

**UCLA Work and Health
2015**

Session # 2

**Theoretical Models of Work Stressors:
Operationalization, measurement and assessment**

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Psychosocial models of work stressors related to CVD

- **Job strain**
- **Effort-reward imbalance**
- **Occupational stress index (in session # 3)**

Precursors of the demand-control model: Early CVD medical findings

- During the 1960:s an important prospective study was published which indicated a higher incidence of myocardial infarction among lower level than among higher level employees in large companies (Pell and d'Alonzo 1963).
- This raised for the first time a suspicion that psychosocial stress may not primarily be a problem for people with a lot of responsibility, as researchers had tended to believe previously.

Early CVD findings cont:

- Kornitzer and his collaborators (1982) observed in the 1970's in a retrospective study of two bank groups in Belgium, one private and one state-owned, that employees in the private banks had a higher incidence of myocardial infarction than employees in the state owned banks.
- The Belgian bank study was one of the first to indicate a possible relationship between psychological work demands (which were higher in the private banks) and risk of myocardial infarction.

Contributing sociological/psychological approaches to Demand/Control model

- **Several earlier theoretical models have been introduced.**
 - E.g., for instance those of the Michigan school of sociology - Person-Environment Fit which included measures of demands that included work load and job complexity. **(Katz and Kahn 1966).**
- **Karasek's demand - control model was a synthesis of two different research traditions.**
 - the "demand" (psychological stress) tradition – a continuation of the Stressful Life Events research tradition.
 - and the "lack of control" (sociological research) (Karasek 1979).
- **In generating the concept "lack of control", or "lack of decision latitude" Karasek had been following earlier sociological traditions (e.g. Karl Marx).**

Job strain (the prototypical workplace psychosocial stressor) was introduced by Dr. Robert Karasek in his doctoral thesis in 1976

- **It was developed for work environments where stressors are:**
 - chronic.
 - not initially life threatening,
 - are the product of sophisticated human organizational decision making.
- **Based on the insight that in decision making the controllability of the stressor is very important.**
 - and becomes more important as we develop ever more complex and integrated social organizations with ever more complex limitations on individual behavior.

The health outcome measures in his original studies were mental health variables

- **The first publication in an international journal with this perspective appeared in 1979 (Karasek 1979) based on epidemiological studies of working Swedes.**

The cardiovascular perspective was introduced in the late 1970's

- The first prospective study appeared in 1981 (Karasek et al 1981).
 - It was based upon randomly selected working men in Sweden who were surveyed initially in 1968 and then followed up in 1974.
 - The outcome measures were cardiovascular mortality and a composite measure of cardiovascular symptoms.
 - The study showed a *significant association*
 - between working in jobs that were psychologically demanding and at the same time low in control (i.e., job strain)
 - and increased likelihood of subsequent development of heart disease symptoms and/or cardiovascular mortality.

**The demand-control model has
two components based on
psychosocial characteristics of
work.**

1 - Psychological demands measured by 9 items¹ (sometimes 5)

- excessive work,**
- conflicting demands,**
- insufficient time to work,**
- work fast,**
- work hard.**
- intense concentration**
- often interrupted**
- very hectic**
- waiting on others**

JCQ Scoring

- ¹All questions are scored on a Likert scale of 1 to 4, and both decision latitude and psychological job demands were constructed to have a range of 12 to 48.
- Responses = strongly agree, agree, disagree, strongly disagree
- Likert scaling is a bipolar scaling method, measuring either positive or negative response to a statement. Sometimes Likert scales are used in a forced choice method where the middle option of "Neither agree nor disagree" is not available.

Likert Items

Typical Format of a Likert Item (single question) is from:

1) Strongly Disagree, 2) Disagree, 3) **Neither Agree or Disagree**, 4) Agree, to 5) Strongly Agree

Likert Scales – Advantages

This is a very useful question type when you want to get an overall measurement of a particular topic, opinion, or experience and also collect specific data on contributing factors.

These scales as a data collection approach are quite versatile

- Adaptable to pre-post testing (or even retrospective pre-testing). This is when you administer the questionnaire once at “post” and ask respondents to think back to the “pre.”

- Applicable to a range of public health efforts.

Training example: “This training met my needs.”

Partnership example: “Being a part of this coalition has helped me better serve my clients.”

Policy example: “It is essential that our community address sodium content in our schools.”

- Provide a way to assess satisfaction without directly asking about satisfaction (which can be overdone). They go beyond “How satisfied are you with this partnership?” and actually use statements about what the partnership achieve

JCQ Scoring Cont:

- Likert scales may be subject to distortion from several causes. Respondents may avoid using extreme response categories what is called (central tendency bias);
or they may agree with statements as presented (acquiescence bias);
or try to portray themselves or their organization in a more favorable light (social desirability bias).

2 - Decision latitude - a combined measure made-up of task control (decision authority) and skill use (skill discretion)

- *Decision authority is measured by three items*
 - have freedom to make decisions
 - choose how to perform work
 - have a lot of say on the job
- *Skill discretion is measured by six items*
 - keep learning new things,
 - can develop skills,
 - job requires skills,
 - task variety
 - repetitious,
 - job requires creativity

Demand-control model predicts an interaction between psychological demands and decision latitude.

- If demands are regarded as the x-axis and decision latitude as the y-axis in a two-dimensional system, four combinations are recognized (see figure 1 – next slide).
 - The high demand-low decision latitude combination is labeled job strain,
 - The high demand-high decision latitude situation is called active work,
 - The low demand-low decision latitude combination is titled passive work
 - and finally, the ideal low demand-high decision latitude combination is called low strain work.

Typical occupations found in four quadrants of Karasek's job strain model (1969-1977 data)

Psychological Job Demands

		Low	High
<i>Job Decision Latitude</i>	High	Forester Repairman Dentist Low Strain	Banker Physician HS teacher Active
	Low	Janitor Watchman Billing Clerk Passive	Assembler Waiter Nurse aide High Strain

First hypothesis of the Demand-Control Model:

- **The most adverse reactions of strain occur (fatigue, anxiety, depression and physical illness) when the psychological demands of the job are high and the worker's decision latitude in the task is low (i.e., job strain).**
- **Job Strain, according to the demand-control theory, if prolonged and repeated for a long enough time, increases sympathoadrenal arousal and at the same time decreases anabolism, the body's ability to restore and repair tissues. (suppresses immune system)**

Examples of jobs characterized by Job Strain: Hypothesis 1

- For example, the assembly-line worker.
 - has almost every behavior rigidly constrained.
 - In a situation of increased demands (“speed-up”), more than just the constructive response of initial moderate arousal occurs → the often helpless, long-lasting, and negatively experienced response of residual strain occurs.
- Or , garment workers under heavy deadline pressure.
 - lose not only the freedom of action as to how to accomplish the formal work task that relieves strain.
 - but may also lose the freedom to engage in the informal “rituals” such as the coffee break or fidgeting, which serve as supplementary “tension release” mechanisms during the work day. (issue of fatigue and recovery)

In the demand-control model, decision latitude refers to the worker's ability to control his or her own activities and skill usage (not to control others).

- **Decision latitude scales have two components:**
 - **task authority** - a socially predetermined control over detailed aspects of task performance (also called autonomy);
 - and **skill discretion** - control over use of skills by the individual, also socially determined at work (and often called variety or substantive complexity) (Hackman and Lawler 1971, Kohn and Schooler 1973).

Decision Latitude

- In modern organizational hierarchies, the highest level of knowledge legitimates the exercise of the highest levels of authority, and workers with limited-breadth, specialized tasks are coordinated by managers with higher authority levels.
- Skill discretion and authority over decisions are so closely related theoretically and empirically that they are often combined.
 - Caveat – lean production techniques may tend to increase skill discretion at the expense of decision authority thru activities such as job rotation, etc.

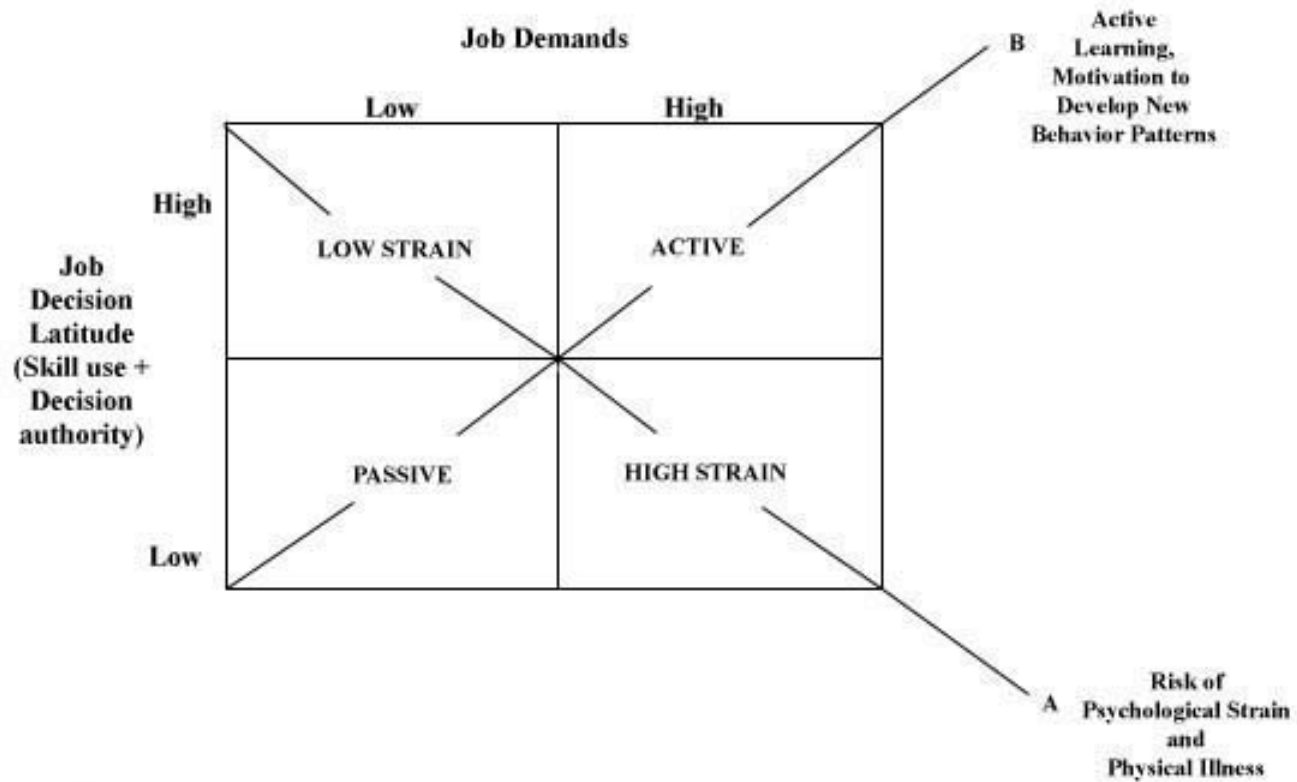
Work's psychological demands

- Examples of - "how hard you work" - include the presence of deadlines, the mental arousal or stimulation necessary to accomplish the task, or coordination burdens. (Physical demands are not included but may be confounders)
- The assessment of psychological job demands has turned out to be methodologically more difficult than has been hitherto believed.
 - In particular, the interpretation of questions regarding psychological demands may differ between different groups in the working population such as white collar and blue-collar workers and between men and women.
 - Furthermore, psychological demands may change in nature as information technology and other ongoing working life changes affect the working conditions.
 - Scale is more subjective – as workers in same jobs report differing levels of demands (more within occupational variance)
- The assessment difficulties may explain why the psychological demands part of the demand/control model has less empirical support than the control part.

Second Hypothesis of the Demand-Control Model: The active learning hypothesis

- When control on the job is high and psychological demands are also high but not overwhelming, **growth** and learning are the predicted behavioral outcomes - this combination of high psychological demands and high decision latitude is defined as the **active** situation.
 - workers with this combination of work environment factors have turned out to be the *most active group outside of work in leisure and political activity*, in spite of heavy work demands (but not overwhelming) Karasek and Theorell 1990.
- For the active job because much of the energy mobilized by the job's many stressors ("challenges") is translated into direct action - effective problem solving - with little residual strain to cause disturbance.

Karasek job strain model



Reference: Schnall PL, Landsbergis PA, Baker D.
Job Strain and Cardiovascular Disease. Annual Review of Public Health; 15:381-411, 1994

Second Hypothesis of the Demand-Control Model: The active learning hypothesis cont:

- The model also predicts that the growth and learning stimuli of these settings, when they occur in a job context, are conducive to **high productivity**.
- According to the demand/control model, **learning occurs** in situations which require both individual psychological energy expenditure (demands or challenges) and the exercise of decision-making capability.

Third Hypothesis of the Demand-Control Model

- The demand/control model predicts that situations of **low demand and low decision latitude (the passive combination)** cause a very “unmotivating” job setting, which leads to “negative learning” and gradual loss of previously acquired skills.
 - *Evidence shows that disengagement from leisure and political activity outside the job appears to increase over time in such jobs (Karasek and Theorell 1990).*
- This “atrophy” may represent “**learned helplessness**”, discussed by Seligman (1975) and may be the result of a sequence of job situations which reject workers’ initiatives.
 - *In the Cornell Worksite HBP project passive jobs were found to be associated with Type B behavior and “learned helplessness” while active jobs had increased Type A behavior and low levels of “learned helplessness”.¹*

¹Landsbergis, Schnall et al 1994.

Final Hypothesis of the Demand-Control Model

- The low demand - high decision latitude situation - low strain - is theoretically the ideal one.
- Low demand in the modern working environment **really means "no excessive demands"**. It should not be literally perceived as low demand since very low demands may themselves be problematic.
- In summary, active learning in the active and low strain situation stimulates feelings of mastery whereas accumulated tension in the strain situation leads to accumulated anxiety, which inhibits active learning.

Isostrain- the addition of social support to the D-C Model

- **Social Support** has emerged as one of the central research areas in social epidemiology of chronic disease.
- **Support in the workplace** has been identified as a major psychosocial resource that serves to modify potentially stressful demands and pressures of modern production process.
- It became evident that a third component was needed in the demand-control model - social support.
 - *Concept introduced by Dr. Jeff Johnson and Ellen Hall of John Hopkins SPH and was called ISOSTRAIN. (Johnson and Hall 1988).*
- As in research on social support in general, there are several different aspects and components of social support that may be relevant to work.

Relevant dimensions of social support.

- At work the source of support is important, supervisor's and coworker's support being the main sources for most employees.

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 - emotional support (someone to share inner feelings with about job problems).

Relevant dimensions of social support.

- At work the source of support is important, supervisor's and coworker's support being the main sources for most employees.
- Two of the most important components of support are instrumental (having needed help available in solving the problems and tasks related to work) and emotional support (someone to share inner feelings with about job problems).
- For the health of workers, the worst hypothesized situation is isostrain.- (I.e., job strain and lack of social support - both instrumental and emotional) Johnson et al 1989.
- Social support buffering of psychological strain may depend on the degree of social and emotion integration and trust between coworkers, supervisors. etc. - socio-emotional support.
- Collective control - a strong social support system among coworkers can also be a way to tackle low individual control by workers. Trade unions, e.g., have often helped to increase workers' influence over their working conditions, when each worker by him or herself had little say.

Some Implications of the Demand/control model

- Executives do not belong to the (high) job strain groups and accordingly they do not record the highest level of stress, as popular belief often holds.
- While “managerial stress” certainly exists because of the high psychological demands that come with these jobs, it appears that the frequent occasions for decision-making and deciding how to do the job are a significant stress moderator.
- Of course, at the highest status levels, executive jobs consist of decision-making as the primary psychological demand, and then the demand/control model fails.
- However, the implication here is that executives could reduce their stress if they made fewer decisions and lower status workers would be better off with a more equal share of decision power.

Problems/limitations of use of occupational title to determine demand-control-support status.

- **Why not just use occupational title to determine work stress?**
 - **Occupational title aggregates groups with widely different working conditions**
 - **An example is that waiters in an exclusive restaurant with few clients are grouped together with waiters in a restaurant in the business district which has a lunch special to attract maximum number of clients. In this aggregation the job strain situation of the lunch workers are drowned in the larger group.**

Distribution of decision latitude/ job strain by gender

- Women are more likely than men to have low levels of control over their work process at the task level (Karasek and Theorell 1990).
- Another major gender difference is the negative correlation between decision latitude and demands for women: women with low control also have higher job demands.
- This means that women are **several times more likely than men to hold high strain jobs** in the general working population.
- By contrast, men's high demand jobs are generally accompanied by somewhat higher decision latitude ("authority commensurate with responsibility").

Changing Nature of the labor market

- It should be pointed out that the labor market is changing and along with it the nature of psychosocial work conditions.
- In Sweden national surveys indicate that there was a long period during the 1970's and 1980's when the psychosocial job characteristics of most jobs were improving with regard to intellectual discretion and authority over decisions and that subsequently they are now declining (Statistics Sweden 1997a).
- Data is not readily available in the U.S. on trends for most job characteristics but there is evidence demand and decision latitude have both increased – demands more than decision latitude.
- Clearly during the past decade workload demands have increased.
 - As a consequence, the percentage of workers reporting exposure to job strain is increasing in Europe (and most likely in the U.S. as well) even while there have been small increases in reported decision latitude (offset by a greater increase in workload).
 - Self-reported work-related stress is increasing (NIOSH Survey)
 - Decision latitude has decreased markedly for certain groups (health workers due to managed care).
- Passive jobs and low strain jobs have also experienced marked increases in workload and as a consequence some passive jobs have become high strain.
- Traditional good “blue collar” jobs with reasonable demands and control seem to be declining with more and more jobs with high control and more with low control (and all with more demands)

Changing Nature of the labor market: cont (2)

- **Some evidence that part of the impact of globalization on jobs in the U.S. has been the disappearance of high quality blue collar manufacturing jobs characterized by medium levels of control and demand.**
- **There appear to be more jobs characterized by either high demands and high control or jobs with high demands and low control (job strain).**
- **When these two extreme groups are averaged it appears as though there has been little change in national averages in terms of demands and control while in reality the two extreme groups are growing in size.**

Effort-Reward Imbalance Model

developed by Johannes Siegrist

The model of effort-reward imbalance defines a theory driven selective approach developed to answer the following three questions:

1. Is it possible to identify those dimensions of stressful experience at work that are *typical* for a wide variety of occupations both in the industrial and in the service sector?
2. Can we identify work-related conditions that are likely to elicit recurrent, *chronically stressful* experience?
3. To what extent can we distinguish *situation-specific versus person-specific* components of stressful experience at work?

Theory and description of the Effort-Reward Imbalance model

- To answer the question what kind of stressful experience might be typical for a broad variety of occupations the focus is placed on the centrality of **paid employment** in adult life.
- Obviously, having a job is a principal pre-requisite for continuous income opportunities and an important means of acquiring social status and social identity.
- In particular, the *work role* defines a crucial link **between self-regulatory needs of a person (e.g. self-esteem, self-efficacy), and the social opportunity structure.**
 - Gaining occupational status is associated with recurrent options of contributing and performing, of being rewarded or esteemed, and of belonging to some significant group (work colleagues).
 - However, these potentially beneficial effects are contingent on a basic pre-requisite of exchange in social life, that is, reciprocity.
 - 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 transmitter systems: money, esteem, and career opportunities including job security.

The model of effort-reward imbalance claims that lack of reciprocity between ‘costs’ and ‘gains’ (i.e. high cost / low gain conditions) defines a state of emotional distress, which can lead to the arousal of the autonomic nervous system and associated strain reactions.

- **For instance, having a demanding, but unstable job, achieving at a high level without being offered any promotion prospects, are examples of high cost/low gain conditions at work.**
- **In terms of current developments of the labor market in a global economy, the emphasis on occupational rewards including job security reflects the growing importance of fragmented job careers, of job instability, under-employment, redundancy, and forced occupational mobility including their financial consequences.**
- **In summary, the model claims that stressful experience is most likely to result from an imbalance between (high) extrinsic effort and (low) extrinsic reward in combination with a high level of overcommitment**

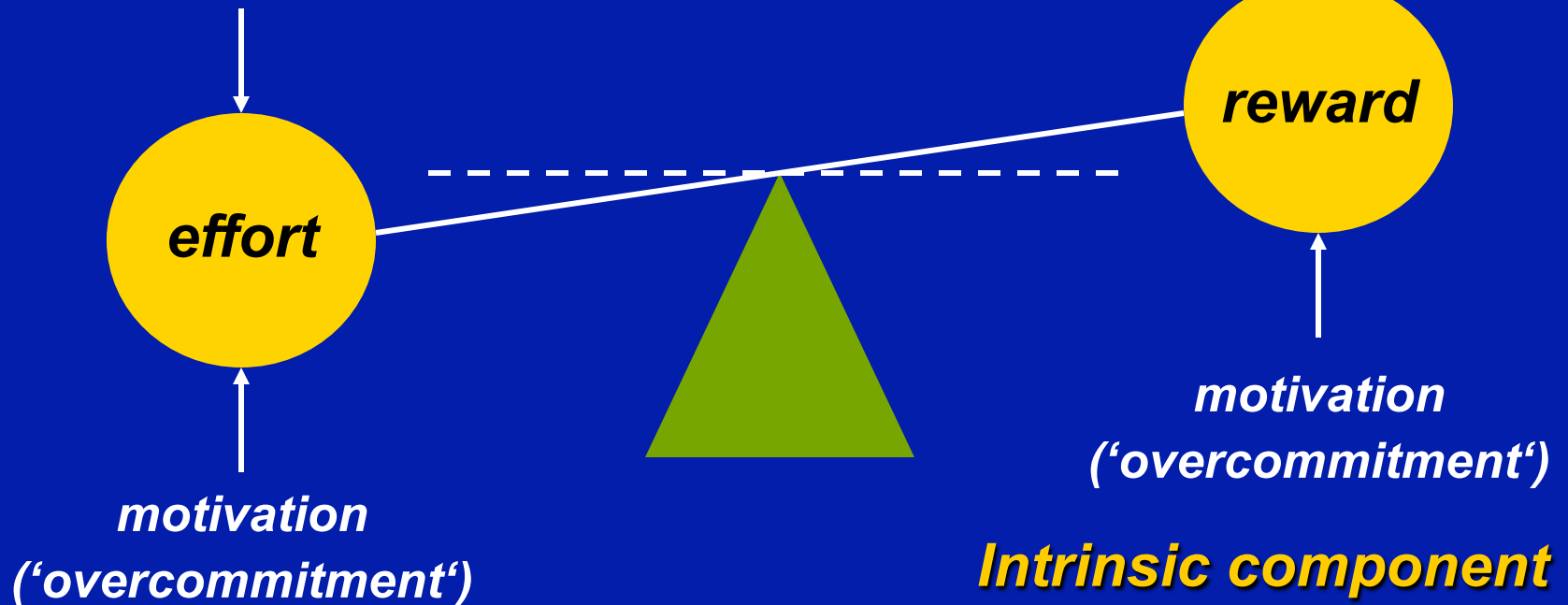
The model of effort-reward imbalance

(Johannes Siegrist, 1996)

Extrinsic components

- labour income
- career mobility / job security
- esteem, respect

demands / obligations



Intrinsic component

Component Scales of ERI Model

1. Extrinsic Effort

- time pressure (12)
- responsibility (14)
- interruptions (13)
- pressure to work overtime (15)
- physically demanding (16)
- increasing demands (17)

2. Low Reward

- Esteem Reward
 - respect (18, 19, 26)
 - adequate support (20)
 - unfair treatment (21)
- Monetary Gratification
 - salary and efforts (28)
- Status Control
 - promotion prospects (23, 27)
 - undesirable change (22)
 - job insecurity (24)
 - status inconsistency (25)

Third Scale – Intrinsic Effort

3. Intrinsic Effort

– Scale

- need for control (immersion) (29-57)

– Subscales

- need for approval (29,39,41,45,46,53)
- Competitiveness (30,33,34,40,49,54)
- disproportionate irritability (31,36,37,42,47,50,51,56)
- inability to withdraw from work (32,35,38,43,44,48,52,55,57)

Who experiences ERI?

- The model of effort-reward imbalance applies to a wide range of occupational settings,
 - Most markedly to groups that **suffer from a growing segmentation of the *labor market* while being exposed to structural unemployment and rapid socioeconomic change** (e.g., typographers).
- Experience of effort-reward imbalance at work is also frequent among **service occupations** and **professions**, in particular the ones dealing with client interaction.

How does effort-reward imbalance provoke stress reactions?

- As **discreet** stressful **life event** (e.g. being denied a promotion)
- As **chronic**, high cost – low gain condition that is **appraised as unfair**
- As chronic high cost-low gain condition that bypasses cognitive appraisal due to **habituation** (affective information processing)

Why do these widely prevalent high cost / low gain conditions at work elicit chronically stressful experience?

- In terms of expectancy value theory of motivation it is likely that workers exposed to high effort / low reward conditions give up this state or, if not feasible, reduce their efforts to minimize negative outcome (Schönplflug & Batman 1989).
- Contrary to this theory the model of effort-reward imbalance predicts continued high effort and, thus, chronically stressful experience, under the following conditions (Siegrist 1996):
 - **lack of alternative choice** in the labor market may prevent people from giving up even unfavorable jobs, as the anticipated costs of disengagement (e.g. the risk of being laid off or of facing downward mobility) outweigh costs of accepting inadequate benefits;
 - **strategic reasons** - unfair job arrangements may be accepted for a certain period of one's occupational trajectory for *strategic reasons*; by doing so employees tend to improve their chances for career promotion and related rewards at a later stage; (**ask students**)
 - **overcommitment** - a specific *personal pattern of coping* with demands and of eliciting rewards characterized by *overcommitment* may prevent people from accurately assessing cost-gain relations.

What is overcommitment?

- **'Overcommitment' defines a set of attitudes, behaviors and emotions reflecting excessive striving in combination with a strong desire of being approved and esteemed.**
- **People characterized by overcommitment are exaggerating their efforts beyond levels usually considered appropriate.**
- **There is evidence that excessive efforts result from perceptual distortion (in particular an underestimation of challenges and an overestimation of one's coping resources) which in turn may be triggered by an underlying motivation of experiencing recurrent esteem and approval (Matschinger, Siegrist, Siegrist & Dittmann 1986, Siegrist 1996).**
- **This latter argument points to the third question mentioned above: it defines a person-specific component of the model ('overcommitment') in addition to the situation-specific component of high extrinsic effort and low reward.**

Some key issues about ERI

- **‘Which dimensions are critical?’**
- **‘Overcommitment’ - a personality trait or a behavior pattern?**
- **What is the significance of the reward dimension**

‘Which dimensions are critical?’

- **Even in the absence of the intrinsic component, high ‘cost’ / low ‘gain’ conditions at work evoke stressful experience, given the significance of unmet reciprocity in social exchange.**
- **Alternatively, continued excessive efforts in combination with disappointed reward expectancy that are attributable to a high level of overcommitment may produce stressful experience even in the absence of the situation-specific component. (high effort alone)**
- **Thus, a comprehensive test of the model covers all three conditions mentioned (see figure 1).**

Is overcommitment' a personality trait?

- This personal pattern of coping with demands and reward expectancies may be reinforced to some extent by specific circumstances in occupational life, most likely at early career stages.
- Although overcommitment was found to be rather stable over time more research is needed to explore this question.

What is the significance of the reward dimension

- As stated, emphasis in stress-theoretical terms is put on violations of expectancies of reciprocity and fairness underlying exchange in significant social roles (here: the work role).
- Unmet reward expectancy following effort is likely to provoke strong negative emotional reactions, as this conflicts with a taken-for-granted basic 'grammar' of social exchange (Cosmides & Tooby 1992).
- All three reward dimensions (esteem reward , status control, monetary gratification) contribute to this negative experience although *most powerful effects may result from poor rewards related to labor market conditions*, such as inadequate wages and salaries, lack of promotion prospects, forced downward mobility, or job loss.
- In view of this latter observation effort-reward imbalance at work is likely to be more prevalent among lower socio-economic status groups.

Some comparisons of The effort-reward imbalance (ERI) model and the demand-control-support (DCS) model

- **Differences between the two models include**
 - **Different analytic models are used**
 - **the approach underlying the ERI model is based on the stress-theoretical paradigm of social reward (Cosmides & Tooby 1992, Henry 1997)**
 - **while the DCS model is mainly based on the stress-theoretical paradigm of personal control (Karasek & Theorell 1990).**
 - **The DCS model has been introduced and measured as a concept that is restricted to the extrinsic or situational aspects of the psychosocial work environment whereas the ERI model includes both extrinsic and intrinsic components.**
 - **Third, components of the ERI model (salaries, career opportunities / job security) are linked to more distant macro-economic conditions while the DCS model's major focus is on workplace characteristics.**

Important similarities between the two models

- **The notions of control and reward may overlap to some extent,**
 - Siegrist maintains in terms of psychological theory of self, control is more closely related to the notion of self-efficacy (Spector 1998) whereas reward is more closely associated with self-esteem (Pelham & Swann 1989). In sociological terms, control is associated with power (Johnsson & Johansson 1991) whereas reward points to a basic 'grammar' of social exchange, i.e. reciprocity and fairness (Cosmides & Tooby 1992).
 - However, the very idea of an imbalance between effort and reward suggests relationships of power are central to the concept even if not so described.
 - Social support at work is very similar to esteem reward. A life course perspective of work task control (Johnson et al., 1996) mirrors part of the notion of occupational status control (Socio-economic variations, 1997, p. 13).
 - Therefore, we may expect to find the two constructs - job strain and effort-reward imbalance correlated in empirical studies.

Which model is better?

- Advantages of ERI as seen by Siegrist.
 - ERI model is distinct from Karasek's model and superior to it by virtue of using a broader sociological model of control (vs Karasek's task-level measures of control), as well as an individual personality component ("need for control").
 - Siegrist argues that adaptation to low task control (job strain) seems less costly to cognitively adapt to than to a low level of status control (in ERI model) because in the former condition fewer fundamental threats are involved (Siegrist, 1996, p, 30).
 - These conceptual differences have direct implications for intervention. The demand-control model focuses on changing task characteristics, while the effort-reward model implies changes on the structural level (e.g., adequate compensation of chronically high work demands by wage differentials, flexible payment and related incentives, opportunities for job training, requalification and increased job security) (Socio-economic variations, 1997).
 - From a neutral position both theories offer different entry points for possible change

Advantages of DC Model over ERI Model as seen by Karasek

- **DC model not intended to restrict the concepts of demands and control to task-level measures (Karasek & Theorell, 1990).**
 - The scales commonly used to measure job demands and job control were derived from specific U.S. and Swedish surveys and therefore created post hoc.
 - However, the Job Content Questionnaire (Karasek et al., 1985), contains items which measure aspects of effort (time pressure, physical demands) and reward (job insecurity, supervisor and coworker support, skill utilization, salary).
 - JCQ also has added items which had not been previously validated on a national sample, but which they recommend for use by job stress researchers. These also include additional aspects of effort (interruptions) and reward (promotion prospects, respected and rewarded).

Advantages of DC Model cont.

- 9 out of the 14 concepts used by Siegrist and colleagues to currently measure extrinsic effort and low reward (Siegrist & Peter, 1996) are also contained in the Job Content Questionnaire.
- However, many researchers chose only to use two of Karasek's scales those measuring decision latitude and psychological workload demands (containing 14 items), due to limited space in their questionnaires and time constraints.
- it must be acknowledged that Siegrist's model does emphasize broader aspects of job control than has typically been done by Karasek and colleagues in their articles.
- The prescriptions for interventions from the D-C-S model are also clearly broader than manipulation of task level characteristics. They involve increased job security, better job skills training, flexible working hours, etc. They describe how social and economic trends (e.g., the global economy, new systems of management such as lean production, work and family roles) impact on job characteristics and stress levels. The implications for intervention of a model emphasizing work control (either Karasek's or Siegrist's) are quite profound.

Important remaining issues

- **Are the combined effects of ERI and Job Strain more than additive.**
 - **Despite the differences pointed out above there is promise in studying the combined effects of the two models in future research (Theorell 1996).**
 - **Preliminary evidence comes from findings of a Swedish case-control study and a British prospective study, indicating that combined effects on cardiovascular health are considerably stronger compared to the separate effects of each model (Bosma, Peter, Siegrist & Marmot 1998, Peter, Hallqvist, Reuterwall, Siegrist, Theorell & The SHEEP Study Group 1999b).**

Need to examine combined effects with other variables

- Need to examine the combined effects of psychosocial work stress and of traditional occupational hazards and stressors on cardiovascular health.
 - *For instance, psychosocial work stress as measured by the above mentioned models may mediate effects of shiftwork on cardiovascular health (Peter, Alfredsson, Knutsson, Siegrist & Westerholm 1999a).*

Future work on ERI Model

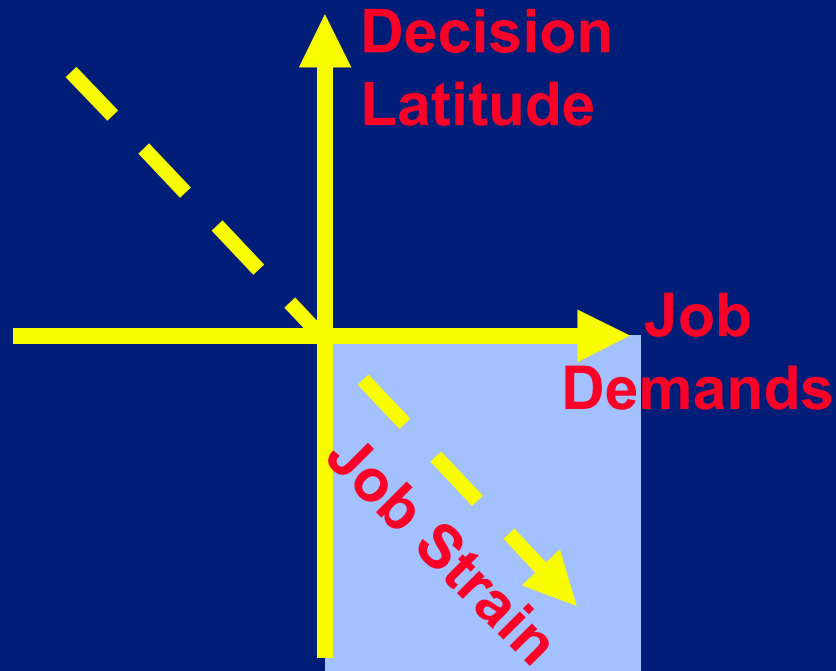
- Much remains to be done concerning an adequate conceptualization of the cumulative effects of effort-reward imbalance over time.
 - For instance, **older workers** may be unable to spend continuously high efforts on their job due to the fact that after years or **decades of exposure their resources are exhausted**. If this situation is not reflected in compensatory wage differentials the stressful effects of imbalance are expected to be much worse than those experienced by younger workers. (Matschinger, Siegrist, Siegrist & Dittmann 1986, Siegrist 1996).
- Finally, adverse health effects of effort-reward imbalance generated in social roles other than work (e.g. marriage, family, neighborhood, civic life) need to be explored to learn how they compensate or aggravate the afflictions produced by chronically stressful work conditions.

End Hour # 1



Job Strain (Karasek)

Definition: The combination of **HIGH Job Demands** and **LOW Decision Latitude**



Confounding of psychological and physical demands

Physical demands are not included although psychological arousal comes with physical exertion and it has been shown for some groups of workers that some of the responses to questions about "working hard" may include physical aspects of work (Josephson 1998).

Paradigm of “learned helplessness”

- **First used by Overmier, Seligman, and Maier to describe**
- **Unexpected behavior of dogs after being given inescapable shocks in learning situations.**
- **After conditioning when placed in shuttle box dogs failed to prevent or escape further shocks (unconditioned animals did escape)**

Limitations of concept of social support – Jeff Johnson

- Too much emphasis on individual transactions to satisfy emotional needs
- As result focus is on atomized individuals who receive support from others or personal social networks.
- Alternative, to view social support as a structural support for coping with demands of the environment.
- Collective control or “workers collectivity” arises in response to the excessive structural demands placed on workers.

Pell and d'Alonzo 1963

They used five job categories. MI incidence went from highest to lowest in this order:

- 1) foremen and clerical supervisors (salary level C)
- 2) clericals and lab techs (salary level D)
- 3) Production workers (wage roll)
- 4) Salesmen, administrators, professionals, researchers (salary level B)
- 5) Executives (salary level A)

The pattern was consistent within age groups.

Joint statement on the relationship between the two theoretical models measuring stress at work: the demand-control model (DC) and the effort-reward imbalance model (ERI)

At the conceptual level the most important differences and similarities are as follows:

1. In stress-theoretical terms, in the DC model, the range of control over one's environmental situation at work is the core dimension (control paradigm of stress). In the ERI model threats to or violations of legitimate rewards based on social reciprocity represent the core dimension (reward paradigm of stress).

2. In terms of outcomes, the DC model covers a broader range than the ERI model as it contains two types of outcome variables: a) health and well-being; b) active behavior/learning whereas the ERI model is restricted to health and well-being.

3. In the DC model an explicit focus is put on situational characteristics of the psychosocial work environment whereas in the ERI model, an explicit distinction is made, both at the conceptual and measurement level, between extrinsic (situational) and intrinsic (personal) characteristics. In the dynamic version of the DC model, personal and environmental factors are integrated in a time-dynamic manner. Personal characteristics in the ERI model are conceptualized in terms of a style of personal coping termed overcommitment. However, it should be noted that, in a career perspective, there is substantial interaction of work exposure experience and coping style, thus lending support to the particular importance of structural conditions.

4. Whereas both models address issues of the proximate psychosocial work environment more distant labor market conditions are considered as well. In the ERI model, two out of three dimensions of reward (money, esteem, career opportunities including job security) are closely linked to labor market conditions (income stagnation or income loss due to downward mobility or unemployment, blocked career/unavailability of alternative jobs etc.). While the DC model's major focus, as it has been traditionally measured, is on workplace characteristics, lifetime measures of job control allow for some inference of occupational mobility. It should also be mentioned that 'job insecurity' has been measured in the Job Content Questionnaire on which the DC model builds.

5. Both models have the potential of being extended beyond work life and of being integrated into a lifetime perspective. This is seen as one of the tasks of future research. In order to avoid confusion at the level of labeling constructs the following new labels are noted for the ERI model:

1. The label for the dimension termed 'occupational status control' is now replaced by 'security/career opportunities'.

2. The label for the dimension termed 'intrinsic effort' is now replaced by 'overcommitment'.

There is considerable overlap between the measures of demands in the two models. Yet, there is an important difference: whereas DC model concentrates on psychological demands, ERI includes physical demands in it's measure and, in some items, is concerned with total workload.

Concerning future research there is promise in studying the combined effects of the two models. Preliminary results suggest an additive effect on health outcomes, such as cardiovascular risk.

Finally, concerning policy implications, it is important to note that the social relational policy measures derived from both models go substantially beyond the simple, market-based cost/benefit approach that is dominating the current economy.

Copenhagen, 1998.08.21.

Robert Karasek, Johannes Siegrist, Tores Theorell

Typical occupations found in four quadrants of Karasek's job strain model (1969-1977 data)

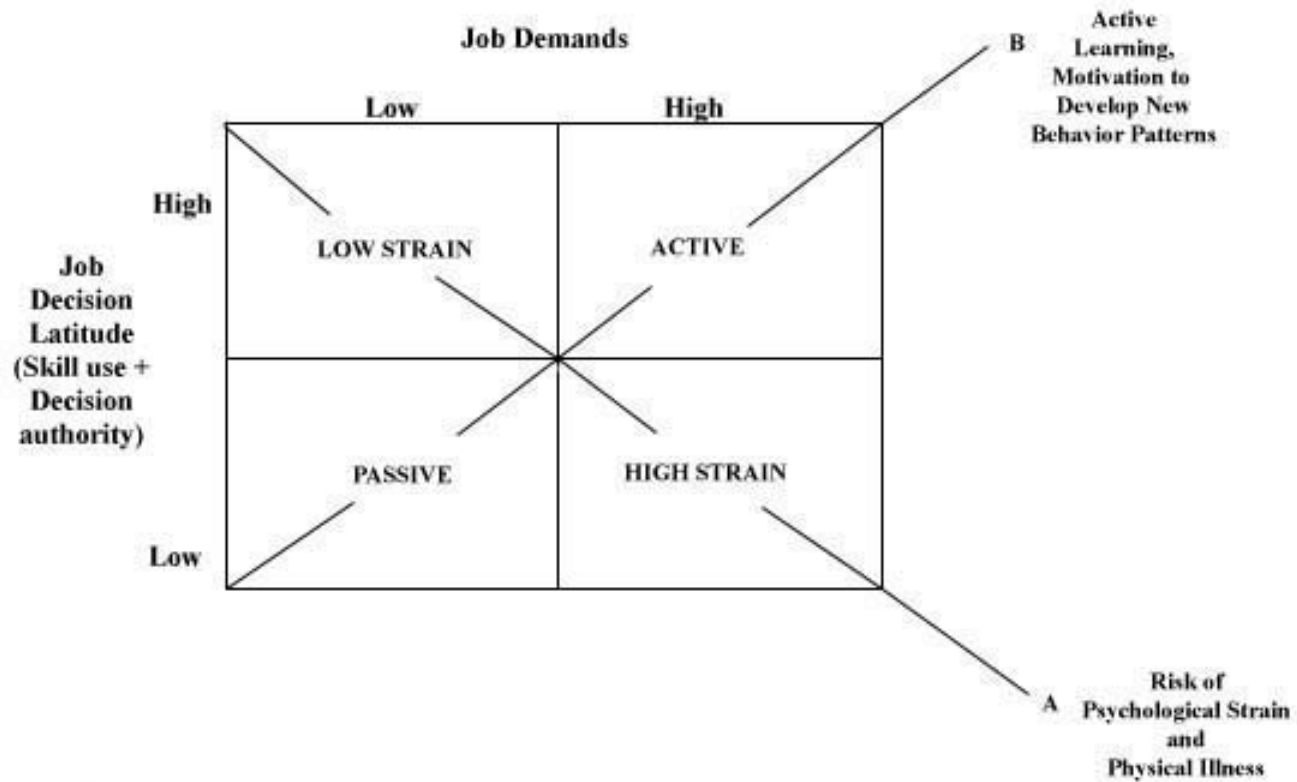
Psychological Job Demands

		Low	High
<i>Job Decision Latitude</i>	High	Forester Repairman Dentist Low Strain	Banker Physician HS teacher Active
	Low	Janitor Watchman Billing Clerk Passive	Assembler Waiter Nurse aide High Strain

The relationship of Occupations and psychosocial job characteristics

- The relationship between occupations and job characteristics has been described by means of national surveys for instance in Sweden and the U.S. Maps that have been published which illustrate the relative positions of different occupations in relation to decision latitude and psychological demands.
 - *Typical "active" jobs have been lawyers, judges, engineers, nurses and managers of all kinds.*
 - *Examples of "passive" jobs have been clerical workers such as stock and billing clerks, as well as service personnel such as janitors.*
 - *In the "job strain" groups typical occupations have been machine-paced operatives such as assemblers, inspectors and freight handlers as well as other service operatives such as waiters or cooks.*
 - *Examples of "low strain" jobs have been self-paced occupations such as repairmen, sales clerks, foresters, linemen and natural scientists.*

Karasek job strain model



Reference: Schnall PL, Landsbergis PA, Baker D.
Job Strain and Cardiovascular Disease. Annual Review of Public Health; 15:381-411, 1994

Likert Scale

- An ordinal scale of responses to a question or statement ordered in a hierarchical sequence such as from “strongly agree” through “no opinion” to “strongly disagree.”
- To avoid “acquiescence bias” some questions should be reversed scored

Hierarchical Corporate Models

- Weber (1922) argued for hierarchical bureaucracy as most efficient organization
- Human Relations School – emphasized importance of social interaction patterns, not just economic rewards or skill specialization in determining the actual productivity of work.