Effort-reward imbalance at work -
theory, measurement and evidence

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November 5, 2012

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1 Theoretical background

Research on effort-reward imbalance and health is part of a larger scientific program that aims at understanding the contribution of social and psychological factors to human health and disease. More specifically, protective and damaging effects on health produced by peoples’ behaviours, cognitions and emotions through core social roles in adult life (work role, civic roles, family roles etc.) are analysed using a specific theoretical and methodological approach.

This theoretical approach is focused on the notion of social reciprocity, a fundamental principle of interpersonal behavior and an ‘evolutionary old’ grammar of social exchange. Social reciprocity is characterized by mutual cooperative investments based on the norm of return expectancy where efforts are equalized by respective rewards. Failed reciprocity resulting from a violation of this norm elicits strong negative emotions and sustained stress responses because it threatens this fundamental principle.

The model of effort-reward imbalance (ERI) claims that failed reciprocity in terms of high efforts spent and low rewards received in turn is likely to elicit recurrent negative emotions and sustained stress responses in exposed people. Conversely, positive emotions evoked by appropriate social rewards promote well-being, health and survival.

A major specification of this theoretical perspective concerns the work role, and in particular its contractual basis. So far, a majority of research evidence concerns ERI at work. More recently, this perspective has been applied to additional social roles in adult life (for further information please click here).

According to the model, effort at work is spent as part of a social contract that reciprocates effort by adequate reward. Rewards are distributed by three transmitter systems: money, esteem, and career opportunities including job security. Each one of these components of work-related rewards was shown to matter for health.

The model of ERI at work claims that an imbalance between (high) effort and (low) reward is maintained under the following conditions:

1. Work contracts are poorly defined or employees have little choice of alternative workplaces (e.g. due to low level of skill, lack of mobility, precarious labor market);

2. employees may accept this imbalance for strategic reasons (this strategy is mainly chosen to improve future work prospects by anticipatory investments);

3. the experience of 'high cost / low gain' at work is frequent in people who exhibit a specific cognitive and motivational pattern of coping with demands characterized by excessive work-related commitment ('overcommitment'). Overcommitted men and women suffer from inappropriate perceptions of demands and of their own coping resources more often than their less involved colleagues, because perceptual distortion prevents them from accurately assessing cost-gain relations.

A graphic representation of the model is given in figure 1.

The following three hypotheses are derived from the ERI model:
1. An imbalance between high effort and low reward (non-reciprocity) increases the risk of reduced health over and above the risk associated with each one of the components.

2. Overcommitted people are at increased risk of reduced health (whether or not this pattern of coping is reinforced by work characteristics).

3. Relatively highest risks of reduced health are expected in people who are characterized by conditions (1) and (2).

1.1 Key publications


2 Measurement

In principle, different measurement approaches towards assessing ERI are feasible. To some extent, contextual information (e.g. job descriptions, level of salary, career mobility, job loss) can be used. However, core aspects of the model concern experiences and perceptions of working people. Therefore, self-report data are of core importance. These data can be acquired through qualitative interviews, ecological momentary assessments, standardized questionnaires or structured interviews.

In large scale social epidemiological research an economic measure in terms of a psychometrically well justified standardized questionnaire has proven to be particularly useful. In this tradition, the ERI model has been operationalized as a standardized self-report measure containing 23 Likert-scaled items in its established short version. These items define three unidimensional scales: 'effort' (6 items), 'reward' (11 items), and 'overcommitment' (6 items) with each item rated on a 5 point (effort, reward) or 4 point (overcommitment) Likert scale respectively. Examples of items are 'I have constant time pressure due to a heavy work load' (effort); 'My job promotion prospects are poor' (reward); 'Work rarely lets me go, it is still on my mind when I go to bed' (overcommitment). For access to information on full wording of the scales (in several languages), on psychometric properties of the scales and on analysis of ERI data please click here.

2.1 Key publications


2.2 Other Publications


### 3 Selected publications on research evidence

#### 3.1 Reviews

The following reviews provide a summary of research on associations between ERI at work and health:


### 3.2 Cardiovascular risk and diseases (including Type-II-diabetes)

Most research on the association between ERI at work and health was done on cardiovascular diseases. Selected studies and reviews are:


3 SELECTED PUBLICATIONS ON RESEARCH EVIDENCE


### 3.3 Psychiatric disorders

Concerning ERI at work and psychiatric disorders (mainly depression), there is evidence from prospective and cross-sectional investigations (selection):


3 SELECTED PUBLICATIONS ON RESEARCH EVIDENCE


3.4 Symptoms and subjective health

A large number of reports analyse associations of ERI with self-reported data on health and well-being (for review see van Veghel et al. 2004). Some recent publications are:

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SELECTED PUBLICATIONS ON RESEARCH EVIDENCE


3.5 Sickness absence

Both short-term and long-term sickness absence are explored in association with ERI. Examples of respective research are:


3.6 Stress-related mechanisms

Several research strategies are realized in order to explain psychobiological mechanisms linking ERI-induced stressful experience with adverse health outcomes. These research strategies include ambulatory monitoring in naturalistic settings, experimental studies and analyses of innovative biomedical markers in high risk groups identified in the context of epidemiological studies. Selected recent publications include:


3.7 Other outcomes

Research on ERI at work has also been extended to outcomes that are not (or at least not directly) associated with health. Examples include job satisfaction, burnout, and deviant behaviour, e.g.:


## 4 Intervention

The model of ERI at work is useful in designing worksite stress prevention and health promotion programs. As a first step, stressful conditions at work can be measured in a standardized way using the psychometrically validated questionnaire available in a number of languages. As a second step, interventions measures can be derived from the model at the personal/interpersonal level and at the structural level.

At the personal/interpersonal level, techniques of stress management including stress inoculation through strengthening of psychological and interpersonal resources are indicated. In order to be effective these techniques need to address cognitions, attitudes and work-related motivations in addition to the rather non-specific relaxation techniques. Improved self-observation and perception of arousal, coping with anger and reinforced self-reliance are important elements of this type of intervention. Another application of stress prevention at the interpersonal level concerns the improvement of leadership skills among supervisors and superiors, in particular the awareness of an important role of esteem, recognition and appropriate feedback, as indicated by the ERI-model.

Structural measures of worksite health promotion derived from this theoretical approach include the implementation of models of gain-sharing and of non-monitory incentives including options of flexible work time arrangements, comparatively high compensation contingent on performance, tailoring of promotion prospects and status according to achievements, improved job security and further measures of organisational and contractual fairness.

It is important to note that the creation of healthy work places produces economic benefits in the long run, in addition to beneficial effects on health and well being. Policy implications of the ERI model are not restricted to occupational life, but may be extended to the design of voluntary work and to ways of improving social capital within communities.

### 4.1 Key publications


### 4.2 Other publications