

# A review of empirical studies on the model of effort–reward imbalance at work: reducing occupational stress by implementing a new theory

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## Abstract

The present study reviews empirical studies of a new occupational stress model of effort–reward imbalance at work to examine its validity as an occupational stress measure and the theory-based intervention approach to occupational stress reduction. The effort–reward imbalance model is valid for demonstrating a stressful work environment that reflects the current labor market and predicts health conditions among a wide range of working populations. The stressful aspects of work measured by the effort–reward imbalance model are different from those shown in the job demand–control model, and the adverse health effects are independent of each other, which suggests that the two models are complementary. The evidence indicates that it is efficient to select psychosomatic symptoms as short-range target outcomes and sick leave as a medium-range target outcome of the theory-based intervention. In addition, it would be preferable to simultaneously measure job satisfaction, morale, motivation, and performance as organizational level outcomes. Although employees engaged in diverse occupations can be target populations, high effectiveness is expected, particularly in service occupations that work shifts. Studies are necessary to determine how long and how intensely interventions are implemented. Target work environments are selected from the perspective of securing or improving employees' sense of fairness and reciprocity by approaching them. Since the theory-based intervention depends largely on organizational changes that are beyond the individual employees' ability, the cooperation of employers is necessary.

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## Introduction

With the accumulated evidence that occupational stress leads to adverse health outcome, occupational stress research has reached the stage of intervention (Kompier & Cooper, 1999). Although most approaches to stress reduction in the workplace focus on individuals (van der Hek & Plomp, 1997), more permanent and

efficient effects are anticipated from organization-focused interventions (Karasek, 1992). Furthermore, in the current labor market, socioeconomic factors beyond an individual's ability to change them have the potential to produce a significant amount of stress. That is, economic recession and globalization lead to organizational restructuring, which includes downsizing, and then to a competitive atmosphere in the workplace. Job insecurity has been clearly identified as a serious health risk.

Stress-reduction approaches in the workplace would be improved by implementing theoretical models (Theorell, 1999). They provide useful tools for dealing with

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real-life complex phenomena in the workplace, and the intervention effect can be evaluated based on the theory. The job demand–control model (Karasek & Theorell, 1990) has had a great impact on the theoretical and practical aspects of research on occupational stress. The job demand–control model includes two components: psychological demands, which tap quantitative and conflicting demands of work, and job control, which measures decision authority and skill utilization over a task. Employees who face high demands and have little control over their work (i.e., job strain) are hypothesized to be at great risk of becoming ill. Later, the third component, social support at work, was incorporated (Johnson & Hall, 1988). According to the extended model—the job demand–control–support model—the highest risk of illness is expected in employees with high demands, low control, and low social support. The predictive validity of the job demand–control (–support) model has been supported by a large number of empirical studies proving the predictions of various health outcomes, particularly cardiovascular diseases (Schnall, Belkić, Landsbergis, & Baker, 2000). Even though theory-based interventional approaches for improving the work environment are scarce (Theorell, 1999), a stress-reduction approach based on the job demand–control model is in a practical phase (Theorell & Karasek, 1996; Kawakami, 2001). The two model components, demands and control, can be used to manipulate the work environment at the task level. The third component, social support at work, also serves as a buffer against job strain.

Recently, Siegrist formulated the model of effort–reward imbalance at work (Siegrist, 1996, 2001). The model emphasizes that important social roles (the work role) are to offer a person recurrent options of contributing and performing (self-efficacy), of being rewarded or esteemed (self-esteem), and of belonging to some significant group. These potentially beneficial effects of the work role on self-regulatory needs are dependent on a basic requirement of social exchange—*reciprocity* and *fairness* (Cosmides & Tooby, 1992; Gouldner, 1960; Trivers, 1971). Effort at work is spent as part of a socially organized exchange process to which society at large contributes in terms of rewards. Rewards are distributed by three channels: money, esteem, and career opportunities, including job security. The model claims that lack of *reciprocity* or *fairness* between “costs” and “gains,” i.e., high cost–low gain conditions, causes a state of emotional distress which can lead to adverse health outcomes.

Another unique feature of the effort–reward imbalance model is the inclusion of a personal component in an otherwise situational model of occupational stress. A distinct personal pattern of coping with job demands is called overcommitment. Overcommitment defines a set of attitudes, behaviors, and emotions that reflect

excessive endeavor combined with a strong desire for approval and esteem. It has been shown that excessive efforts result from perceptual distortion (in particular, an underestimation of challenges and an overestimation of coping resources), which in turn may be triggered by an underlying motivation to experience recurrent esteem and approval (Siegrist, 1996). Therefore, Siegrist proposes that this coping is not only critical enough to result in emotional exhaustion but also exacerbates the negative effects of the effort–reward imbalance.

In contrast to the job demand–control model, which emphasizes task-level control, the effort–reward imbalance model emphasizes the rewards given to employees. Considering current labor market developments in the global economy, career opportunities, including job security and work prospects, are a sensitive measure for the current working conditions. In addition, employee self-esteem is affected by several organizational factors. Such broad sociological contexts beyond the scope of task-level control and the inclusion of the personal component will expand the repertoires of the interventional approach for occupational stress reduction. The objectives of this review are two-fold: (1) to confirm the usefulness of the effort–reward imbalance model as an instrument for evaluating a stressful working environment, and (2) to provide clues for designing a theory-based intervention approach for occupational stress reduction.

## Methods

We intended to prepare a thorough review of the literature in English dealing with the effort–reward imbalance model. The relatively short research history was an advantage to our research, and for pragmatic reasons, we included studies from Japanese authors as well. The empirical studies of the effort–reward imbalance model at work were identified by means of a systematic search of MEDLINE, Science Direct, and PsycINFO. The databases were searched from January 1985 to July 2003 using the key words “effort–reward imbalance.” In addition, reference lists of relevant publications were screened for additional empirical studies. A representative work was included if studies derived from the same data source displayed the same analytical results. A meta-analytical procedure was not employed since the studies were diverse in terms of outcomes and the measures used to evaluate the outcomes. Empirical observational studies with health outcomes are listed according to the outcomes and the study design. Two studies (Kuper, Singh-Manoux, Siegrist, & Marmot, 2002; Peter & Siegrist, 1997) are listed across two tables in order to match the two main outcomes and the categorization. Based on this review, the empirical evidence is discussed from the perspective

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