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New Directions in Organizational Psychology and Behavioral Medicine

PSYCHOLOGICAL AND BEHAVIOURAL ASPECTS OF RISK

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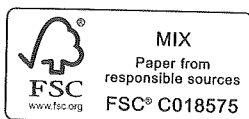
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The Changing World of Work and Occupational Health

Maria Armaou and Alexander-Stamatios Antoniou

The world of work has changed dramatically during the last decades as technological advancements, organisational restructuring and new forms of employment have become common place for most organisations. According to Kompier (2006) the major changes that organisations have faced involve globalisation, increased utilisation of information technology, changes in the workforce, flexibility and new organisational practices, together with their effect on job characteristics and employees' health and well-being.

In fact, the European Agency for Safety and Health in Work (2007), based on the results of an expert forecast on emerging psychosocial risks related to occupational safety and health (OSH), categorised them as either new or increasing. New risks were identified as either 1) previously unknown and caused by new processes, new technologies, new types of workplace, or social or organisational change, 2) long-standing issues newly considered as risks due to changes in social or public perceptions or 3) new scientific knowledge allowing a long-standing issue to be identified as a risk. Subsequently, risks are characterised as being on the increase if 1) the number of hazards leading to them is growing, 2) the likelihood of exposure to the hazard leading to them is increasing (exposure level and/or the number of people exposed) or 3) the effect of the hazard on workers' health is getting worse (seriousness of health effects and/or the number of people affected).

The expert survey actually revealed that emerging psychosocial OSH risks for employees were often related to technical and organisational as well as to some socioeconomic, demographic and political changes, including the phenomenon of globalisation. In particular, the top 10 emerging risks were

categorised into five main topics: new forms of employment and job insecurity; OSH risks for the ageing workforce; work intensification; high emotional demands at work; and poor work-life balance.

New Technology, Computerisation and Work Intensification

The introduction of new technology in the working environment has largely meant the computerisation of today's workplace. Indeed, it has been estimated that at least 76 million people in the United States used a computer in their workplace in 2003, accounting for at least 56 percent of all employed adults aged 18 years and older (US Census Bureau, 2005). This has changed the way in which work is organised, adding to today's work intensification, which is associated with deterioration in working conditions, whether they are assessed in terms of physical or psychological discomforts, nuisance or occupational risks (Ashkenazy, 2004; European Foundation for the Improvement of Living and Working Conditions, 2006). Specifically, it is those changes in the working conditions, where there is an exposure to risk factors, that are believed to influence all types of health and safety issues (Berthet and Gauthier, 2000). For example, the European working conditions survey, 2000 (European Foundation for the Improvement of Living and Working Conditions, 2005) showed that the higher the pace constraints are, the more probable is workers' perception that their health is threatened (Burchell, 2004).

Moreover, it has been reported that work intensification often causes employees to neutralise the safety systems of machinery and equipment in order to work faster and maintain production rates, which may lead to injuries. The results of different studies indicate that work intensification can have a direct influence on the occurrence of epidemics of musculoskeletal disorders (MSDs) and stress-related diseases (Chouanière, 2006; European Foundation for the Improvement of Living and working Conditions, 2002; Kompier and Levy, 1994), though it is also indicated that the harmful character of work intensity depends on the interrelationship between aspects of the work (e.g. work rhythm pressure or tight deadlines) and aspects of the situation (personal, work or job-related).

Griffiths et al. (2007) investigated the impact of the computerised work environment on professional occupational groups and subsequent risk factors for musculoskeletal symptoms by reviewing papers published between 1980 and 2007. Overall, the computerised work environment involves a number

of biomechanical and psychological work demands that depict certain psychosocial stressors, causing behavioural and physiological responses that lead to an increased risk of upper body musculoskeletal symptoms. As far as biomechanical work demands are concerned, job computerisation may include the introduction of more repetitive upper limb work, with longer periods of sedentary postures, resulting in reduced task diversity and variability of muscle activity (Waersted and Westgaard, 1997). With regards to psychosocial work demands, these may include increased information processing requirements and greater demands on attention and memory (Carayon and Smith, 2000; Smith, 1997), high precision and concentration (Birch et al., 2000), and multi-tasking demands.

Regarding the psychosocial stressors of computerised work, these involve increased workload demands, reduced discretionary control over task scheduling, increased workplace, deadline and electronic performance monitoring pressures, the need for sustained concentration with diminished social interaction, a sense of being rushed and a tendency for increased supervisory control with reduced autonomy (Griffiths et al., 2007). There is growing evidence that such psychosocial factors associated with computer work may also increase the risk of upper body musculoskeletal symptoms and disorders, particularly neck/shoulder pain (Griffiths et al., 2007).

In addition, some researchers assert that psychosocial risk factors are at least as important as the biomechanical risk factors in the aetiology of work-related musculoskeletal symptoms and disorders (Lundberg, 2002; Winkel and Westgaard, 1992) and may increase the effect of the biomechanical loading (Hanse, 2002; Melin and Lundberg, 1997). Behavioural responses related to the above work demands and psychosocial work stressors involve working long hours, fast-paced work, applying excessive forces to the keyboard or mouse and inadequate work breaks; while the physiological ones involve increased stress response and heightened muscle tension (Griffiths et al., 2007).

New Organisational Practices, New Forms of Employment Contracts and Job Insecurity

There are several taxonomies of new organisational practices, such as lean manufacturing, total quality management, call centres, telehomeworking etc., all of which have flexibility in common (Kompier, 2006). Flexibility has several types, including structural (flatter hierarchies), functional (e.g. lean

manufacturing), numerical (e.g. part-time, temporary work), geographic (e.g. telework) and job-based flexibility (e.g. re-designing jobs for better control) (Sparrow and Marchington, 1998); it can also be distinguished as quantitative (e.g. overtime work, temporary work, part-time contracts etc.) and qualitative (job rotation, job enrichment etc.) flexibility (Kompier, 2006). These new organisational practices can have a positive effect on employees' health if organisational redesign efforts intend to create jobs of high intrinsic quality so that employees can experience less strain (Brockner et al., 2004; Karasek and Theorell, 1990).

Otherwise, such changes can be detrimental to employees' health and well-being. Osthus (2007) addressed these issues by examining the outcome of downsizing and internal reorganisation on the quality of jobs and work-related health problems for workers in Norway. He noticed that all of these changes generally led to poor quality jobs and higher work-related effort, while increasing demands were not followed by increasing rewards (e.g. more control over work processes). In general, both type of changes had a negative effect on employees' health but the effect was stronger in the case of internal reorganisation.

An example of geographic flexibility is telework and just like all recent changes in the workplace it can have either a positive or a negative effect on employees' health. Specifically, telehomeworking is considered to help workers cope with the mutual incompatibility of paid work and home obligations (Baruch and Nicholson, 1997) as well as enabling them to work at convenient times and plan their work activities more efficiently (France et al., 2002; Tremblay, 2002; Vittersø et al., 2003). However, Peters and van der Lippe, (2007), on examining time-based and strain-based work-home interference in a sample of Dutch employees, noticed that heavy telehomeworking practices were accompanied by higher levels of strain spilling into the home domain, and by longer working hours. Similarly, a case study by Kellihera and Anderson (2008) showed that such flexible working arrangements, even when they are chosen by the workers themselves, may aggravate and generate stress and have a negative impact on opportunities for learning and development.

The most typical example of organisational flexibility is the numerical flexibility that involves different types of non-standard forms of work such as temporary, part-time, on-call, day-hire or short-term work or self-employment (Cooper, 2002). These types of employment contracts are often described as precarious work as there is growing evidence that there are specific risks

for health and safety in the workplace connected with the conditions that characterise these forms of work (Rodgers and Rodgers, 1989). For example, temporary workers are more often exposed to adverse conditions in their physical work environment, such as noise, painful and tiring positions, and repetitive movements. They also have less control over working times, often work in less skilled jobs and have less insight into their work environment, mainly resulting from a lack of training (Benach et al., 2002a; Benach et al., 2000; European Foundation for the Improvement of Living and Working Conditions, 2001a).

In addition, temporary workers have fewer opportunities for training and lifelong learning (European Foundation for the Improvement of Living and Working Conditions, 2001a). Indeed, a study by the Organisation for Economic Cooperation and Development (OECD) (2002) found that in 12 investigated European countries, temporary workers were far less likely to receive formal training. Apart from training, it is also indicated that personal protective equipment is made available less often to temporary workers than to permanent workers (McLaren et al., 2004). Thus, fewer workers are reached by OSH measures and adequately trained in the field of OSH. For example, an Italian survey carried out on a sample of 800 workers in different economic sectors showed that atypical workers tended to underestimate work-related risks. In fact, as regards psychosocial risks, 57.8 percent of atypical workers versus 41.4 percent of standard workers had a tendency to consider that they were very rarely, or never exposed to these risks (Battaglini, 2007).

Finally, due to the wide range of flexible employment contracts, it is important to examine the differences among them with regards to workers occupational health. Aronsson et al. (2002), when examining the Swedish workforce, noticed significant differences among different types of employment contracts. Specifically, they found that work conditions for project employees and people in probationary employment were most similar to those of permanent employees. Substitutes occupied an intermediate position, whereas seasonal workers and persons working on-call operated under conditions most dissimilar to permanent employees. Regarding health, only workers on-call and substitutes showed strikingly more health complaints than those in other forms of employment.

Nevertheless, the effects of different forms of precarious employment vary, and are not always negative. Self-employed workers, for example, enjoy greater control over working time and have a higher level of autonomy. However, at the

same time they have very little social support. Part-time employees also show lower levels of health-related absenteeism and report less stress, particularly when they choose voluntarily to work part-time (Benach et al., 2002b; McLaren et al., 2004). A few studies report no difference at all in implications for the health of precariously employed workers in comparison to permanent workers (Bardasi and Francesconi, 2003). For example, two surveys of the European Foundation for the Improvement of Living and Working Conditions in 2001 showed no evidence that temporary or part-time employment had negative long-term effects on mental health among British men and women during the 1990s (2001a; 2001b).

Worse health outcomes were only found for certain kinds of jobs such as in lean production or self-employment when compared with other forms of employment (European Foundation for the Improvement of Living and Working Conditions 2001a; 2001b). Furthermore, in a UK study on call centres (Sprigg et al., 2003), employees with non-permanent contracts reported better well-being than permanent employees. Fixed-term or temporary workers were less anxious, less depressed and more satisfied with their job. Such differences have not been identified for part-time workers. Finally, a study among workers with different work contracts in Brazil showed no statistically significant health outcomes at all (Santana and Lomis, 2004).

It is no surprise that the recent trends for organisational restructuring and downsizing have been followed by an increase in perceived job insecurity. For example, Worall and Cooper (1998) found that over 60 percent of a national sample of 5,000 British managers had undergone such major organisational changes and the main consequences were that nearly two thirds experienced increased job insecurity, reduced morale and erosion in motivation and loyalty. Attention has been given to the issue of the health consequences of job insecurity as there is evidence that perceived job insecurity is significantly related to medically certificated, long-term (i.e. greater than three days) sickness absence (Vahtera, Kivimaki and Pentti, 1997). Researchers have often focused on its effects on mental health rather than physical health, and studies usually indicate a relationship between job insecurity and poorer mental health. In these types of studies, mental health is usually measured using the general health questionnaire (GHQ). This is a scale developed for the purpose of detecting non psychotic mental health symptoms (such as sleeping problems, anxiety and depression) in the population. In a few studies, other indicators of mental well-being have been used, for example burnout, job-induced tension and depression.

A meta-analysis by Sverke et al. (2002) showed that the higher the job insecurity, the poorer the mental health. This relationship was confirmed by longitudinal studies which unequivocally showed that job insecurity should be treated as the cause of worsening mental health and that a reverse relationship is statistically irrelevant (Ferrie et al., 2003). Perhaps not surprisingly, the aspect of job insecurity that is most connected with decreasing mental health is the fear of job loss (Hellgren et al., 1999). Furthermore, the impact of job insecurity on mental health is more frequently reported in men (De Witte, 1999; Ferrie et al., 1998; Kinnunen et al., 2000).

As far as the relationship between job insecurity and physical health is concerned, there is less evidence of that than of the relationship between job insecurity and mental health. Nevertheless, Sverke's (2002) meta-analysis also showed that the higher the job insecurity, the poorer the physical health. Indeed, high job insecurity is connected with worse self-reported health, more frequent somatic ailments (e.g. headaches and spinal aches) and the appearance of long-lasting illnesses. Some studies found that the above relationships were identified only for men, others identified them for women also. In Switzerland, a survey carried out in 2002 revealed that 37 percent of workers who feared losing their job suffered serious functional disorders such as headaches, back pains and sleeping disorders, compared with 17 percent of those who did not fear losing their job (Steinman, 2006). Some studies have used physiological health indicators and show that job insecurity might be connected with heightened systolic and diastolic blood pressure, with ischaemia and with higher BMI (Ferrie et al., 1998; Kinnunen et al., 2000).

Flexibility and Work Patterns

Technology development and rapid organisational change has also greatly altered employees' work patterns, which has been found to affect their mental and physical health. Among the most common changes in work patterns to have been investigated are overtime work, extended working hours, irregular or unpredictable working hours and long working hours. There are many studies which show that working long hours increases the risk for hypertension and cardiovascular disease (Hayashi et al., 1996; Liu et al., 2002; Nakanishi et al., 2001; Yang et al., 2006); while others have detected relationships between long hours at work and musculoskeletal injuries (Lipscomb et al., 2002; Trinkoff et al., 2006), diabetes (Kawakami et al., 1999) and chronic infections (Mohren et al., 2001). Evidence also suggests that overtime and extended

work schedules can lead to depression and other psychological conditions (Glass and Fujimoto, 1994; Shields, 1999).

Overtime work refers to those hours worked beyond the contractual working hours (Riedmann et al., 2006). According to the report *Time and Work: Duration of Work* (Boisard et al., 2003), a rather large proportion of employees (around 17 percent of full-time employees and 14.2 percent of all employees) work long hours. For this reason, the concepts of long working hours and overtime work are often used interchangeably within the literature. Bourdeaud'hui and Vanderhaeghe (2006) studied to what extent overtime had an influence on work stress, well-being and work-life balance in the Flemish workforce. They concluded that overtime work increases the number of workers with work-related stress and problems in their work-life balance. This was true for all groups studied, independent of gender, age, family situation, sector, job, company dimensions and management or non-management function.

Moreover, the level of work stress was at its lowest when the worker did not work overtime and at its highest when the worker had to work overtime and was not compensated for it. Also, Dembe et al. (2005) found that work schedules involving overtime hours had the highest risk of injury (61 percent) among non-standard schedules. However, it is important to differentiate between long working hours and overtime work with regards to part-time and full-time employees, as for the latter overtime work is related to their work motivation (Beckers et al., 2007).

Long work hours, on the other hand, can be defined as hours that exceed the standard full-time work-week that implies by definition a certain number of overtime hours. Most studies agree that working long hours is an important occupational stressor that increases the risk of mental health problems. For example, a NIOSH report provided an integrative review of 52 research reports recently published in the United States that examined the associations between long working hours and health outcomes. There was a pattern of poorer performance on psychophysiological tests, especially when the employees worked long shifts and when shifts of more than 12 hours were combined with more-than-40-hour work-weeks. Some of these studies mentioned that the ninth to twelfth hours of work were associated with feelings of decreased alertness and increased fatigue, lower cognitive function, reduced vigilance on task measures or increased injuries (Caruso et al., 2004).

The report *Time and Work: Duration of Work* (Boisard et al., 2003) showed that employees clearly perceive increased working time as being linked to health and safety risks. In particular, employees tended to blame their work as being a risk to their health and as the reason for their health problems if they were forced to work long hours. This link was also noted with regards to specific health problems such as headaches, fatigue, anxiety and insomnia. In the same way, employees who had atypical working time schedules also blamed this for a number of health problems. Night work, working days of more than 10 hours and the changing of schedules within a month were seen as particularly detrimental to their health. Almost 70 percent of the employees who worked at least one night per month were of the opinion that their work affected their health. The effects most frequently reported were insomnia, stress, fatigue and irritability.

In addition, working long hours can also affect employees' domestic relationships, as employees working long hours report high levels of stress and work-family conflict. For example, Grosch et al. (2006) found that employees working more than 48 hours per week were significantly more likely to have disruptions in family life compared to those working 35–40 hours per week. Similarly, Spurgeon (2003), on examining British male, white-collar workers, found that 50 percent of them reported that their family life suffered due to their long working hours, while 20 percent thought that their partner had been negatively affected.

However, the relationship between long working hours and stress or psychological health seems to be mediated by individual factors such as the amount of control the workers feel that they have, and the way in which they regard their job (White and Beswick, 2003). Bourdeaud'hui and Vanderhaeghe (2006) found that overtime work can increase work stress when it concurs with the risk factors of high workload and low autonomy. In particular, they indicated that workers with low autonomy, high workload and overtime work without compensation report the highest prevalence of work-related stress.

However, Spurgeon et al. (1997) noticed that there is a particular shortage of studies that focus solely on the relationship between long working hours and health problems related to stress, such as gastrointestinal disorders, musculoskeletal disorders and depression of the immune system. Another problem arises from the lack of well-controlled and comparative studies. Consequently, there is no clear evidence-based recommendation for the design of flexible working hours (Janssen and Nachreiner, 2004). However, it appears

that it is important for workers' well-being that they are involved in the decisions about how their work time is organised.

Extended working hours refers to work when the hours of the standard shift are extended. This implies a high number of hours worked either during a day or a shift, or a high number of days worked per week. Extended working hours generally refer to a working week of more than 48 hours or to 10- to 12-hour shifts instead of 8-hour shifts (Harrington, 2001). According to the Fourth European Working Conditions survey, 14 percent of all European employees work longer than 48 hours per week, while Americans work longer hours and more weeks per year than workers in other industrialised nations (Caruso et al., 2004). Research in nursing work shows that extended working hours are associated with increased MSD (Engels et al., 1996; Lipscomb et al., 2002). For example, Engkvist et al. (2000) found that Swedish nurses working full-time were at increased risk of back injury. Recently, Trinkoff et al. (2006) using a longitudinal, three wave survey of 2,617 registered nurses in the United States found that the work schedule independently increased nurses' risk of developing an MSD.

There is also some evidence that irregular working hours may have an effect on work-related accidents. This is thought to originate from the increased fatigue resulting from long working hours, influencing workers' behaviour and attention during work. Specifically, unconventional shift work, including night shifts, evening shifts and rotating shifts can disrupt circadian rhythms and sleep patterns, resulting in stress, fatigue and impaired performance among affected workers (Akerstedt et al., 2002; Costa, 2003; Harrington, 2001; Hughes and Stone, 2004; Knutsson, 2003). As a matter of fact, industrial accidents and injuries are more likely to occur on night and evening shifts than on day shifts (Brogmus and Maynard, 2006; Dembe et al., 2006; Folkard et al., 2005; Spurgeon, 2003). Furthermore, it has been shown that unconventional shift work can increase the risk of suffering sleep disturbances (Akerstedt, 2003; DeMoss et al., 2004; Lee, 1992), digestive problems (Caruso et al., 2004), particular types of cancer (Davis et al., 2001; Hansen, 2001; Schernhammer et al., 2003) and reproductive problems (Axelsson and Rylander, 1989).

In addition, Hanecke et al. (1998) studied more than a million German injury reports and found that there is a higher risk of injuries after the eighth and ninth hour at work for all shifts. Researchers have also documented increased risks of accidents and injuries among unconventional shift workers in a variety of industries including health care, public safety, manufacturing, construction

and transportation (Horwitz and McCall, 2004). Likewise, recent evidence suggests that construction workers are particularly susceptible to job injuries on the evening shift, compared to day or night shifts (Dembe et al., 2008).

Finally, it has been suggested that non-standard work schedules weaken injured workers' rehabilitation (Anema et al., 2004; Kearney, 2001; Krause et al., 1997). For example, Dembe et al. (2007) investigated the relative effects of different types of work schedules on the likelihood of injured workers resuming their work successfully following an injury. Overall, they found that job re-entry following an occupational injury was more difficult for workers returning to non-standard schedules, especially schedules involving overtime and long working hours. They also identified differences among different types of non-standard schedules. For example, among workers on extended work-hour schedules the greatest likelihood of them quitting their job after an injury or working less than full time following an injury were seen in those with jobs involving long hours per day and long hours per week. Employees working overtime schedules experienced the greatest risks of being temporarily assigned to another job, being unable to perform normal duties and facing any kind of job disruption following injury. Employees with long commuting schedules by far had the greatest danger of being fired or changing occupations following an injury, compared to injured workers in other kinds of extended hour schedules.

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