

**UCLA Work and Health**

**Session # 3**

**April 15<sup>th</sup> 2015**

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

**Marnie Dobson, Ph.D.**

# Participant Observation

## Discussion

1. Discuss with a partner, your experience observing a working person (2-3 minutes only).
2. Make note of the differences or **similarities** between the workers in “demands”, “work pace”, “job control”, and social support.
3. What person-specific stressors or job task-level stressors did you notice?
4. Discuss as a group

# 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?

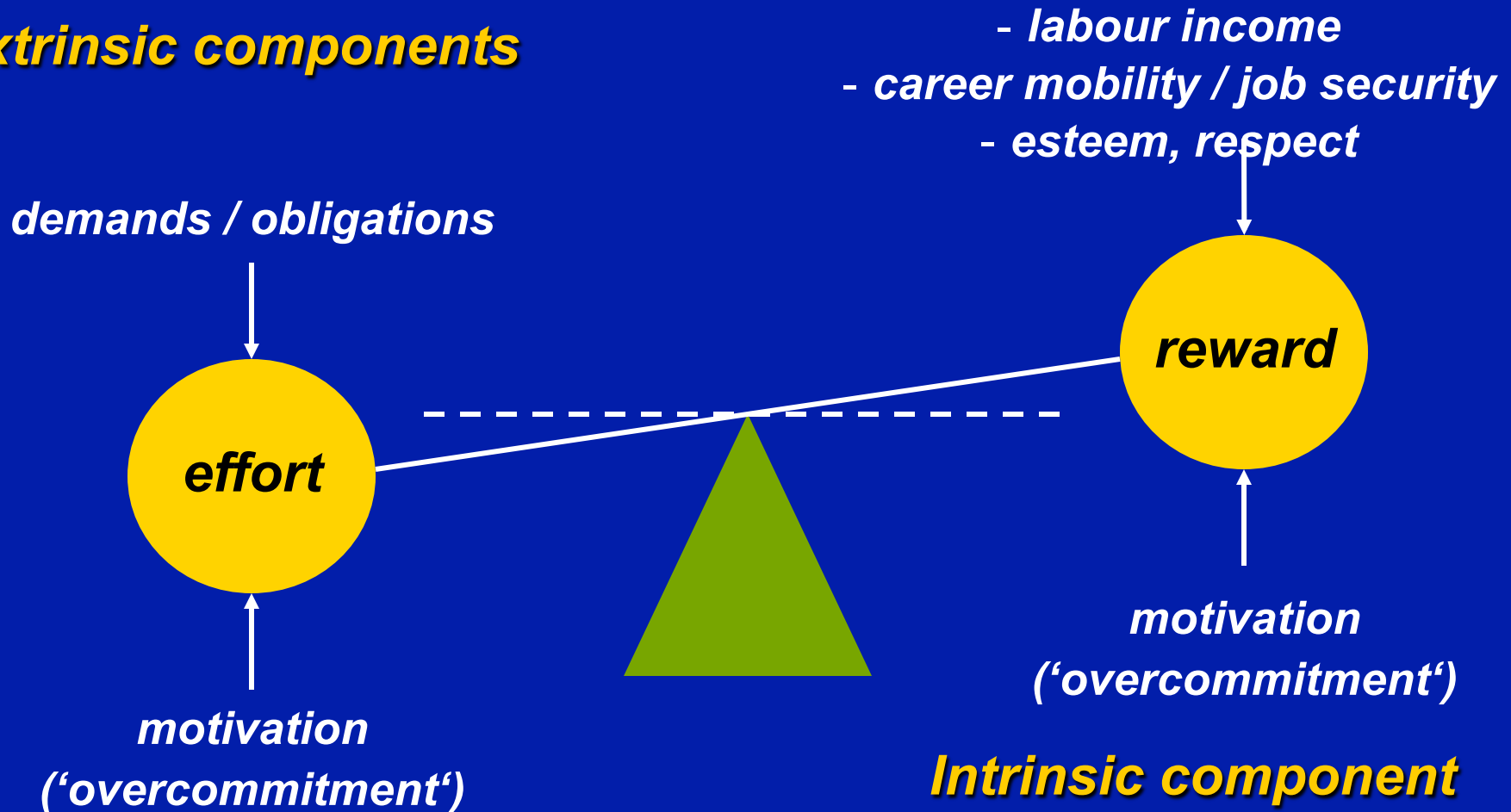
# **Theory and description of the Effort-Reward Imbalance model**

- **Social Exchange Theory**
- **Centrality of paid employment in adult life**
  - Acquire income, social status and social identity
  - Work role – links self-esteem, self-efficacy and the social opportunity structure
  - Occupational status – contributing/performing, rewarded or esteemed, belonging
- **Social reciprocity** – benefits contingent on exchange of effort which society rewards
- **Reward transmitters** – money, esteem, career opportunity/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.**

# The model of effort-reward imbalance (Johannes Siegrist, 1996)

## *Extrinsic components*



# 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?

- Expectancy value theory: workers likely to give up this state (high effort-low reward), reduce their efforts to minimize negative outcome.
- 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.**

# Discussion Question

- What else could the components of the intrinsic effort/overcommitment scale be measuring?
- Is it a personality (person-focused) variable or reflecting structural factors?

# 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.

# Discussion Question

- **‘Which dimensions are the most critical?’**

## **‘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).**



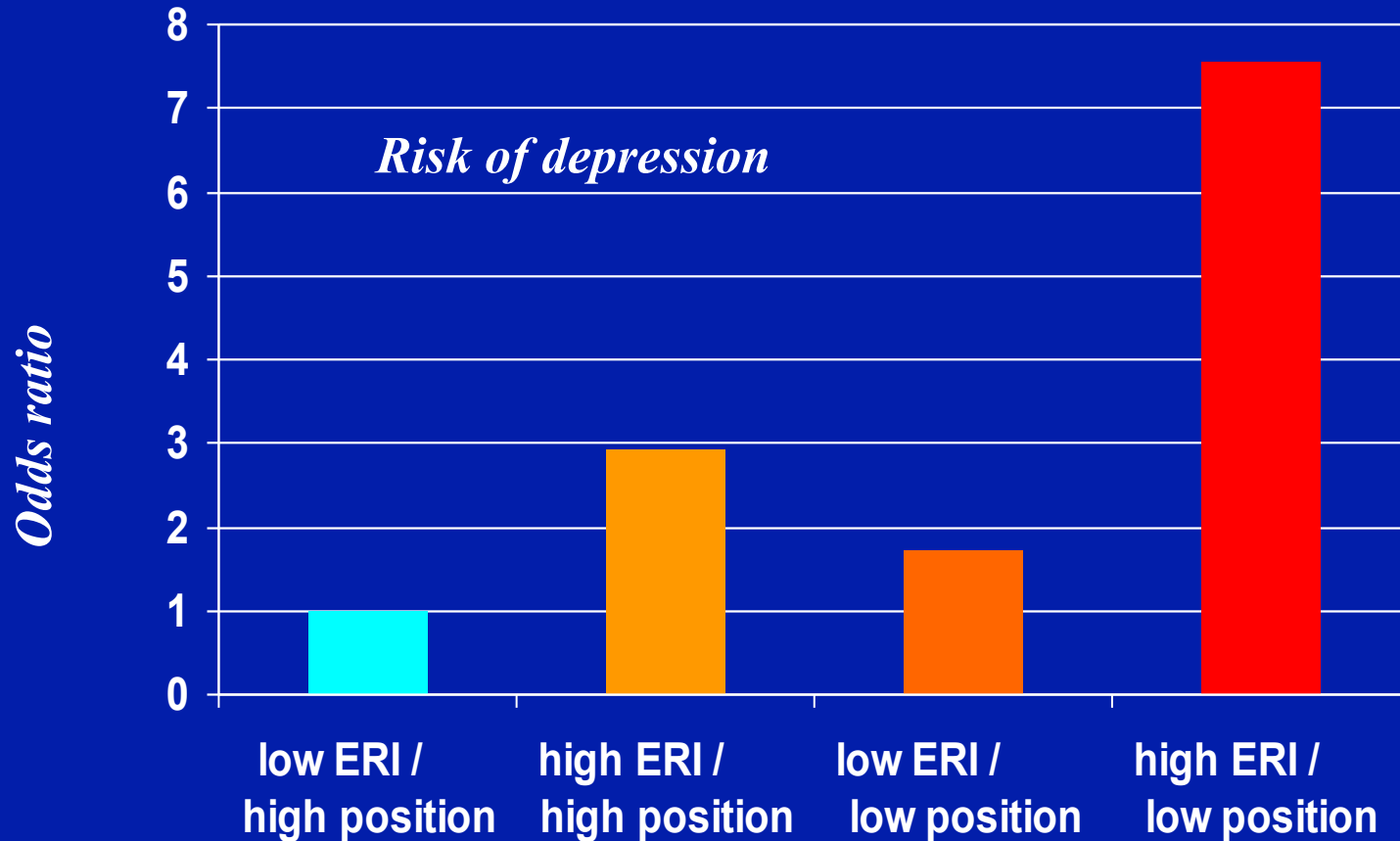
# What is the significance of the reward dimension

- 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.

# Discussion Question

- Do you think ERI is more or less prevalent among lower socio-economic groups – why?

# Effort-reward imbalance (ERI), occupational position and depression (HNR Study; baseline; N=1811 men and women aged 45-65)



*N. Wege, N. Dragano, J. Siegrist (2007), JECH (in press).*

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

- **Differences between the two models include**
  1. **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).
  2. **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.**
  3. **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.
  - **Broader sociological model of control (vs. Karasek's task-level control) AND individual personality component "need for control"**
  - **Adaptation to task control (job strain) less costly to adapt to than a low level of status control (ERI) because the former has fewer fundamental threats (e.g. employment security, low opportunities)**
  - **Differences have implications for intervention**
    - **DCS – changing task characteristics (work pace)**
    - **ERI – changing structural level (adequate compensation etc.)**
  - **Both theories offer different entry points for 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 JCQ.
- 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

- Break

# Measurement issues in the assessment of psychosocial stressors at work

Dr. Marnie Dobson

Session 3 – 2<sup>nd</sup> Hour

April 18 2012

# Reliability\*

The degree of stability exhibited when a measurement is repeated under identical conditions (replicability)

## Unreliability

Measurement error – due to observer or instrument variation, or instability of the attribute being measured

\*From LAST 4<sup>th</sup> Edition

# Validity

Construct – extent to which a measure corresponds to theoretical concepts (constructs) concerning phenomenon under study. (e.g., demands varies with work pace)

Content – extent incorporates domain of the phenomenon under study (JCQ control – how measured?)

Criterion – extent measure correlates with an external criteria (e.g, predictive - Job strain and BP, or concurrent – visual inspection of wound and “culture” etc.)

# Measurement of psychosocial stressors at work

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- Imputation of job characteristics scores
- Self-report questionnaires
- Expert-observer assessment



# Imputation of job characteristics scores

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- **A procedure for averaging self-reports across a job title**
  - Take a national database which contains job characteristics data for each job title
  - Average the scores for demands, authority, skill, support, etc., For everybody within the same job title
  - Assign your study subject (in the database you are interested in) the average score for their job title
- **Advantages**
  - More objective measure -- avoid criticisms due to self-reports
  - Use them in studies that contain job title, but not job characteristics
- **Limitations**
  - Loss of within-occupation variability
  - Lack of precision of means for small occupations
  - Generalize scores to other groups or time periods?

# 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 <b>Low Strain</b>	Banker Physician HS teacher <b>Active</b>
	Low	Janitor Watchman Billing Clerk <b>Passive</b>	Assembler Waiter Nurse aide <b>High Strain</b>

# Expert-observer assessment

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- **Primary techniques**

- examination of company records
- expert assessment w/o actual observation of workers
- supervisor or coworker assessments
- work site observations by trained observers

- **Advantages**

- helps to validate self-reports (e.g., job demands)
- if suspect “repressive coping” or “denial”
- in companies with a large number of similar work tasks
- gather detailed information for intervention studies

- **Limitations**

- time-consuming
- expensive

# SF Muni Bus Drivers

Job strain and BP – no relationship using self report questionnaires

Time constraints – determined by trained observer found + relationship between constraints and BP in same drivers. Greiner, etal. 2000, 2002 JOHP

# Self-report questionnaires

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- **Which aspects of work should be measured?**
  - Perceptions of stress at work
  - Interactions between personality and work environment
    - Type A behavior
  - Job (task) characteristics
    - Job demands
    - Job decision latitude or control
    - Social support
  - Higher-level influence
  - Organizational climate
    - Participation
    - Support
  - Hours, shifts, schedule
  - Systems of work organization
    - Lean production
    - Total Quality Management

# Self-report questionnaires

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- **Occupation-specific**
  - Developed for bus drivers, nurses, teachers, etc.
  - Provide rich detailed information especially useful for intervention efforts
- **Generic (global) measures of job characteristics**
  - Can compare job stressors across different occupations
  - Less useful for intervention studies
  - Essential for development of theories and testing hypotheses
- **New method which combines general and occupation-specific questions**
  - Occupational Stress Index (OSI)

# Self-report questionnaires

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- **Generic job characteristics questionnaires**
  - NIOSH – 20 scales, over 100 questions
  - Karasek's Job Content Questionnaire, based on U.S. Quality of Employment Surveys
  - Swedish Demand-Control questionnaires
  - Effort-Reward Imbalance (ERI) questionnaire
  - Whitehall study questionnaire
  - Danish version of Whitehall questionnaire

# Self-report questionnaires

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- Job stressors commonly measured in generic job characteristics questionnaires
  - Psychological demands
  - Skill discretion
  - Decision-making authority
  - Decision latitude (control)
  - Social support (supervisor or co-worker)
  - Job insecurity
  - Exposures to physical and chemical hazards



# Self-report questionnaires

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- **Advantages**

- Inexpensive
- Easy to administer
- When national occupational survey data is available, comparisons can be made between study participants and national averages of job characteristics by job title

# Self-report questionnaires

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- Limitations

- Possibility of self-report bias
- Difficulties due to low literacy levels
- Lack of translation of questions into the participants' native language or other problems of transcultural validation
- Others?

# Measurement of psychosocial stressors at work -- Recommendations

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- Self-report questionnaires
  - Supplement generic job stressor questionnaires with questions specific to the occupation(s) and target groups being studied
- Use multimethod strategies -- to achieve “convergent validation”
  - Self-report questionnaires
  - Imputation of job characteristics scores
  - Expert-observer assessment
  - Qualitative methods (interviews, focus groups)

# Hand out Practicum Packet

- Review the assignment