employees’ understanding of headset maintenance.

We conducted a small pilot study to assess ease of questionnaire completion and the average time taken to do so.

Procedure
Call centres participated in the study on a voluntary basis, and we requested that employees were instructed that questionnaire completion was also voluntary. We negotiated access to employees in each call centre separately and asked that employees were given the opportunity to complete the questionnaire during work time. We composed a detailed covering letter for each questionnaire and provided a reply paid envelope for ease of return.

Results

Questionnaire Response
One thousand, one hundred and thirty completed questionnaires have been returned, representing an overall response rate of 38%. Such a response is good for a postal survey. This sample includes employees from 20 organisations in various locations across England, Scotland, Wales and Northern Ireland.

Initial Analyses
Throughout the questionnaire, employees were requested to make written comments on specific aspects e.g., the frequency and duration of their rest breaks, and about how they were spent; their views of EPM, hotdesking, and the physical work environment. At present, we are simply reviewing these written comments, but, in the future, we intend to subject them to further analysis using a specialist software package e.g., Non-numerical Unstructured Data Indexing searching and Theory-building (QSR-NUD*IST).

The quantitative data have recently been entered into SPSS; a statistical package used for the analysis of social science data. So far, we have conducted simple frequency analysis, which satisfies initial requirements.

We plan to conduct more detailed statistical analyses and start writing an HSE Contract Research Report (CRR) later in 2001. More detailed analysis will allow for comparison of data from the affective response measures, e.g., job-related well-being, with appropriate benchmarking data published by Mullarkey, Wall, Warr, Clegg & Stride (1999).
Discussion

As occupational health psychologists working for an Agency of the UK HSE, we have a number of roles. One role is the examination and interpretation of research literature and the translation of this into a readily useable form for health and safety enforcers. Another role is in the generation of further knowledge and understanding of the psychosocial risks to employees’ health and safety. Other roles include the suggestion of interventions to minimise such psychosocial risks and to maximise employees’ well-being.

In fulfilling the requirements of these roles, we wrote the LAC (94/1) ‘Initial Advice Regarding Call Centre Working Practices’ based on the exploratory study. The LAC has been viewed positively by employers and LA enforcement officers. A guide aimed at providing advice on good employment practices in call centres produced by UNISON (a major union representing many call centre employees) in June of this year takes much of its Health and Safety chapter from the LAC. This provides a good indication of the continued practical value of our earlier publication.

Part of the remit of the main study is the production of a revised LAC. In the revision process, we have examined, in detail, existing HSE Regulations and guidance applicable to the call centre context. Our questionnaire data will give LAU a picture of the employees’ understanding of current DSE regulation and guidance.

By taking account of employees’ written comments, we have been prompted to introduce new advice in the LAC e.g., on the risk of verbal abuse. A new section gives good practice suggestions on how employers and employees can deal with this potential psychosocial health risk. We describe verbal abuse as a potential psychosocial health risk, as there is little, if any, research that has evaluated the impact of verbal abuse on individuals’ psychological well-being. By examining the written comments, it is evident that some employees find the frequent verbal abuse from callers an unquestionable source of stress.

Where HSE does not have advice or guidance, as is the case with EPM, we have examined the EPM research literature (e.g., Stanton 2000) to formulate our suggestions of workplace good practice.

Our revised LAC is due to be released in the autumn 2001. Currently, HSE colleagues, who are experts and policymakers, are reviewing and commenting on a first draft of the LAC. Next, the document will be passed to industry and union representatives for further comment and review.

As OHP practitioners/researchers, we are keen to exploit our unique data set to its fullest potential. Our ambition is to publicise our findings in HSE’s CRR series and in the academic literature. We will be in a better position to tell you more about our findings in Munich next year.

Acknowledgements

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How to be a Stressor: Training and Research Design Issues in a New Course for Heads of Department and Senior Managers

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Background

We have recently designed a one-day course entitled ‘Motivators, Mediators or Intimadators?’ for Managers and Principal Investigators at University College London. The nature and aims of this course merit special attention for the following reasons:

1. It is designed in the first instance for a specific client group – Managers and Principal Investigators (PIs or Directors of Research Projects). The first assumption here is that this client group confronts specific forms of stress: they are both principle stressors – they “hire and fire” (to use an Americanism) – and they have personal experience of stress in meeting set objectives – targets, and being seen and monitored in running their department/unit efficiently. The second assumption is that higher education Institutions incorporate distinct paradigms that differ in important ways from the commercial sector. Crucial here is research and creative output. As one participant in the course observed: personal esteem produced by research and creative output is often higher valued in academic environments than financial gain.

2. The course adopts a group-relations design (French 1999; Coleman 1975 & 1985; Obholzer 1994). This has important practical implications: first, that the form, nature and function of groups themselves generate conflict and stress that is approachable primarily on the group level – and not on the individual level. Workplace stress and conflict, for example, is not necessarily reducible to individual pathology – and treatable by individual staff counselling – but requires a group relations approach engaging with the specific group dynamics involved(Obholzer 1994). Secondly that managers and PIs are therefore on occasions going to be unable to “manage” group conflict, and will require appropriate mediation. The inability to manage the group dynamics of conflict is often marked by high levels of (unavowed) anxiety in managers and PIs, accompanied by defensive, autocratic, and unilateral interventions which serve to heighten rather than alleviate group stress. Thirdly, “awareness” of the group-related form of stress must inevitably involve some sense of the basic forms and functions of different sorts of group. Classically, this involves the differences between:
   a) large and small groups
   b) leader-led and leaderless groups
   c) the importance of the position in the group (central or peripheral)
   d) the formal setting of the group (such as the rectangular or circular shape formed by the chairs)

Fourthly, conflict and stress in a group-relations perspective may be characterised by a managerial entrenchment in a narrow and singular conception of the operation of power within the group; namely, the intimidation-capitulation vector based on the plenipotentary position. Integral to unlocking gridlocks provoked by such entrenchment is the exploration of other power relations within the group based on more negotiated and objectively informed processes involving delegation and consultancy. Crucial in this context is the role and potential of the observer position.

3. The course is constructed to indicate the potential space for mediation (Alternative Dispute Resolution) in departmental and unit conflicts, and to illustrate the obvious psychological and financial benefits of ADR over other formal alternatives such as grievance procedures and litigation. As part of our course, a barrister who specialises in work-related stress cases, informs the group of the consequences and costs of litigation – including the sobering fact that managers and PIs may be personally as well as institutionally liable in stress related cases; and that Institutions are required by law to respect, protect and care for the physical and mental health of their employees. Mediation/ADR has therefore been actively promoted in recent UK Government legislation concerning public, commercial and family/marital disputes. In the context, an employer’s provision of a mediation and staff counselling service is now widely and formally viewed as an important step in meeting legal requirements involved in Occupational Health provision.

4. The course is intended to perform a vital informative role in the future production of a specific Employee Support Programme to meet UCL’s needs. There are two prominent issues here;
a) the whole field of EAP’s is undergoing both rapid expansion and increasing sophistication and refinement. EAP’s no longer simply or mainly represent and brief individual counselling service, but include an increasingly varied package of personal and group support services, including financial and legal advice. Even so, mediation forms a recent arrival in this arena, so UCL is aware that it is pioneering largely new territory here.

b) unlike the commercial sector, UK Universities do not have extensive experience of EAP’s for this reason, it is important to appreciate the specific strengths that a University community might bring to the design and implementation of an appropriate EAP – notably the important input of academic research.

The Course Design

These overall course objectives argue against a more informative course aimed at promoting a preliminary theoretical understanding of the group dynamics of workplace conflict and stress, but indicate rather a more flexible course structure that includes group experiential components. It seems particularly important to incorporate an appropriate context in which participants can be provided with the opportunity to experience directly the structural differences involved in various power position within small and large groups. The simple way to enable this is first to conceive of the preliminary, mid-point, and closing plenaries as ‘large group’ sessions in which staff-consultants can intervene appropriately to indicate the specific group positions and dynamics – such as small-groupings, pairings, central positioning for executive power, or the peripheral location of observers; and secondly to conceive of the constituent workgroup meetings as ‘small group’ sessions, which progressively explore throughout the day the various dynamics of leaderlessness, active facilitation, and consultant intervention. The small constituent workgroups therefore are constructed by the organisers prior to the event with a view to choosing eight people who come from separate departments and also reflect gender and ethnic difference as far as possible.

Group Facilitators open the first small session by inviting each participant to introduce themselves not by their title or profession, but by describing an object of personal significance that they are carrying with them. The facilitator then briefly describes the group task for the day.

The group task is to participate in a case study which starts after coffee in the morning and reconvenes in the afternoon. The main features of the case study are scripted prior to the course, and character/role instructions are written for each of the participants prior to the event. When the scenario reconvenes in the afternoon, the participants are allocated different roles. This allocation (organised prior to the course) pays no attention to the gender of the participant in relation to the character.

This group-task is called ‘a case study’ rather than a role-play for specific and important reasons. First of all, unlike many role-play procedures, the formal task of the group is not simply contained here within a set performance, but rather serves as an impetus for various levels of intervention. Particularly important here are the various levels on which observation is invited. Characters are invited by the Facilitator at various points (particularly gridlocks) to feed back their thoughts (in or out of role) to the group. Two of the participants in each session are also cast as observers, who may be invited by either the Facilitator or the Consultant to comment on their current observations. The main staff-consultant visits the groups in turn and interrupts and comments as appropriate. Finally, after each of the sessions, each of the characters is asked in role to fill in a stress self-assessment questionnaire (Cohen, 1997) This both enables some immediate differential ‘research’ feedback in the final plenary about the character roles and their similarity and different in the various groups; and it also generates important data for research on the structure and development of group conflict in such case study situations.

The preliminary case study was constructed around a complaint over promotions procedure involving lost documents, allegations of personal favouritism, and contravention of equal opportunities policy. At the time of its conception, it seemed a suitably evocative site for members of an academic community to reflect on the relative interaction of personal and institutional issues, but on the day, it actually provoked an initial knee-jerk institutional response from some participants; course teaching staff were variously informed that actually UCL promotions procedure does not operate exactly in this way, or that a different officer and the Dean would be called in if such a dispute went this far, and so forth. At this point, it was important to recall for the members of the group that they are in role – not in managerial or PI positions at UCL – and that therefore they are not empowered or at liberty to chance the operant procedures of the case study. Nonetheless this response and the general feedback has prompted us to make sure that such detail-issues do not reoccur. In fact a major input from the final plenary was the offer from some of the participants to provide alternative case studies for the future. The on-going training group for facilitators is also working on, and revising case study options so that the course will have a range on offer within the near future.

The basic issue which is intended to emerge from the case study is that some group situations cannot be easily “managed” either by the manager, or by the group itself. The manager – or the group – will need to seek outside help, be it in the form of consultancy (including research), legal advice, mediation, or counselling in individual cases where personal issues figure prominently. The consultant and facilitators open the final large group session with an open discussion on how to unlock the gridlocks that have occurred in the previous case study meetings. In particular, they look at options of dividing up the group following specific lines of conflict, and invite characters first individually then in pairs (or occasionally foursomes) to identify and negotiate practical differences of procedure. The aim of this concluding part of the case study is not to provide a “solution” to previously intractable problems, but to illustrate the group-relational form of mediation (ADR) that is available if necessary at UCL. Again the very fact that participants can speak from the various characters’ positions – rather than from their own “real” role as managers or PI’s at UCL – enables an open endedness that is vital for this kind of experimental and experiential course.
The Future

The principle value of this course is that it offers options in conflict and stress-resolution that had previously been obscure or non-existent. These options are first of all practical, as UCL, like many other Universities, did not previously have staff counselling and mediation services within its Occupational Health Department. Furthermore, knowledge that these services exist, or of what they might entail, remain scant, despite exclusive in-house advertising. The course also offers an outlet for stressed or pressured managers or pi’s to unpack issues and look at problems in a different and less-stigmatised context than personal counselling (which many patently do not need). The playful – and fictional – nature of the case study, combined with the informative introductory sessions on the group relations and legal aspects of conflict and stress, foster a more enthusiastic, speculative, and experimental involvement, than exclusively lecture-based courses. From initial monitor-report feedback, it now seems that one possible outcome might be to develop an on-going or continuous form of the course, where managers or pi’s might choose to return as and when they wish. In this context it is often the unique and unfinished nature of the group-event which inspires participants, usually through small points of coincidental detail, rather than a broad sense of a new field of “knowledge”.

Finally, the course forms part of a much wider impetus within Occupational Health at UCL to establish a comprehensive EAP which will meet the University’s specific range of personal and group needs. The self-assessment and monitor forms used in the course are designed to promote specific service-related research which will enable accurate and informed planning of future developments. It is particularly hoped that this research component can be integrated as far as possible into related or parallel research projects running in other departments and units at UCL. In this way, such future developments in Occupational Health will not be founded on outside or independent assessment workplace needs within the University, but rather on an on-going group-relations culture which included integral research, self-assessment, counselling and mediation components.

Appendix – The course outline and structure

This course provides managers and principal investigators with basic mediation skills. It also enables them to gain practical insight into their role as stress-provokers: both to appreciate and assess the stress they may provoke in others; and to draw useful distinctions between productive and destructive forms of stress.

**Learning objectives of the course:**

- to acquire basic mediation skills
- to understand the various factors that contribute to conflict and stress
- to recognise and manage stress in oneself and others
- to distinguish between productive and destructive forms of stress
- to gain a preliminary understanding of stress-management strategy in the workgroup
- to understand the role and function of staff counselling and employee support in the Occupational Health Service at UCL.

**Course format:**

The course combines lectures by specialists in the field, small group-work on case studies (led by a facilitator), and plenary feedback sessions.

**Timetable:**

9.15am  registration
9.30am  plenary
10am  lecture on Mediation, Conflict and Stress
10.30am  small group meetings

Group introduction, preliminary discussion of introductory lecture, and explanation and preparation of forthcoming case study work.

11.15am - 11.30am  coffee
11.30am - 12.30pm  case study 1
12.30pm - 1pm  plenary feedback session
2pm  lecture on litigation
3.00pm - 3.45pm  case study 2
3.45pm  tea
4.00pm -  plenary on case-study: mediation in practice
5.00pm - 5.30pm  plenary feedback session
Effects on Health and Safety in Offshore Construction Projects

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Background
By the end of the 1990s the petroleum industry was facing a challenge of cost and time cutting and new technology. To meet these challenges the NORSOK concept (Norwegian Offshore Cost Effective Initiative) was established in 1993 in Norway, after an agreement between the government and the industry. The aim was to construct new installations faster and cheaper, while still maintaining high standards on safety and health performance. Together with optimistic market prospects this lead to high activity with increase in investments and projects. In the winter 1998/1999 the activities were reduced dramatically.

This paper aims to demonstrate that while safety has focus in the construction projects of oil and gas installations in Norway; health and psychosocial factors seem to play a more peripheral role. This paper also argues that there might be an interesting link between deviation in project executions and health indicators like sick leave, turnover, burn out, work related diseases etc. This could motivate managers in general to focus more on health and safety issues. The customers could also reinforce this focus. It is also possible that health and psychosocial factors could play a more important and active role in the overall risk management.

Methodology
This study is based on interviews of major stakeholders, study of documents and accident HSE- statistics from companies and authorities were analyzed. 30 in-depth interviews were carried out from 1998 to 1999. The in-depth interviews were supplemented by three case studies of specific installations. The study covers both the period of high and parallel activities and the period of low activity and few projects in construction.

Theoretical framework and research literature
The US Institute for Occupational Safety and Health conclude that 80 % of accidents are caused directly or indirectly by stress (In Kahn, 1996). This encourages us to examine parameters or “early warnings” for health and safety. There is a strong focus on safety in the petroleum industry today. Rakel (1998) argues that emphasis in Health and Safety is on the word safety today. The employees get training to operate new equipment. But the same people are left alone in how to accomplish their job with fewer colleagues, tighter deadlines, guidelines, and ISO 9000 requirements.

Recent studies have pointed out that for more and more people have their working conditions shaped by their customers (Torvatn, 2001). Examples are “just-in time”, lean production, TQM- certification etc. The NORSOK initiative was beside the effort of producing faster and cheaper installations, a delegation of more responsibility for contractors including Health, Environment and Safety (HSE).

Kaplan and Norton (1996) have focused on the limitation of today’s performance measuring in companies. Too much emphasise is put on financial indicators and on historical data. They argue that we need more process oriented target goals and balance them according to the company’s strategy. It is also important that the top management get access and overview of a wider scope of data providing an overview of financial and non- financial data to manage companies. Kaplan and Norton’s (1996) thoughts could provide an opportunity to lift issues like health and safety to a higher level and hopefully increase the consciousness.

Results
Results from our study show that the platform-building boom in Norway resulted in:
- use of over-time
• extended use of hired personnel
• health concerns especially in periods with parallel activity in engineering and construction
• long time burnout was observed

Results from the study show that strain on workers and engineers during the construction phase have been tremendous for some projects, at least in periods. But this was not reflected in statistics presented for the oil companies, nor did the oil companies ask for it. A yard CEO said that the oil companies always compared the competing yards by LTI (Loss Time Injury) rate. But no oil company had ever asked them of their sick leave statistics. That yard had shown both improved LTI numbers and sick leave statistics. They had improved their numbers despite higher and more parallel activity. But they knew that in periods the engineers would have a rise in sick leave when they had parallel activities. The same trend was seen for the construction workers during completion of parallel activities. In general, when “projects where out of hand”, they experienced problems with sick leave.

The mismatch between the focus on safety and health from the customers’ point of view (oil companies) could be illustrated by this quotation from the CEO of one leading yard:

“No yard with a LTI figure larger than 8 is considered in the bid for the contract. But no one is asking us for the figures on sick leave. Considering that two of the companies are full or partly state owned15. I must say that something is wrong”. Yard CEO

This statement shows the customers impact on health and safety, but it also shows the government has different roles and that these roles also might conflict as both regulator and owner. An average one day’s sick leave costs Norwegian business and industry NOK 1,700 (approximately Euro 210) in addition to sick pay (Hem, 2000).

The NORSOK process was necessary to create more activity and make the oil industry more profitable. In the start of the NORSOK-process, the focus was on what to do. The question of how to do it wasn’t consciously or unconsciously presents. The how was left open to the construction projects. Both Pfeffer (1998) and Mintzberg (1989) have criticised managers for being to unaware of the processes in the organization. These assumptions are supported in our study (Hvalgård and Steiro, 1999). Our study found that the project organizations were not measured on process goals. An example is the benchmark study from the oil and gas fields Vigdis and Njord (Andersen, 1996). The study makes it possible to compare and contrast the two projects. But it also shows that investigators focus on static goals on behalf of more process-oriented goals. The industry argues that benchmark studies on HSE are conducted. But these studies are done separately and are not a part of the overall benchmark studies.

The NORSOK process helped to create faster and cheaper oil and gas installations even if the media focused on the budget imbalances. To some extend all benefited from more activity both government, oil companies, design and engineering and suppliers. It seems reasonable to conclude that the government and the oil companies had the greatest benefit. This is fair enough since they have often had the highest risk in their investment. Suppliers paid per hour seem to have had good margins. The greatest losers however, have been employees in design and engineering and construction, especially in periods with high activity. This meant long working hours due to deadlines and stress. The NORSOK process focused on what to do and not so much on how to do it (Hvalgård and Steiro, 1999). During the winter 1998/1999 the fall in oil and gas investment was significant. After high and parallel activity, a lot of the employees were laid off. The labour market in general was tight and one can only speculate on the long-term effect for recruitment especially for young people seeing the possibility for other career options.

Today products are more and more results of processes. And processes rely heavily on people. The industry has perceived a major change in both market and structural terms. When we carried out our study, the industry went from a high activity to a total stop in new project and this changed by the winter 1998/1999. Today both the construction companies face a major downsizing and consolidation. This is critical for the loyalty in the work force. It is reported in our study that people

14 Referring to Statoil and Norsk Hydro ASA. Statoil has no gone public, but the Government is still the major share holder controlling 52 % like in Norsk Hydro ASA

15 LTI is every absence caused by accident per every million worked hours.
“A lot attention is given if someone is killed in an accident. And that is how it should be. But what happens if someone die from a heart attack? ‘Alas, he died. A bad heart perhaps?’” — Corporate Union Boss

This quotation shows that health plays a more peripheral responsibility to the organizations. But an accident and immediate cause would be attributed as the responsibility of the organization itself and by the customer.

**Discussion**

Performance indicators are important. Especially the Loss Time Injury (LTI)-rate is being widely used and recognized. This indicator has been a great motivator and it is still of great importance. But in order to get the full view of Health and Safety problems, the industry has to extend the use of other performance indicators. LTI- indicators do not tell enough about psycho- social conditions. Some damages are perhaps not significant after several years of accumulation. Stress, for instance, is sometimes referred to as a “silent killer”. The Oil Company has experienced a drop in LTI-numbers but the curves seem to be flattening out. This is of course positive, but it does not necessarily say something about health issues.

Burnout can be seen as a result of long-term stress and increasing demand. The typical burnout syndrome consists of the feeling of being unable to solve all the tasks and that there are piles of papers constantly waiting for you. People working with risk analysis may also have the pressure to perform the analysis on a shorter limit of time due to the new project model. This is despite that new information tools provide them to do more and better analysis.

The unions in Norway were major contributors for the Working environment act in Norway in 1978 (Ryggvik, 1999). Skaar (1993) has concluded that organizations outside the company are important to both impose and reinforce health and safety concerns. In this case oil and gas companies could influence and contribute to the work and health and safety work in organizations by demanding acceptance criteria for health similar to what they demand for safety. Sick leave statistics have also their limitations. For instance, they don’t take into account age, gender, the demands for physical work, organizational efforts to bring the employee back to work etc. But they are still of great importance and should play a more significant role.

All this should be linked and provided for the top managers and board of directors. This would send an important signal to the organization and help project managers justifying time used on people related matters in general. Both safety and health have a lot to do with people and people relations. And often one could suggest a connection between working environment issues and safety issues. I.e. bad communication could not only lead to bad working environment, but also to lack of demand for safety job analysis (SJA) and a possible higher risk for an accident.

**Conclusions**

The oil company must ask for softer statistics, helping and reinforce the construction workers to stress the focus on organizational and psychosocial matters. Sick leave statistics have their weaknesses. But it is important that they are given enough attention in the total HSE (Health, Safety and Environment)-management system. It is important to triangulate between different measures and performance indicators. But it is also important to have the right indicators picking up the total picture. At the same time it is important to provide the information or the top management in a reasonable design. Statistics on sick leave, turnover and burnout etc. aren’t perfect, but they are some of the best quantitative indicators for the working environment.

Organizations must to a greater extent highlight the processes in the organization and look at interactions of health, safety and well being. Well-being has traditionally been seen as a major concern for the employees and their trade unions perhaps because of the well-fare association of it. However, interactions between stress and accidents are reasonable. Dynamic organizations need statistics and systems to monitor and control dynamic processes. Although this paper does not provide the whole answer, it points out some indicators that should also be taken into account together with LTI-indicators.

Health could be an important indicator for project management. Projects with large budget override experienced health problems. This should be further investigated and detailed studies from large-scale projects would be very interesting. If it is true that there is a link here, this could serve as a motivator for more focus on health and safety in projects. There are no single numbers that fill the whole picture. Companies need to triangulate between several performance indicators. However, they need to a greater extend to widen the perspective and open up for other perspectives. Health and Safety - performance numbers are an important platform for HSE-efforts. But we also need to foster and reinforce communicational skills and empathy. This will contribute to a proactive way of thinking Health and Safety in the organization and among the customers. The customers should to an increasing degree take responsibility for the working environment of the supplier. The consciousness of this responsibility seems to be very weak concerning work environment, but quite strong for safety in the oil and gas industry today. Increased focuses on these issues by the customers are ethical right, but it could perhaps also pay off by better control of the deliveries by the suppliers. Delays in offshore construction projects have an enormous impact on cash flows.

In this study there was a link between health problems and problems in the projects. This could be further studied and it would be interesting with an in depth study of the overall risk management in large-scale projects.
Acknowledgements

The Norwegian Research Council financed this study. The Council should also be praised for their trust in our work. Lars Edgar Onsøyen (Stavanger University College) and Hans Torvatn (SINTEF Industrial Management) have provided valuable comments. The responsibility for eventual blunders or mistakes is fully the author’s.

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Links between Safety Climate and Work-Place Accidents

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Background

Safety culture has been defined as “the set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimising the exposure of employees, managers, customers and members of the public to conditions considered dangerous or injurious” (Turner et al., 1989). Safety climate may be view as a temporal measure of organisational safety culture, focusing perceptions, values and attitudes at a particular time (Cheyne et al., in press). Coyle et al. (1995) argue that measuring the potential precursors of accidents identified in a safety climate analysis provides a powerful proactive management tool, and that the analysis of differences between and within organisations in terms of safety climate factors seems as important as traditional hazard analyses. Recognising its importance, they also argued that the relationship between safety climate and performance outcomes as occupational injuries has not been widely reported and provides a major area for future research. In fact, the interest of measuring safety climate as a precursor of occupational accidents is exacerbated by the major problems with the definition and measurement of accidents in the workplace. Common problems associated with accident rates include among others a) they present highly skewed distributions; b) they lack variability in general populations; c) there may be sources of bias in self-reports of accidents at the individual level; and, d) they are too associated with lost-days accidents at the organisational level; etc. Although the relationship between safety climate and accidents may not be a simple one, it is extremely interesting to explore data on how safety climate dimensions relate to (predict) both safety behaviour and injury rates.

An approach to assessing safety climate

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Several notions and operationalisations of safety climate exist. Different approaches produce different measures of safety climate and, therefore, different structures (for instance: Coyle et al., 1995; Donald, 1995; Lee, 1995; Mearns and Flin, 1996; Zohar, 1980, 2000). Recent reviews suggest the possibility of identifying 'core' dimensions relating employee attitudes to safety, explored in detail by Flin et al. (2000) and Clarke (2000). The collaborative work between the Universities of Loughborough and Valencia has developed such an approach. This approach comprises 29 indicators of safety climate into five factors: safety management, communication, responsibility, safety standards and goals, and personal involvement. Together with the factor structure, the research group developed a structural model relating the dimensions (Cheyne et al., 1998). This model is shown in figure 1.

**Figure 1. Structural model of safety climate**

Given that safety climate may be a potential antecedent of several safety related variables, the five factor structural model of safety climate has been used to predict appraisal to commitment to safety (Cox et al., 1998) and also the levels of safety activity (Cheyne et al., 1998).

At what level safety climate or culture is shared is an important question. Some authors have found differences between occupational levels, organisations, work-groups and/or plants of the same company in terms of safety climate interpretation, dimensionality and intensity (for example: Alexander et al., 1995; Harvey et al., 1999; Niskanen, 1994). Therefore, another potential use of the safety climate structural model is the applied research on safety climate stability. The five factor structural model of safety climate has been used to test for stability across a variety of conditions: plants of the same organisation (Cheyne et al., 1998); different industries (Cheyne et al., 1999); or employment levels (Cheyne et al., in press). The model has proved its validity and utility in order to understand changes in the safety climate dimensions across a broad range of companies and occupational aspects.

**Current Study**

The objectives of this paper are twofold: first, to test the factor structure of safety climate for a Spanish sample described in this paper via confirmatory factor analysis; second, to study the relationships between the safety climate dimensions, identified by the authors in former research, with accident rates.

**Method**

The research was based on a questionnaire survey of a population of industry workers in the Valencian region of Spain. Data were gathered through random sampling from the population of workers in the province. Workers were interviewed while they were undergoing annual medical tests at the Valencian Health and Safety Executive. The data includes 544 valid questionnaires. The most common type of organisation in the sample were small and medium enterprises, as it is usual in the Valencian area, and all types of industrial activities developed in Valencia are represented. With respect to respondents, 80% were employees, 10.4% were supervisors, and 9.6% were managers.

The survey instrument was developed by Cheyne et al. (1998), and comprises five sections: a) demographic information; b) work environment; c) hazard checklist; d) safety climate items; and e) accident rates. Work-place accidents were not included in the Cheyne at al (1998) study and have been measured here at the organisational and individual levels. Near misses, minor and major injuries have been considered.

Structural equation modelling has been the main statistical tool employed in the analyses presented here. Confirmatory factor analysis has been used to test the factor validity of the safety climate questionnaire. In addition structural equation models with observed variables (path analysis), and structural models with latent variables were used to explore the overall pattern of interrelationships between the variables of interest in the different sections of the survey, and specifically to predict accident rates. The structural models described in this study were estimated using maximum likelihood techniques using EQS 5.1. The overall fit of the models was assessed using a number of indices, all of them recommended in the statistical literature (Tanaka, 1993). The theoretical structural model with latent variables estimated in the overall sample is shown in figure 2. This model is based on that found in previous research (Cheyne et al., 1998) with the substitution of accident history for safety activities.
**Results**

A first aim of the study was to establish the factor validity of the scale for the Valencian population. A theoretical, five factor, model, had been found to exist in British samples. Therefore, a confirmatory factor analysis was specified, estimated and evaluated with this theoretical structure. Overall fit indices gave support to the five structure of safety climate: The chi-square was 838.441, with degrees of freedom 314 (p<0.001), the Comparative Fit Index was 0.89, Goodness-of-Fit Index was 0.824, and the Root Mean Squared Error of Approximation 0.074. On the other hand, detailed examination of the factor structure also gives support to the five factor model. All indicators loaded statistically significant (p<0.001) and high in their hypothesised factors, with factor loadings ranging from a minimum of 0.533 to a maximum of 0.876. With respect to correlation between factors, they were presumed orthogonal, and their correlations were about the expected direction and strength.

Four path analyses, with the same structure as model presented in figure 2, were employed in order to predict the four dependent variables of accidents: near misses, minor accidents, non-severe accidents and major accidents. Due to space limitations, the four models are not presented in full. However, the four models presented an adequate model fit, giving support to the safety climate model presented in figure 1 presenting some statistically significant effects of safety climate dimensions on accident rates. The CFI indices for the four models were around the 0.96 value, the GFI were about the same value, and the RMSEA ranged between 0.08 and 0.09.

Finally, a structural equation model with latent variables was used in order to study the link between safety climate and the different accident rates, taken as indicators of an overall accident factor. The proposed model resulted in a good model fit, after a few minor modifications. The chi-square is statistically significant (=1293.559, df=586; p<0.001), but the CFI and the GFI were 0.87 and 0.81, respectively, indicating an acceptable model fit, and finally, the RMSEA shown an excellent fit (0.063). The standardised relationships between the variables (latent and observed) in the model are shown in figure 3. The measurement part of the model has been avoided for the shake of clarity, but all factor loadings were statistically significant (p<0.01), in the theoretical direction and large, indicating that all indicators were highly reliable in the measurement of latent factors, including the different accident rates.

It is important to note some of the aspects about the relationships between the safety climate dimensions before paying attention to accident prediction. Safety management plays a pivotal role in the safety climate model. It is related to safety standards and goals, on one hand, but on the other hand is the main predictor of work-group variables, personal involvement and communication, indirectly affecting individual responsibility. With respect to accident prediction, the main predictor was safety standard and goals, an organisational variable. Work-place hazards also had an important effect...
on accidents. Overall, the amount of variance of accidents explained for by both predictors was a 25%, which may be considered a large effect on accidents in this context.

![Diagram of safety climate model predicting accidents](image)

**Figure 3.** Final model of safety climate predicting accidents  
(Note: n.s. means p>0.05; all other effects p<0.01)

**Conclusions**

One aim of this paper was to investigate the suitability of the existing safety climate framework, found in United Kingdom samples, for a Spanish sample. While the sector or organisational specific structures are useful for the targeting of improvement strategies in specific cases, this type of model would be of greater use if it were possible to describe the characteristics of safety climate across organisation, sectors, and national boundries, allowing more general safety strategies to be recommended. The similarities between the structures found in UK samples and the Spanish sample described in this study allow a core general model to be derived. In effect the safety climate dimensions are stable for this sample of the Spanish populations, providing some empirical support for the generalisation of the five factors model of safety climate across cultures.

Furthermore, the results also suggest that the structural model also generalises across cultures. The broad hypothesis presented by Cheyne et al (1998), that organisational variables (safety management and safety standards and goals) influence environmental (physical work environment and workplace hazards appraisal) and group process (communication and personal involvement) variables which, in turn, influence individual precursors to behaviour (individual responsibility and level of safety activity), was supported in part by the Spanish data. In the Spanish sample, most of the relationships hold up and the main effects are of about the same strength as in previous British samples. Differences are mainly in terms of a few relationships, and not in the direction but in the intensity of those relationships. More specifically there are no relationships between workplace hazards and the physical environment and between safety management and workplace hazards. This suggests that those in the Spanish sample perceive the hazards they face in their workplace as more distinct from the organisation and its management, than do those in previous studies, although they still feel that these affect their individual responsibility.

Finally the prediction levels of accidents within the model are quite good. Of the safety climate dimensions, safety standards and goals is highly related to accidents, suggesting that this measure of climate is indeed related to accidents as an outcome index. The model also shows a relationship between workplace hazards and accidents. It seems that, while respondents in this study do not perceive a relationship between management issues and the hazards that they face, they do recognise that these both have an influence on the occurrence of accidents, more so than their own responsibility.

**References**
Coping and Health in a Swedish Telecom Company from a Gender Perspective

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Stress at work is an increasing problem in Western societies, resulting in costs both for the organizations involved and for the individual employees. When we are confronted with stressful events, coping is essential for relieving stress. It also plays a major role in an individual’s health and well-being (Endler & Parker, 1990). The concept of coping has gained increasing importance in research aimed at better understanding stress.

Coping is a process concerned both with the appraisal of threats of various kinds and the mobilization of strategies to manage the problems and emotions involved. Lazarus and Folkman (1984) have defined coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person”, (p.141). Coping refers here to efforts aimed at dealing with different demands placed on us, whatever the success of such efforts may be.

Folkman and Lazarus (1980) have outlined two main coping dimensions that serve as prototypes for research on coping. They consider coping to consist of two main dimensions or be of two main types: problem-focused and emotion-focused coping. Problem-focused coping strategies involve efforts to solve a problem or change a difficult situation in an
active way. Emotion-focused coping strategies, in contrast, do not change the problem or the situation directly, but instead help new meaning to be assigned to it or serve to regulate the emotions that are aroused. Problem-focused coping has been viewed as the more adaptive of the two since it eliminates the source of stress rather than simply ameliorating the negative effects stress brings about (Lazarus & Folkman, 1984). Thus, it helps individuals to avoid or resist the harmful effects of stress (Billings & Moos, 1984; Endler & Parker, 1990; Stone & Neale, 1984).

Several studies report that men differ from women in the coping strategies they employ. Men have been found to use active, problem-focused coping strategies more often than women (Folkman & Lazarus, 1980; Hurst & Hurst, 1997; Stone & Neale, 1984), and women to use emotion-focused coping strategies more than men (Carver, Scheier & Weintraub, 1989; Hurst & Hurst, 1997; Muhonen & Torkelson, 2001; Stone & Neale, 1984). However, men have also been found to use more frequently report using alcohol or drugs as a means of coping (Carver et al., 1989; Muhonen & Torkelson, 2001). Some authors, on the other hand, have found no gender differences in coping (Bhagat, Allie & Ford Jr, 1991; Parkes, 1990). Also Long (1990) has pointed out that studies that have shown differences between men and women in their way of coping with stress have compared them in different contexts and that the belief that women respond to stress in a more passive way than men can be seen as a gender-role stereotype. Long and Kahn (1993) argue that findings showing men to use more problem-focused strategies than women stem from studies in which men and women were not matched on occupational level or power. The way of coping can be thought to differ across the organization hierarchy. In higher positions, coping can be thought to be more problem-focused and in lower-level jobs, where control of the situation is more difficult, to be more emotion-focused (Narayanan, Menon & Spector, 1999). The ability to maintain control and influence over one’s work situation has also been found to be closely related to how one copes (Callan, 1993), problem-focused strategies being shown to be particularly effective in situations in which people have control (Folkman & Lazarus, 1980). Colwill (1993) argues that in many countries women tend to be in positions in which they lack power and control, which in turn fosters a feeling of learned helplessness.

Several authors have pointed out that stress and coping have often been studied from a male perspective, the gender issue not being considered in such studies (Christie & Shultz, 1998; Greenglass, 1993; Parkes, 1990). Banyard and Graham-Bermann (1993) state that there is a need to reformulate theories of coping so as to include the role of social forces and differences in access to resources and to power. Long and Kahn (1993) have found there to be a need for research in which men and women are studied in equivalent jobs.

In the present investigation, coping was studied in the context of gender and of power. We were able to compare women with men who worked at similar tasks, both at a managerial and a non-managerial level. This is rather unusual due to both the vertical and the horizontal segregation of gender in the Swedish labor market. By comparing women and men in the same type of job and at both high and low levels in the organization, it was possible to study how coping was related both to gender and to power (in the latter case, to the level in the organization and access to control). It was hypothesized that men and women at the same level of power and with the same type of job would use problem-focused coping strategies to the same extent. A further aim of the study was to investigate how coping is related to health. There was hypothesized to be a negative relationship between health problems and the use of problem focused strategies.

**Method**

**Participants**

Questionnaires were distributed to 422 persons, both women and men, employed at different organizational levels (both managerial and non-managerial) in a Swedish telecom company. All employees at the managerial level were included here (45 women and 67 men), as were 300 randomly selected employees at a non-managerial level (155 women and 155 men). A total of 283 of the questionnaires were completed, yielding a response rate of 67 %.

**Measures**

**Power** was measured in terms of occupational level (1 = managerial position, 0 = non-managerial position). Three questionnaire items concerned with control at work (Dallner, Gamberale, Olsson & Örelius, 1999) were also used as indicators of power, the respondents being asked how often (1 = very seldom to 4 = very often) they were able to make decisions that were important to their work, to carry out their work in their own way, and to influence changes in the work level or power. The way of coping can be thought to differ across the organization hierarchy. In higher positions, coping can be thought to be more problem-focused and in lower-level jobs, where control of the situation is more difficult, to be more emotion-focused (Narayanan, Menon & Spector, 1999). The ability to maintain control and influence over one’s work situation has also been found to be closely related to how one copes (Callan, 1993), problem-focused strategies being shown to be particularly effective in situations in which people have control (Folkman & Lazarus, 1980). Colwill (1993) argues that in many countries women tend to be in positions in which they lack power and control, which in turn fosters a feeling of learned helplessness.

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**Health problems** were assessed by the Hopkins Symptom Checklist-25 (HSCL-25), (Derogatis, Lipman, Rickels, Uhlenhuth & Covi, 1974). HSCL consists of 25 items measuring symptoms (α = .94). The respondents indicated the intensity of different symptoms on a four-point scale ranged from 1 (not bothered) to 4 (extremely bothered).
Results

Power differences were measured by occupational level (non-managers and managers) and perceived control. As evident in Table 1, several differences between female and male non-managers were found concerning the use of coping strategies. Male non-managers reported using more Planning and more Alcohol-drug disengagement, whereas female non-managers used more Instrumental social support, Emotional social support and Focus on and venting of emotions.

Table 1. Differences in Coping Strategies between Male and Female Non-managers

<table>
<thead>
<tr>
<th>Coping strategy</th>
<th>Male non-managers (n = 85)</th>
<th>Female non-managers (n = 94)</th>
<th>t</th>
<th>df</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Active coping</td>
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<td>1.83</td>
<td>12.71</td>
<td>1.68</td>
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<td>11.40</td>
<td>1.75</td>
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<tr>
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<td>2.04</td>
<td>10.58</td>
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</tr>
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<td>11.51</td>
<td>2.01</td>
</tr>
<tr>
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<td>11.02</td>
<td>2.28</td>
</tr>
<tr>
<td>Positive reinterpretation</td>
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<td>1.90</td>
<td>11.58</td>
<td>1.78</td>
</tr>
<tr>
<td>Acceptance</td>
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<td>2.13</td>
<td>10.05</td>
<td>2.36</td>
</tr>
<tr>
<td>Denial</td>
<td>5.71</td>
<td>1.98</td>
<td>5.71</td>
<td>2.36</td>
</tr>
<tr>
<td>Focus on &amp; venting of emotions</td>
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<td>2.48</td>
<td>9.46</td>
<td>2.16</td>
</tr>
<tr>
<td>Alcohol - drugs</td>
<td>1.17</td>
<td>0.46</td>
<td>1.03</td>
<td>0.18</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01.

In comparing women and men who were at a managerial level, only one significant difference in the use of coping strategies was found. Female managers used more Emotional social support (M = 11.40, SD = 2.57) than male managers did (M = 9.60, SD = 2.62; t = -3.39, df = 98, p < 0.01).

No significant differences either between female and male managers or between female and male non-managers were found in terms of perceived control. On the whole, managers (M = 9.66, SD = 1.63), both women and men, perceived more control than non-managers (M = 8.42, SD = 2.17; t = -5.0, df = 277, p < 0.01).

Correlations between health and different coping strategies are shown in Table 2. Active coping and Positive reinterpretation were associated with fewer health problems and appeared therefore to be adaptive coping strategies. Denial, Focus on and venting of emotions and Alcohol - drug disengagement, on the other hand, appeared to be less adaptive strategies since they were associated with significantly more negative health signs.

Table 2. Correlations between Health Problems and Coping Strategies

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td>Health problems</td>
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<td>.17</td>
<td>-</td>
<td>.11</td>
<td>.67</td>
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<td>.10</td>
<td>.49</td>
<td>.47</td>
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<td>.47</td>
<td>-</td>
<td>-</td>
<td>.07</td>
<td>.35</td>
<td>.32</td>
<td>.25</td>
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<tr>
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<td>-</td>
<td>-</td>
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<tr>
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<td>.21</td>
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<td>.53</td>
<td>-</td>
<td>-</td>
<td>.18</td>
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<td>.40</td>
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<tr>
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<td>.32</td>
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<td>Emotional support</td>
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<td>.53</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Positive reinterpretation</td>
<td>-.18</td>
<td>.50</td>
<td>.57</td>
<td>.40</td>
<td>.16</td>
<td>.17</td>
<td>-</td>
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</tr>
<tr>
<td>Acceptance</td>
<td>.03</td>
<td>.07</td>
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<td>.06</td>
<td>.04</td>
<td>.04</td>
<td>.15</td>
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</tr>
<tr>
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<td>.26</td>
<td>-.29</td>
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<td>-.12</td>
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<td>Focus on &amp; venting of emotions</td>
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<tr>
<td>Alcohol – drugs</td>
<td>.24</td>
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<td>-.03</td>
<td>.08</td>
<td>.33</td>
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</tbody>
</table>

Note: N = 279. Correlations greater than or equal to .12 are significant at p < 0.5.

Separate correlational analyses for women and men suggested Positive reinterpretation to be a coping strategy more beneficial for health in women, and Active coping and Planning to be coping strategies more beneficial to health for men. Focus on and venting of emotions was positively associated with health problems in both women and men, whereas Acceptance, Denial and Alcohol–drug disengagement appeared to be related to health problems only for men.

Discussion

Overall, the coping styles adopted appear to be at least partly related to power. For managers the hypothesis that men and women who are at the same occupational level and are doing the same type of job use problem focused coping strategies to the same extent was supported.

At the non-managerial level, however, this hypothesis was not supported. Indeed, the study showed there to be significant differences in the use of coping strategies between women and men in lower positions in the organisation.
Although men and women who were at the same level reported having control to the same extent, they differed in their coping styles. The men at a non-managerial level used the problem focused strategy of Planning more frequently than the women did. They also reported more frequent use of alcohol or drugs. In contrast, the women in lower positions used the two social support related strategies Instrumental- and Emotional support and also the strategy Focus on and venting of emotions more often than the men did.

The hypothesis that there would be a negative relationship between problem focused strategies and health problems was only supported for the strategy Active coping. At the same time, one emotion-focused strategy, Positive reinterpretation and growth, was negatively related to health problems. Three further strategies Denial, Focus on and venting of emotions and Alcohol – drug disengagement, were connected with the occurrence of negative health signs.

References


Acknowledgement

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The Psychological Consequences of Aggression to Healthcare Staff

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Introduction
Previous research has documented the incidence and nature of aggression to healthcare staff (Hobbs, 1991; Rose, 1997), the staff groups most vulnerable (Arnetz, Arnetz & Petterson, 1996), factors contributing to aggression (Whittington & Wykes, 1996) and the likely perpetrators (Cooper & Mendonca, 1991). However, psychological effects often appear to be ignored and the severity of incidents is commonly judged by the physical consequences (e.g. Cooper & Mendonca, 1991; Haller & Deluty, 1988; Nolan et al., 1999). Few studies have specifically investigated the psychological effects on staff. This is an important omission as knowledge of psychological consequences and factors influencing them can inform strategies to minimise or prevent staff distress as well as acting as a further spur to tackle the problem.

The few studies documenting psychological reactions have noted an incidence of problems ranging from 30% (Lanza, 1983) to 86% (Zahid et al., 1999) of those experiencing aggression. Reactions reported include anger (Ryan & Poster, 1989), fear (Fernandes et al., 1999), role conflict (Lanza, 1992), depression and sleeplessness (Zahid et al., 1999) and intrusions, hypervigilance and recall of previous trauma (Flannery et al., 2000). Distress can persist for between one week (Cottle et al., 1995) and one year after an incident (Ryan & Poster, 1989). A proportion of staff ranging from 5% to 17% of those exposed to aggression are found to fulfill criteria for Post-Traumatic Stress Disorder (Caldwell, 1992; Wykes & Whittington, 1998; Whittington & Wykes, 1992).

There are few reports of the factors influencing psychological reactions, but the availability of peer support (Collins, 1996), professional group membership (Koopman, Zarcone, Mann, Freinkel & Spiegel, 1998), and experiencing verbal threats (Whittington et al., 1996; Zahid et al., 1999) are implicated. Common methodological problems in this area of work include retrospective design (e.g. Zahid et al., 1999; Lanza, 1983; Caldwell, 1992; Whittington et al., 1996) and failure to use standardised measures (Flannery et al., 2000; Fernandes et al., 1999; Lanza, 1983; Zahid et al., 1999).

The present study begins to address the gap in knowledge about the psychological effect of aggression on health care staff and the factors influencing response. It improves on previous studies by collecting data prospectively and by using a standardised measure of response to incidents. The aims of this study are to investigate the extent of distress following aggressive incidents and to explore whether the following factors are associated with adverse reactions: the extent to which staff felt prepared to manage aggression, the extent to which they expected the incident, whether the aggression was verbal or physical, staff age, the nature of any injury sustained, whether they had experienced a similar incident previously and whether or not other staff were present at the time.

Method
The participants were UK NHS Trust employees working in primary care, learning disabilities, mental health and older adults. For a period of 3 months, all staff who reported aggression at work were sent a questionnaire pack which was anonymous but coded to allow matching with the incident report forms.

Measures
a) The Trust's incident record form. This contained details about the incident, any injury and basic information about the staff member. "Aggression" included verbal or physical abuse from any source.

b) Impact of Events Scale - Revised (Weiss & Marmar, 1997) (IES-R). This 22 item scale is a development of Horowitz's (1979) original scale and includes a third subscale, Hyperarousal, in addition to the original two: Avoidance and Intrusion. The new subscale targets anger, jumpiness, concentration problems, arousal and hypervigilance.

c) A questionnaire designed for this study containing the following questions which were rated on a five point scale:

1. How prepared were you (e.g. training, knowledge) for managing an incident like this?
2. How much were you expecting the incident?
3. Has anything similar happened to you before?
4. Overall, how would you rate the psychological impact of this event on you?
5. Were you surprised by your reactions to this incident?

Participants were also asked how much, if any, sick leave they had taken as a result of the incident and whether they were alone at the time of the incident.

Results
A total of 318 incidents were reported over three months, thus 318 questionnaire packs were sent out and 126 of these were returned (40% response rate). The majority of the respondents were nurses (88%), the average age was 40 (s.d. 10.5, range 18 - 62). Respondents were representative of all staff reporting incidents in terms of occupation, grade, age, type and time of
injury and attention received. They differed in that the study sample contained more women (Pearson chi square = 4.89, d.f. = 1, p< .05) and fewer staff experiencing multiple incidents over the study period (Pearson chi square = 28.18, d.f. = 8, p< .001).

The Nature Of The Incidents
Most incidents were described as physical aggression (80%, N=99), the remainder as verbal aggression. Half resulted in injury, mostly bruising or scratching and of those injured, the majority (88%) received either no medical attention or first aid. Four incidents (3%) resulted in sickness absence ranging between one and four days.

Study Questionnaire
Most staff (82%, N=104) reported feeling prepared to manage aggressive incidents and a large proportion (68%, N=86) had experienced similar incidents before. Nevertheless, over half (59%, N=75) reported not expecting the incident in question. A considerable proportion (42%, N=53) of incidents were rated as having at least a 'moderate' psychological impact on staff with 14% (N=18) rated as having a 'considerable' or 'very great' impact. Twenty-seven staff (22%) described being surprised by their reactions.

Symptoms Reported On The Ies - R
Whilst the majority of participants (73%) obtained zero, a quarter described the intensity of their reactions as “a little bit” or more on the total scale score. Hyperarousal symptoms were most commonly experienced with 40% respondents indicating their presence. Eight (6.5%) respondents rated reactions as “moderate” or greater on at least one of the sub-scales.

Factors Associated With Distress
IndependentT tests showed that verbal aggression resulted in higher rated impact (t= -2.13, p<.05) and higher Intrusion scores on the IES-R (t= -2.06, p<.05) than physical aggression. Receiving an injury to the head resulted in higher scores on all measures (t=3.25, p<.01 for total IES-R score) and was strongly related to avoidance symptoms (t=3.77, p<.001). Staff age, inexperience in being subject to aggression and being alone at the time had no effects on measured response. Total IES-R scores were negatively correlated to the level of preparedness staff felt for dealing with the incident (Pearson r= -.21, p<.05). Intrusion scores were negatively related to the extent to which staff expected the incident (Pearson r= -.20, p<.05) and how prepared they felt for dealing with it (Pearson r= -.23, p<.05).

Discussion
Despite the minor physical nature of the incidents, a large proportion of staff reported that the incident had a psychological impact and indicated the presence of symptoms on the IES-R. Perhaps surprisingly, staff rated verbal aggression as having a higher impact than physical aggression and this was associated particularly with symptoms of intrusion. Perhaps verbal aggression is experienced as more personally meaningful and therefore more threatening than the common acts of physical aggression. In addition, verbal aggression may be perceived as less controllable than physical aggression which can be subject to restraint. Control and threat are regarded as important aspects of traumatic incidents. Ehlers and Clark (2000) suggest that the perceived loss of psychological autonomy during a trauma makes it more likely that the victim will experience distress and Kilpatrick et al. (1997) found that perceived threat predicted post-traumatic stress better than actual injury

It is of interest that participants reported higher levels of impact on the 'overall' impact item on the study than on the IES-R. Perhaps respondents are expressing a general sense of distress which is not reflected in specific symptoms as described by the IES-R. This general distress may result from experiencing frequent, minor incidents of aggression which constitute 'daily hassles' as described by DeLongis, Folkman and Lazarus (1988) which have been shown to have a negative effect on general mood (Clark & Watson, 1988). Future studies should take this into account when measuring response to incidents.

With regard to the determinants of response, preparedness for managing aggression and the degree of expectation of it are important and are related to intrusion symptoms. Some understanding of this may be sought from emotional processing theories of post trauma reactions (e.g. Foa, Steketee & Rothbaum, 1989; Horowitz, 1986) where intrusions are seen as part of the process of recovery in that they represent a repetitive revision of the trauma-related information until it is incorporated into existing inner models. Unexpected aggression and feeling unprepared for managing aggression may be particularly likely to provoke the cognitions thought by Foa & Riggs (1993) to be relevant to post-incident distress: the world is dangerous and the self is incompetent. These are likely to represent extreme departures from existing beliefs and so may result in higher level of intrusions until the experience is assimilated. However, it should be borne in mind that the correlations found between variables do not imply a causative relationship and so these explanations are speculative. Future research could clarify this by including measures of post-incident cognitions.

These results should be interpreted with some caution considering the study's shortcomings. First, the measure used has some limitations. Because the revised version of the IES has been less widely used than the original and normative data is not yet available, it has not been possible to make comparisons with other studies. However, it has provided useful information about hyperarousal symptoms which would not have been available with the original scale. Further, it may not be possible to generalise from this sample to other health care settings such as acute care, where the type of aggression
experienced may be quite different. Future research could investigate staff reactions to different types of aggression in different settings so that training can be tailored more specifically to staff needs.

Despite such shortcomings however, the results of this study have important implications both for training in the management of aggression and for responding to staff after incidents. In particular, the demonstrated impact of verbal abuse must be emphasised given that it is a common experience of health workers (Hobbs, 1991). With regard to pre-incident preparation, interventions should be aimed at increasing staff expectation of aggression by for example, raising awareness of factors predicting aggression and improving staff communications to routinely include information about risk factors. Increasing staffs' sense of preparedness for managing an incident could be addressed by training in the management of aggression which should include handling verbal abuse.

With regard to post-incident interventions, managers should be aware that although most incidents appear to be minor, many will have at least a moderate psychological impact on staff and will result in some anxiety-related symptoms. This is not to suggest that these reactions are abnormal or that they require specialist help but rather that they should be acknowledged and attended to by managers and supervisors. There are risks in dismissing such incidents as unimportant as research indicates that negative social interactions such as victim blame or disbelief have negative effects on adjustment (Davis, Brickman & Baker, 1991).

### References


Adverse effects of emotional work: Does social support help?

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Background
While working, people experience and express emotions. Emotional work is work that puts a strain on the emotional resources of a worker. In this study, we distinguish between two types of emotional work: emotional demand and hiding of emotions. Emotional demand refers to the perception that work requires high commitment and burdens the emotional resources of the worker. For example, nurses may perceive their work as emotionally demanding (Maslach & Jackson, 1982). A nurse has to interact with patients who may be suffering, distressed, or even dying. This may lead to uncertainty about how to act and feel, to awkward interactions with patients and coworkers, and eventually to burnout (Buunk & Schaufeli, 1993 Büssing & Glaser, 1999). Hiding of emotions is an aspect of “emotional labour” (Hochschild, 1983), which refers to having to regulate the expression of emotions at work. For example, waiters are expected to smile and be kind to customers, so when they feel depressed or irritated with a customer they cannot show these feelings.

This study examines potential antecedents and consequences of emotional work (i.e., emotional demand and hiding of emotions). We first examine to what extent occupations differ in emotional work, and whether perceptions of emotional work depend on gender and age. After considering these antecedents of emotional work, we examine the relationship of emotional work with two traditional outcome measures of work: job satisfaction and burnout. Although no causal conclusions can be drawn from this study, we consider job satisfaction and burnout as potential consequences of emotional work. Finally, we examine whether social support from supervisor and from coworkers can buffer adverse effects of emotional work (Cohen & Wills, 1985; Karasek & Theorell, 1990).

Method
For this study, a representative sample of 8500 persons from the working population in the Netherlands was drawn. Of this sample, 270 persons could not be traced, and the remaining 8230 were asked to fill out a questionnaire about their work. We received completed questionnaires from 4334 participants (53%). The majority of the sample was male (73.4%), and age ranged from 17 to 79 years (M = 43, SD = 9.3 years).

The questionnaire covered several aspects of the participant’s work. Table 1 gives an overview of the variables that are used in the present study, with the number of items for each variable, the Cronbach’s α of the scale, and an example of the items16. A classification into 40 occupational groups was used. Examples of these groups of jobs can be found in Table 2. The social support items were answered only by participants who did have a supervisor at work (N = 3567), or did have coworkers (N = 4016).

16 All items were derived from existing scales. You can contact the first author <J.Ybema@arbeid.tno.nl> for more information on the nature and sources of the scales used.
Results and Discussion

Occupational group and emotional work

First, it was examined to what extent occupations differ in emotional demand and in hiding of emotions. The classification into 40 occupational groups explained 18.5% of the variance in emotional demand, and 5.7% of the variance in hiding of emotions\(^\text{17}\). This means that occupations differed considerably in emotional demand, but relatively little in hiding of emotions. Table 2 presents occupational groups that differ more than half a standard deviation from the overall average. A standardized difference of 0.50 is generally regarded as a moderate effect (Cohen, 1992). Table 2 shows that industrial and construction jobs were especially low in emotional demand, whereas jobs in health care and education were especially high in emotional demand. Artists also reported high emotional demand. As to hiding of emotions, only the group of “policemen, firemen, guards” was more than half a SD above the overall average.

Table 2. Occupational groups high or low in emotional demand and hiding of emotions.

<table>
<thead>
<tr>
<th>variable</th>
<th># items</th>
<th>(\alpha)</th>
<th>example</th>
<th>emotional demand</th>
<th>hiding of emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>painters</td>
<td>1</td>
<td></td>
<td></td>
<td>-0.78</td>
<td>-0.26</td>
</tr>
<tr>
<td>plumbers, fitters, welders, sheet metal workers</td>
<td>2</td>
<td></td>
<td></td>
<td>-0.60</td>
<td>-0.32</td>
</tr>
<tr>
<td>bricklayers, joiners, and other construction workers</td>
<td>3</td>
<td></td>
<td></td>
<td>-0.72</td>
<td>-0.43</td>
</tr>
<tr>
<td>other crafts and industrial jobs</td>
<td>9</td>
<td></td>
<td>-0.51</td>
<td>-0.39</td>
<td></td>
</tr>
<tr>
<td>loaders, unloaders, excavation workers, crane drivers</td>
<td>12</td>
<td></td>
<td>-0.55</td>
<td>-0.41</td>
<td></td>
</tr>
<tr>
<td>policemen, firemen, guards</td>
<td>25</td>
<td></td>
<td>0.32</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>physicians, dentists, veterinarians</td>
<td>28</td>
<td></td>
<td>0.61</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>nurses, caretakers for the sick</td>
<td>29</td>
<td></td>
<td>0.94</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>geriatric helpers, child care workers, home helpers</td>
<td>30</td>
<td></td>
<td>0.52</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>teachers in primary education</td>
<td>31</td>
<td></td>
<td>0.91</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>teachers in secondary education</td>
<td>32</td>
<td></td>
<td>0.72</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>teachers in higher education</td>
<td>33</td>
<td></td>
<td>0.51</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>artists</td>
<td>36</td>
<td></td>
<td>0.85</td>
<td>-0.04</td>
<td></td>
</tr>
</tbody>
</table>

Note: Standardized differences between group mean and grand mean are presented. Groups that are not included score between –0.50 and 0.50 on both variables.

It can be concluded that occupational groups differ strongly in emotional demand, and that especially jobs in health care and education are emotionally demanding. These are jobs in which human interaction is a central aspect of the work. This suggests that interactional stress could be a major component of emotional demand at work. The high emotional demand

\(^{17}\) Significance tests are respectively, \(F(39, 4065) = 24.84, p < .001\), and \(F(39, 4065) = 7.40, p < .001\).
among artists seems of a different kind. Perhaps artists consider their work as emotionally demanding because of special commitment to the products they create.

Gender and age
We next examined whether gender and age influence perceptions of emotional work. Hochschild (1983) assumed that females do more emotional work than males (see also Schaubroeck & Jones, 2000). In line with this assumption, we found that female participants perceived higher emotional demand than males, with a standardized difference, $d = .31$ ($p < .001$). Female participants also perceived higher need to hide their emotions at work, $d = .21$ ($p < .001$). The size of these standardized differences shows that differences between males and females in emotional work are modest. Moreover, when occupational group was controlled for, the differences between males and females in both emotional demand and hiding of emotions disappeared. This means that differences in emotional work between males and females are due to differences in the jobs they hold. For example, industrial and construction workers are almost exclusively males, whereas females are relatively more often health care workers and teachers.

Older workers perceived higher emotional demand ($r = .09, p < .001$), and higher need to hide their emotions ($r = .09, p < .001$) than younger workers. Controlling for occupational group did not affect these relationships between age and emotional work. However, the size of the correlations shows that the differences in emotional work between younger and older workers are small. Moreover, it is not fully clear how this finding should be interpreted. One explanation would be that this relationship is driven by a hidden aspect of the job: older workers may generally have jobs with more responsibility, which could be more emotionally demanding, and may require more hiding of emotions than jobs with less responsibility. Such responsibilities are not captured in the rather broad categorization of occupational groups that was used in the present study.

Job satisfaction and emotional exhaustion
A major objective of the present study is to examine how emotional work is related to job satisfaction and emotional exhaustion, and whether social support moderates these relationships. Table 3 shows how job satisfaction and emotional exhaustion were related to emotional work. The zero order correlations show that both emotional demand and hiding of emotions were negatively related to job satisfaction, and positively related to emotional exhaustion. These correlations remained virtually identical when occupational group was controlled for. It can be concluded that people who find their job emotionally demanding or who have to hide their emotions at work, are relatively dissatisfied with their job and are relatively high in emotionally exhaustion.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-.10</td>
<td>-.17</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.38</td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>4</td>
<td>.28</td>
<td>.24</td>
<td>-.36</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: All correlations are significant at $p < .001$.

Finally, it was examined whether the relationships between emotional work and job satisfaction and emotional exhaustion were moderated by social support. For job satisfaction, four separate regressions were done on emotional work (emotional demands or hiding of emotions), and social support (from supervisor or from coworkers), and the appropriate interaction term (Aiken & West, 1994). The interaction term contributed significantly ($\alpha = .01$) in one of these regressions of job satisfaction, i.e., when hiding of emotions and support from the supervisor were included as predictors. Figure 1A shows that satisfaction with work was higher when someone experienced much support from the supervisor ($\beta = .35, p < .001$), and when the need for hiding emotions was low ($\beta = -.11, p < .001$). Moreover, the interaction term ($\beta = .06, p < .001$) shows that especially when social support from the supervisor was low, having to hide emotions lowered job satisfaction. When social support was high, hiding of emotions was unrelated to job satisfaction. Thus, social support from the supervisor buffers adverse effects of having to hide emotions at work.
For emotional exhaustion, four similar regressions were done. Three of these regressions yielded significant interaction terms. Social support from supervisor and coworkers were related to lower emotional exhaustion ($\beta$ ranged from -.10 to -.20, $p < .001$). Emotional demand ($\beta = .28$, $p < .001$), and hiding of emotions ($\beta = .20$ or $.23$, $p < .001$) were both related to higher emotional exhaustion. The interaction term between emotional demand and support from the supervisor did not reach significance, but the other interaction terms were significant ($\beta$ ranged from -.04 to -.09, $p < .01$). The pattern of the interaction was similar in all regressions. The strongest interaction was found for hiding of emotions and support from the supervisor (just as for job satisfaction). As shown in Figure 1B, hiding of emotions was related to more emotional exhaustion especially among those who received little support from their supervisor. Thus, social support from the supervisor buffered the adverse effect of hiding of emotions on emotional exhaustion. The other significant interactions showed that support from coworkers also buffered to some extent the effects of both emotional demand and hiding of emotions on emotional exhaustion.

**Conclusions**

This study among a representative sample of the Dutch working population shows that occupations differ substantially in emotional demand. Especially working in health care and education is emotionally demanding. This may be due to problematic social interactions, and to confrontation with people suffering. Artists also perceive high emotional demand, probably because of their strong emotional commitment to their work. Hiding emotions differs less among occupations. Especially policemen, firemen, and guards have to hide their emotions.

Emotional work is related to lower job satisfaction and to higher emotional exhaustion. However, the present study does not reveal whether emotional work causes low job satisfaction and high emotional exhaustion or vice versa. For example, it could be argued that workers who are high in emotional exhaustion may perceive their work as emotionally demanding, regardless of the actual characteristics of the job. Nevertheless, the finding that occupational groups differ substantially in emotional demand suggests that emotional work is – at least to some extent – a characteristic of the job.

Finally, it can be concluded that the supervisor’s supporting behavior (and to a lesser extent, supporting behavior from coworkers) is important for well-being and satisfaction at work as a protection against having to hide emotions at work. Perhaps venting one’s emotions to the supervisor, instead of to customers, patients or pupils, can compensate for the negative effects of being unable to speak up during most of the working day. The negative effects of emotional demand were only slightly buffered by social support from coworkers, and unaffected by social support from the supervisor. This suggests that emotional demand – which may often be the result of interactional stress – is not so easily countered by supportive behaviors from others.

**References**


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Appraisal Of Work Environment Changes And Stress: Validation Of A New Scale

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Theoretical background
Many studies have shown the negative impact of major organizational changes on survivors (Brockner, 1988; Cascio, 1993; Kets de Vries & Balazs, 1997; Kozlowski et al., 1993). In most of these studies, being faced with a major organizational change (i.e., downsizing) is considered to be a stressor that will elicit strain reactions. For example, it has been shown that organizational changes generate negative effects such as psychosocial strains, somatic complaints or decreased performance. But it could be asked whether such studies succeeded in capturing the actual causes of these negative consequences. Major organizational changes are often accompanied by micro-changes because the psychological climate as well as the way tasks are performed is modified. Doing the same job with less people, having a new supervisor or changing colleagues are minor changes at the organizational level but more significant ones for workers. Thus, we assume that it is important to capture which kind of minor changes individuals are confronted with to fully understand how they react during major organizational changes.

Moreover, most authors today stress the importance of taking into account situational characteristics as well as individual differences in the appraisal of events to better predict how people react to them (Dewe, 1992; Payne & Morrison, 1999; Schwartz & Stone, 1993; Terry & Callan, 1997). In the context of organizational changes, it means that the way people appraise changes in their work environment is of critical importance. Omitting to take into account the appraisal phenomenon takes for granted that changes in the work environment have similar meanings for all individuals. Such a view seems overly simplistic. For example, having more tasks to perform will certainly be a source of strain for already overloaded employees but may be a source of satisfaction for less busy ones.

Research objectives
Following a transactional perspective of stress, Schwartz and Stone (1993) measured separately the content of work-related problems, the appraisal of these problems through eight questions (dealing with controllability, undesirability or degree of anticipation of the problem, etc.) and person factors to explain coping reactions. Based on the results of their study, we developed a questionnaire to assess independently work environment changes employees were faced with, the appraisal of these changes and the corresponding level of stress, job satisfaction, and intent to quit. Our hypothesis was that negative appraisals rather than merely the occurrence of work environment changes would explain strain reports and their associated outcomes.

Method
Samples and procedure
In a first step, interviews were conducted with workers who have been confronted to a major organizational change in the last two years. These interviews contained open-ended questions as well as standardized items with the aim of capturing which kind of work environment changes workers were faced with and how they react to them.

In a second step, a survey questionnaire was distributed to a sample of workers from different organizations, both in the French-speaking and the Dutch-speaking parts of Belgium. Questionnaires were sent in the mother language of respondents. In total, 431 and 343 usable questionnaires, respectively, were returned for these two populations of workers.

French and Dutch-speaking samples were comparable concerning demographic characteristics. The respondents ranged in age from 21 to 63 years with a mean of 41 years. The average time they had been with their organization ranged from 1 to 42 years with a mean of 15 years. Among respondents, 28% (N = 219) were females.
Measures
Demographic data. The following demographic data were collected: gender, age, tenure, professional group, work contract, and work schedule.

Work environment changes. Based upon the results of the interviews, we selected six work environment changes: (a) changes in work schedules, (b) changes of immediate supervisors, (c) task-related changes, (d) changes in colleagues, (e) changes of work pace, and (f) multiplicity of changes. Each respondent was asked to report whether he/she was confronted to each work environment change or not during the last year. For each work environment change, five items were developed to capture the different ways changes were appraised by employees. Based upon the work of Schwartz and Stone (1993), these items assessed the extent to which (a) the individual had an influence over the occurrence of the change, (b) the change was desired, (c) the change was disturbing, (d) the change was unexpected, and (e) the change was stressful. Each appraisal dimension was measured via 1 item using a 5-point Likert-type scale. Response categories ranged from “strongly disagree” (1) to “strongly agree” (5).

Strain. Strain was measured with the French-validated scale called “Measure of Psychological Stress” (Lemyre & Tessier, 1988) which assessed cognitive, emotional, somatic and behavioral components of strain reactions (25 items in total). The response scale for this measure captured the severity with which the described strain reaction was experienced, and ranged from 1 (“not at all”) to 8 (“very strongly”).

Job satisfaction. Satisfaction was measured by two items that addressed overall job satisfaction. Responses for these items were obtained via a 5-point Likert-type scale ranging from “strongly disagree” (1) to “strongly agree” (5).

Intent to quit. Three items were used for measuring intent to quit. Responses for these items were obtained via a 5-point Likert-type scale ranging from “strongly disagree” (1) to “strongly agree” (5).

Results
Comparison of the French and Dutch-speaking samples
As one-way Anovas revealed that there were significant differences among the two samples for the outcome measures, we decided to conduct the analyses separately for the two samples. For each table, results are thus reported separately for the French-speaking and for the Dutch-speaking samples.

Dimensionality of appraisal measures
Principal components analyses were performed for the five appraisal items separately for each work environment change. These analyses revealed a two-dimension structure in each case. Items assessing the extent to which the change was disturbing, stressful and unexpected loaded on the first factor, that we called emotional appraisal (emotion). This dimension reflects the extent to which the individual appraised the situation as emotionally threatening. Although Cronbach’s alphas varied from one change to another, the mean alpha was acceptable given the number of items within each scale (.73 for the French-speaking sample and .65 for the Dutch-speaking sample). Items assessing the extent to which the change was desired and the individual perceived to have an influence on it loaded on the second dimension, that we named control appraisal (control). This dimension reflects the extent to which the change was desirable and controllable. Although Cronbach’s alphas varied from one change to another, their mean values were reasonable given their being composed of two items only (.67 for the French-speaking sample and .61 for the Dutch-speaking sample).

Correlation and regression analyses
Descriptive statistics and correlations among the study variables are presented in Table 1. Regression analyses predicting strain were conducted separately for each work environment change (Table 2). Results indicate that emotional appraisal of work environment changes significantly predicts strain for each change and for each sample. On the other hand, the control appraisal of changes does not significantly predict strain. In the French-speaking sample, gender significantly predicts strain. Females confronted to multiple changes, changes of immediate supervisor, and changes among colleagues tend to report more strain than their male counterparts. A similar pattern of findings occurred when intent to quit was the dependent variable (cf. Table 3). In contrast, the emotional appraisal of changes seemed to be less influential when it comes to predict job satisfaction, especially among the Dutch sample (cf. Table 4).

Discussion
As hypothesized, the meaning given to work environment changes affects strain, job satisfaction, and intent to quit among workers. Merely being exposed to changes does not seem to be enough to fully understand how people react. It appears that any work environment change could negatively affect workers insofar as they perceive this change as emotionally demanding. In contrast, perceiving work environment changes as controllable and desirable is less influential on psychological strain, job satisfaction, and intent to quit. From a managerial point of view, there is an interest for managers to prepare their employees to emotionally cope with changes when they have been planned. Indeed, being prepared and informed about changes should positively affect the emotional appraisal of changes and, consequently, should reduce the negative influence of changes on employee well-being.
References


Table 2. Regression analysis predicting strain for French and Dutch-speaking samples

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*p<0.05; **p<0.01; ***p<0.001

Table 3. Regression analysis predicting intention to quit for French and Dutch-speaking samples

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*p<0.05; **p<0.01; ***p<0.001

Table 4. Regression analysis predicting satisfaction for French and Dutch-speaking samples

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