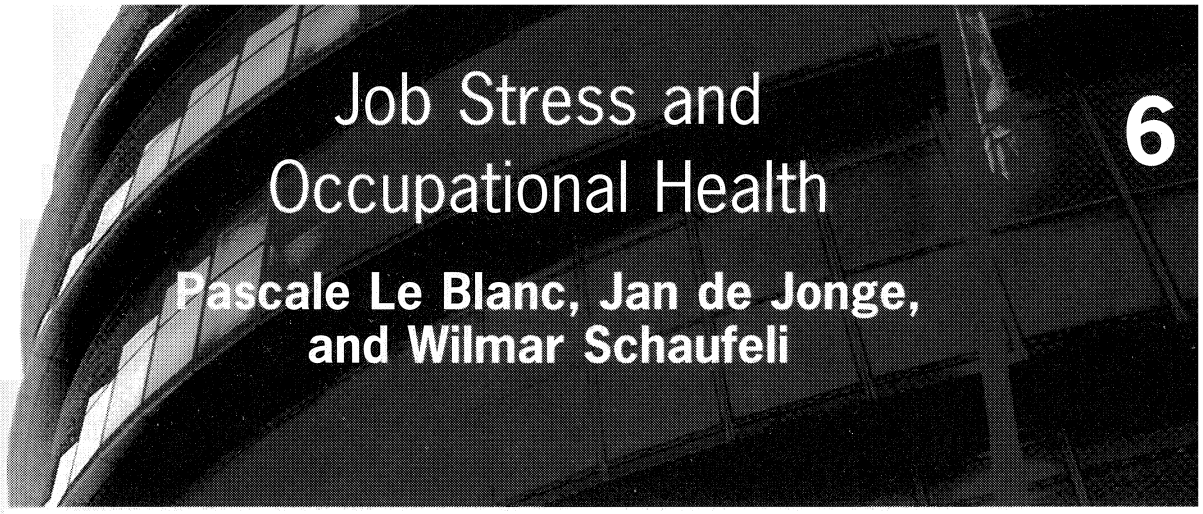

Job Stress and Occupational Health

6

Pascale Le Blanc, Jan de Jonge, and Wilmar Schaufeli

Overview

This chapter focuses on job stress in relation to employee physical and psychological health. We begin with an outline of job stress as a social problem, followed by a discussion of the main perspectives on (job) stress, including eustress ("good" stress), and of the potential role of individual differences variables in the stress process. In the next section, an integrative process model of job stress is presented that will be used as a frame of reference in the remaining part of the chapter, followed by a discussion of several prominent and new models on job stress and health. Finally, an overview of organizational and individual interventions to reduce job stress is given.

1 Job Stress as a Social Problem

Job stress is a major concern in all developing and industrialized countries, affecting not only employees whose health is at stake but also organizations and society as a whole. The workplace has changed dramatically due to globalization of economic activities, increased utilization of information and communication technology, growing diversity in the workplace (e.g., more women, older, and higher educated people, as well as increased migration, particularly between the EU Member States), flexible work arrangements, and changed organizational work patterns (e.g., Just in Time management) (European Foundation for the Improvement of Living and Working Conditions [EFILWC], 2005; Landsbergis, 2003). The impact of the global economy has also led to an increase in knowledge- and service-based organizations. One of the most striking developments, however, is the changing nature of work itself and increased workloads. New jobs (e.g., software consultant, process-operator, and cad-cam designer) and new types of companies (e.g., call centers) have arisen (De Jonge & Kompier, 1997).

Nowadays, for many employees, work poses primarily mental and emotional demands instead of physical ones.

According to recent figures, the prevalence of job stress is high. For instance, in the 2000 European Working Conditions Survey (EWCS), job stress was found to be the second most common job-related health problem across the EU Member States (28 percent) (European Foundation for the Improvement of Living and Working Conditions [EFILWC], 2005). Moreover, job stress is related not only to psychological disorders but also to a number of physical ailments such as cardiovascular diseases (Belkiç et al., 2004), musculoskeletal diseases (such as RSI, e.g., Ariëns et al., 2001), chronic low back pain (Hogendoorn, van Poppel, Koes & Bouter, 2000), and to absenteeism from work (Houtman et al., 1999). Finally, it should be noted that in addition to the direct costs due to work disability and sickness absence, there are also "hidden" consequences of job stress for organizations, e.g., more problems, conflicts, disturbed relations and turnover, and losses in the domain of image, corporate values, and productivity/quality of services (e.g., Gaillard, 2003; Schabracq, Maassen van den Brink, Groot, Janssen, & Houkes, 2000).

Prevalence rates of job stress not only are high, but also rising continuously. In Britain, an immense growth of stress-related absenteeism was observed across a 25-year period: from 1955 to 1979 absenteeism due to "nervousness, debility and headache" increased by 528 percent! (Hingley & Cooper, 1986). In The Netherlands, in 1967 when the Disability Security Act was introduced, mental disorders only accounted for 11 percent of workers' disability claims, whereas in 2002, 37 percent of disability claims were based on mental disorders.

Needless to say, the expenditures on job stress are huge. On the average, in the European Union about 10 percent of the Gross Domestic Product (GDP) is spent on the consequences of job stress (Cartwright & Cooper, 1996).

These immense costs have led to stronger legislation with regard to psychosocial work conditions and sickness absence. At the level of the European Union (EU), various countries have introduced legislation to improve the health and safety of employees in their work environment. Moreover, quite recently, the EU social partners signed a framework agreement for employers and employees aimed at preventing, identifying, and combating job stress (European Foundation for the Improvement of Living and Working Conditions [EFILWC], 2005). Modern European and national legislation emphasizes: (1) a broad and positive health concept; i.e. instead of solely combating ill-health, health, safety, and well-being at work are promoted; (2) a comprehensive approach, integrating health, safety and well-being at work; (3) active involvement and joint responsibility of employer and employee; (4) self-regulation by providing a supportive environment, for instance, by institutionalizing Occupational Health and Safety Services (see also De Gier, 1995).

Thus, job stress is a major and rising concern in industrialized countries and it seems that the level of job stress has increased alarmingly in the past decades. This is illustrated by increasing stress related absenteeism and work incapacity rates, as well as by rising associated costs.

2 What is Job Stress?

The original meaning of the term "stress" is derived from engineering. By analogy with physical force, it refers to external pressure that is exerted on a person, which in turn results in tension or "strain" (Kahn & Byosiere, 1992). Within certain limits, people are able to deal with this pressure and adapt to the situation, and to recover when the stressful period is over. However, in everyday language as well as in the scientific literature, the term "stress" is used to refer to the accompanying state of tension, and to the negative consequences of this state, as well as the cause. As there is little agreement as to how exactly "stress" should be defined, there is no general theory of stress. One of the main reasons for this lack of agreement lies in the large number of disciplines with different perspectives involved in stress research, such as biology, psychology, sociology, occupational medicine, and epidemiology. Nevertheless, most researchers in the field of stress do agree that three different meanings of the term stress can be distinguished (e.g., Cooper & Payne, 1988; Kahn & Byosiere, 1992; Kasl, 1987; Semmer, 2003): stress as a stimulus, stress as a response, and stress as a mediational process between stressor (stimulus) and reaction (response). Each of these perspectives is discussed below, with a focus on *job-related* stress.

Job stress as a stimulus: Job demands and job resources

In the domain of job stress, stressful stimuli can be categorized under two broad main categories: job demands and (lack of) job resources (cf. Frese & Zapf, 1994; Schaufeli & Bakker, 2004). Job demands refer to the degree to which the work environment contains stimuli that require sustained cognitive, emotional and/or physical effort (cf. Jones & Fletcher, 1996), and include workload, emotional labor and physical exertion. Other, more general demands are bullying, role conflicts, role ambiguity, and work-home conflicts. Job resources can be broadly conceptualized as a kind of energetic reservoir tapped when the individual has to cope with stressful stimuli (cf. Hobfoll, 1989; 2002). Examples of job resources are job autonomy, job variety and workplace social support. In general, individuals – when confronted with job stress – strive to minimize net loss of resources. In addition, when workers are not confronted with job demands, they strive to develop resource surpluses in order to offset the possibility of future loss ("energy accumulating behavior"; cf., Hobfoll, 1989). However, employing resources for coping purposes could be stressful in itself. Schönpflug (1985), for instance, showed that employment of resources in the coping process often depletes these resources.

Job demands and job resources may comprise cognitive, emotional and/or physical components. Three types of job demand can be distinguished: (1) cognitive demands that impinge primarily on the processes involved in information processing (Hockey, 2000); (2) emotional demands such as emotional labor,

which refer primarily to the effort needed to deal with organizationally desired emotions during interpersonal transactions (Morris & Feldman, 1996); and (3) physical demands that are primarily associated with the musculo-skeletal system (i.e. sensomotor and physical aspects of behavior; cf. Hockey, 2000). Similarly, job resources may have a cognitive-informational component (e.g., colleagues providing information), an emotional component (e.g., colleagues providing sympathy and affection), and a physical component such as instrumental help of colleagues or ergonomic aids (cf. Cohen & Wills, 1985; Cutrona & Russell, 1990).

Job stress as a response: Job-related strain

In psychophysiology and occupational medicine, stress is viewed as a psychological and/or physiological *response* of the organism to some kind of threat. This notion of stress is based on Selye's (1956) classical General Adaptation Syndrome (GAS): exposure to a noxious stimulus triggers a complex of nonspecific physiological reactions that are intended to protect the individual against harmful consequences. The GAS consists of three stages: the alarm reaction (mobilization by means of physiological and hormonal changes), the resistance stage (optimal adaptation by activating appropriate systems), and exhaustion (depletion of adaptation energy). Although the GAS may be adaptive initially, negative consequences such as fatigue, tissue damage and high blood pressure may occur if the individual is not able to cope with the stressful stimulus and the stress reactions persist over longer periods of time. As stated above, it is assumed that different types of stressful stimuli trigger the same, nonspecific, response pattern, and that an individual's thoughts and emotions do not influence the type of response. However, these assumptions have proven to be untenable, as numerous studies have demonstrated that different types of physiological and hormonal reactions may occur, depending on the nature and interpretation of the stimulus and accompanying emotions (see e.g., Frankenhaeuser & Gardell, 1976; Frankenhaeuser, 1978).

Stress reactions (strains) can be expressed in different ways. They can be classified in five different clusters: (1) affective, (2) cognitive, (3) physical, (4) behavioral, and (5) motivational. In addition, three levels of expression, related to individual, interpersonal and organizational foci can be distinguished. In table 6.1, an overview of different types of stress reactions on each of the three different foci is presented.

Of course, stress reactions can differ in their intensity. Sometimes, the negative effects of stressors can easily be overcome by recreation and relaxation. However, in case of prolonged exposure to stressful stimuli, the individual may not able to reduce his or her (physiological) state of stress, and high activation levels are sustained (Ursin, 1986). This can in turn give rise to chronic physical (e.g., coronary heart disease; Siegrist, 1996) and/or psychological stress complaints (e.g., burnout; Maslach & Jackson, 1986; Schaufeli & Enzmann, 1998).

Table 6.1: Possible stress symptoms at the individual, interpersonal, and organizational level

Type/Level	*Individual*	*Interpersonal*	*Organizational*
Affective	anxiety tension anger depressed mood apathy	irritability being oversensitive	job dissatisfaction
Cognitive	helpless-/powerlessness cognitive impairments difficulties in decision making	hostility suspicion projection	cynicism about work role not feeling appreciated distrust in peers, supervisors and management
Physical	physical distress (headache, nausea, etc.) psychosomatic disorders (gastric-intestinal disorders, coronary diseases etc.) impairment of immune system changes in hormone levels		
Behavioural	hyperactivity impulsivity increased consumption of stimulants (caffeine, tobacco) and illicit drugs over- and under eating	violent outbursts aggressive behaviour interpersonal conflicts social isolation/withdrawal aggressive behaviour	poor work performance declined productivity tardiness turnover increased sick leave poor time management
Motivational	loss of zeal loss of enthusiasm disillusionment disappointment boredom demoralisation	loss of interest in others indifference discouragement	loss of work motivation resistance to go to work dampening of work initiative low morale

Job stress as a mediational process

Whereas both the stimulus approach and the response approach of stress emphasize directly measurable factors (characteristics of the psychosocial environment and measurable stress reactions, respectively), this approach focuses on the *cognitive, evaluative and motivational processes* that intervene between the stressful stimulus and the reaction (response). According to the mediational approach,

stress reactions are a result of the interaction between person and environment. Potentially stressful stimuli may lead to different types of stress reactions in different individuals, depending on their cognitive evaluations (appraisals) of the situation (Lazarus & Folkman, 1984) and the resources they have at their disposal to cope with the stressful situation.

Latack and Havlovic (1992) developed a conceptual framework for coping with job stress. In this framework, a distinction is made between the focus of coping and the method of coping. The focus of coping can be problem-oriented or emotion-oriented. Problem-oriented coping refers to efforts aimed at altering the transaction between person and environment. For instance, it may include behaviors like seeking help or increasing efforts to counter the threat. Emotion-oriented coping, on the other hand, is defined as efforts aimed at regulating the emotions of a person (e.g., cognitive strategies like avoidance and relaxation techniques). With respect to the method of coping, two dimensions are distinguished. First, coping behavior can be observable (overt) or not observable (covert). Second, each of these two types of coping behavior can either be aimed at control or at escape. When the focus and/or method of coping do not match the stressor at hand, feelings of stress will be sustained or even intensified. Basically, active ways of coping (e.g., control coping) are to be preferred to passive ones such as escape coping (e.g., De Rijk, Le Blanc, Schaufeli, & De Jonge, 1998), provided the situation allows it.

In the preceding paragraphs, a static (stimulus or response) versus a more dynamic, interactionist, perspective (mediational process) on (job) stress was presented. Though the mediational approach has paved the way for a more theoretical view of the (job) stress process, a key disadvantage is that it is very difficult to disentangle the occurrence of an event, its cognitive evaluation and the individual's reaction to it. Within Work and Organizational Psychology, it is recommended to use all three perspectives to encompass the richness of the job stress process. For that very reason, job stress is defined as an experienced incongruence between job demands and job or individual resources that is accompanied by cognitive, emotional, physical or behavioral symptoms.

The other side of the coin: "good" stress and work engagement

From the outset, the very nature of stress has been debated: is it "bad" or does "good" stress exist as well? Originally, Selye (1956) defined stress as a nonspecific biological response to a stressor, meaning that stress in itself is neither bad nor good. He claimed that depending upon conditions "distress" (from the Latin *dis* or bad, like in disease) or "eustress" (from the Greek *eu* or good, like in euphoria) might occur. Despite this early distinction between good and bad, "stress" became the scientific and colloquial term for distress, whereas the conceptual development and empirical research on eustress was limited. However, eustress can be reconceptualized as a positive response to a cognitively appraised stressor. For instance, being accountable for a multimillion Euro project might be appraised

as a threat to one's reputation because many things could go wrong, or it may be appraised as a challenge because it provides an opportunity to move one's career ahead. The former case would lead to distress, whereas in the latter case eustress might result. Indeed, researchers have found at least two differential physiological response patterns associated with positive and negative appraisals of a given situation (Nelson & Simmons, 2004). Thus it seems that rather than a nonspecific biological response pattern, as originally hypothesized by Selye, two such patterns exist that are associated with negative (distress) and positive (eustress) cognitive appraisals.

A new psychological movement has emerged recently that (re)emphasized psychology should cover the entire range of human behavior instead of being almost exclusively concerned with disease, damage, disability, and dysfunctioning (Seligman & Csikszentmihalyi, 2000). Positive Psychology – as this movement is called – seeks to study human resilience and flourishing. In a similar vein, an Occupational Health Psychology is developing that includes the entire spectrum of employee health and well-being, ranging from ill-health, unwell-being and poor functioning to positive health, well-being and optimal functioning (Schaufeli, 2005). This development coincides with major changes in modern organizations that expect their employees to be proactive and show initiative, collaborate smoothly with others in teams, take responsibility for their own professional development, and to be committed to high quality performance. Clearly, this cannot be achieved with a work force that is "healthy" in the traditional sense, that is, with employees who are merely symptom free. Instead of just "doing one's job," employees are nowadays expected "to go the extra mile." Thus, engaged employees are needed. But what exactly is work engagement, how can it be conceptualized?

Work engagement is considered to be the positive opposite of burnout; that is, contrary to those who suffer from burnout, engaged employees have a sense of energetic and effective connection with their work activities. More specifically, work engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002). Vigor is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one's work, and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work. Being fully absorbed in one's work comes close to what has been called flow, a state of optimal experience that is characterized by focused attention, clear mind, mind and body unison, effortless concentration, complete control, loss of self-consciousness, distortion of time, and intrinsic enjoyment (Csikszentmihalyi, 1990). However, typically, flow is a more complex concept that includes many aspects and refers to rather particular, short-term peak experiences instead of a more pervasive and persistent state of mind, as is the case with engagement.

In-depth interviews showed that engaged employees are active agents, who take initiative at work, and generate their own positive feedback loops, they keep looking for new challenges in their jobs, and when they feel no longer challenged they change jobs (Schaufeli, Taris, Le Blanc, Peeters, Bakker, & De Jonge, 2001). Also, because of their involvement they are committed to performing at a high quality level, which usually generates positive feedback from their supervisors (e.g., praise, promotion, salary increases, fringe benefits) as well as from their customers (e.g., appreciation, gratitude, satisfaction). Furthermore, the values of engaged employees seem to match quite well with those of the organization they work for, and they also seem to be engaged in other activities outside their work. Finally, engaged employees are not addicted to their work as they enjoy other things outside work and, unlike workaholics, they do not work hard because of a strong and irresistible inner drive, but because of the fun of it.

Engagement is particularly related to the availability of job resources such as job control, social support, task variety, performance feedback, training facilities, and career opportunities. Possible consequences of engagement that have been identified are: positive job attitudes, (job satisfaction, work involvement, and organizational commitment) good health (low levels of anxiety, depression, and physical complaints), extrarole behavior, and individual work performance (quality of service, academic performance) and business-unit performance (profitability, productivity). It seems that an upward spiral exists in the sense that job resources and personal resources (notably efficacy beliefs) increase positive work outcomes via work engagement. In their turn, these positive outcomes and high levels of engagement seem to have a positive impact on both types of resources. These, and other more recent empirical findings on work engagement are described in greater detail in Schaufeli and Salanova (2007).

Individual differences and job stress

As people differ in the probability of encountering stressors, in their appraisal of stressors, and in their way of coping with stressors, associations between job stressors and strains may not hold for everyone in the same way (Spector, 2002). Research indicates that job stressors have negative effects on the health of all workers, although these may be more severe for some and less severe for others. Individual characteristics, such as age, gender, level of education, values, and personality, may influence one's coping abilities; they may interact with job stressors and either exacerbate or alleviate their effects. Three main categories of individual difference variables (cf. Parkes, 1994; Payne, 1988; Warr, 1987) can be distinguished:

1. *genetic characteristics* (like gender, constitution, and physique);
2. *acquired characteristics* (e.g., education, social class, and skills);
3. *dispositional characteristics* (such as coping styles, preferences, and type A/B behavior).

Space does not allow a complete description of all three categories. In this chapter, we will therefore restrict ourselves to the category of individual difference variables that stands out in the literature as being potentially relevant in the job stress process: dispositional characteristics (e.g., Parkes, 1994; Spector & O'Connell, 1994).

Some job stress studies have shown that the relationship between a certain job stressor and a certain strain reaction mainly, or even exclusively, occurs in employees with particular dispositional characteristics (e.g., Parkes, 1994; Warr, 1987). For example, a study among Intensive Care Unit (ICU) nurses by De Rijk et al. (1998) showed that the increase in job strain due to high job demands was attenuated by high levels of job control only for nurses high in active coping. In other words, job control acted as a stress buffer only for those nurses who are inclined to use it as a coping resource. In a study among Japanese managers, Shimazu, Shimazu, and Odahara (2005) found that psychological distress was lowest among managers with high levels of co-worker support combined with high levels of active coping, indicating that active coping can only be effective in reducing distress in working situations where job resources are present. Certain people are prone to becoming overcommitted to their job, which will have negative consequences for their health. Empirical support for this idea has been found in a study by Bakker, Killmer, Siegrist, and Schaufeli (2000), who showed that burnout was particularly prevalent among those nurses who experienced an imbalance between efforts invested in and rewards obtained from their jobs and who were overcommitted.

However, it remains unclear at what point in time the individual difference variables influence the job stress process. For instance, do they change the objective-subjective stressor relationship, or do they affect the perceptions of job stress as related to affective, cognitive, physical and behavioral outcomes? Moreover, it should also be noted that physical and psychological characteristics, such as physical fitness or a high level of optimism, may not only act as precursors or buffers in the development of stress reactions, but may also change as a result of these effects. For example, if workers are able to deal with job stressors at work, they will be more experienced and self-confident in overcoming similar situations the next time they have to face them (European Foundation for the Improvement of Living and Working Conditions [EFILWC], 2005).

3 Theoretical Models of Job Stress

Many different models focusing on job stress have been illuminated in the literature, and most of them are connected with our process-model that is presented in Figure 6.1. This process-model is based upon insights gained from several theoretical models and empirical studies concerning job stress and health, and integrates much of what has been outlined before.

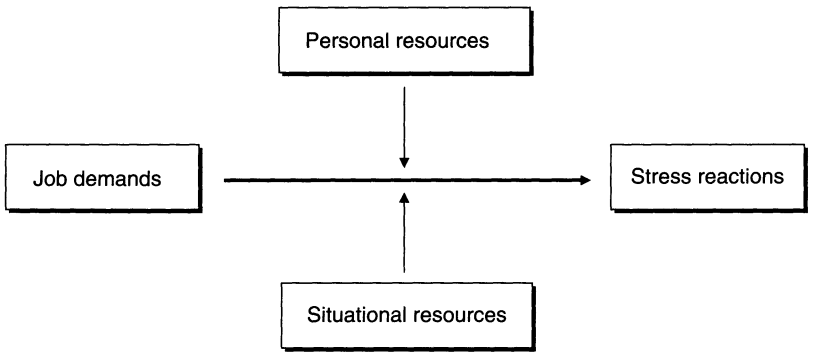

Figure 6.1: A process model of job stress

According to this process-model, different types of demands (i.e., stressors) can result in different types of stress reactions. Moreover, the relationship between demands and stress reactions may be moderated by a) personal resources (e.g., coping styles), and b) situational resources such as job autonomy or workplace social support. The different components of our process-model will be elaborated in the next paragraph by discussing central themes in current theories on job stress.

In this section we discuss several theoretical models on job stress, viz. the Vitamin Model, the Demand–Control–Support Model, and the Effort–Reward Imbalance Model. Furthermore, we discuss two recently developed models, viz. the Job Demands–Resources Model and the Demand-Induced Strain Compensation Model.

Vitamin Model

The most general job stress model was developed at the Institute for Social Research (ISR) of the University of Michigan (hence the designation "ISR" or "Michigan Model"; cf. Kahn & Byosiere, 1992). The Michigan Model assumes a general causal sequence from organizational characteristics via stressors leading to stress reactions and illness. Its successor is the Person–Environment (P–E) Fit Model, which is based on the premise that the interaction between environmental variables and relevant properties of a person determines job-related stress reactions. Based upon these two initial stress models, Warr (1987) developed in the 1980s his framework of mental health, referred to as the Vitamin Model (VM). The central idea underlying the VM is that mental health is affected by environmental psychological features, such as job characteristics, in a way that is analogous to the effects that vitamins are supposed to have on our physical health. Warr's framework has three principal parts:

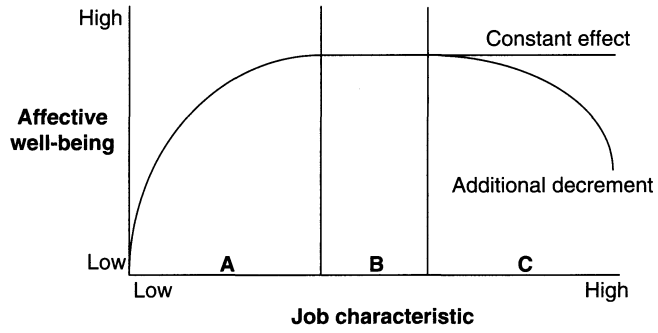

Figure 6.2: The Vitamin Model

1. Job characteristics are grouped into nine categories that relate differently to mental health outcomes according to the type of "vitamin" they represent;
2. A three-axial model of affective well-being, a core aspect of mental health, is postulated;
3. It is assumed that persons and situations interact in the prediction of mental health.

Warr (1987) draws an analogy between the way in which vitamins act on the human body and the effects of job characteristics on mental health. Following this line of reasoning, De Jonge and Schaufeli (1998) refer to Warr's vitamins as "psychological work vitamins."

Generally, as figure 6.2 shows, the absence of certain job characteristics impairs mental health, whereas their presence initially has a beneficial effect on employee mental health (segment A). Beyond a certain required level, vitamin intake no longer has any positive effects: a plateau has been reached and the level of mental health remains constant (segment B). The next segment shows that further increase of job characteristics may either produce a "constant effect" (denoted by CE) or may be harmful and impair mental health (denoted by AD or "additional decrement"). According to Warr (1987, 1994), which of the two effects will occur depends on the particular job characteristic.

Warr (1987, 1994) identified nine job features that may act as determinants of job-related mental health (see table 6.2). Warr assumes that six job characteristics (e.g., opportunities for control and variety) have curvilinear effects (U-shaped). The lack of such features or an excess of such features will affect mental health negatively. For example, the negative impact of excessively high levels of job control has been identified in laboratory as well as occupational studies (e.g., Burger, 1989; De Jonge, Schaufeli, & Furda, 1995). The remaining three job characteristics (i.e., physical security, availability of money, and valued social position) are supposed to follow a linear pattern: the higher such a job characteristic, the higher the level of mental health will be. Warr (1998) noted, however,

Table 6.2: The nine job characteristics of the Vitamin Model (cf. Warr, 1994)

CE Job Characteristics	*AD Job Characteristics*
– availability of money	– opportunity for control
– physical security	– opportunity for skill use
– valued social position	– externally generated goals
	– variety
	– environmental clarity
	– opportunity for interpersonal contact
CE: Constant Effect	*AD: Additional Decrement*

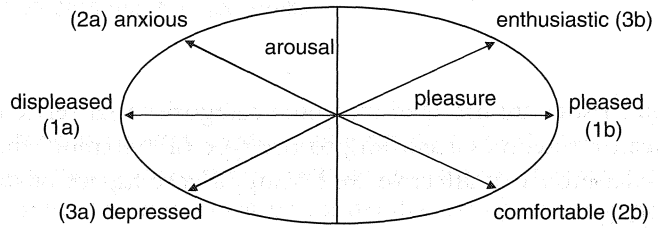

Figure 6.3: Job-related affective well-being

that it is improbable that the latter associations are purely linear. For instance, it seems plausible that an increase in income will have greater benefits at low income levels than at extremely high income levels. In other words, increased levels are desirable until a certain plateau has been reached. In addition, there is considerable evidence that younger employees have greatest need for income increase, whereas older employees consider income increase as relatively less important (e.g., Birdi, Warr, & Oswald, 1995).

A principal indicator of *job-related* mental health in psychological research is affective well-being. In order to measure affective well-being empirically Warr (1994) proposed three dimensions: displeasure-to-pleasure, anxiety-to-comfort, and depression-to-enthusiasm (see figure 6.3). Job-related affective well-being has most commonly been studied by measures of job satisfaction, job-related anxiety or tension, and by measures of occupational burnout and depression.

Finally, the interaction between persons and situations will be discussed. Essentially, the VM is situation-centered in that it focuses on the association between job characteristics and mental health. However, there are undoubtedly differences between people in the nature of those associations (Warr, 1994). Therefore, three categories of individual characteristics are viewed as possible moderators of the effects of job characteristics on mental health: *values* (e.g., preferences and motives), *abilities* (like intellectual and psychomotor skills) and *baseline mental health* (i.e., dispositions like negative affectivity).

Moderating effects are expected especially in the case of a so-called "matching" individual characteristic (Warr, 1994). In that respect, individual characteristics

that match particular job characteristics will cause a stronger moderating effect than those that lack this matching property. Job autonomy may serve as an example: a matching individual characteristic might be the value "preference for autonomy." It is assumed that the preference for autonomy moderates (i.e. changes) the relationship between job autonomy and, for instance, job satisfaction (cf. Warr, 1987). In case of low preference for autonomy the relationship between autonomy and satisfaction will be zero (or even negative), whereas in case of high preference for autonomy the relationship between the two variables will be positive.

In recent years, a few cross-sectional studies have investigated the patterns proposed by the VM (e.g., De Jonge & Schaufeli, 1998; Jeurissen & Nyklícek, 2001; Xie & Johns, 1995; Warr, 1990). To summarize results were mixed and inconclusive. Job demands and job control, for instance, seem to be curvilinearly related to some aspects of employee mental health in the way that is predicted by the model, whereas the effect of workplace social support does not follow the model. Furthermore, all studies have failed to take account of the possible multifaceted ways in which the nine job characteristics may affect job-related well-being. Added to this, longitudinal studies have not been reported yet, which means that causal orders in associations still have to be proved. Finally, there has been no empirical evidence for the interactions between individual and job characteristics as related to employee health *within* the VM.

Demand–Control–Support Model

Since the 1980s, the Demand–Control (DC) Model has dominated the empirical research on job stress and health. The model was introduced by Karasek in 1979 and further developed and tested by Karasek and Theorell (Karasek & Theorell, 1990; Theorell & Karasek, 1996). In 1988, Johnson and Hall elaborated the DC Model with the dimension of *workplace social support.* This expanded model was called the Demand–Control–Support (DCS) Model. In order to understand the principles of both models, we will first discuss the DC Model.

The DC Model depicted in figure 6.4 draws upon two research traditions, namely the occupational stress tradition (e.g., Michigan Model, Kahn, 1981) and the job redesign tradition (e.g., Hackman & Oldham, 1980). In both research traditions, attempts were made to relate job characteristics to employee health. The occupational stress tradition focused on "stressors" at work, such as high workload, role conflict, and role ambiguity (e.g., French & Kahn, 1962). The job redesign tradition focused mainly on job control, as its primary aim was to inform the (re)design of jobs in order to increase motivation, satisfaction, and performance at work.

For that reason, the DC Model postulates that the primary sources of stress lie within two basic job characteristics: *psychological job demands* and *job decision latitude.* According to the model, the jobs most likely to show extreme job-related stress reactions (like exhaustion and cardiovascular diseases) are those that

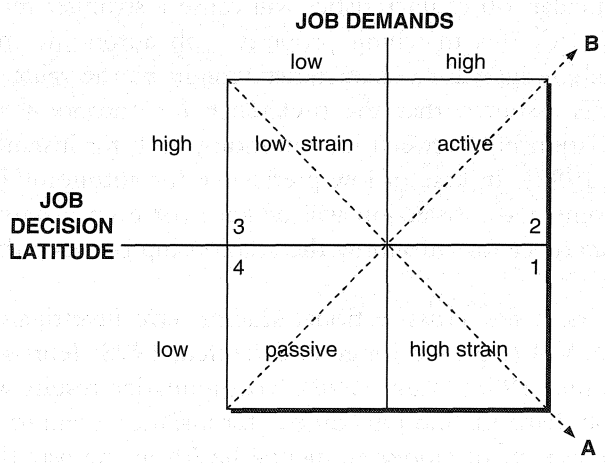

Figure 6.4: The Job Demand–Control Model

combine high demands and low decision latitude. This combination is labeled *high strain* (quadrant 1). There is also an opposite situation termed *low strain*; that is, jobs in which job demands are low and worker's decision latitude is high (quadrant 3). In this situation the model predicts lower than average levels of stress reactions.

The second important assumption of the model is that motivation, learning and personal growth will occur in situations where both job demands and decision latitude are high (i.e., *active jobs*; quadrant 2). This assumption is closely related to what might be called "good stress" since most job stressors are translated into direct action (i.e., effective problem solving) with too few stressors left to cause job-related stress (cf. Karasek et al., 1998; Selye, 1956). The opposite of this situation is formed by *passive jobs*, in which skills and abilities may atrophy (quadrant 4). This situation resembles the "learned helplessness" phenomenon (cf. Lennerlöf, 1988). In short, psychological demands and decision latitude affect two psychological mechanisms, reflected by diagonal A and B in figure 6.4. The first mechanism influences the (adverse) health of the employee (diagonal A), while the other influences the work motivation and the learning behavior of the employee (diagonal B).

The assumption that more or less job decision latitude can translate (high) job demands into either positive or negative effects on employee health and well-being has often been operationalized as an *interaction effect* between job demands and job decision latitude. An interaction effect means that the total effect of high demands and low control is larger than the sum of the separate effects of high demands and low control on employee well-being.

The elaborated DCS Model (figure 6.5) was developed to examine the joint effects of three instead of two basic characteristics of the work organization, viz. job demands, job control and workplace social support. In this extended model,

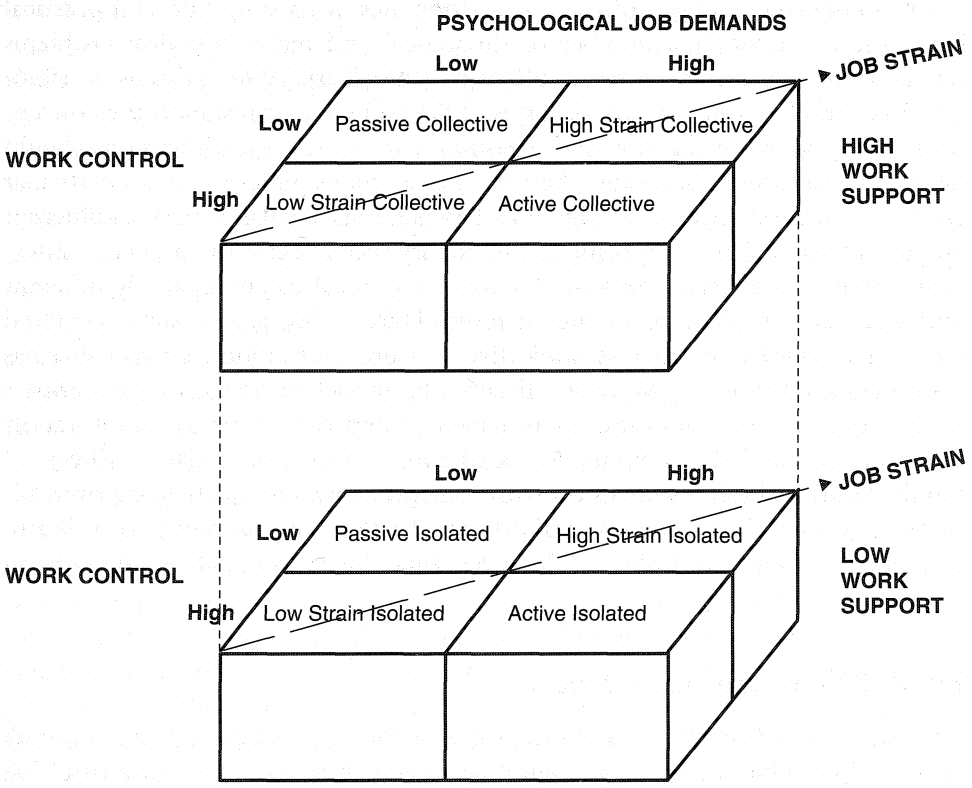

Figure 6.5: The Demand–Control–Support Model

both the strain and activity assumption are split up into *isolated* and *collective* conditions, and the processes are consequently redefined. In that respect, it is for instance assumed that the most unfavorable effects are expected for a combination of high demands, low decision latitude and low social support. This combination is sometimes called *iso-strain* (cf. Johnson & Hall, 1988). Workplace social support is assumed to buffer psychological strain depending on the degree of social and emotional integration, help and trust between supervisors, colleagues, etc.

Two major conclusions can be drawn from the studies using and evaluating the two models (De Jonge & Kompier, 1997; Van der Doef & Maes, 1998, 1999). The first conclusion is that large (mostly epidemiological and population-based) studies offer the most support for the model, and for the strain assumption in particular. The second conclusion is that the interaction assumption that particularly the combination of psychological demands, decision latitude and social support involves stronger responses (such as more physical symptoms or more work motivation) is not often supported. It is more often the case that the three components separately have an impact on the outcome variables, than that they reinforce each other in this respect (so-called synergistic effects).

Obviously, the strength of the DCS Model lies in its simplicity and practical implications. However a number of theoretical and methodological problems remain to be solved (e.g., Jones & Fletcher, 1996; Kasl, 1996; Kristensen, 1996; Van Vegchel, De Jonge, & Landsbergis, 2005). Firstly, for instance, the conceptualization, operationalization and measurement of the basic dimensions should be elaborated further. Secondly, there is no unanimous preference for a particular type of interaction term to test the model, which logically has also led to different empirical results. This is suprising as DC theory should drive the particular interaction term to be tested, because different theoretical meanings imply different mathematical formulations of such a term. Thirdly, being a situation-centered model, the issue of objective vs. subjective measurement of job characteristics has been neglected thus far. More specifically, the model focuses on characteristics of the work situation, but these are usually determined with the use of self-report questionnaires and the subsequent risk of common method variance. Effects of job demands and job resources on stress outcomes are very likely to be overestimated due to such a common method bias. Lastly, many studies have failed to take into account individual differences (like locus of control and coping styles).

Effort–Reward Imbalance Model

The Model of Effort–Reward Imbalance at work (e.g., Siegrist, 1996; Peter & Siegrist, 1997) has a more sociological focus and shifts from the concept of job control to the reward structure of work.

In the Effort–Reward Imbalance (ERI) Model, the work role of an employee is considered a basic tool to link important self-regulatory functions (i.e., self-esteem and self-efficacy) with the societal structure of opportunities and rewards (see Figure 6.6). Essentially, the model is based upon the principle of reciprocity: high effort spent at work in combination with low reward obtained in turn may cause a state of emotional distress and sympathetic arousal with an inclination to cardiovascular risks.

Effort is evaluated as two components: extrinsic effort or *job demands* (like time pressure, responsibility and physical demands), and intrinsic effort or *overcommitment*. The latter is regarded as a specific personal pattern of coping with

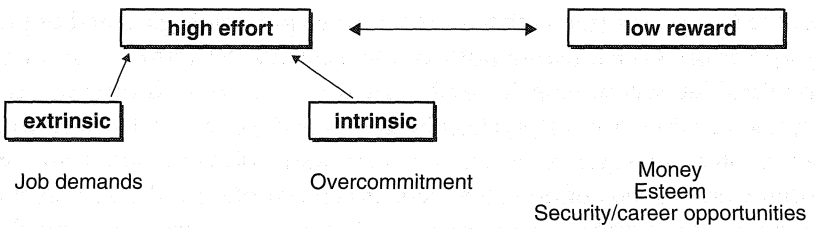

Figure 6.6: The Effort–Reward Imbalance Model

job demands and of eliciting rewards that is relatively stable over time, and that may prevent people from accurately assessing cost-gain relations. Overcommitment is assessed by using four dimensions of coping behavior (i.e., need for approval, competitiveness and latent hostility, impatience and disproportionate irritability, and inability to withdraw from work obligations), which are combined to form one latent factor. According to Peter, Geissler, and Siegrist (1998) rewards are distributed to employees in three different ways: *money* (i.e., adequate salary), *esteem* (e.g., respect and support), and *security/career opportunities* (e.g., promotion prospects, job security and status consistency).

The combination of high effort and low reward at work has been found to be a risk factor for cardiovascular health, sickness absence as well as self-reported symptoms (for reviews, see Tsutsumi & Kawakami, 2004; Van Vegchel, De Jonge, Bosma, & Schaufeli, 2005).

Although the ERI Model looks very promising in the research domain of job stress and health, several preliminary comments have to be made (see also Kasl, 1996; Siegrist, 1996). First, it seems inconsistent to make a clear distinction between extrinsic and intrinsic efforts, but no clear distinction between extrinsic and intrinsic rewards. Intrinsic rewards, however, seem to be part of the overcommitment construct (i.e., need for approval). Second, one might question the extent to which the overcommitment construct is a stable trait and to what extent it is related to the work environment. For instance, will some employees experience more stress because of their character, or do some job characteristics evoke overcommitment? Third, the term *status inconsistency* is used to describe a misfit between occupation and education in both directions. In the model, both directions reflect low reward or low status control, which is not completely consistent with the work and organization psychology literature that indicates only an excess of education over occupational status as a risk factor. Fourth, because the model encompasses a broad social context, it is remarkable that little attention has been paid so far to the relationship between work and family life as an environmental factor of possible relevance ("work–home interference"). Finally, a last comment concerns the dynamic nature of the ERI Model. Longitudinal studies are clearly needed in order to investigate the time-dependent, causal and accumulating effects for both effort and reward in the prediction of health outcomes.

The Job Demands–Resources Model

Introduced by Demerouti and colleagues in 2001, the Job Demands–Resources (JDR) Model has gained popularity since with a lot of empirical studies applying the model to various occupational groups. The JDR Model has been designed to encapsulate job demands and resources unique to various occupations. Each occupation may have specific risk factors associated with job stress, but the JDR Model provides an overarching framework of burnout and engagement that can be applied to various occupational settings, irrespective of the particular demands and resources involved (Bakker, Demerouti, & Euwema, 2005). The choice for

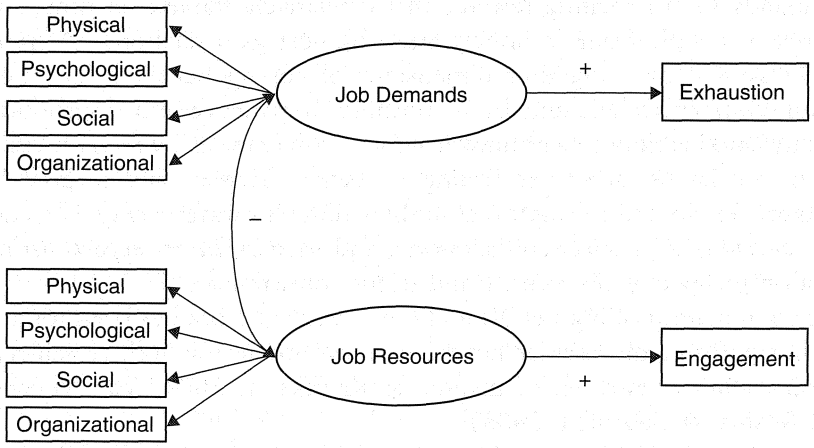

Figure 6.7: The Job Demands–Resources Model

demands or resources is determined by empirical data analysis (e.g., confirmatory factor analysis), rather than theory. The model hypothesizes that job demands and resources are negatively related and that high job resources may reduce the negative impact that job demands may have on the individual. In addition, Demerouti et al. (2001) predict that job demands are primarily associated with exhaustion (the energy depletion process) while job resources are primarily and inversely associated with disengagement (the motivation depletion process; see figure 6.7).

The *original* JDR model concentrated on the unique contribution of demands and resources (main effects) in the prediction of burnout and engagement (Demerouti et al., 2001; Halbesleben & Buckley, 2004). Recently however, the interaction between them has been more explicitly tested as a buffer function of resources between demands and stress reactions.

At a global level, and in line with the assumptions of the model, most empirical studies provide strong evidence that working conditions (demands and resources) evoke two distinct processes, (1) the energy/erosion/health impairment process that links job demands with burnout; and (2) the motivational enhancement process that links job resources with engagement (Cotton, Dollard, & De Jonge, 2006). Moreover, the majority of job resources were capable of buffering the impact of job demands on employee well-being (burnout and to a lesser extent engagement). So, the combination of high job demands and low resources resulted in comparatively more feelings of exhaustion than would be expected on the basis of main effects alone (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003). In their systematic review of 20 JDR studies, Cotton et al. (2006) concluded that - given the newness of the model – the development of its theory has not been as clearly defined as the more traditional DC or ERI Models. Furthermore, because of the predominantly cross-sectional nature of the studies (85

percent of the studies included in the review were cross-sectional), common method variance may have influenced the results. While the studies conducted so far suggest causality, conclusions about the direction of effects can *not* be drawn. Finally, the potential for positive research bias; that is, a greater percentage of studies in agreement with the model being published and the fact that a large percentage of articles have yet to be peer-reviewed (50 percent of articles in the review were unpublished), needs to be considered with the appropriate level of caution. Notwithstanding, the JDR's broader, holistic framework – as compared to the restrictive nature of the DC and ERI Models – seems to be better able to capture the complexities across different work environments and in this way accounts for such promising support for the interaction hypothesis.

The Demand-Induced Strain Compensation Model

In light of the conceptual and practical limitations of the DC and ERI models De Jonge and Dormann (2003) developed a new model of job stress. This model, the so-called Demand-Induced Strain Compensation (DISC) Model, tries to unify principles that are common to both models, and thus create a more cohesive theoretical model of job stress (see figure 6.8).

The DISC Model is premised on four key principles. Firstly, De Jonge and Dormann (2003) emphasize the need to recognize the multidimensionality of concepts. They observe that job demands, job resources, and job-related strains each contain cognitive, emotional, and physical elements. Secondly, the Triple Match Principle (TMP) was developed. The TMP proposes that the strongest, interactive relationships between demands and resources are observed when demands *and* resources *and* strains are based on qualitatively identical dimensions. For instance, emotional support by colleagues is most likely to moderate (i.e., mitigate) the relationship between emotional demands (e.g., irate customers) and emotional exhaustion. The TMP suggests not only that stressors and resources should match (cf. Cohen & Wills, 1985), or that resources should match strains (cf. Frese, 1999), but also that stressors should match strains. For instance, insolent customers are more likely to cause emotional disorders than physical complaints. Thirdly, the compensation principle proposes that the negative effects of job demands can be counteracted through the availability and activation of job resources. It is also predicted that job resources from within the same domain as the job demands (i.e., cognitive, emotional, or physical) will produce a greater likelihood of counteracting the negative effects of job demands. The fourth principle of the DISC Model is that of balance. It is theorized that the optimal conditions for active learning, growth, and creativity exist where a balanced mixture of (high) job demands and corresponding job resources occurs. For instance, employee creativity may occur if an employee has a lot of job control in facing high mental demands.

While a body of empirical evidence for the DISC Model has not been established in the job stress literature due to its recent development, De Jonge and

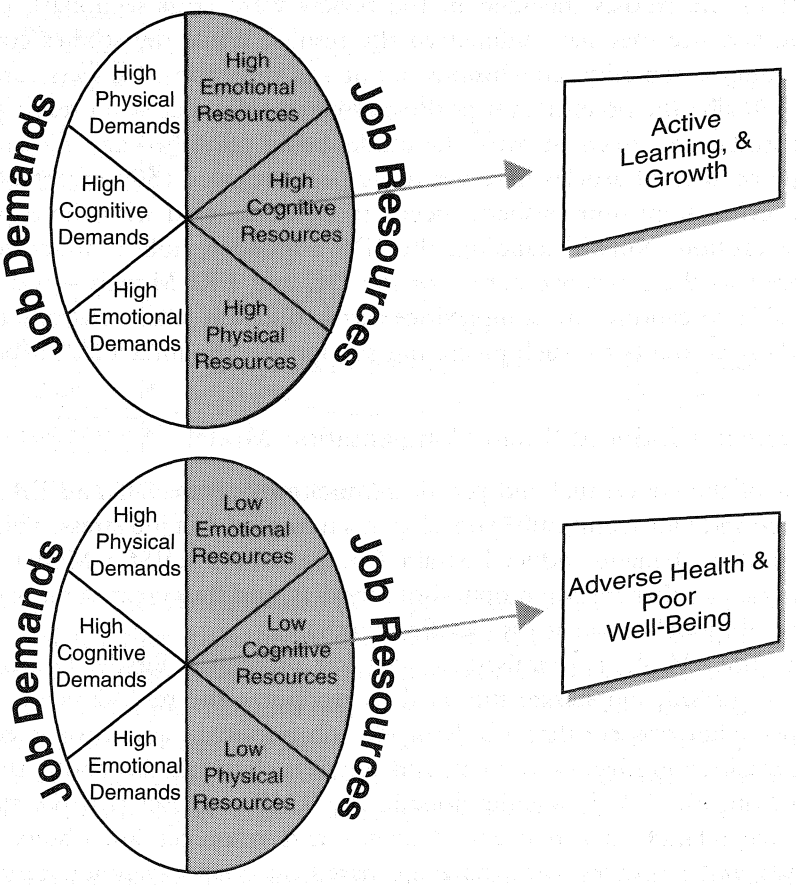

Figure 6.8: The Demand-Induced Strain Compensation Model

Dormann (2004; 2005) presented evidence for the assumptions in the model. Belgian, German and Dutch studies conducted to test the principles of the DISC Model show that results have been supportive. More specifically, 8 out of 11 DISC studies (i.e., 73 percent) showed evidence for the TMP (cf. De Jonge & Dormann, 2005). For instance, two two-wave panel surveys among 280 and 267 health care workers showed robust support for the TMP (De Jonge & Dormann, 2006). The likelihood of finding moderating effects was linearly related to the degree of match, with 33.3 percent of all tested interactions becoming significant when there was a triple-match, 16.7 percent significant interactions when testing for so-called double-matches, and 0.0 percent when there was no match. Findings were most consistent if there was an emotional match or a physical match.

In conclusion, job stress research may benefit from the idea that job demands and job resources do not interact randomly in the prediction of health and performance outcomes. Rather, it is the idea of *common match* (i.e., job demands

and job resources should match) and the idea of *extended match* (job demands and job resources should also match job-related strain), both reflected in the *Triple Match Principle*, that merit attention in future job stress research.

By clarifying the relationships between different types of job characteristics and health, the above models have given some indications of interventions that can be used to prevent or reduce job stress. In the final section of this chapter, a systematic overview of different types of interventions is presented and discussed.

4 Interventions to Prevent or Reduce Job Stress

Job stress interventions may focus on three levels:

- *The organization.* By changing the work situation through organization-based interventions, the source of the problem is tackled and the employee's negative reaction is reduced.
- *The individual/organization interface.* By increasing the employee's resistance to specific job stressors, his or her vulnerability decreases.
- *The individual.* By learning to cope better with stress in general, the individual prevents negative psychological effects of job stressors.

In addition, job stress interventions may serve five purposes:

- *Identification* (i.e. early detection of job stressors and stress reactions)
- *Primary prevention* (i.e. reduction of job stressors)
- *Secondary prevention* (i.e. altering the ways employees respond to job stressors)
- *Treatment* (i.e. healing those who suffer severely from job stress)
- *Rehabilitation*[1] (i.e. planned return to the previous job)

Levels and purposes of job stress interventions may be combined into a classification table that constitutes a framework for discussing various approaches (see Table 6.3; for more elaborate recent reviews see: Kompier & Kristensen, 2000; Murphy, 2003; Semmer, 2003; Quick, Quick, Nelson. & Hurrell 1997).

Interventions primarily aimed at the organization

Instead of a prime target, reducing job stress is a mere byproduct of organization-based interventions. Usually, such interventions are primarily aimed at improving efficiency or effectiveness. Organization based interventions focus on: (1) diagnosis (i.e., job stress audits, cf. Zapf, Becholdt, & Dormann, in press); (2) removal or reduction of stressors (i.e., improve workload, job content and the work environment (job enlargement, job enrichment, job rotation), role clarification, better time scheduling, communication, decision-making, conflict

Table 6.3: Overview of job stress interventions

Focus/Purpose	*Identification*	*Primary prevention*	*Secondary prevention*	*Treatment*	*Rehabilitation*
Organization	job stress audit	improving work content and environment time scheduling management development corporate fitness and wellness programmes career management	anticipatory socialization communication, decision making, and conflict management organizational development	institutionalization of occupational health and safety services employee assistance programmes	outplacement
Individual/ Organization	personal screening	time management interpersonal skills training promoting a realistic image of the job balancing work and private life	peer-support groups coaching and consultation career planning	specialized counselling and psychotherapy	individual guidance and assistance
Individual	self-monitoring	didactic stress management promoting a healthy life style	cognitive-behavioural techniques relaxation		

management, and Organizational Development); (3) improvement of fit between the employee and the organization (i.e., career management, anticipatory socialization, Management Development, and outplacement); (4) institutionalization of procedures and services (i.e., corporate fitness and wellness programs, enrichment of Occupational Health and Safety Services, and Employee Assistance Programs).

In Europe, *the institutionalization of Occupational Health and Safety Services* has been facilitated by the introduction of new occupational health and safety legislation. OHSS's play an indirect role in reducing job stress in at least three ways: (1) by regularly carrying out stress audits and personal screenings; (2) by offering a specialized individual counselling and rehabilitation service for employees with work-related mental problems; (3) by expert consultation in occupational medicine, safety engineering, human factors and occupational psychology.

Employee Assistance Programs (EAPs) are worksite-based programs to assist in the identification and resolution of productivity problems associated with employees impaired by personal concerns including health, marital, family, financial, alcohol, drug, legal, emotional, stress, or other personal concerns which may adversely affect employee job performance (Lee & Gray, 1994). The ultimate concern of EAPs is with prevention, identification, and treating personal problems that adversely affect job performance.

Interventions primarily aimed at the individual/organizational interface

This type of interventions seeks to (1) increase awareness (i.e. personal screening); (2) improve individual coping skills (i.e. time-management, interpersonal skills training, promoting a realistic image of the job, and balancing work and private life); (3) provide emotional and instrumental support at work (i.e. peer-support groups, coaching, and career planning); (4) cure target complaints by intensive treatment (i.e. specialized counseling and psychotherapy); (5) rehabilitate employees (i.e. individual guidance and assistance).

Interventions primarily aimed at the individual

Most individual level interventions are well established and have a long and successful history in clinical or health psychology. Principally, individual strategies are aimed towards: (1) increasing the individual's awareness (i.e., self-monitoring and didactic stress management); or (2) reducing negative arousal (i.e., promoting a healthy lifestyle, cognitive-behavioral techniques, and relaxation).

Self-monitoring assumes that by explicitly focusing on the signs and symptoms of distress the individual's self-awareness is increased ("know thyself"). A powerful self-monitoring technique is to keep a stress diary; a personal record or log of stress symptoms and related events.

Didactic stress management refers to all kinds of information about job stress that is provided with the intention to increase awareness and to improve self-care.

For instance, workbooks are available with tips, tricks, and exercises that teach how to deal with job stress (e.g., Fontana, 1989; Schabracq & Cooper, 2001).

Promoting a healthy lifestyle includes regular physical exercise, proper nutrition, weight control, no smoking, enough sleep, and periods of rest for relaxation and recharge during the workday and thereafter. Many of these elements are part of corporate fitness and wellness programs. Of these approaches, physical exercise is perhaps the most powerful antidote to stress (McDonald & Hodgdon, 1991; Salmon, 2001).

Relaxation is considered to be a universal remedy to stress. Therefore, it is the cornerstone of virtually every stress-management program, often in combination with *cognitive-behavioral techniques* (Murphy, 2003). The goal of relaxation is to teach the aroused individual how to produce voluntarily a positive, alternate physiological response, a state in which (s)he deliberately eliminates the undesirable physiological effects of stress.

Despite their importance, relatively few sound empirical studies have been conducted on interventions aimed at preventing and/or reducing job stress. Therefore, it's difficult to compare the effectiveness of each of these types of interventions. However, on the basis of eleven European case studies, Kompier and Cooper (1999) concluded that interventions that are (a) comprehensive, i.e. addressing both individual and organizational factors, (b) use a stepwise approach (preparation, analysis, choice of measures, implementation, and evaluation), (c) involve workers centrally in the process (by considering them as "experts" with respect to their own working conditions and ways to improve them), (d) are context-specific, i.e. based on an accurate assessment of risk factors and/or risk groups, and (e) have top management support hold the greatest promise for effective prevention and/or reduction of stress at work.

Summary

Job stress is a scientific as well as a social problem. From a scientific point of view it may seem somewhat disappointing that after more than 30 years of intensive research a "grand, unifying theory of job stress" is still not within reach. However, the feasibility of one overarching framework can be seriously questioned, as job demands (stressors) are constantly and rapidly changing due to social developments. Over the past decennia, the nature of job demands (stressors) has shifted from purely physical to mental and emotional demands, which has important implications for job stress and thus for the theoretical models describing it. Therefore, the models that have been discussed in this chapter should be considered complementary rather than mutually exclusive. Nevertheless, future job stress research may benefit from the idea – as outlined by the Demands Induced Strain Compensation Model – that job demands and job resources do not interact randomly in the

prediction of job-related strains. Rather, it is the idea of matching (job demands and job resources match job-related strain) that merits attention in future job stress research.

Unfortunately, there is still a gap between theoretical knowledge and practical implications. It seems most realistic to pursue an eclectic approach to job stress, in which possible solutions to stress-related problems are derived from one or several models of job stress that best fit the problem at hand. However, all models do make clear that job stress interventions should be targeted primarily to the source of many of the problems, i.e. the stressful working situation. For reasons of "fine tuning," these work-oriented interventions may be supplemented by measures aimed at the individual worker. As mentioned above, this point of view is also supported by modern labor legislation in many Western countries.

Discussion Points

Which job stress model is your personal favorite, and what are the key hypotheses? Explain why this model is especially suitable to apply to everyday practice in organizations.

Which level of implementation seems to be most effective for job stress interventions?

Key Studies

Van der Doef, M., & Maes, S. (1999). The Job Demand–Control(–Support) model and psychological well being: A review of 20 years of empirical research. *Work and Stress, 13*, 87–114. A state-of-the-art review of empirical research on the JDC(S) model in relation to psychological well-being.

Van Vegchel, N., De Jonge, J., Bosma, H., & Schaufeli, W. (2005). Reviewing the Effort–Reward Imbalance model: Drawing up the balance of 45 empirical studies. *Social Science & Medicine, 60*, 1117–31. A state-of-the-art review of empirical research on the ERI model.

Further Reading

Kahn, R. L., & Byosiere, P. (1992). Stress in organizations. In M. D. Dunette and L. M. Hough (Eds.), *Handbook of industrial and organizational psychology (volume 3)* (pp. 571–650). Palo Alto, CA: Consulting Psychologists Press. Chapter that gives a clear overview of what job stress is and how it "works."

Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productivity and the reconstruction of working life*. New York: Basic Books. Book that describes the development of the JDC(S) model and its practical implications.

Schabracq, M. J., Winnubst, J. A. M., & Cooper, C. L. (Eds.) (2003). *The handbook of work and health psychology, second edition*. Chiches-