

**Work and organizational psychology**

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## Work and organizational psychology

**KEY CONCEPTS** • organizational socialization • training • selection • organizational structure • performance • stress and health at work • leadership and management • work and organizational design

### Chapter preview

When you have read this chapter, you should be able to

- understand some central work and organizational concepts, such as socialization, training, selection, stress, performance, leadership and work design
- understand the major theories and empirical findings in each area
- be able to critically evaluate the advances made in work and organizational psychology
- understand how practice and science are related in the area of work and organizational psychology

## Introduction

There are many reasons for studying work and organizational psychology. First, work and organizational psychology is useful. In my introductory class I often challenge students to name an important societal issue for which work and organizational psychology does not play any role. Usually, we find that work and organizational psychology is involved in nearly all issues ranging from distribution of income, railway or nuclear power plant accidents, environmental problems, the emergence of a leisure time society, to the issue of unemployment in the European Union. As most societal issues have implications for people working, work and organizational psychology has something useful to contribute.

Second, everything that one learns about work and organizational psychology can be applied in everyday life. For example, the section on performance may help you to study or work efficiently or you could analyse the bar tender in your favourite pub.

Third, a large number of psychologists are employed in this area. Approximately one-third of psychology students will eventually be employed as work and organizational psychologists. In the European Union, there are 30,000 work and organizational psychologists (de Wolff *et al.* 1991). The fastest growing sub-discipline of psychology in terms of both employment and student enrolment in nearly every European country is work and organizational psychology (de Wolff *et al.* 1991).

Fourth, psychology without work and organizational psychology is not complete. Work is composed of actions

that use tools systematically and is societally organized. Tools are broadly conceptualized to include not only physical tools (e.g. a hammer) but also mental ones (e.g. a theory). Work in this sense differentiates humans from animals (Dolgin 1985; Schurig 1985). While animals sometimes show instinctive or accidental tool use (e.g. bees or beavers), only humans develop tools systematically and teach tool use to their offspring. Our environment – houses, machines, streets, clothes, food – is a product of human work. Thus, not only do we apply psychology but also the category work needs to be studied in its own right as an area of psychology in general.

Fifth, people regard their work as important. The question 'Imagine that you won a lottery or inherited a large sum of money and could live comfortably for the rest of your life without working, would you continue to work?' is answered 'Yes' by an average of 86 per cent (the British were lowest with 55 per cent and former Yugoslavians were highest with 96 per cent affirmative answers) (MOW 1987: 348). Moreover, people suffer when work is taken away from them. The clearest evidence comes from unemployment research, which shows conclusively that unemployment leads to depression and other forms of ill-health (Frese 1987a; Frese and Mohr 1987; Warr *et al.* 1985; see also the case study).

Finally, there is the objective influence of work on people. Work usually comprises the largest proportion of adults' waking hours and thus influences people's values, ideas, attitudes, personality and actions (see next section).

## Case study

### Unemployment

Mr B. is a 56-year-old German plumber, who has been unemployed for 2 years. He describes his psychological state:

In the beginning, there was total despair, not really because of the material situation (I can live on 60 per cent of gross income that I receive as unemployment benefit). But from a psychological point of view... not to be useful any more, to be put on a dead end track, this just pulled me down.

He attempted to get work through various means but he would dread the question about his age and then hearing 'Sorry, you are too old for us'. He reports that he could deal with this for six months but then

he started to brood and became very depressed. As he describes it: 'Those who are insecure drink and smoke more, they get depressed and nothing is worth it; nothing is fun any longer, going for a walk, and not even sleeping.' He tried to do something about it: he took a French language course at evening school and he has regular times to walk with his dog, which give the days some structure. He describes his work:

Work was really fun; it was hard work, but I was needed. Sometimes, I worked for 14 and even 18 hours, at night, when I cleared a blocked pipe in an apartment house; the tenants were glad then, when I got everything in working order again.

Source: Frese and Mohr (1979)

What do work and organizational psychologists do? A study in Germany found these results that training, personnel selection and organizational development as well as personnel development were done most often (Methner 1990). In Europe, work and organizational psychologists are more frequently employed in industry in comparison to the USA. In the UK and France, work and organizational psychologists work frequently as human factors specialists; in the Netherlands many work and organizational psychologists work as consultants; in the USA a much larger proportion of work and organizational psychologists (36 per cent) are based in universities (Howard 1990).

There are three branches of work and organizational psychology (Roe 1995): work, organizational, and personnel psychology. Work psychology includes stress, training, job design, automation and software ergonomics, performance appraisal and performance improvement programmes, motivation and safety. Organizational psychology covers organizational development, group development and management consulting. Personnel psychology includes career counselling, test construction and selection (Greif and Bamberg, 1994; Katzell and Austin 1992; Roe *et al.* 1994; Wilpert 1995).

All these topics cannot be covered in one chapter. Therefore we shall concentrate on those issues that appear when you join an organization and when you work in an organization; maybe you also want to change it. Figure 20.1 describes all the topics. At first you enter the organization after you have been selected and you have selected the organization. Then you are socialized into the job and you are trained. These are the first three topics discussed in this chapter (but arranged in a slightly different order). Of course, you want to know how the organization looks like and want to be able to describe it – this is the next topic. You are supposed to perform in the organization and this may affect your well-being and stress levels. Thus, these are two further topics. Usually you will have a supervisor or manager. You might also want to change the organization; so does work and organizational psychology which is a science that intervenes so that working conditions and organizational functioning are improved. This is the final topic.

h l **Organizational socialization**

People enter different organizations at various stages of their lives. Students enter a university and graduates get

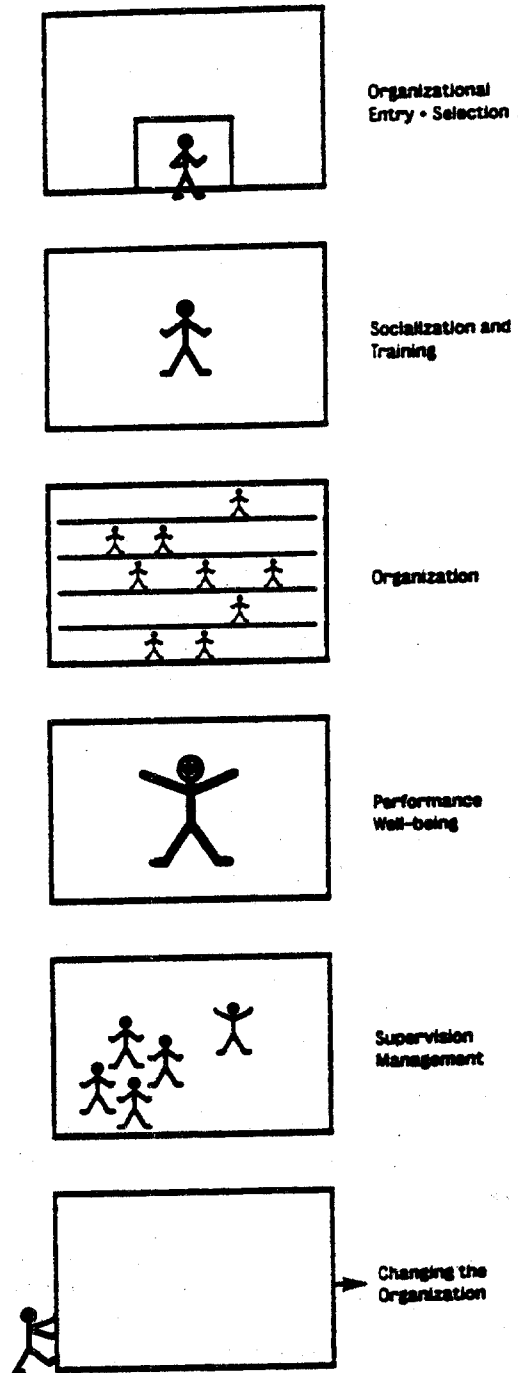


Figure 20.1 Stages in working for an organization

their first job in a company. On entry, the individual attempts to find a place in the organization and the organization changes the person. Why are organizations interested in socializing people? The main reason is that there are demands by the organization that individuals should comply with and issues that are important but which cannot be regulated. An example is customer orientation; it cannot be formalized easily because it changes its meaning from situation to situation. One solution is to select the right people but this does not assure customer orientation. Socialization produces a set of similar values, similar behaviours and similar ideas of customer orientation.

Three issues are discussed: phases of organizational socialization, impact of the job on the person, and strength and extent of socialization processes.

### Phases of organizational socialization

There are four phases of **organizational socialization**. First, in the phase of **anticipatory socialization**, people develop expectations about the job, e.g. when you develop ideas of what your first job will be like and perhaps you already practise behaviours needed then.

Second, **arriving and reality shock**: when entering the organization, one is usually disconcerted (Louis 1980). Wanous (1978) has suggested that companies can reduce reality shock by providing a **realistic job preview**. Most recruiters describe only favourable aspects of the job; a **realistic job preview** presents the negative aspects too (Wanous *et al.* 1992). This helps people to be more committed to the organization and to stay with the organization longer. These positive effects occur because a realistic job preview clarifies the work role, presents the company as honest and caring, and improves information for self-selection (Wanous 1978).

Third, in the period of settling in, people are getting used to how things are done. Everything appears 'natural'. Actually, the problem here is that people are too settled in their ways and do not like to participate in changes any longer. The long-term effects are the fourth phase of socialization.

### Impact of the job on the person

This issue is of theoretical importance. If people change because of the job, this shows the importance and strength of work as a developmental influence factor. Frese (1982) argued that socialization can have cognitive effects (e.g. intellectual flexibility), effects on activity

(e.g. leisure time activities), role taking and development of values (e.g. commitment) and emotional effects (e.g. stress effects, job satisfaction).

### Cognitive effects

Both psychologists and non-experts agree that intelligence does not change much and there is clear evidence that a large part of intelligence is genetically determined (compare the chapter on personality). If we can show that work changes intelligence, then work is important. Kohn and Schooler (1978) studied the relation between complexity at work and 'intellectual flexibility' in a ten-year period and found a substantial **reciprocal relationship**. Both socialization (impact of work on the person) and selection effects (impact of individuals on jobs) occur. That is, complexity at work leads to higher intellectual flexibility and lack of complexity to lower flexibility. In addition to the socialization, there is also the selection effect: higher intellectual flexible leads to more complexity at work; thus, intellectually flexibility people eventually find more complex jobs. The selection effect is stronger than socialization. Schallberger (1988) confirmed these results by using a traditional IQ measure.

### Effects on activity

Ulich and Ulich (1977) argued that there are the following potential relationships between work and leisure activities

- **Compensation**: people compensate for something in their leisure activities (e.g. they rest more to make up for hard work)
- **generalization or spill over**: work activities spill over into leisure activities (e.g. those socially more active at work are also more active outside work)
- **identity**: one does the same thing at work as one does for leisure (e.g. a farmer)
- **non-relationship**: work does not have anything to do with leisure activities.

Unfortunately, the empirical evidence is not good enough yet, although first results are interesting. Meissner (1971) argued for the generalization effect – the 'long arm of the job': people with social contacts at work also have more social contacts outside work. Getting more decision latitude in the job resulted in more active leisure-time activities (Karasek 1978). Kohn and Schooler (1982) found that lack of complexity and control in the job leads to higher fatalism.



### Role taking and development of values

One interesting finding is that occupational self-direction (being able to decide things at work by oneself and the complexity of work) is related to how authoritarian parents educate their children (Kohn and Schooler 1969). Since authoritarian education reduces children's activity levels, parents' occupation may influence the long-term likelihood of children being active copers.

Values are changed quite easily when a new job demands this. For example, rank-and-file workers who become foremen or forewomen readily change to a more management-oriented position (Lieberman 1956). People who start with a 'green' attitude and who support environmental protection and are against career orientation, become more career oriented (and less 'green') once they have a job in a company (Von Rosenstiel 1989).

Mortimer and Lorence (1979a) carried out a longitudinal study of the development of extrinsic (money, prestige), intrinsic (job content, autonomy, challenge) and social values (liking people). People usually want more of what they already have. People with high incomes would like to have more money, people with social jobs seek more social contacts, and people with high work autonomy want more challenges. People value those things that they are receiving in the job more and more. Thus, job selection and socialization feed upon each other.

### Emotional effects

These are quite important at work (Pekrun and Frese 1992); one part of it will be discussed in the section on stress at work.

### Strength and extent of socialization processes

Some organizations have strong socialization regimes that attempt to remodel the person. US Marines, religious groups, and fraternities are examples. Successful organizations have a stronger culture (Collins and Porras 1994) which means that they rely on internal promotion and continuing education, use collective and formal socialization strategies, have a mentor system, and sometimes even use debasement to break down individuals' self-pride to replace it by organizational pride (Van Maanen and Schein 1979). Many Japanese firms rely on such strong socialization strategies (see pp.000-0).

The goal of these strong socialization strategies is to ensure a higher degree of compliance and internalization

of values. While there is anecdotal evidence that these strategies work (and given that one of the oldest organizations – the Roman Catholic Church – uses them extensively, there is at least some relationship to longevity of the organization), we do not know much about how these strategies interact with personality and what short-term and long-term problems they produce. One drawback of strong socialization is that people lose an innovative and fresh approach and stop to attempt to change the organization.

### Ψ Section summary

Organizations attempt to influence people in the workplace. This may be done with an explicit design or be implicit strategies. People change with their work and their roles in an organization. However, there is also an interaction with selection effects: some people stay longer in a certain organization and in a certain job, while others leave or are never selected for this job in the first place

- 1 Think of how an organization that you belong to has influenced you (this may be the university, a sport association or an enterprise). Try to explain this by relating it to the concepts, theories and empirical findings of organizational socialization.

### Training

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### Importance of training and learning

A usual part of the socialization process is that the new-comer receives some training in the new organization. In principle, much of work and organizational psychology is to increase the fit between the person and the organization and the job. Socialization and training are two ways of increasing this fit. Training is defined as a learning process structured in a systematic fashion to raise the performance level of the employee. Contrast this to the education you are getting at the university which is more broad, longer and not so task specific. Training and learning on the job occurs, of course, not only at the start of a job but throughout the working life (and will be more and more important in the future). Training is big business. For example, German firms

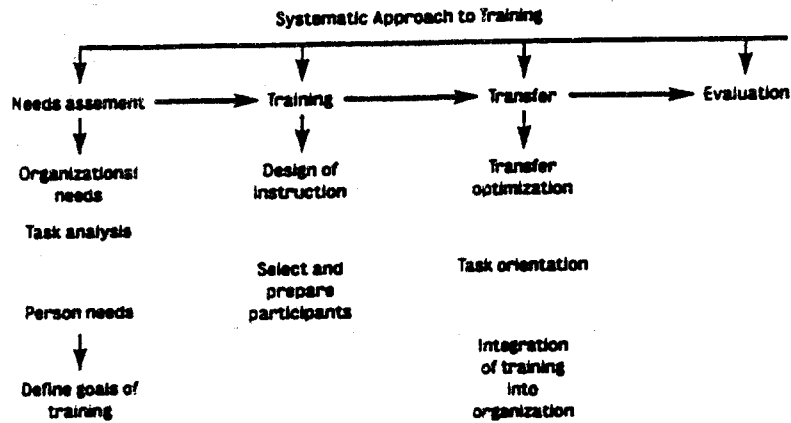


Figure 20.2 Training issues

spend about DM26.7 billion (c. US\$18 billion) per year on training and development of their personnel, which is more than the total expenditure for all German universities, for example (Weiss 1990). Training is also important for every student because some part of what he or she does in the university is training for future performance. Figure 20.2 gives an overview of issues that are important in training (see also Goldstein 1991; Hacker and Skell 1993; Patrick 1992; Stammers 1996).

### Training needs assessment

It is necessary to analyse in a **training needs assessment** the present and future tasks people do to know what people have to learn. In principle all the known methods of task and job analysis can be used: observation, questionnaires, key people consultation, interviews, group discussion, using records, and work samples (that is letting people perform a certain activity and checking what they need to know to perform well).

### The training plan: how to do training

European work and organizational psychologists have traditionally done quite a bit of work in this area, most notably from the UK (Patrick 1992) and from Germany (Hacker and Skell 1993; Semmer and Pfäfflin 1978; Volpert 1971). US work and organizational psychologists have also become interested in training (Tannenbaum and Yukl 1992).

There are, of course, many different training methods: on-the-job training, lectures, simulations, case studies, programmed instruction, to name only a few. Two influential ones are **behaviour modelling** and **action training**.

### Behaviour modelling

This combines role play and behaviour modelling (cf. Bandura's social cognitive theory: Bandura 1986). A model is presented on video or in real life and the special behaviours of this model and the rationale for the behaviour are discussed with the trainees. Then the trainees role play the behaviour, receiving feedback from the trainers and fellow trainees. This type of training has proved to be very effective (Burke and Day 1986; Tannenbaum and Yukl 1992). A typical example of behavioural modelling is a study by Latham and Saari (1979). An experimental group of foremen received nine sessions of two hours on various important topics (e.g. motivating poor performers, reducing absenteeism, overcoming resistance to change). A film was shown in each session to provide a model of a supervisor effectively handling the situation. Learning points (principles of good behaviour) were presented (e.g. avoid responding with hostility and defensiveness; ask for and listen openly to the employee's complaints). This was followed by role play, with one supervisor playing the supervisor and another one playing the employee. The trainer gave feedback so that people's confidence was

not undermined, by restating negative comments in a positive manner (e.g. 'encourage the hourly employee to talk', not 'you talk too much'). The supervisors of those trained foremen were encouraged to praise them if they showed the desired behaviour. The experimental group was significantly better in all measures of supervisory behaviours at work than the control group.

### Action training

Action training follows from action theory (Frese and Zapf 1994; Hacker and Skell 1993) and exploratory learning (Bruner 1966; Greif 1992; Greif and Keller 1990) and includes the following principles.

First, the trainees are supposed to take an active approach and are asked to learn while doing a task (e.g. through role playing). Various studies have found that exploration leads to better performance (E. Smith *et al.* 1997).

Second, people should get a good mental model of the tasks and how to approach it. A mental model is a representation of how something functions and how one can act in this area. The importance of having a good mental model is a prerequisite for effective actions (Gentner and Stevens 1983; Hacker 1992). One trainer developed an 'orientation poster' giving an overview of the hierarchical structure of a software program to be learnt (e.g. a word processing program) (Greif and Janikowski 1987). Another approach is to give heuristic rules (rules of thumb). These heuristics have been shown to be important in training (Voipert *et al.* 1984). A few examples by Skell (1972: 48) for training tool and dye maker apprentices (non-literal translation by the present author): 'Compare the drawing with the raw material. What do you have to do to achieve the changes demanded by the drawing?', 'Try to eliminate movements that are not necessary; you can do that by thinking about the following questions: can I do different types of actions with the material clamped the same way into the vice? Can I use the clamped item again?'

Third, actions lead not only to feedback but also to errors. Adequate and informative feedback and learning from errors are both emphasized. Feedback has to be given frequently in the beginning but less frequently later on so that people develop their own internal feedback process (Kluger and DeNisi 1996). Action training provides both positive and negative feedback in order to give full information to the trainee. This is in contrast to learning theory, which argues that there should be only positive feedback (Skinner 1968).

Fourth, the most extreme form of negative feedback is errors. Errors have a positive function for learning. Error training has been added to the action training approach. Error training has been experimentally researched by comparing one group that received ample opportunity for making errors (essentially by being given tasks too difficult to do) with another group that was given an instruction of how to go through these difficult tasks and therefore could not make any error. The error training group has consistently fared better (Dormann and Frese 1994; Frese *et al.* 1991; Greif 1992). Most of these trainings also presented general heuristics to produce a more positive attitude towards errors (e.g. 'I have made an error. Great!' 'There is always a way to leave the error situation': Frese *et al.* 1991: 83).

### Action training for negotiating skills

A typical action training for developing negotiating skills of shop stewards is described by Semmer and Pfälzlin (1978). Each trainer is responsible for five trainees. The trainers provide negative and positive models in a role play. The negative model is played first and is used to discuss with the trainees what mistakes and errors appear. From these mistakes, principles (heuristic rules) of good negotiating behaviour are developed with the trainees. Thereafter, a positive model is shown. Participants then practise these principles in a role play. At first, the trainers interrupt ongoing sequences to give immediate positive and negative feedback (the trainer always gives the positive feedback first so that the trainee's self-esteem is not reduced). The feedback is always explained in functional terms and related to a rudimentary theoretical understanding (mental model) of how a good negotiation looks like (e.g. 'If you say this, then the other person will just get upset, but you do not get what you want; so you should be more specific in your demands'). Initial feedback by the trainer is frequent, but later the other trainees provide more and more feedback.

### Transfer

Students know the problem of transfer very well and they often complain that their studies are not practical enough. This means that they assume that what they have learnt in the study cannot be used in one's work afterwards. The issue of transferring what has been learnt in the training to the tasks at work is a big problem in training in general. People are using only half of what





## Research update

### Self-management and learning vs performance goals

**Self-management** techniques were influenced by advances in clinical psychology (Kanfer and Kanfer 1991). Self-management implies that one acquires the skills to deal with difficulties, rewards oneself and increases self-efficacy (Frayne and Latham 1987). A typical study of self-management principles is by E.M. Smith *et al.* (1995), who studied metacognition (with statements like 'I noticed where I made the most mistakes during practice and focused on improving those areas') and self-efficacy (among other variables). They found that metacognition was related to training performance and to self-efficacy and self-efficacy related to transfer performance. Similarly, Martocchio (1994) found that computer efficacy increased knowledge after training. Thus, self-efficacy functions both as a predictor of training performance and as a predictor of transfer performance.

'Learning vs. performance goals' is used to explain differences in how people conceptualize their ability (Dweck and Leggett 1988). It is argued that some people conceptualize their ability as something that grows with learning (**learning orientation**), while others see it as something fixed (**performance orientation**). People with a learning orientation learn from mistakes and challenges. However, if people are performance oriented, a mistake is an example of poor performance and challenges make it unlikely that they succeed. Thus, performance oriented people will be helpless more often and learn less. Martocchio (1994) has manipulated the ability conceptualization (mistake is a reminder that you should work more effectively, versus a mistake is just normal in training) and found that it relates to both computer anxiety and self-efficacy after the training (however, it was not related to knowledge).

they have learnt in their job (J.K. Ford *et al.* 1992) and personal and organizational characteristics make it less likely to use new skills in practice (Tziner *et al.* 1991). The challenge for work and organizational psychologists is to bridge the transfer gap. Three general factors are important: first, the similarity of training to work tasks; second, the motivation to use the newly learnt behaviour at work; and third, organizational issues.

### Task examples

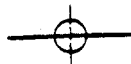
Task examples should be used in the training process. The theory of **identical elements** (Thorndike 1906) explains that there should be identical elements in the behaviours trained and in the behaviours required at work. However, a trainer may also go too far. If one teaches only the bare minimum of necessary skills, people are not prepared for future tasks that change quite frequently and that often turn out to be more complex than thought originally. People also need some knowledge of the overall context in which tasks are situated (for example, people who do not deal directly with customers outside the organization should know how their work contributes to the finished products for the customers).

### Transfer knowledge

Von Papstein and Frese (1988) have suggested that training should increase **transfer knowledge**, which conveys the knowledge acquired in training to the task situation. Transfer knowledge was shown to mediate between performance at the end of the training and the amount of time the knowledge was used six months later (von Papstein and Frese 1988). Transfer knowledge is increased if trainees are asked to think of examples on how they can use what they have learnt.

### Motivation

Motivation is of particular importance in transfer (Baldwin and Ford 1988; Noe 1986). Numerous issues of motivation have been studied, the most important ones being self-efficacy, relapse prevention, pay-off perceived by the trainee, goals and training or transfer contract. **Self-efficacy** has been shown to be important for transfer. People will use a skill only if they have the expectation that they can actually perform the appropriate behaviour (Tziner *et al.* 1991). **Relapse prevention** focuses on teaching solutions to those situations in which it may prove difficult to use the newly learnt skills (R.D. Marx 1982). Trainees who



received a relapse prevention training used their skills more often and were doing their job better (Tziner *et al.* 1991). Trainees develop expectations whether or not it will pay off when they use what they have learnt in training. Often, companies teach one thing and reward a completely different behaviour. For example, trainees learn to be co-operative in a training course, but then they are paid for their individual contribution in a highly competitive environment. In such situations there is no transfer.

A **transfer contract** stipulates when and where the skills learnt in training will be used in practice. Sometimes positive or negative reinforcers will be incorporated (e.g. having to give a high amount of money to the political party that one abhors most in case one does not use the skills within a certain time).

### Organizational issues

Organizational issues have been largely ignored in transfer research but are also important (Kozlowski and Salas 1977). We already alluded to the pay-off situation at work. Another factor is the amount of supervisor support that is given to transfer skills learnt in training. Practice niches and task-oriented advice have been suggested in the human computer literature (Frese and Brodbeck 1989). Since people rarely learn a skill well enough in the training situation, there will always be a need to practise the skill (e.g. a new computer program) under favourable circumstances. As an example for a **practice niche**: a bank clerk learnt a new program to calculate mortgages, and practised it first while answering written requests. Thus, the customer does not see all the mistakes the bank clerk makes when using the new program.

### Evaluation of the training

A training needs to be evaluated otherwise, it can at worst have negative consequences. Moreover, only precise data on how well the training works can lead to improvements. In practice, evaluations are done infrequently, partly because it is inherently difficult to evaluate a training programme and partly because training departments are anxious that negative or null-effects may lead to negative consequences for them. A discussion of **training evaluation** principles is given by Goldstein (1991).

### Ψ Section summary

Training works via assessment of training needs, the training design, transfer and evaluation. Two useful and partly overlapping training designs are behaviour modelling and action training. The issue of how to improve transfer from training into doing the tasks at work is particularly important and difficult to do.

- 1 Think of a wordprocessing system that you use and develop a training programme for this system. Use different training procedures and think of psychological reasons for each step in your training programme.

### Selection

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Selection is a widespread phenomena. People select their friends, lovers and spouses, groups select their members, and companies select their employees. Of course, to be a member of an organization you have to select one you want to be a member of and the organization has to select you. There are several reasons for paying a lot of attention to selection: the person ought to fit into the organization to be able to work well. One way to increase this fit is to get the 'right' person. Moreover, selecting a 'wrong' person is costly both for the person and for the company. An individual who has trouble doing a job well or who does not fit into a company suffers from this experience. Hunter and Hunter (1984) have calculated that the federal government could save US\$15.6 billion per year when using a high validity selection procedure (cognitive ability) in comparison to a random procedure. The savings are still US\$11.6 billion if it uses a high as compared to a low validity test (an example of a low validity test is an unstandardized interview). Finally, people need to get the feeling that they are treated fairly in the selection procedure; discrimination and nepotism should be reduced by an objective selection procedure.

It is sometimes surprising for lay people that any selection instrument is called a psychological test by psychologists. Thus, if someone who gazes deeply into another person's eyes is using a psychological test (even

though the validity of this test is zero); when personnel managers say a few words and get 'a good (or bad) impression' of somebody, they are using a psychological test (again, one with very poor validity).

Different selection procedures are used in different countries. In the European Union interviews are preferred in nearly every country (cf. overview of Levy-Leboeuf 1994). Cognitive (intelligence) and personality tests are not used in Germany but frequently in France, Belgium and the UK. References by the former employee are used in the UK and Belgium but not in Germany and France. Structured interviews are more frequently used in Germany. German firms use assessment centres more frequently, sometimes even for the selection of blue-collar workers. In France and Belgium, there is a higher reliance on graphology. It is unfortunate that graphology is still used because this technique has been shown to be not valid (Rafaeli and Klimoski 1983: 212). Sometimes, graphologists may have a certain hit rate because the handwritten material is autobiographical but *only* because of the autobiographical content (Ben-Shakhar *et al.* 1986: 645).

Whether or not the tests used are good is an important competitive factor, particularly in Europe, which does not have the hire-and-fire mentality of other areas of the world and, therefore, has to be more careful in the selection process.

### Test criteria: reliability and validity

All testing instruments can be judged on whether they show a reliability and validity. **Reliability** means that the same results are obtained every time and that there is little measurement error. An example of an unreliable measure is to use a rubber band to measure head size. Since it is elastic, it is not reliable. Each time it is used, there is a different result. **Validity** is whether the test actually measures what it is required to measure.

#### Reliability

Suppose you want to develop a measure of psychological energy level. How do you know that you have a reliable scale? Obviously, one answer is that you get the same result every time you use the same measure. This is called **test-retest reliability**.

Another reliability measure is to correlate **parallel tests**. Thus, you use two tests which measure the same thing. An easier way to get two tests is to assemble a large number of items and use alternate items for the first and

the second test. The correlation between these two tests is then your reliability (corrected for the length of the test, because longer tests are more reliable).

The most frequently used measure of reliability is **internal consistency** or Cronbach's Alpha (Cronbach 1951) which is based on the intercorrelations of the items. This is really just a variant of a parallel test, but now every item is taken as a sort of parallel test.

Why should more than one question be used? Psychological energy cannot be directly ascertained. It manifests itself in different situations. Therefore, several questions need to be asked to encompass the full concept of energy level. Moreover, every question carries some truth and some error in it. Errors appear, because individuals may not understand a particular question; they may be unattentive for a short period; they may think of an example when answering a particular question that is not representative of their real energy level (Guion 1965). Errors that appear when answering one item are not necessarily the same ones when answering another item. Thus, the more items there are in a test, the more the errors cancel each other out and the more accurate is the test.

Reliabilities of 0.70 are usually considered necessary to use a test for a study of group differences. However, when making an individual selection decision (taking one person instead of another one), reliabilities of 0.90 and higher are required (Nunnally 1978).

#### Validity

Even perfect reliability does not ensure validity. If you want to measure the weight of a person but you use a metre rule, you have an instrument that has perfect reliability (for measuring height) but low validity to measure weight. Of course, nobody would do that. However, in psychology we often do not know precisely how to measure a theoretical concept.

Some personnel officers regard the firmness of a handshake as a measure of how energetic a person is. It is necessary to be 'theoretical' here: sometimes it may be possible to infer the energy level of a person from a handshake. But one observation (a one-item test) is never enough. Moreover, people can be trained to give a firm handshake; this is just a superficial motoric response which can be easily changed.

#### Construct validity

Arguments like this are related to the **construct validity** of a test (Cronbach and Meehl 1955).



Construct validation means to derive hypotheses from a theory and to establish empirically that a test behaves in the hypothesized way. One may, for example, argue that high energy people work long hours. Thus, people who score highly on your newly developed energy tests should work longer than people with low scores. Obviously, there are many other potential hypotheses and they have to be tested similarly. One is never finished with construct validation. As Guion (1965: 128) explained: 'Construct validity must be expressed as a judgment, inferred from the weight of research evidence gathered in many independent studies.'

**Content validity**

**Content validity** means that a sample of test items is drawn from a universe of items that make up the whole construct; this implies that one has to have a good idea of what belongs to this construct and what does not belong to it. Therefore, one must know the construct and its boundaries well.

**Criterion validity**

**Criterion validity** measures the relationship of the test with a criterion. Often, some measure of productivity is taken as a criterion. Productivity is measured by supervisors' assessments, output measures (e.g. number of sales made by insurance people), money earned, career advances, grades in training courses (Landy and Farr 1980). It is not easy to decide on an appropriate criterion. Output would be a good criterion; however, it is not always in the hands of the workers to determine the output (e.g. when machines can run only at a certain maximum speed). Thus, we have to make theoretical (or at least plausible) judgements, whether or not we accept something as a good criterion for a certain test.

**Validity generalization**

Traditionally, work psychologists have suggested redoing validity studies in each company and with each group of workers (e.g. blue-collar vs white-collar employees, different races). Schmidt and Hunter (1981) argued that this procedure is unnecessary because one can make **validity generalizations** from one context to the next one. They showed that differences between companies and different groups of employees were mostly due to methodological reasons (e.g. number of subjects, reduced variance, reliability of the criteria) and not to real differences in the validity data.

**Intelligence tests, personality tests, assessment centres, and interviews**

**Intelligence tests**

**Intelligence tests** are frequently used in the Anglo-American world and have been shown to have good correlations with performance criteria. Hunter and Hunter (1984) argued that one of the best predictors of good performance is general intelligence and that this is a good predictor across most jobs with the exception of very simple jobs. They found that the average corrected correlation is 0.53 between cognitive abilities and performance in various jobs (Table 20.1). This correlation is higher with training performance than with performance in the job (after all, intelligence measures how well one learns). Other meta-analyses report smaller average correlations, for example Schmitt *et al.* (1984) reported an uncorrected correlation of 0.25 (Table 20.1). A major reason for these differences is that Hunter and Hunter (1984) used correction formulas (Hunter and Hirsh 1987), while Schmitt *et al.* (1984) did not.

**Personality tests**

**Personality tests** show much lower correlations to performance (Table 20.1). Nevertheless, there has been a revival of interest in personality tests. One reason for this relates to new theoretical developments of the performance construct. Motowidlo and Van Scotter (1994)

Table 20.1 Meta-analytic validity coefficients of various selection procedures

Selection procedures	Corrected mean validity coefficient
Unstructured interview <sup>(a)</sup>	0.20
Unstructured interview by board <sup>(a)</sup>	0.37
Structured interview <sup>(a)</sup>	0.56
Cognitive ability (e.g. IQ tests) <sup>(a)</sup>	0.53
Cognitive ability <sup>(a)</sup>	0.25
Personality <sup>(a)</sup>	0.15
Work sample <sup>(a)</sup>	0.41
Assessment centre <sup>(a)</sup>	0.43

Source: (a) Wiesner and Cronshaw (1988) (b) Huffcutt and Arthur (1994) (c) Hunter and Hunter (1984) (d) Schmitt *et al.* (1984: here coefficients are lower because they are not corrected)



### Research update

#### Social validity of tests

Schuler (1993) studied the selection process from the applicant's perspective. This led to the concept of **social validity**: is the selection procedure accepted by the applicants? Social validity is influenced by four factors: information, participation, transparency and feedback to the applicants. Information on why certain areas are

covered should be given. One of the reasons why assessment centres are preferred in Germany (in spite of their expense) is that they are more accepted than other tests. Despite their low validity, interviews are also accepted more than IQ and personality tests because applicants believe they have more control in the interview. Privacy and fairness are important issues here.

have shown that supervisors actually have two concepts in mind when they think of good performance – task performance and contextual performance (see pp.000–0). Task performance is doing the tasks well. Contextual performance means that people help each other and the company by doing extraordinary things, by following organizational rules and procedures (Borman and Motowidlo 1993). Contextual performance is a bit better predicted by personality measures than by ability (Van Scotter and Motowidlo 1996).

a much better validity than one (Wiesner and Cronshaw 1988; see also Table 20.1) – or by structuring questions and answers (Huffcutt and Arthur 1994). Structuring involves asking the same questions in all interviews and standardizing the scoring of the answers.

#### Assessment centres

Work samples as precursors were developed in Germany (Giese 1924) and the UK and were later applied as **assessment centres** in the USA (Bray *et al.* 1974). An assessment centre looks at people's behaviour when they do tasks thought to be important in their jobs. An example is the leaderless group discussion in which leadership ability, co-operative behaviour and problem-solving skills are observed. One advantage of an assessment centre is that potential supervisors are included in the selection procedure, after they have been trained in observational skills. Assessment centres have good validities (Table 20.1). They attempt to measure job-relevant behaviour directly. Assessment centre results are highly correlated with intelligence, social competence, achievement motivation, dominance and self-confidence (Scholz and Schuler 1993).

### Ψ Section summary

All selection decisions are based on some kind of test. Tests developed by psychologists usually have a higher reliability and validity. Most selection decisions are based on unstructured interviews which have a poor validity; however, they can be improved by having two interviewers or by structuring the questions and developing a coding key for the answers. Assessment centres and intelligence test are also valid selection procedures

- 1 Develop a few items for a test that measures knowledge in work and organisational psychology. Note some of the difficult decisions you have to make to develop these items.
- 2 Give these items to a few friends. Observe them and have them think aloud while they work through the items.

#### Interviews

The most frequently used selection test is the interview. Unfortunately, the unstandardized interview by one interviewer is a poor psychological test. The validity of interviews can be improved relatively easily, by increasing the number of interviewers – two interviewers show

### Organizational structure

ch4

A person entering an organization is confronted with a certain organization. Socialization, training and selection function to increase the fit between the individual on the one hand and work and the organization on the



other hand. To understand the other side of the fit, we need to examine the **organizational structure** in more detail.

People cannot help being involved in organizations. Students are members of a department, of a university, of some student organization, a state and a recreational association. You probably belong to many more organizations than you think. You should find that you can describe the organization better with the following analysis in mind.

### Descriptive dimensions and structure of organizations

When comparing the organizational features of, say, a local sport association and a company, some descriptive dimensions are needed in order to carry out this comparison. Pugh and colleagues (1968) differentiated:

- specialization: the degree of division of labour
- standardization and formalization: the degree to which work is proceduralized and written up
- centralization: the degree to which decisions are made at the top
- configuration: how the organization is structured in terms of organizational charts, with line and staff positions, etc.

Mentally compare a local sport association with a company you know well. You may notice that there are systematic configurations. Your sport association might be a chaotic organization that is mainly dependent upon one leader; if the leader should leave, the association might fall apart (here, specialization and standardization are low, centralization is very high, configuration is simple); the company might be bureaucratic (specialization and standardization are high, centralization might be medium, configuration is complex, with many clearly defined chains of command that one is not allowed to circumvent).

### Five types of organizations

An influential configurational approach (Mintzberg 1979) distinguished five types of organizations.

#### *Simple structure*

In young, entrepreneurial organizations, simple structures prevail. The owner may be authoritarian. Communication is informal and goes across all levels. The sport association discussed above has such a simple structure.

#### *Machine bureaucracy*

This is the kind of bureaucratic organization with a high degree of specialization, many routine tasks, formalized procedures, many regulations, low flexibility, and relatively centralized power structure. 'Attempts are made to eliminate all possible uncertainty, so that the bureaucratic machine can run smoothly, without interruption' (Mintzberg 1979: 320). The machine bureaucracy is usually found in mature organizations; a mass production assembly line is a good example.

#### *Professional bureaucracy*

Professionals have internalized standards (e.g. in nursing or medicine). They use fixed procedures but the adherence to them is the result of training and socialization and not of external forces as in the machine bureaucracy. Such structures are often decentralized. The university is a good example of a professional bureaucracy. Usually, its structure is inflexible and it is hard to change procedures that are deeply engrained in the profession.

#### *Divisionalized form*

It 'relies on the market basis for grouping units' (Mintzberg 1979: 381). Many large corporations have divisionalized forms that work independently of each other and that are supposed to react better to market forces. Each division may be rather bureaucratic in itself; however, the divisions overall are not governed bureaucratically; usually the divisions are left to their devices as long as the output (profit) is above a certain standard.

#### *Adhocracy*

This has little formalization. Adhocracies are often created within larger organizations to make it possible to innovate.

### Ideal types

Mintzberg's theory not only describes different types of organization but also posits ideal types: organizations that are more similar to the ideal type should be more effective than organizations that misapply a certain type. So, for example, a young organization working in a dynamic environment should be better off if it uses a simple structure than if it relies on a bureaucratic structure. Unfortunately, the empirical evidence speaks against this hypothesis (Doty *et al.* 1993).

### Four types of strategies

A better fit with the data appears for the Miles and Snow (1978) organizational typology, which differentiates four

types of strategies to adapt to the environment: the prospector, the analyser, the defender, and the reactor.

#### *Prospector*

The prospector adapts to environmental turbulence by scanning the environment for opportunities. Whenever a good market opportunity arises, the prospector quickly takes the chance and develops an appropriate product. To be able to do this, the prospector should have a low level of specialization and formalization and a high degree of decentralization. An example is Richard Branson, whose many business interests include an airline (Virgin Airline), a music shop and a railway company.

#### *Defender*

'The most notable feature of the Defender's product-market domain is its narrowness and stability' (Miles and Snow 1978:37). In stable environments, the defender focuses on efficiency, economy of scale, and a mechanistic orientation, leading to bureaucratization.

#### *Analysier*

The analyser is in the middle between prospector and defender and has elements of both approaches. The analyser locates and exploits 'new product and market opportunities while simultaneously maintaining a firm base of traditional products and customers' (Miles and Snow 1978: 78). Mass production and product innovation is combined.

#### *Reactor*

Finally, there is the reactor, a company that does not have any stability, lacks a clear strategy and therefore reacts only to turbulences in the environment. According to Miles and Snow (1978), this type is not successful, while the three others can all be successful. The empirical support for this theory is quite good (Doty *et al.* 1993; Zahra and Pearce 1990).

### Organizational factors leading to success

Companies are naturally interested in knowing which organizational factors lead to success. Therefore, there have been many attempts to look at such factors. One of the most interesting ones has been by Collins and Porras (1994) who compared so-called 'visionary' companies with not so visionary ones (e.g. Hewlett-Packard vs Texas Instruments or General Electric vs Westinghouse). Visionary companies had a strong core ideology, they were driving for progress and they were organizational visionaries.

Examples of core ideologies were technical contributions in the case of Hewlett-Packard. A strong ideology most clearly showed up when these companies were taking heavy losses to defend their core ideology. Moreover, they created very strong cultures which would sometimes repel people ('love it or leave it'). For example, Nordstrom (a visionary company) made sure that every employee started on the sales floor rather than as a manager. The core ideology is also preserved by recruiting top management from within the company.

The drive for progress is accomplished by developing very high goals ('big hairy audacious goals') and a purposeful evolution by trying things out and keeping what works; there is continuous self-improvement and more long-term investments in equipment, in people, and in research and development.

The visionary companies are called clock builders; they were able to develop new organizational solutions; for example, General Electric was the first one to build a systematic Research and Development Unit. The visionary companies had organizational visions that facilitated continuous development even when the founders died or left the company.

These are interesting results; however, there are obvious weaknesses of these kinds of studies (in the case of Collins and Porras the authors know this). The visionary companies were nominated by other managers. Obviously, they selected successful ones. But what about those companies that used the same strategies and died along the way? They might have used the same 'risky' strategies but were just not lucky. Moreover, could it be that some of the assumed causes are just side-products of a high degree of success?

Organizational theorists have become rather sceptical of one-dimensional explanations. People have argued too long for organizational solutions that fit all purposes and environments. Probably a much better answer is: success depends on the environment; this is discussed next.

### The contingency approach: organization-environment interactions

The contingency approach argues that there is no such thing as an organizational design that is always successful. Rather, there has to be a good fit of the organization to the technology used, to environmental conditions, and to the state of the life cycle that the organization is in.

Woodward (1958) was the first one to point out that British firms had different organizations depending upon their manufacturing technology. Three production

systems were differentiated: unit production (which produced only small batches of specialty products, e.g. locomotives), mass production (which manufactured large batches of the same product, e.g. cars on an assembly line) and process production (in which a continuous process would exist, e.g. in a chemical firm). Different technologies were associated with different organizational features. In process control and small batch production, supervisors had fewer people to supervise than in mass production. The number of levels and the proportion of highly qualified employees increased with level of technology (and was highest in process control). Moreover, the better the fit between the technology and the structure, the better was the performance of the firm.

Three environmental issues are important:

- Simple-complex: is it an environment that is easy to understand or not?
- Stable-dynamic: how high is the volatility of the market, how much turbulence is there, and can one predict how the market will develop?
- Munificence (generosity)-hostility: is it an easy environment to work in, did the company develop a niche product that 'sells itself' or is it a highly hostile market with many competitors?

These dimensions are often related. For example, the airplane market is complex, unstable and hostile, while the foodstuff market is much less complex and more stable, and usually also less hostile. Some representative results are that a complex environment necessitates a more decentralized structure (Mintzberg 1979). The more dynamic the environment is, the better it is to have a non-bureaucratic and decentralized structure (Burns and Stalker 1961). Finally, the more hostile the environment is, the more organizations tend to centralize their structure (Mintzberg 1979). A good example is trade unions, who had to operate in adversarial environments and became quite centralized.

### Organizational culture

Organizations develop certain cultures. They manifest themselves in values and beliefs, in symbols and rituals, in certain habits, and in taking certain things for granted.

One practical implication of organizational culture is that it is not easy to 'marry' two organizations. Indeed, mergers and acquisitions often do not work out because the different cultures do not get along (Cartwright and Cooper 1990). A further problem is

that people make implicit assumptions of how things are to be done in a company. Again, this leads to conflicts and difficulties when new people enter such an organization. Cultures have a tenacity that goes beyond rationality; thus, it is quite difficult to change a deeply embedded culture in an organization.

Not every culture has the same strength; in some cultures there is a high degree of consensus among the members of the organization, in others there is not. The assumption is that a strong culture will have a stronger influence on the individuals in terms of organizational socialization (Payne 1996)

### Ψ Section summary

While there have been many attempts to describe the one best organizational design, this may in vain, because success comes about only in the interaction with the environment - the contingency theory of organizations. Organizational culture is a new area of research which looks at what distinguishes one organizational from the next one and describes which aspects of the organization are taken for granted by its members.

- 1 How could Ford in the early part of the twentieth century with his strict hierarchical organization and his assembly line actually produce more efficiently than other organizations of his times?

### □ Performance

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### The concept of performance and its differentiations

When working in an organization, one has to show some kind of performance. Usually some kind of standard of excellence is applied here. Raising performance is one of the goals of work and organizational psychology (the others are to increase health and to foster the development of employee's personality).

Performance is sometimes used to signify the outcome of behaviour (e.g. 'X has shown high performance') and sometimes it refers to the action itself. Performance is probably better defined as an action that is relevant to the organization's goals and carries a cer-



tain standard of excellence (Campbell *et al.* 1993: 40). Since we equate performance and actions, this section is based on a theory of action (Austin and Vancouver 1996; Frese and Zapf 1994; Hacker 1986).

Actions at work are oriented towards two domains: one is the task domain and the other is the social domain. As already discussed (p. 000), it has significantly advanced our understanding of performance to differentiate between task and contextual performance (Borman and Motowidlo 1993). Task performance is the more obvious aspect of performance – work is defined by having a certain task to do. The task is usually given to the worker or a group of workers.

The following are issues of contextual performance (Borman and Motowidlo, 1993):

- upholding the smooth functioning of the organization through conscientiousness and compliance; this is sometimes also called organizational citizenship behaviour (Organ, 1988)
- making the social situation conducive to effective task performance; altruism – another factor of organizational citizenship behaviour – is important here
- keeping up and servicing the technical and production equipment; this implies that production methods have to be continually improved, etc.
- keeping up human production capabilities; of particular importance is participation in continuing education
- supporting and defending organizational objectives.

Contextual performance is not usually written into a work contract. Thus, people show contextual performance without formal demands; this implies that some degree of personal initiative is shown by the employee. Personal initiative is defined as a behaviour syndrome resulting in an individual's taking a self-starting, proactive, and persistent approach to work that goes beyond the job description (Frese *et al.* 1996). Initiative is related to problem-focused coping and to getting a job more easily if someone was unemployed before; small-scale entrepreneurs exhibit a higher degree of initiative (Frese 1997) and it is related to objective job effectiveness (Crant 1995).

### Analysis of performance

In the following we present an action theory account of performance. Think for a moment of your own performance as a student or an employee. Most certainly, you will recognize that some things you know how to do and you do not have to pay much attention to them; other

tasks are more difficult to do and you have to concentrate very strongly. This will be discussed as a hierarchical structure of levels of regulation. Moreover, it also makes sense that you develop goals, check and make sense of the environment, that you have a certain plan of action and that you pay close attention to the results of your actions. They will be discussed under the heading of action process.

### Action process

The following steps can be minimally differentiated in the action process: goal-setting, orientation, plan development, monitoring of the execution, and feedback (Dörner and Schaub 1994; Frese and Zapf 1994).

#### Goal-setting

A goal is an 'internally represented desired state' (Austin and Vancouver 1996: 361). Goals can be developed from within the person or through external tasks. An example of the former is wanting to do an assignment particularly well (sometimes the term 'intrinsic goal' is used here). At work, people are usually assigned external tasks. However, we do not usually take over organizationally prescribed goals completely; there is a translation process which actually changes the goals, sometimes quite subtly, sometimes quite strongly – this is the redefinition process (Hacker 1986; Hackman 1970; Staw and Boettger 1990).

Goals have a motivating function. One of the best practices of motivation is to give specific and high goals to people, which leads to higher performance than 'do your best' or easier goals (Locke and Latham 1990).

Goals change; the driving forces for such changes can again be internal as well as external. External reasons are task changes (e.g. because of market or job changes). Internal reasons may be that one wants to increase goal difficulty so that enough challenges are present (McClelland 1987; White 1959).

#### Orientation

Extensive orientation and the development of an adequate problem representation is often observed in expert task performance. For example, Klemp and McClelland (1986) described 'diagnostic information seeking' as a central characteristic of high performing managers.

#### Plan development

Plans (or action programmes) are not to be confused with their everyday meaning. Plans comprise everything from an elaborate blueprint, a general idea, to an

automatized schema (or frame) for walking (G.A. Miller *et al.* 1960). Gollwitzer (1993) has shown that combining goals (he calls them intentions) with a concrete anticipatory plan (e.g. specifying when and where one will start the action) leads to a much higher goal implementation rate than when one has just a goal but without the appropriate specific plan. Think how often you actually wanted to do something but did not do it. If you had then decided on a specific plan of action, the likelihood of putting the goal to work would have been increased.

There is evidence that high performers plan their actions to a greater extent than average or low performers (Dörner *et al.* 1983; Early *et al.* 1987; Klemp and McClelland 1986). However, more important than single acts of planning are general strategies. Hacker (1986) differentiated between a momentary and a planning strategy (see also Frese and Zapf 1994). The planning strategy can be characterized as a proactive strategy based on a long-term goal-hierarchy. The planning strategy includes preventive actions and active search for task-relevant information. In contrast, the momentary strategy is characterized by mainly reacting to ongoing processes. Research summarized by Hacker (1992) shows that high performers in manufacturing tasks use a planning strategy more often; however, high performers do not necessarily plan everything out in detail but they do some sort of localized planning (Sonnentag 1997).

#### *Monitoring of the Execution*

The concept of plan already implies execution: it is the bridge between cognition and action (G.A. Miller *et al.* 1960). Nevertheless, plans are sometimes in a sort of waiting line; therefore, we differentiate a phase called executing. Monitoring of the execution draws heavily on working memory; therefore, omission errors appear here easily, particularly when there are interruptions to one's work.

#### *Feedback*

Without feedback individuals would not know where they stand with regard to a goal (Erez 1977; Locke and Latham 1990; G.A. Miller *et al.* 1960). On the other hand, feedback may also divert attention from the task, actually producing negative learning effects (Kluger and DeNisi 1996). An important issue is, whether or not feedback triggers self-relevant thoughts that divert from the task (Kluger and DeNisi 1996; Kuhl 1992).

Some important parameters with regard to feedback are the degree of realism vs self-serving interpretations

(Dörner and Schaub 1994) and reactions to the social content of feedback vs performance content (e.g. losing face instead of learning from criticism).

Feedback processing was found to be essential for superior performance. There is evidence from some studies that high performers engage more in feedback processing (Dörner *et al.* 1983) and seek more negative feedback (Ashford and Tsui 1991).

#### **Hierarchical structure of action: regulation levels**

Table 20.2 explains how these steps are related to the levels of regulation levels. Only the concept of hierarchy can explain that a higher level goal (e.g. writing a thesis) actually regulates (affects) lower level behaviours (e.g. typing the word 'behaviour', or using the appropriate muscles to strike a key) (Carver and Scheier 1982; Miller *et al.* 1960). The higher levels are conscious, thought oriented and more general, the lower levels are automatic, specific and involve muscle movements. There are three levels of regulation of task-oriented actions and one metacognitive level.

#### *Skill level of regulation*

This lowest level of regulation has been variously called skill level (Rasmussen 1982), sensory-motor level of regulation (Hacker 1986), psychomotor (Ackerman 1988) and procedural knowledge (Anderson 1983). It is the lowest level of regulation with highly specific automatized skills, usually involving some motor components. Information on this level is parallel, rapid, effortless, and without apparent limitations. However, it is difficult to modify automaticity of action at this level. In order to change these programmes, they have to be lifted to a higher level of regulation, so that some conscious form of (effortful) processing can be applied. An example is to change a certain technique in a sport; usually it is not easy to change it and use a somewhat different technique.

#### *Flexible action patterns*

Well-trained schematic action patterns (Norman 1981) dominate here. These ready-made action programmes are available in memory but must be flexibly adjusted to situationally defined parameters. Perceptual processes of action signals are important (Ackerman 1988; Hacker 1986). Rasmussen (1982) uses the concept of rule-based regulation for this level.

Table 20.2 A model of levels of regulation

Levels of Action regulation	Skill level	Level of flexible action pattern	Conscious level	Heuristic level
Consciousness of regulation	Unconscious; normally no access to consciousness	Access to consciousness possible, but not necessary	Conscious representation necessary	Both conscious and automatic use of heuristics
Goals	Automatic goals	Sub-goals	Goals	Standard meta- and life goals
Action programmes	Blueprints of elementary movement patterns and cognitive routines	Well-known patterns with situations specifications	Conscious complex plans, strategies	Metaplans, heuristics
Feedback/signals	Stereotype test programmes, unconscious processing of kinaesthetic and proprioceptive feedback signals	Processing of known signals/ feedback	Analysis and synthesis of new information	Abstract (non-object-oriented) checks logical inconsistencies

Sources adapted from Hacker (1986), Frese and Zapf (1994)

### Conscious level

This level is concerned with conscious regulation of goal-oriented behaviour. It has been variously called knowledge based (Rasmussen 1982), declarative knowledge (Anderson 1983), controlled (Shiffrin and Schneider 1977), cognitive (Ackerman 1992), intellectual level (Frese and Zapf 1994; Hacker 1986). Conscious processing implies effort (Kahneman 1973), it is slow, it is constrained by limited resources of the central (conscious working memory) processor (Baddeley 1986), and works in a serial mode. Thus, when working on this level, it is slow, difficult and often not really elegant. Just think about training for the first time to ski down a hill.

### Metacognitive heuristics

People have some knowledge about how they use their thoughts and strategies (knowledge on cognitive regulation: A.L. Brown 1987). People know how much they will be able to learn and what kinds of strategies they use (Gleitman 1985; Weinert and Kluwe 1987). Further, people have general heuristics, of how they plan, set goals, and process feedback (Frese *et al.* 1987). We assume that these general heuristics can be either conscious or automatic (A.L. Brown 1987; Flavell 1987) and they may be highly generalized or specific. The highest level – the meta-level – is usually not implicated

when we receive an outside task and when the task solution is known. This is one reason why we typically do not think about our life goals in our everyday activities. The meta-level will be consulted, however, when things go wrong or when the situation is new. Therefore, when one moves or when one separates from a love, one thinks of one's life goals more generally.

### Automaticity and the levels of regulation

It is not only sensory-motor acts that can be and are routinized and thus become automatic, but also our thoughts and metacognitive strategies. Mental skills may be automatized as well. This also applies to the use of theories. For example, somebody raised in the tradition of the psychoanalytic theory will automatically think about the importance of sexual development of clients when he or she is confronted with a practical problem. This is one reason why theories have a life of their own and it is difficult (and effortful) to change them (even if one becomes convinced that the theory is wrong). The automatic use of the theory gives an impulse to ask certain questions and not other ones, for example in therapy.

Evidence for the differentiation of levels of regulation comes primarily from training studies. Ackerman (1988) has shown that intelligence predicts performance better in the beginning of the training process

(when processing is done consciously), perceptual speed is a good predictor in the middle (when processing is on the level of flexible action patterns) and psychomotor predictors are good at the end of the training (when the task is handled routinely).

### Relationship between upper and lower level processing

Routines are developed when the environment is redundant and when satisfactory results can be achieved with the routine. Whenever possible, people prefer to regulate their actions on the lower levels because processing on this level is less effortful and the action is smoother. It leaves the higher levels of regulation free from the constraints of the working memory; it also allows people to do other things, for example, while walking one can be delighted about nature's beauty or daydream about one's future.

However, routines can also have negative effects. Keeping routines makes people conservative. This goes for thought routines (e.g. using a certain theory and keeping this theory even when there are actually better alternatives available) as well as for sensory-motor routines (e.g. a certain way to ski or to do one's banking although more efficient alternatives are available). Performance problems ensue, particularly when continuous improvement is necessary, when innovations have to be speedily implemented (e.g. 'not invented here syndrome'), or when team composition is changed quickly (e.g. in project work). In all these cases, there is a tendency to keep conservative routines going even against a certain amount of environmental pressure. On the other hand, routines may also lead to boredom because the higher levels of regulation are underoccupied.

Actions are regulated on a higher level when barriers, opportunities for new goals, or environmental pressures appear.

- Barriers are, for example, errors or problems that are difficult to solve, or a no-go situation. The consequence of moving up the level of regulation is that one is able to think consciously about the problem. This is frustrating because one's plan of action is interrupted (Mandler 1964) but it can also lead to new learning (Frese 1995).
- Opportunities for new goals may appear, if these opportunities are important given a certain latent action tendency or current concern (e.g. when some one cleans the kitchen and notices that a cupboard is not in order and rearranges the contents as well). In

such a case the person may focus consciously on the task and decide whether to finish it or to use the opportunity as a trigger of new actions.

- Environmental pressures may be direct pressures by the environment to process something on a higher level. An example is a training situation, in which people are asked to think consciously about how they are doing things.

Most probably, there is some kind of self-reflection when processing one's actions on a higher level. One positive side-effect of this higher level of self-reflection may be a higher innovation rate (West *et al.* 1997).

On the other hand, problems appear when moving up the level of regulation: overload of processing capacity, lower degree of elegance, and sometimes a disruption of the smoothness of actions. Overload is the direct result of having more things to do on the upper levels of regulation (Kahneman 1973). Especially frustrating is the lower degree of performance elegance and smoothness when people are asked to control consciously a routinized action (Kimble and Perlmutter 1970).

### Performance appraisal

Whenever we talk about people, we also make judgements of their performance, for example after watching a ballet (it was excellent) or after a dinner (there was incompetent service). **Performance appraisal** is usually a bit more systematic and is often fed back to the employee in an appraisal interview. Grades serve as performance appraisals for students.

The following are important issues of performance appraisal: developing good criteria, appraisal errors, strategies to overcome these errors via training and ratings scales, and the relationships of performance appraisal with performance.

### Criterion development for performance appraisal

Performance appraisals should be based on objective and observable criteria, which are related to those results that are under the control of the person to be appraised; the criteria should also be representative to the job. It is difficult to achieve all of these. For example, the output of an automatic tool and dye machine operator can be measured quite objectively. However, this output is not under the control of the worker, who is dependent upon the programmer, the quality requirements, the repair people, the prior shift, the condition

of the machine, etc. All these factors contribute to higher or lower output. If one uses the criterion of how diligently the worker works, there are problems with observability, particularly when the managers have to supervise many workers.

### Errors in performance appraisal

Social cognition research has shown that we make errors when judging other people. These errors are related to rater and ratee characteristics, different rating procedures (more on this later), the amount of training received by the rater, the type of job, and other background variables (Landy and Farr 1980). The most important appraisal errors are the following:

- The **halo effect** implies that the manager generalizes from one positive or negative characteristic to other ones, e.g. an intelligent person is also seen to be more conscientious (Pulakos *et al.* 1986). Thus, different dimensions of the rating tend to be lumped together.
- The **leniency/severity error** means that some people tend to be generally more positive while others tend to give more negative ratings. On the whole, leniency errors are more frequent.
- **Central tendency errors** means that raters only use the midpoints of a scale, rather than the extremes (Guion 1965).
- The **similar-to-me-error** (Wexley and Yukl 1977) occurs when managers judge their workers better when they use similar work methods or when their personality characteristics are similar to them.

### Training for performance appraisal

Four different training concepts have been used to increase appraisal accuracy (Woehr and Huffcutt 1994).

- In **rater error training**, the managers are taught the above errors and told to reduce them. There is some controversy over whether this training is useful (summarized by Woehr and Huffcutt 1994).
- In **performance dimension training**, the raters are taught the performance dimensions in detail, how to keep them apart and how to operationalize them (D.E. Smith 1986).
- In a **frame-of-reference training**, the trainees are taught to keep the dimensions apart, to discuss and practise on samples of behavioural incidents for each dimension. Thus, common evaluative standards are trained.

- **Behavioural observation training** distinguishes sharply between observation and evaluation of behaviour. Raters are taught how to observe behaviour and to use appropriate records (note taking, diary, etc.) and not to fall into the trap of immediately judging the ratee.

The frame-of-reference and the behavioural observation trainings generally showed the best effects (Woehr and Huffcutt, 1994).

### Rating scales to improve appraisal

Several different rating procedures have been developed for performance appraisal. In general, the more behaviourally oriented the rating scales are, the better, for example, the Behaviourally Anchored Rating Scale (BARS) (P.C. Smith and Kendall 1963) and Behavioural Observation Scale (BOS) (Latham and Wexley 1977). Two items of an behavioural observation scale to measure a manager's ability to overcome resistance to change are 'Describes the details of the change to subordinates' and 'Asks the employee for help in making the change work' (Latham and Wexley 1981: 56).

### Performance appraisal and performance

It has been assumed up to this point that performance appraisal interviews always have positive consequences on subsequent performance. However, doubts have been raised about this presupposition. Kluger and DeNisi (1996: 254) found little evidence in their **meta-analysis** that feedback interventions (feedback given in addition to the task, as in an appraisal interview) had generally positive effects on performance. The majority of their studies were experimental; thus one cannot generalize from these findings to all appraisal systems. However, these results cast some doubt on the naïve assumption common to most psychological theorizing in this area. Kluger and DeNisi (1996) have provided a comprehensive theory of feedback intervention. Important for our discussion is the fact that whenever the self-system gets involved, feedback can even have negative consequences on performance. You might think that this is true only for negative feedback. If you are told that your class paper is really inferior, you may be less motivated later on. However, this is also true for positive feedback, e.g. getting the feedback that you have done a marvellous job with your paper. Your attention is then diverted to the self and away from the task; you are thinking about yourself, about how great you are, and so on.

Thus, performance appraisal systems are far from trivial and have many inherent problems that need to be taken into account before they can produce positive performance effects.

### Action errors: the opposite of good performance?

Action errors are discussed here for three reasons: first, they are often seen as the opposite of good performance. If individuals perform well, they should not make any errors. Second, errors are intrinsically fascinating, partly because they are so frequent. Most probably, you do not even realize how many errors you have made today. Third, errors are the 'building blocks' of positive and negative events in the workplace: errors may lead not only to negative events like accidents and low quality, but also to positive events, such as learning and exploration.

### Definition of errors

Errors imply the non-attainment of a goal and they should have been potentially avoidable (Frese and Zapf 1994; Reason 1990). Errors and violations have to be differentiated, the latter being a conscious behaviour against some norm. Errors should also be differentiated from faults (e.g. product or machine faults). Since machines do not have goals, they cannot make errors. However, there faults may be the result of a designer error.

### Concept of error management

Usually, people try to prevent errors from occurring. However, recently, I have become convinced that it is as important to think of **error management**. This term should be distinguished from **error handling**. Error handling is a descriptive term and implies any type of response towards an error, while error management is prescriptive. Error management means that error handling is supported with the goals of avoiding negative error consequences, of dealing quickly with error consequences once they occur, and of learning from an error to reduce the future occurrence of this type of error. The issues of error management will now be explained.

#### Avoiding negative error consequences

One prerequisite of the concept of error management is the differentiation between the error itself and the negative error consequences. People do not break an

arm every time they trip over. Tripping is the error, the negative error consequence is to break an arm. The concept of error management argues that the negative error consequences have to be avoided, not the error *per se*. Figure 20.3 explains the differences between error prevention and error management. The strategy of error prevention attempts to reduce the number of faulty actions. Thus, a barrier is erected to prevent a faulty action occurring. The error management strategy is not concerned with a specific error but attempts to erect a barrier between the error and the potential negative error consequences. Learning how to fall over without breaking an arm would be an error management approach (as is routinely done when learning a sport like judo).

#### Dealing quickly with the negative error consequences once they occur

This aspect of error management works from the assumption that errors have more negative consequences if the person does not detect errors immediately and/or does not correct the error consequences quickly. This is so particularly in dynamic systems, for example organizations which deal with a competitive market (Dörner 1989).

#### Learning from an error to reduce the future occurrence of this type of error

Error prevention strategies attempt to prevent errors. The concept of error management is much more sceptical about the viability of such an approach. More likely than not, errors will appear anyhow. However, individuals should not repeat the errors that they have made. Therefore, error management implies that people should learn as much as possible from their errors.

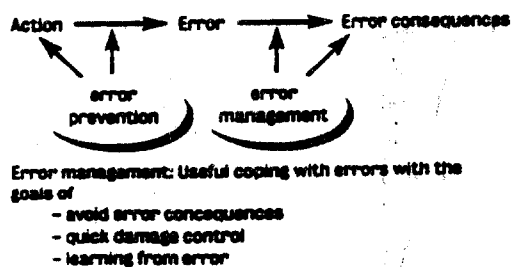


Figure 20.3 Error prevention and error management

### Errors and organizational learning

Error training was discussed in the section on training, where it was shown that errors can lead to learning. Prerequisites to learn from errors are that people get good error feedback, are not too upset about an error, and are able to explore (Frese 1995). These principles can also be used in organizational learning. Therefore, a positive or negative error culture will determine organizational learning to some extent. Organizations that are strong on error prevention and sanction errors negatively will probably have the following problems:

- A reduced anticipation of errors: people assume that errors will not really appear but if so, that other people or subsystems will find the error and deal with the error consequences.
- Losing one's ability to cope with errors: if error prevention works, actions to cope with errors are rehearsed less frequently and are, therefore, not available when really needed.
- Errors are not accepted: this leads to concealing errors, less communication about errors and, therefore, less individual and collective learning from them.

### Errors and accidents

Up to this point, we have talked about ridding the error concept of some of its negative connotations. Thus, errors may lead to exploration, opportunities to learn and eventually to higher performance. But errors are, of course, also related to accidents and negative events such as inferior quality of products. A good case is the Three Mile Incident that nearly led to disaster (see Reason's account of it in the case study).

Figure 20.4 explains how an accident may occur (Maurino *et al.* 1995). There are organizational processes that lead to working conditions and to defences and barriers against accidents. An active error occurs when there are local conditions (triggers) that mismatch with the working conditions and with the procedures. Usually, there are also organizationally produced latent errors when an accident occurs (because otherwise the safeguards prevent an accident even if there individuals make errors). Therefore, organizational defences should be strengthened to avoid accidents. Thus, errors may lead to accidents, but we should remember that an organization that attempts to minimize errors may have its own problems because it is too much focused on error prevention.

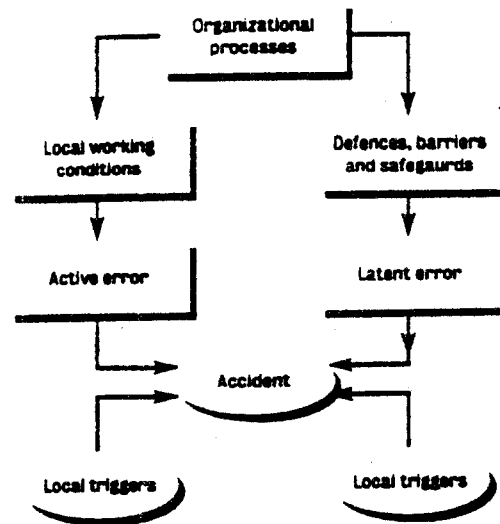


Figure 20.4 How errors lead to accidents  
Source: adapted from Maurino *et al.* (1995: 24)

### Ψ Section summary

Performance and well-being are the two most important criteria of psychological interventions at the workplace. Performance falls into two parts: task and contextual performance. Performance can be analysed according to the action process and the levels of regulation. Performance appraisal is the systematic appraisal of employees. Action errors are not just to be seen as negative events, although they can also lead to accidents.

- 1 Analyse a fellow student's high or low performance in a study task (You can also observe a bar tender and analyse this performance in the same way, if you prefer.) Ask yourself where the student (or bar tender) is high or low in performance and in which way, how the person works on the task, what errors he or she makes, and so on.
- 2 Think of an error that has happened to you; how can you analyse the error and in which way did you respond? How could have error prevention and error management been supported?

**Case study****Three Mile Island****Chain of events and active errors**

Maintenance crew introduces water into the instrument air system.

Turbine tripped. Feedwater pumps shut down. Emergency feedwater pumps come on automatically, but flow blocked by two closed valves.

Rapid rise in core temperature and pressure, causing the reactor to trip. Relief valve (PORV) opens automatically, but then sticks in the open position. The scene is now set for a loss of coolant accident (LOCA) 13 seconds into the emergency.

Operators fail to recognise that the relief valve is stuck open. Primary cooling system now has hole in it which radio-active water, under high pressure pours into the containment area, and thence down into basement.

Operators failed to diagnose struck-open PORV for more than 2 hours. The resulting water loss caused significant damage to the reactor.

The crew cut back the high-pressure injection (HPI) of the water into the reactor coolant system, thus reducing the net flow rate from around 1000 gallons/min to about 25 gallons/min. This 'throttling' caused serious core damage.

Source: Reason (1990: 251)

**Contributing conditions and latent failures**

Although this error had occurred on two previous occasions, the operating company had not taken steps to prevent its recurrence. (*Management failure*)

The two block valves had been erroneously left in the closed position during maintenance, probably carried out two days prior to the accident sequences. One of the warning lights showing that valves were closed was obscured by a maintenance tag. (*Maintenance failures*)

During an incident at the Davis-Besse plant (another Babcock & Wilcox PWR) in September 1977, the PORV also struck open. The incident was investigated by Babcock & Wilcox and the US Nuclear Regulatory Commission. However, these analyses were not collated, and the information obtained regarding appropriate operator action was not communicated to the industry at large. (*Regulatory failure*)

- 1 Operators were misled by control panel indications. Following an incident 1 year earlier, an indicator light had been installed. But this merely showed whether or not the valve had been commanded shut: it did not directly reveal valve status. (*Design and management failure*)
  - 2 Operators wrongly assumed that high temperatures at the PORV drain pipe was due to a chronically leaking valve. The pipe temperature normally registered high. (*Management/procedural failure*)
- 1 The control panel was poorly designed with hundreds of alarms that were not organised in a logical fashion. Many key indications were sited on the back wall of the control room. More than 100 alarms were activated with no means of suppressing unimportant ones. Several instruments went off-scale, and the computer printer ran more than 2 hours behind events. (*Design and management failures*)
  - 2 Operator training, consisting largely of lectures and work in the reactor simulator, providing an inadequate basis for coping with real emergencies. Little feedback given to students, and training (*Training and management failures*)
- 1 Training emphasised the dangers of flooding the core. But this took no account of the possibility of a concurrent LOCA. (*Training and management failures*)
  - 2 Following the 1977 Davis-Besse incident, the Nuclear Regulatory Commission issued a publication that made no mention of the fact that these operators had interrupted the HPI. The incident appeared under the heading of 'valve malfunction' not 'operator error'. (*Regulatory failure*)



## 7 Stress and Health

### Stress

In an organization you have to perform but this may lead to stress. Work is interesting because it can contribute not only to well-being (consider the fact that depressed unemployed become well again, when they find a job) but also to ill-health. Work and organizational psychologists have, therefore, attempted to understand the issue of stress better.

Stress at work is a major factor contributing to ill-health, to human suffering, and to productivity loss. Rosch and Pelletier (1989) have estimated the costs of stress at work to be US\$150 billion in the USA because of increased absenteeism, diminished productivity, compensation claims, health insurance and medical expenses. About 35 per cent of the European employees said that they were working at high speed, 40 per cent that they were carrying out repetitive tasks, and 27 per cent said that they are working in painful positions; 39 per cent said that they could not change the work speed by themselves (Paoli 1992).

Research has suggested that many different ill-health problems are related to stress, for example, coronary heart disease, elevated blood pressure, psychosomatic disturbances, depression, etc. (Cooper and Marshall 1976; Fletcher 1991; Karasek and Theorell 1990). Pain-related diseases, such as musculo-skeletal diseases may also be related to stress at work (Osterholz *et al.* 1987). Even cancer and the common cold may be related to stress because stress has an effect on the immune system which in turn influences the development of cancer cells and infections (Fletcher 1991; Herbert 1993).

### Specific stressors at work

A list of stressors is presented in Table 20.3. Stress research has always emphasized the fact that there is an interrelationship between the physical and the psychological side of the human. This is also true of physical stressors. For example, noise that people can control has less negative impact than uncontrollable noise (Glass and Singer 1972). Work-related stressors tax the person's capabilities. Role conflicts exist when a secretary has two bosses and role ambiguity means 'uncertainty about what the occupant of a particular office is supposed to do' (Katz and Kahn 1978: 206). Social stressors are aversive interactions with co-workers and supervisors

Table 20.3 Stressors at work

Phenomenon	Timescale
<b>Physical stressors</b>	
• noise, dirt, heat, vibrations, chemical substances	
• danger	
<b>Work-related stressors</b>	
• time pressure (quantitative overload)	
• work too complex (qualitative overload)	
• monotonous (quantitative overload)	
• not enough to do (qualitative overload)	
• disruptions (e.g. machine breakdown)	
<b>Role in organization</b>	
• role ambiguity (unclear role requirements)	
• role conflicts (conflicts from different role requirements)	
• responsibility for people	
<b>Career</b>	
• overpromotion	
• underpromotion	
• job insecurity	
<b>Social stressors</b>	
• poor relations with supervisor, colleagues, subordinates, others (e.g. customers)	
• mobbing	
<b>Timing of work</b>	
• night-work and shift-work	
• odd hours or badly designed shift schedules	



### Research update

#### Mobbing or harassment

Harassment (sometimes called mobbing) has been discussed in the press. Mobbing implies that individuals at work are bullied and harassed over a long period by several people (usually including the direct superior). Mobbing is directed against an individual and occurs frequently (once a week) and over a long period of time (at least six months) (Leymann 1996). There are clear relationships of mobbing with psychosomatic and psychological disturbances although the causal connection is as yet unclear (Leymann and Gustafsson 1996; Zapf *et al.* 1996). In Norway 8.8 per cent had been bullied at work in the previous six months and in Sweden 3.5 per cent (Einarsen and Skogstad 1996).

and harassment (see the research update). Other organizational stressors may be related to career-related stress. Finally, night-work and shift-work are serious stressors.

### Resources in the stress process

Up to this point we have just talked about the stressors. From a practical perspective this would mean that one should reduce these stressors. However, this is often not feasible and may sometimes even lead to negative effects (see the case study on p. 000). There is also a paradox from this viewpoint. Managers have stressful jobs. They work long hours and they have to make complex decisions at high speed. Nevertheless, their psychological illness rates or the degree of stress-related diseases are much lower than those of blue-collar workers (Karasek and Theorell 1991; Schaefer and Blohmke 1977).

One answer is that resources play a role. Resources are conditions and personal characteristics that can be used to attain goals (Hobfoll 1989; Schönplig 1985). Internal resources are qualifications and knowledge. External resources are control and social support. Since both internal and external resources of managers are higher, this would explain why there is less ill-health in managers than in blue-collar workers.

Just think of whether or not you can control a stressor. If it is no problem to walk over to your neighbours and ask them to turn the music lower, the music does not bother you. But if you know that no matter what you do, your neighbours will blast the music into your cars, you may become annoyed (and feel strain).

Thus, instead of a simple relationship between stressors and ill-health, we now have to consider the moderating factor of resources. Figure 20.5 shows that there is a high correlation when control at work is low (that is, stress produces ill-health for these people) and a low

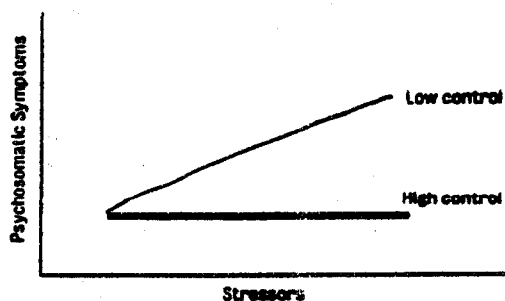


Figure 20.5 The moderating effect of control

relationship when control is high (that is, these people do not become ill from health because they are protected from having a higher level of control).

### Control

**Control** (autonomy or job discretion) means to have an impact on the conditions and activities in correspondence with some higher order goal (Frese 1989; Gardell 1971; Karasek and Theorell 1990). Control is an important variable because it explains why managers have less strain than non-managers although the stressor level of managers is probably higher than those of non-managers.

Control has been shown to be a moderator, both in experimental and (to a lesser extent) in field research. Glass and Singer (1972) showed that noise as a stressor had stronger emotional and performance effects on people when they thought that they could not turn this noise off. Sometimes it is enough to know that one has potential control. Subjects had a button that could turn off a loud noise; they were asked, however, not to use this button (all of them complied). This condition produced less stress than not having a control button (Glass and Singer 1972).

The basic experiment by Seligman (1975) was to shock two groups of animals. One group was able to turn the shock off (e.g. by pressing a bar). Another group of animals received exactly the same amount and time of electric shock as the first group, but the helpless group had no control over the stressor. In a second phase of the experiment, the animals were put in a shuttle box and were shocked again. But this time, all animals could escape the shock by jumping across a barrier. This was no problem for the animals that had had control over the stressors: they quickly jumped over the barrier and learned that it was safe on the other side. However, the helpless animals sat in the shuttle box and did not attempt to jump across the barrier. They showed all signs of emotional turmoil, such as defecating, urinating and whimpering. Seligman likened their state to human depression and showed that there was considerable symmetry between learned helplessness in animals and depression in humans.

Gardell (1971), Frankenhaeuser and Gardell (1976) and Karasek (1979) showed the importance of control at work. In each case, ill-health was more frequent if there was little control at work. However, this so-called moderator effect could not be shown reliably in non-experimental field studies (Kasl 1989). Currently there is a debate about what this means: some people argue that this means control is simply not a moderator, others argue otherwise. Most of those studies that failed to find

a moderator effect have shown a direct relationship of non-control at work with ill-health (Carayon, 1993; Clegg *et al.* 1987; Kauppinen-Toropainen *et al.* 1983; Melamed *et al.* 1991; Payne and Fletcher 1983; Sonnentag *et al.* 1994; Spector 1987). Moreover, there are several studies that showed the hypothesized moderator effect (Dwyer and Ganster 1991; Fox *et al.* 1993; Parkes *et al.* 1994; Wall *et al.* 1996). There are three reasons for the difficulties in finding a moderator effect. First, the statistical method (moderated regression analysis) is quite conservative and often does not find the effect, for example, because the sample size is too small (Aiken and West 1991). Second, stressors and non-control at work may be confounded; if the employees have control, they have reduced the stressors in the first place. Thus, people who have high stressors usually also have little control; thus, when one asks them about stressors, they usually report on non-controllable stressors. Finally, affectively charged stress scales or subjectively worded control scales are used. The more subjectively worded items should confound control and strain because people perceive stress situations that are non-controllable as more straining. Better scale development may lead to getting interaction effects more reliably (Wall *et al.* 1996). For all of these reasons and the fact that there is ample support from the laboratory, it is my contention that we should assume control to act as a moderator with low levels leading to a high relationship of stressors and ill-health and with high levels of control producing no impact of stressors on strain.

### Social Support

**Social support** – another resource – is characterized by affective support (i.e. love, liking, respect), confirmation (i.e. confirming the moral and factual 'rightness' of actions and statements) and direct help (aid in work, giving information or money) (Kahn and Antonucci 1980). One prominent hypothesis about the function of social support is the so-called buffer hypothesis (House 1981; LaRocco *et al.* 1980) whereby social support is supposed to moderate the relationship between stressors and ill-health; high support should protect individuals from the negative effects of stressors. Social support works like sun-cream. If one uses sun-cream, the radiation (the stressor) is still there but it does not affect the skin negatively.

As with control, the moderator effect hypothesis has received confirmation (House and Wells 1978; LaRocco *et al.* 1980; Norbeck and Tilden 1983; Roos and Cohen 1987; Winnubst *et al.* 1982), but there have

been opposite findings as well (e.g. Ganster *et al.* 1986; LaRocco and Jones 1978; R.J. Turner 1981). In their overview, Cohen and Wills (1985: 314) argue that buffer effects occur when there is a 'reasonable match between the coping requirements and the available support'. For practical purposes, it makes sense to assume that social support has positive effects at work, although there are some inklings in the literature that also show some negative effects under special circumstances (e.g. when social support undermines self-confidence: cf. Peeters 1994).

### Theories of the stress process

The two most influential theories about stress are by Selye and Lazarus.

#### General adaptation syndrome

Selye coined the term 'stress' in 1936. Selye (1976) has described the **general adaptation syndrome (GAS)** as a general response of the organism to every stressor. The first stage of this syndrome is the alarm reaction. In this alarm reaction, the organism is made ready for a flight-or-fight response. Like other animals, humans fear predators. When a predator comes near, the organism has to be prepared for fight or flight. Thus, there is an arousal of the sympathetic arousal system which leads to stronger pumping of blood to increase oxygen transport to the body cells. It also leads to more support for the heart muscles, but less to the stomach and the skin. Further, the blood clots more rapidly, which helps stop bleeding in case of an injury (but it also contributes to a heart attack when the arteries get blocked). Further, many different hormones are excreted, for example catecholamines which have an energizing effect. After this alarm reaction, there is a resistance stage, which is followed by the exhaustion stage if the stressor persists.

Selye rightly observed that in the workplace, there is no opportunity for flight or fight. People cannot attack their boss (fight) or get away (flight). When people are trapped in the stressful situation, the psychophysiological system becomes exhausted in the work environment.

#### Cognitive stress theory

Selye's theory has one problem: as a purely physiological theory it does not tell us anything about the cognitive processes which play a role, as Lazarus *et al.* (1962) showed. They compared different soundtracks on a film on the initiation rites of Australian Aborigines. This film showed in excruciating detail their Stone Age methods

of circumcision. Soundtrack of denial ('it does not hurt that much') and intellectualization ('let's look at how different cultures do their initiation rites') reduced the physiological strain of the subjects considerably.

Figure 20.6 describes Lazarus's cognitive transactional stress theory (Lazarus and Folkman 1984; Lazarus and Launier 1978); its central concept is the appraisal process. External stimuli are appraised on whether they constitute harm or loss, a threat or a challenge. This **primary appraisal of stress** is the phase in which the person finds out whether or not there are stressors. A **secondary appraisal of stress** process looks at coping resources and coping options to deal with these stressors. There are two broad coping strategies: coping with the problem (e.g. 'let me change this situation now') or coping with the emotions (e.g. 'let me relax now'). The appraisal determines the reactions; reactions can be to escape the negative stimulus, to attack it (i.e. do something actively about the negative situation), or to be passive. A form of passivity is just to sit and take the negative situation (as in helplessness). Finally, there is the possibility that the person reappraises the stress situation (possibly in the sense of a defensive reappraisal) and comes to the conclusion that there is no harm or threat in the environment.

**Prevention of stress: practical approaches**

Stress prevention can be achieved with different sorts of programmes. Figure 20.7 gives an overview. In the

USA, stress management programmes are usually directed at the individual. In Europe, there has been more emphasis on job-oriented stress prevention programmes (Cooper and Payne 1992). However, it would not be useful to pit one method against another; the best approach is probably to attempt to reduce the stress problem via several methods.

Figure 20.7 displays institutional and personal approaches and stressor, strain and resource approaches.

**Stressor-reduction**

Stressors can be reduced by technical and organizational means (e.g. reduction of noise, change of assembly line speed in accordance with the circadian rhythm, reduction of interruptions of work). This institutional stressor reduction approach is useful, although there are a few problems:

- Reducing one stressor and concentrating on just this stressor may actually lead to an increase of other stressors (see the case study on p. 000).
- Reducing stressors may sometimes lead to a reduction of challenges. If there is high qualitative overload, one may be tempted to reduce this overload by decreasing the cognitive demands of this job. Often this is suggested by engineers and leads not only to a reduction of overload but also to a reduction of challenges and resources (see the case study on p. 000).

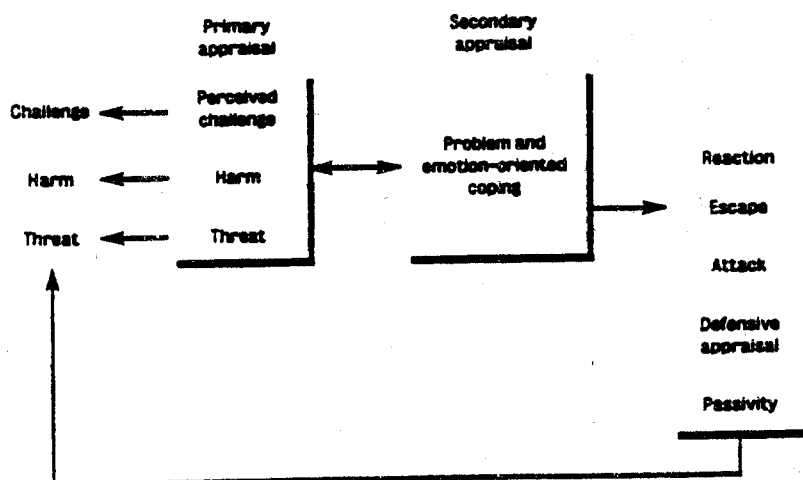
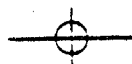


Figure 20.6 Lazarus's cognitive stress theory



	Individual	Institutional
Resources-oriented	Competence training	Increase of control
Stressor-oriented	Reduction of individual stressors	Reduction of stressors
Stress/Stress reaction oriented	Relaxation-training	Rest periods

Figure 20.7 Stress prevention in an organization

- Since technological changes are quite frequent, research is too slow to tell us which stressors are particularly problematic and need to be taken care of. For this reason, reduction of stressors should usually be accompanied by an increase in resources.

**Increase in resources**

Resources in the sense of control help individuals to have an influence on how to do their work and to increase or reduce stressors appropriately. Stressors that

come about through new technology can best be dealt with when resources are given to influence one's work. Thus, restructuring work by increasing job content and responsibilities often has a stress preventive function as well. However, this should be complemented by improvements in skills because skills are needed to make use of the higher resources.

**Strain reduction**

Stress management programmes are oriented to reduce the appraisal that something is stressful and to rather appraise something as a challenge. It also attempts to teach a person to increase the quality of one's coping strategies and to attempt to reduce strain (stress immunization or relaxation techniques). In addition, they often attempt to improve diet, to support healthy living (e.g. reducing alcohol and tobacco consumption) and to increase physical exercise (e.g. Neidhardt *et al.* 1985). Stress immunization works by helping the person to use more rational self-instructions. For example, a person might exaggerate a given stress situation and see catastrophies when something goes wrong (primary appraisal). Alternative self-instructions are then trained (for example, it is not catastrophic if something goes wrong, because it happens to most people from time to time) (Meichenbaum *et al.* 1975).

The success of any one approach is usually overrated. There are success stories on stress management programmes, however; for example New York Telephone

**Case study**

**A case of wrong stress reduction**

An instructive historical example for the problems that appear when taking a one-sided approach to dealing with stress at work is the introduction of typing pools in Germany. Central typing pools were introduced partly because they seemed to reduce stress. T. Peters (1974) had found that interruptions to work because of telephone calls, people walking into the office, etc. was the most important stressor for typists and secretaries. A steady state of the pulse rate could be maintained if there were no interruptions. Therefore, he suggested homogenizing work and reducing all potential disruptions. A typing pool seemed ideal for this purpose because it precluded

the boss storming into the office, clients to take care of, and intrusive phone calls.

Unfortunately, typing pools eliminated not only the stressor disruption of work, but also the positive aspects of work. After the 'homogenization' of work, there was no more complexity, challenge and control in the typists' work. Previously, they could do their work according to their own ideas and they had a sense of the importance of their work because of their close association with their boss. After homogenization, their work was given to them by the typing pool supervisor without regard to the variety and content of work. The end-result was that monotony increased and challenges and control at work decreased (Jacobi and Weitz 1981; Saupe and Frese 1981).

Company's 'wellness' programme saved \$2.7 million by decreasing absence and treatment costs (Cooper and Cartwright 1995). A meta-analysis of such programmes found a good effect size of 0.41 (Bamberg and Busch 1996). However, it is quite plausible that negative or zero effects do not find their way into the journals. For this reason, a certain degree of scepticism has to prevail (Murphy 1984). An additional constraint of most stress management programmes is that they presuppose that the employees can actually do something about their stress level (i.e. have at least some measure of control at work). For this reason, stress management programmes are probably less useful for blue-collar workers than for white-collar workers and managers.

### Ψ Section summary

Stressors at work can arise from several areas: physical layout and environment, work itself, role, career, social situation and timing. However, a complete picture not only looks at those stressors but also looks at the resources, most notably control and social support. The most important theories are by Selye (this theory is more physiological) and by Lazarus.

- 1 Think about the job of an operator of an automatic tool and dye machine. What stressors might exist in this job? What can a psychologist do to reduce stressors and strain at work?

the organization or the group, while managers are those with formal authority who make sure that the organization is functioning well and that people behave in accordance with its goals (House 1995).

Because of their popularity as research topics, there have been numerous theories of leadership and management. Five issues are (in my opinion) the most important ones and will be discussed here: differences between emergent and effective leaders, behavioural theory of leadership, Fiedler's contingency theory of leadership, charismatic and transformational leadership, and leadership substitute theory.

### Differences between emergent and effective leaders

Some kind of leadership occurs in every group of people (whether the leader is a manager or not). Think of a study group that comes together for the first time – some person will emerge as leader. The leader will be most active in the discussion, structure the discussion and suggest when to meet again, etc. However, this emergent leader does not have to be an effective and good leader, who helps to increase the chances to achieve the group's goals and to motivate the participants to do their work well. There are many examples of politicians who have emerged but have not been good leaders. Thus, an emergent leader is a leader because people perceive this person to be a leader, but not because this person proves to be effective as a leader.

This differentiation between effectiveness and emergence of leaders is important for the debate, whether or not personality traits play a role in leadership. At one point, there was a consensus in work and organizational psychology, based on the reviews by Mann (1959) and Stogdill (1948), that personality factors do not matter in leadership. This conclusion turned out to be wrong in the light of a meta-analysis (Lord *et al.* 1986) which proved that personality measures were indeed important in leadership. However, personality did not predict effectiveness but emergence of leaders (i.e. perceptions by the followers that this person is a leader). Intelligence (corrected  $r = 0.50$ ), adjustment ( $r = 0.24$ ), extraversion (0.26), as well as masculinity (0.34), and conservatism (0.22) show appreciable relationships with followers' perception of leadership. Such correlations did not appear for leadership effectiveness. Thus, these personality traits are probably important for the emergence of a leader but not for the effectiveness of leadership.

## 48 Leadership and management

We now go one step further in our travel through the organization: you work in an organization but usually you do not work alone. Unfortunately we cannot discuss group work here due to space constraints. But more likely than not, the most significant person for you is probably your supervisor or manager, who will tell you what kind of work you have to do and will give some appraisal of how well you are doing. Moreover, we know a lot about managers because this occupation has been studied more frequently by work and organizational psychologists than any other one.

Leaders and managers are often conceptually distinguished; leaders are thought to help define the goals of

### Behavioural theory of leadership

The Ohio studies (Fleishman 1973) led to a two factor description of leadership behaviour. The first factor is **consideration**, which means that the leader is concerned about the people, emphasizes satisfaction with the job, treats the subordinates as equals, etc. The second factor is **initiation of structure**, which implies that the leader activates, organizes and defines work for the subordinates. Clear work tasks are given without consulting the group. Reviewing the evidence on the leadership behaviour approach, Bass (1990) concluded that consideration increases job satisfaction and initiating structure increases performance.

In contrast to laypeople's opinion, consideration and initiating structure are independent (orthogonal) dimensions; thus, leaders can be high on both, low on both or be high on one and low on the other. It follows that one should attempt to teach leaders to be high on both so that the group is satisfied and shows high performance (Blake and Mouton 1964).

When you think about this theoretical approach, you will probably see the problem very quickly: managers do not just behave in one way, without regard to the situation. Moreover, in one situation, one strategy may be more successful, in another, the manager should behave differently. Thus, the situation was taken into account as well. This is the core of Fiedler's theory (discussed next).

### Fiedler's contingency theory of leadership,

Fiedler (1971) took two factors into account: the person's leadership style and the situation. The person's leadership style was ascertained with a measure of the **least preferred co-worker**. A high score means that leaders say nice things about the co-worker they like least and they are, therefore relationship oriented. A low score means that leaders say nasty things about this person which makes them task oriented (Fiedler and Chemers 1984).

With regard to the situation, Fiedler differentiated leader-member relations (how good is the relationship with the subordinates), task structure (how much is the task structured) and position power (the extent to which the leader has power over the subordinate and the subordinate accepts it). These three factors make up the difficulty of the situation because they determine how much control the supervisor has. If the leader-member relations are good, if the tasks are clearly structured, and

if the leader has a lot of power, then the leader has a high degree of control.

Figure 20.8 shows the results of Fiedler's theory. The x-axis spans the eight situations. The high control situation is on the left, the low control situation on the right. The dots in the figure are correlations. Thus, this figure is different from others – you actually see the correlation between the least preferred co-worker (LPC) score and the group performance. A low score (e.g.  $-0.40$ ) as in the first octant) means that those with a high score on the preferred co-workers' scale (they like even the most disliked co-worker) have groups that perform badly. In other words, in this situation it is much better to be task oriented and not relationship oriented. In octant IV, on the other hand, you see a positive correlation of  $0.40$ . This means that being relationship oriented as a leader helps to have a good group performance. Thus, relationship-oriented leadership is better in this situation. If you have a situation in which there are poor relations, an unstructured task, and a weak leader position, the correlation is again negative: the group will perform better if you are task oriented in this situation. Thus, if the situation is very easy, you can be task oriented and even authoritarian because you are accepted anyhow. If the situation is very difficult, task orientation may be necessary to get the group off the ground. In the middle, it is better to be relationship oriented.

Given the complexity of the theory, it is surprising that meta-analyses have been quite positive; there is good evidence for Fiedler's theory to be correct (L.H. Peters *et al.* 1985; Strube and Garcia 1981). Support for the theory is better in laboratory studies, however, than in field studies (L.H. Peters *et al.* 1985).

Nevertheless, there are weak points in this theory (Landy 1989). First, the dependent variable (as displayed in Figure 20.8) is a correlation, which means that we do not really know anything about the absolute level of performance, we just know something about the relationship between leadership style and group performance.

Second, Landy (1989) distrusts the least preferred co-worker scale and questions whether the validity of this scale has been established well enough.

Third, the characteristics of the situation are not independent of the leadership style. This problem is most obvious for leader-member relations which should be influenced by how the leader behaves.

These criticisms notwithstanding, Fiedler was the first one to develop a theory that took into account situational and leader characteristics at the same time, thus advancing our knowledge considerably.

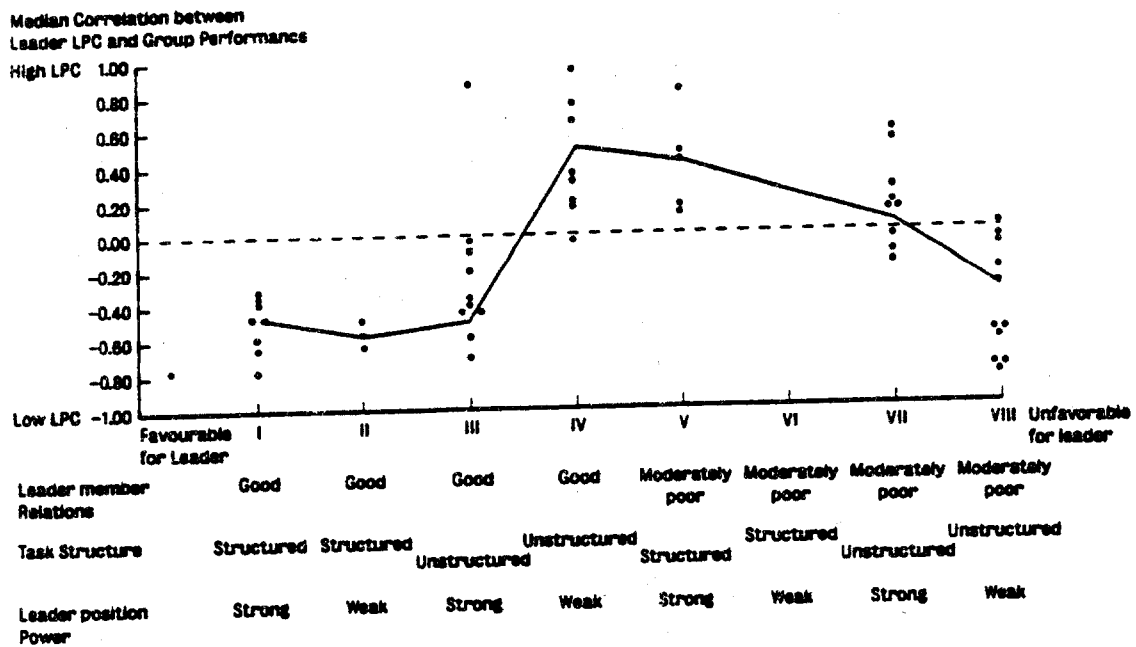


Figure 20.8 Fiedler's view of the least preferred co-worker and group effectiveness performance  
 Source: Fiedler (1971)

### Charismatic and transformational leadership

Charisma means originally a gift of god and implies that people follow a leader based on their emotions. House and Bass and their co-workers have used the concept of charismatic leadership to understand why some leaders can get the followers to make an extra effort while others do not. Charisma is defined as 'the ability of a leader to exercise diffuse and intense influence over the beliefs, values, behaviour, and performance of others' (House *et al.* 1991: 366). Central features of charismatic leaders are to be high in dominance, self-confidence, need to influence others, and beliefs in own values. These leaders articulate their goals and visions well which leads to favourable perceptions of the leader in the eyes of the followers. Charismatic leaders have high expectations of the followers' performance. All of this leads to better self-confidence, trust, etc. in the followers which in turn helps to increase performance (House 1977).

The concept of transformational leadership is similar to House's theory (Bass 1990), although Bass differentiates between the four factors (the four Is):

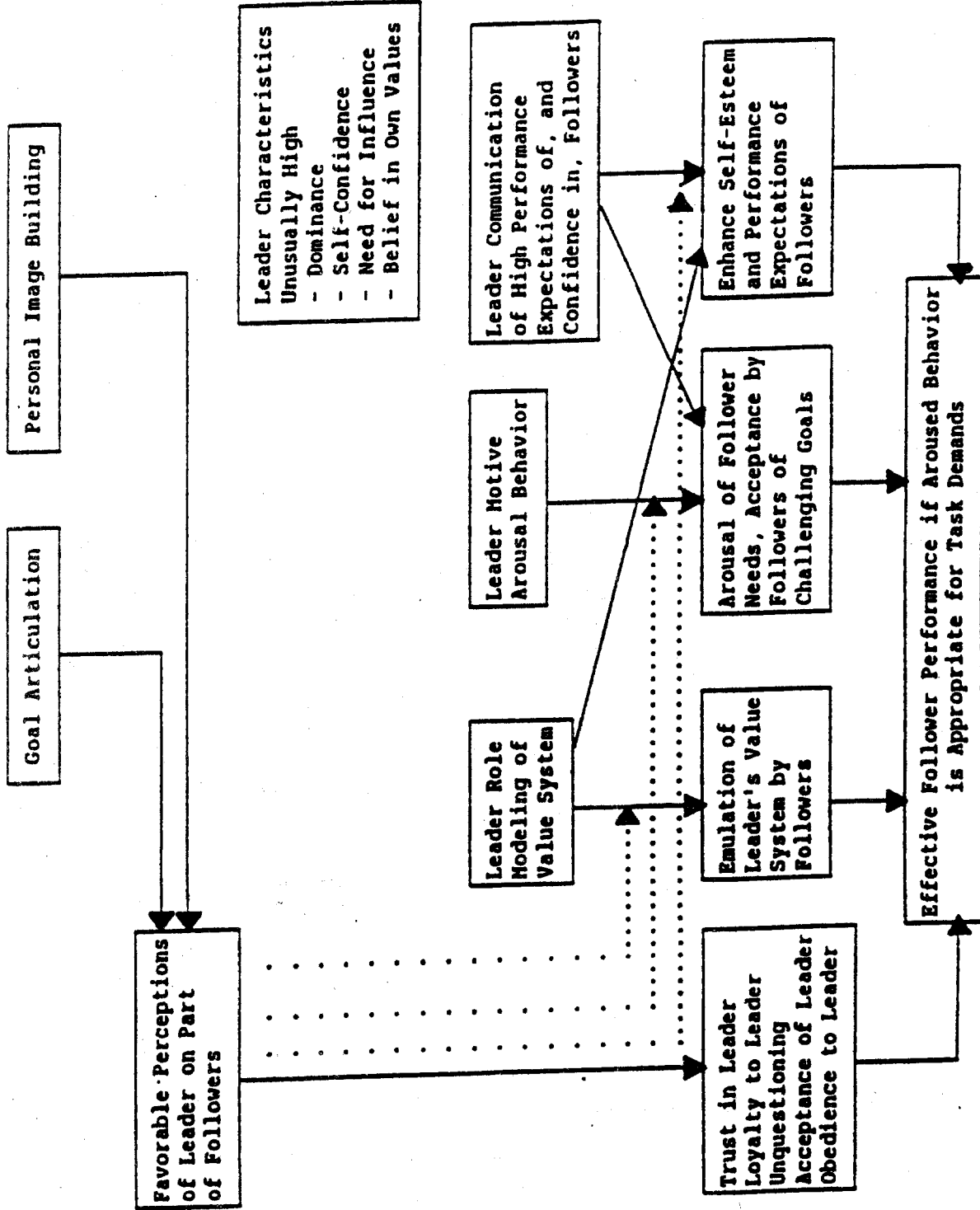
- idealized influence: charismatic leadership in the sense of being a model and symbol for the followers
- inspiration: inspiring the subordinates to put in extra effort to achieve the goals of the organization and having high expectations of the followers
- intellectual stimulation: in the sense of creating and encouraging new ideas and making sense of things
- individual consideration (similar to the factor consideration of the Ohio studies).

There are three types of studies that have supported the claim that charismatic leadership enhances productivity. First, it was shown that leaders who are perceived to be charismatic, have higher productivity (Geyer and Speyrer 1997; see research update on p. 000), produce higher levels of effort and satisfaction in their followers (House *et al.* 1997).

Second, an experimental study showed that charismatic leaders actually caused higher performance and satisfaction, particularly in groups with low productivity norms (Howell and Frost 1989).

Finally, former US presidents were appraised as to their charisma in several different ways. Moreover, their





..... indicate that favorable perceptions moderate the relationship between leader behavior

power, achievement and affiliation motives were coded. It could be shown that several performance indicators (e.g. economic performance, great decisions made, etc.) were related to charisma and power orientation (House *et al.* 1991; Spangler and House 1991)

Thus, charismatic leadership is of high importance; it is also something that can be changed through training (because it was possible to enact it in an experiment, it is also possible to learn to be more enthusiastic and to be inspirational). Charismatic leadership has given the emotional appeal of leaders to their followers its proper place in leadership theory.

However, it is obvious (particularly for this German author) that charismatic leadership can also have negative consequences. Hitler certainly was charismatic. Howell and House (1995) have, therefore, distinguished between personalized and socialized charismatic leadership. Socialized means that the leadership

(a) is based on egalitarian behaviour; (b) serves collective interests and is not driven by the self-interest of the leader and (c) develops and empowers others. Socialized leaders tend to be altruistic, to work through legitimate established channels and systems of authority when such systems exist, and to be self-controlled and follower-oriented rather than narcissistic.

(Howell and House 1995: 6).

Personalized charisma is the opposite. Thus, one can distinguish psychologically between leaders like Hitler who used personalized charisma and other figures who show the more helpful socialized charisma.



### Research update

#### Transformational leadership

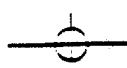
Geyer and Speyrer (1977) have looked at transformational leadership and productivity in Austrian banks. In all, they had 1,458 direct reports of 116 branches of 20 banks fill out the questionnaire by Bass and Avolio. Unlike other studies, this study was extremely careful to develop a good measure of productivity. Therefore, they developed a number of categories for banking (such as volume and number of checking accounts) and weighted these by market conditions (because every branch works under different conditions) and developed in this way an objective performance indicator. They showed that transformational leadership was clearly related to such objective indicators. Thus, it pays off for companies to enhance transformational leadership in their companies.

### Leadership substitute theory

Reading some of the management literature gives the impression that managers are the real heroes of organizations and that everybody else in the firm is really quite unimportant. The poet Bertolt Brecht (1935) has aptly suggested that it was not Alexander the Great who conquered India but that it was his soldiers who did it.

Table 20.4 Specific substitutes and neutralizers: supportive and instrumental leadership

Substitute or neutralizer	Supportive leadership	Instrumental leadership
<b>Subordinate characteristics</b>		Substitute
• experience, ability, training	Substitute	Substitute
• 'professional' orientation	Neutralizer	Neutralizer
• indifference toward rewards offered by organization		
<b>Task characteristics</b>		Substitute
• structured, routine, unambiguous task		Substitute
• feedback provided by task	Substitute	
• intrinsically satisfying task		
<b>Organization characteristics</b>	Substitute	Substitute
• cohesive work group	Neutralizer	Neutralizer
• low position power (leader lacks control over organizational rewards)		Substitute
• formalization (explicit plans, goals, areas of responsibility)		Neutralizer
• inflexibility (rigid, unyielding rules and procedures)	Neutralizer	Neutralizer
• leader located apart from subordinates with only limited communication possible		



To counter this heroization of leadership, it is useful to acknowledge that leadership is often not really that important for high performance. This has been discussed under the topic of **leadership substitute theory** (Kerr and Jermier 1978; Podsakoff *et al.* 1993). Examples are first, leadership in terms of giving direction is not important when the subordinates know how to do things because they have been trained. Second, on the assembly line, much of what the leader does is actually materialized in the line itself, for example, giving a rhythm to work, making sure that there is always enough work around to be done, etc. Third, the relationship with the leader is less important, when the task is intrinsically satisfying (Kerr and Jermier 1978; see also Table 20.4).

While empirical research on the substitute for leadership model was only partially successful in the support of its claims (Podsakoff *et al.* 1993), the notion is useful and should be pursued further. This view will become more important in the future, because there will be less direct contact between a manager and the subordinates in future virtual and lean companies.

We began this section on leadership by describing the importance of leaders; we have appropriately ended with some findings that call the heroization of leadership into question. We already know quite a bit

about how to describe and change leaders' behaviours and it is still an area of great interest for work and organizational psychology.

## Work and organizational design

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### Organizational development and change

In Figure 20.1, you saw a person trying to move the organization, that is to change it. I am sure that after you have entered an organization, you have thought about the necessity to change some features of it. It is not enough to describe an organization well, it is also necessary to change it. Thus, for work and organizational psychologists it is necessary to know not only how something works but also how to make it better. An organization functions better if work is done skillfully, if efficiency and effectiveness are high, if there is general well-being and no short- or long-term damage from work, and if employees develop their skills at work (Hacker 1986; Ulich 1991; Warr 1987).

This list suggests that all of the issues discussed so far are relevant for job design. Moreover, the reason why European work and organizational psychologists have traditionally insisted on the unity of work and organizational psychology is that work design can be done only if you have expertise in ergonomics (the study of the interaction of the human with the machine), work design (how work should be designed to decrease strain, maximize knowledge and efficiency), and organizational issues (organizational development and change). In the USA, there has been an unfortunate division between personnel psychologists (testing, training), organizational psychologists, and ergonomics (called human-factor specialists in the USA) that leads to separate developments with little cross-reference to each other's areas.

### US theories of work design

There have been a number of grand theories or approaches to work design. Two important ones that originated in the United States are Taylorism and the human relations school.

#### Taylorism

Frederick W. Taylor (1856–1915), the father of scientific management, started out with the problem of loafing (employees being idle or wasting time). To reduce it, he

### Section summary

There are many theories of leadership and each one seems to cover one particular part. For trait approaches, it is important to differentiate between emergent and effective leadership: traits are more important for the emergence of leaders than for the effectiveness of leaders. We have discussed behavioural, contingency and charismatic leadership theories. To avoid the idea that leaders are the only important heroes of organizational success, we have also covered the leadership substitute theory.

- 1 Write down as many comments, sentences and adjectives that you can think of that describe leaders. Discuss these from the background of the different theories and critically examine where these theories can help you to describe effective leaders and where they do not.
- 2 Differentiate between leaders and managers and discuss how you can easily make this differentiation and where it may break down.



eventually came up with the following strategies. First, he made the workers' income depending upon their output. Money was the all-important motivator in his management system. Second, he divided up the labour in various functions. Taylor broke radically with the handicraft tradition of work which was prevalent then. He argued that people could do only one task well. Third, the various functions would be devised by a scientific planning department. In this way, he would work against the rules of thumb that were prevalent in the craftsman tradition. An important method used in planning was **time and motion studies** developed by the psychologist Gilbreth. This helped to cut out superfluous movements. Fourth, work would be supported by exactly planned tools, again arranged by the planning department or by the supervisor. For example, different size shovels were developed for materials with different weights. If you have to shovel iron into a wagon, you need a smaller shovel than if you shovel grain.

Taylor's teachings were highly controversial in his day. Workers usually went on strike when they heard that Taylor was asked to be a consultant in their company. However, for better or for worse, **Taylorism** laid the foundation for modern work with its high division of labour and its detailed planning, with an emphasis on saving seconds. Moreover, Taylor helped to define the role of supervisors (the functional foremen) so that they would become helpful managers who had the task to increase productivity. However, many present-day problems, such as stressful jobs with little control at work and a division of labour that reduces individuals' responsibility for their work and makes them 'cogs in the machine', were also a result of Taylor's teachings.

### Human relations

The **human relations school** was developed during the so-called Hawthorne studies (Roethlisberger *et al.* 1956) and sees itself as an important alternative to Taylor's scientific management. The first set of experiments concerned illumination. This was still done within the tradition of Taylor: the engineers wanted to see whether productivity was increased or decreased by illumination. The amazing finding was that productivity went up even when there was very low illumination (in one experiment it was as little as under moonlight). The researchers interpreted this to be due to the good relations between the experimenters and supervisors with the workers. Relations were good because workers received friendly attention during these experiments.

Thus, the human relations at work became the focus of further experiments.

In a second set of experiments, a kind of human relations supervision was introduced – relaxed, with little Tayloristic discipline. Roethlisberger *et al.* (1956) thought that the relationship between the workers and the supervisor had improved which led to higher productivity.

In contrast to Taylor, the human relations school was interested to overcome workers' loafing by developing a common goal and by human touch. Mayo (the popularizer of the human relations school) actually thought that through the human relations idea, trade unions would wither away (Landy 1989).

The Hawthorne studies have been criticized by several scientists. For example Bramel and Friend (1981) maintain that it was actually external pressure and not human relations that led to remarkable improvements of productivity in the one group that was studied most intensively. However, in spite of these criticisms, there is no doubt that human relations play an important role in the workplace.

### European tradition of alternatives to Taylorism

Taylorism essentially took away responsibility for production from rank-and-file workers and gave it to supervisors and to the planning department. This kind of system had several disadvantages: industrial engineering cannot anticipate all the mishaps that are possible; therefore problems and faults regularly occur in a well-designed workplace. If workers behaved as Taylor thought, they would simply not care; the result would be extreme quality problems. However, workers do not behave the way Taylor thought. Rather, workers frequently compensate for work design problems and adjust flexibly and intelligently (for example, in one car company that I visited, control tags were marked by the blue-collar workers because otherwise wrong headlights would have been installed). Thus, spontaneous responsibilities were assumed by the blue-collar workers. The paradoxical result is that Tayloristic job design could function only because the workers did not behave as Taylor thought.

However, workers' interventions of this kind are not done systematically, therefore quality problems do arise because of Tayloristically designed jobs. Moreover, the workers do not have an overview of what they are doing. For example, car company workers would sometimes

drill too far because they did not know that they could damage the previously installed cables lying on the other side of the metal to be drilled.

Taylor's critiques wanted to give responsibility back to the workers. One of the more radical approaches was group work.

### Autonomous work groups

The first group work experiment was done by Lang and Hellpach (1922). In this experiment, a whole product – a motor – was produced by a group and the authors argue that productivity and job satisfaction were higher in this group (Lang and Hellpach 1922).

After the Second World War, Trist and Bamforth (1951) showed in a detailed account of coal-mining that a new technology installed without regard to human factors, led to a number of problems; for example, workers did not trust safety precautions done by a prior shift – so there was inefficient double checking (in the previous system, every shift took care of their own safety work). Moreover, people did not co-operate as well as they had done in their old system. People became sick more often and productivity decreased with the new technology. These problems were solved when group production was introduced (Trist *et al.* 1963); group work led to lower rates of absence, fewer accidents and higher efficiency.

**Autonomous work groups** (sometimes also called semi-autonomous because there is no complete autonomy in companies) were regarded as alternatives to traditional assembly lines and machine operating. The assembly line was dissolved and, for example, a group of three workers produced a motor (Ulich 1983). The work groups were allowed to make all the necessary decisions: who would work, where, and how long. The supervisors were not supposed to interfere with the functioning of the groups but were supposed to serve as resource persons to help when needed and to train the workers. The group was responsible for the upkeep of their tools and simple repairs. Group leaders were elected by the group (and could be deselected if the group chose to do that). In some experiments, the groups could also decide on their own composition (Gulowsen 1972) and select new members. Pay was determined by how many tasks an individual could do and by how much the group actually produced. There was a weekly or monthly negotiation on how many products the group would produce.

Unfortunately, there are only a few well-controlled studies that look at the effects of autonomous work

groups (Cummings *et al.* 1977; Goodman *et al.* 1988; Wall *et al.* 1992). Some of the best controlled studies have been done by Wall, Clegg and colleagues (Wall and Clegg 1981; Wall *et al.* 1986, 1992); by Schmidt and co-workers (Schmidt *et al.* 1981a, 1981b), by Cordery (1991), by Antoni (1996) and by Den Hertog (1977). All of them reported positive outcomes of group work, although in Wall *et al.* (1986), and Antoni (1996), not all of the expected results prevailed.

Introduction of group work was also seen as an answer to many problems that beset European companies in the 1960s and 1970s (Den Hertog 1977; Ulich *et al.* 1973):

- a high degree of absenteeism from work
- high fluctuation, particularly in assembly-line work
- difficulty in finding workers willing to take assembly-line jobs because people became more interested to actualize themselves in work than earlier cohorts
- co-ordination problems, e.g. when absenteeism or machine trouble led to standstills at the assembly line
- lack of flexibility
- product quality concerns
- strikes and sabotage by the workers

More comprehensive productivity studies concluded that local productivity improvements may sometimes lead to productivity losses of the whole system. For example, the introduction of central typing pools led to higher productivity if one considered the number of keystrokes typed in a particular typing pool. But at the same time, turnover of mail actually slowed down because of the number of mistakes made by the typists and the lack of co-ordination between the specialists and the typists – thus, the whole system became less efficient (Gaugler *et al.* 1977).

Introducing semi-autonomous work groups is one of the most powerful interventions to enhance productivity, as shown by a meta-analysis (Guzzo *et al.* 1985, see also Table 20.7, p. 000). Only goal-setting and training were more powerful. Another meta-analysis showed that productivity (output and quality) was increased but absenteeism and fluctuation were not reduced much (Beekun 1989). Beekun (1989) also showed that the effects of semi-autonomous work groups were lower in the USA than in other countries. This may be related to the higher degree of individualism in the USA in comparison to Europe (Hofstede 1991). The following is a summary of the effects of autonomous work groups:

- more job satisfaction (although in some cases, it decreased after a while)
- increased well-being



- higher work involvement
- absenteeism and fluctuation are reduced only slightly
- more flexibility in production (e.g. when products are changed or new technology is introduced)
- more direct costs (workers receive more money for their higher qualifications) and fewer indirect costs (fewer repair people and supervisors, etc.)
- concomitant technological change made the intervention less successful for reasons yet unknown
- higher product quality and in many cases also higher output
- works much better when pay system is changed accordingly
- works much better if there is a higher degree of autonomy in the groups
- both white-collar as well as blue-collar workers are positively affected
- workers who once participated in these groups did not want to go back to the old production system.

In spite of public and government support, most autonomous work groups have either disappeared with time or have continued only as isolated experiments. This was true of the work groups introduced in the British coal-mines as well as of many experiments in the automobile industry. Even the Volvo plant in Kalkar – the showcase for this design concept – was recently closed down. There are several complex reasons for this. Many times, the first-line supervisors and middle management sabotaged the autonomous work groups because they did not want to give up power. Sometimes, a change in management led to a change in management style. More autocratic managers have little interest in autonomous groups. In some cases, the trade union was against it (particularly in the USA and to a lesser degree in Germany) because they feared that their traditional strategies of negotiations would be undermined by shopfloor participation. In many cases, management thought that robotization and increased use of technology would do away with assembly lines more efficiently and were better alternatives than autonomous work groups. Moreover, increased unemployment levels and reduced welfare support reduced fluctuation and made workers more interested in jobs they would not have taken before. Finally, the threat from Japan to industry in the USA and Europe convinced people that one had to look for answers with assembly lines intact (see lean production, p. 000).

However, in the late 1990s there is a revival of group work both in Europe and in the USA (in Asia group

work was always done more frequently). The old ideas of autonomous work groups are often taken as a starting point (as in the case of Opel in Germany). There is an attempt to combine the old ideas of humanization of work with the newer ideas of empowerment, lean production and modern technology.

In a way, the history of what happened to autonomous work groups is typical of many ideas developed by work and organizational psychology: an idea is around for a while and it takes many experiments, modifications of these ideas, new challenges from the outside, and newly educated managers until it is really used. The time has to be ripe for a new idea. Self-managed groups are alive and well again and seem to be used more frequently today than ever before although the more recent uses of group work are not exact replicas of older approaches in this area.

### Sociotechnical system approach

The **sociotechnical system approach** was developed by Trist and Emery to understand the effects of group work (Alioth 1980; Cherns 1976; Clegg 1979; Emery and Thorsrud 1969; Emery and Trist 1969). The following propositions explain the theory (note that they contradict Taylor's concepts in nearly every point):

- There is a technical and a social side to each job. Neither the technical nor the social side should be optimized without regard to the other; thus, only the complete sociotechnical system should be optimized.
- Systems are conceptualized as open systems. This means that turbulences in the environment also lead to problems in a company's work groups. These problems should be regulated via self-regulation in those groups affected (in traditional firms only the highest management decides and then gives orders to the employees). This allows a more flexible and task oriented reaction to environmental turbulences.
- Work practices should not be specified any more than is necessary so that people can use their own ingenuity in making a product; however, there should be continuous training and search for improved procedures.
- All problems of product and production quality should be dealt with as near to the point of origin as possible (e.g. machine failures or errors).
- The work group should get all the information in order to do the job optimally (e.g. customer complaints should be quickly communicated to the group).
- Self-regulation is best done within the work groups. Everybody should be able to do all the tasks within a group to maximize flexibility.

- Boundaries between groups should be drawn to reduce interference but these boundaries should be permeable to allow sharing of knowledge. This means, for example, that planning of an action, executing it, and quality inspection should not be done in different departments but should be kept in one group.
- Different work groups, different departments within an organization have dynamic interactions with each other. Negative effects on the whole organization may appear if only a part of an organization is optimized (as in the example of a typing pool above).
- The function of supervisors in a self-regulated group should not be to disturb self-regulation but to support it. Thus, the supervisor is a trainer, helps with tips and ideas and communicates with the other departments.
- There is no one 'best way' as described by Taylor. In a complex task, there are several effective ways to do work.
- One should look not only at the short-term but also at the long-term consequences of change. For example, rigid division of labour may have positive consequences in the short term, but may lead to rigid organizations which cannot react flexibly to changing environmental demands.

**US tradition of alternatives to Taylorism**

**Job Enrichment**

While there have been work group, the high degree of individualism in the USA has made job enrichment much more popular. In contrast to autonomous groups, **job enrichment** does not leave it up to the group to organize task distribution, but expands the job content for the individual worker. Herzberg put forward the idea of job enrichment (Herzberg 1968; Paul *et al.* 1969). An example for job enrichment is to empower sales representatives to make deals within certain limits without having to ask anybody. Thus, they can immediately settle claims, can reduce or increase prices and do not have to write reports on every customer calls (Paul *et al.* 1969). Introducing job enrichment has been shown to have a major positive impact on productivity (Guzzo 1985).

The most sophisticated theoretical concept (as well as a measurement model) has been put forward by Hackman and Oldham (1975). Figure 20.9 describes this model: it differentiates core job characteristics from critical psychological states. The five core characteristics

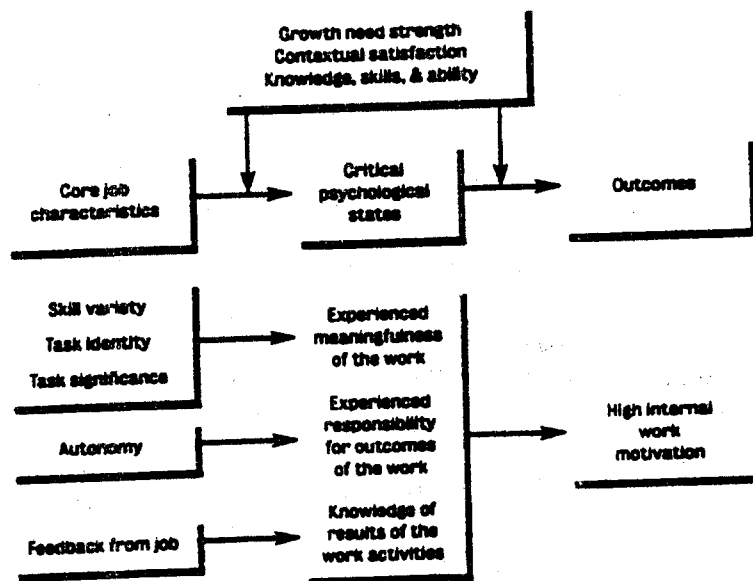
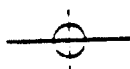


Figure 20.9 Job characteristics model of Hackman and Oldham  
Source: Hackman and Oldham (1976: 256)



are skill variety (how many different activities are required), task identity (completing a whole identifiable piece), task significance (important for others), autonomy (independence and job discretion) and feedback from job (information on performance). The critical psychological states are experienced meaningfulness of the work, experienced responsibility for outcomes of the work, and a knowledge of results of the work activities. These in turn are supposed to produce better performance outcomes through higher motivation. A moderating factor is growth need strength. This means that people who have a higher need for self-actualization react more positively to job enrichment.

Hackman and Oldham's model has stirred up some controversies (well described by Ilgen and Hollenbeck 1991). While the details of the model can certainly be called into question, the general motivating function of the core job characteristics has been well substantiated (Berlinger *et al.* 1988).

### The Japanese challenge: lean production

Traditional mass production – as in the example of the assembly line for cars – has several implications: workers are seen as variable capital (thus, workers are dismissed if there is not enough work for them and reducing training costs is positive). Efficient use of machinery implies that many parts are produced and put into a storage room to be later assembled with other parts produced later. Thus, stocks are high. An assembly line may not be stopped. Thus, when problems and mistakes occur, the line still has to move on. At the end of the line, skilled workers are then repairing the newly produced cars. This is wasteful because as Womack and Jones (1996) argue, something that can be repaired for \$1 at the assembly line may cost \$100 at the end of the line and \$1000 after delivery of the car.

This mass production system can be contrasted to lean production.

**The truly lean plant has two key organizational features: it transfers the maximum number of tasks and responsibilities to those workers actually adding value to the car on the line, and it has in place a system for detecting defects that quickly traces every problem, once discovered, to its ultimate cause.**

(Womack *et al.* 1990: 99).

The workers are highly skilled, work in groups, are empowered to make decisions and to participate in a quality improvement system, produce quality instead of inspecting quality after the production. This is coupled

with a just-in-time technique which implies that the parts to be assembled are delivered when they are needed (reducing costs for stocks). For example, at Porsche 20 per cent of all parts delivered from suppliers came more than three days late (30 per cent having wrong numbers of parts) and 10,000 parts per million were defective, before Porsche switched to lean production. In contrast, Toyota's supplies came on time and in the right quantity in 99.96 per cent of the cases and there were five defective parts per million (Womack and Jones 1996).

From an organizational point of view, responsibility is given back to the workers. Rank-and-file workers are trained continuously, quality control and improvement rests with the workers and they get the necessary information in highly visible form. The assembly line is organized in self-managed teams that trouble-shoot immediately when problems occur. In this sense, lean production shares the theoretical concepts of the sociotechnical system and the job characteristics model of Hackman and Oldham. However, it couples this with a much stronger emphasis on reducing waste through reorganization, on product innovation, and just-in-time techniques (Womack and Jones 1996). Since the shopfloor is supposed to participate in the rationalization process, it is necessary to give guarantees that no worker will be dismissed because of lean production.

Table 20.5 shows the superiority of lean production. Automobile productivity was much higher and number of defects much lower in Japan than in North America and Europe (these figures were assembled in the late 1980s; since then both US and European car manufacturers have done a lot to increase productivity). The size of the repair area was smaller in Japan; the same goes for inventories. Many more people worked in teams and did some job rotation; there were fewer job categories, and training was frequent. However, there were no differences in the degree of automation: lean production is not dependent on new technology. Table 20.5 also shows that the Japanese firms in the USA do as well as the Japanese firms in Japan (with the exception of the number of suggestions). Thus, in principle it is possible to transplant lean production to other countries. The Opel plant in Eisenach and Porsche's turnaround show that this is also possible in Europe (see also Taira 1996). This does not mean, of course, that such a transplant is easy (Young 1992 describes the problems).

A modern version of combining the sociotechnical system approach with lean production has been presented by Wall and Jackson (1995). They suggest that



the organizational ones; this is the essence of the sociotechnical system approach (discussed on pp. 000–0). Fortunately, in Europe, the unitary function of work and organizational psychology still exists.

Human–computer interaction is one part of ergonomics and, since nearly all machines are now computer driven to a certain extent, it is the most important part of ergonomics (for a review see Frese 1987b; Osborne 1987). Table 20.6 presents one aspect, the ergonomic requirements for office work with computers – the so-called dialogue principles (which are based on Dziula *et al.* 1978).

### Organizational development and its difficulties

Change in any organization means trouble. The following are the main difficulties:

- lack of readiness and motivation for change
- too little power behind the change process
- conflicting interests
- anxieties
- resistance and reactance
- passivity, helplessness and overconformity
- keeping old routines
- double work

We are not able to discuss these issues in detail. Often, there is too little managerial support for a change process (French and Bell 1995). Most frequently, changes lead to conflicting interests, for example, the change process may make one department bigger and more influential in comparison to another one. Conflicts are not a problem *per se*; as a matter of fact, work and organizational psychology has a rather positive view of conflicts because they are necessary for innovations; however, conflicts have to be managed well (De Dreu and Van de Vliert 1997; Greenhalgh 1987).

Whenever changes occur, there is resistance to change (Coch and French 1948; see the case study).

A change situation can be a non-control situation which may lead to learned helplessness (Seligman 1975), that is to passivity and overconformity. Change may lead to situations of non-control, because old skills and ideas do not work any more and new skills may be difficult to learn. Moreover, people may have repeatedly learnt that the change situation itself cannot be controlled because management does not allow participation.

Table 20.6 Standards on Dialogue Design of the International Standards Organization (ISO 9241, Part 10)

Principle	Example
Suitability for the task	One should have to do only a few steps from turning on the computer to being able to work on the task
Self-descriptiveness	In one text-processing program, a file with name DESIGN was to be loaded. However, this was not possible. The text program needed the name, 'DESIGN.' (with the full point). No error message explained this.
Controllability	The user is able to ask how much the data bank is being used today to estimate how many different requests can still be answered
Conformity with user expectations	The user works with a dialogue system with different application programs. In all applications the user can use the same syntax and semantics.
Error tolerance	The system can continue to work in spite of an obvious error or only minimal correction effort is needed.
Suitability for individualization	The program can be adjusted to individual tasks, individual preferences, and skills.
Suitability for learning	The system supports learning.

Source: ISO (1986)

Overconformity is a form of helplessness because people do not question the rules and just conform to them without adapting them creatively and without showing initiative. The opposite of helplessness and passivity is a high degree of initiative. Initiative itself is related to how much control individuals have at the workplace; people learn through organizational socialization to approach things actively (Frese *et al.* 1996)

Change means we have to break our old habits which leads to the following problems:

- We fall back into our old habits, particularly under stress and when things have to be done quickly.
- Since the new behaviour has to be regulated consciously, we find it difficult and effortful.
- The new behaviours do not run as smoothly as our old habits.

Table 20.5 Summary of assembly plant characteristics, volume producers, 1989 (averages for plants in each region)

	Japanese in Japan	Japanese in North America	American in North America	All Europe
<b>Performance</b>				
Productivity (hours/vehicle)	18.8	21.2	25.1	38.2
Quality (assembly defects/100 vehicle)	60.0	65.0	82.3	97.0
<b>Layout</b>				
Space (sq. ft./vehicle/year)	5.7	9.1	7.8	7.8
Size of repair area (as % of assembly space)	4.1	4.9	12.9	14.4
Inventories (days for 8 sample parts)	0.2	1.6	2.9	2.0
<b>Workforce</b>				
% of workforce in teams	69.3	71.3	17.3	0.6
Job rotation (0 = non, 4 = frequent)	3.0	2.7	0.9	1.9
Suggestions/employee	61.6	1.4	0.4	0.4
Number of job classes	11.9	8.7	67.1	14.8
Training of new production workers (hours)	380.3	370.0	48.4	173.3
Absenteeism	5.0	4.8	11.7	12.1
<b>Automation</b>				
Welding (% of direct steps)	88.2	85.0	78.2	78.6
Painting (% of direct steps)	54.6	40.7	33.6	38.2
Assembly (% of direct steps)	1.7	1.1	1.2	3.1

Source: Womack et al. (1990:92)

just-in-time, total quality management and advanced manufacturing technology have similar implications for the work organization. Just-in-time means to reduce the stock costs organizationally. Total quality management implies that 'high quality is built in throughout all stages of manufacturing from product design to delivery' (Wall and Jackson 1995: 144). The just-in-time and total quality management approaches make up lean production. Advanced manufacturing technology implies that flexible manufacturing is done in small batches by computer-driven machines. First, these systems lead to an increase in cognitive demands; this may contribute to psychological stress. Second, higher responsibility for production is given to the workers. For example, every interruption of the work flow has serious consequences with a just-in-time system; therefore, there are high attentional demands and a high degree of responsibility for the work flow. Similarly under total quality management, the shopfloor workers are supposed to take care of problems immediately and improve production, and thus, have to assume responsibilities. Finally, there is a high interdependency because modern production strategies imply that the links between work teams have to run smoothly. Thus, there has to be good communication between the workers. There are two

mechanisms by which modern production processes lead to higher productivity. One mechanism is via higher motivation; here Wall and Jackson agree with Hackman and Oldham. The other mechanism is that a higher degree of knowledge on the production process is developed and used by the workers.

The more general implication is that there are two underlying processes: an initial application of existing knowledge, where the mandate to rectify faults necessarily brings benefits through enabling a quicker response, and a subsequent development of predictive knowledge through learning, which allows fault prevention.

(Wall and Jackson 1995: 160-1)

### Human-computer interaction

It may seem surprising to find a short description on human-computer interaction here. As we have seen, lean production was an organizational improvement that did not *per se* depend on new technology. Further, human-computer interaction is often relegated to human factors specialists. But the important point is that change processes are unitary: work and organizational psychologists have to be able to deal with the ergonomic and human factors part of the problems as well as with

Table 20.8 Corrected effect size for intervention programmes on productivity factors

	Effect size
All programmes	0.44
Training	0.78
Appraisal and feedback	0.35
Management by objectives	0.12
Goal-setting	0.75
Financial incentives	0.57
Work redesign	0.42
Supervisor methods	0.13
Work rescheduling	0.21
Sociotechnical	0.82

Source: adapted from Guzzo et al. (1985)

ing supervisory techniques (e.g. increasing participation in decision-making) alone does not have a large effect on performance.

Job satisfaction is increased by laboratory training and team-building techniques, which are similar; trainees discuss how decisions are made in the group, how they feel in the group, and which problems should be solved by the group. Job enrichment and sociotechnical interventions are effective for productivity improvements but not so effective for increasing job satisfaction. Note, however, that goal-setting is one of the best intervention strategies both for job satisfaction and productivity enhancement.

The most important message of these two meta-analyses is that organizational development methods derived from psychology are effective in most circum-

stances (possibly with the exception of financial incentives which sometimes leads to productivity losses). Thus, if one uses organizational development techniques, the effects may not always be very high but they are most likely not negative. This stands in contrast to other interventions (e.g. purely technical or Tayloristic ones) which have been shown to decrease output in many cases.

**Ψ Section summary**

Work and organizational psychology cannot be content with just describing a job. It should also be able to suggest how to change jobs so that people can work better, with better results and with an increased well-being. It is possible to differentiate Tayloristic, human relations, sociotechnical, job enrichment and lean production perspectives, although there is clearly some overlap among them. Regardless from which perspective workplaces are changed, there are certain difficulties. The most important ones are anxiety, resistance, helplessness, breaking old routines, and lack of personal and institutional power to back up the change process.

- 1 Think of any job you know well. Can you change the workplace to make it more efficient and/or increase well-being? Attempt to change the job from each perspective described.
- 2 What do you have to do in the change process so as to make the change more effective?

**Ψ Chapter summary**

• **organizational socialization**

Socialization means that the organization has an impact on the person working in it; sometimes this is intended (e.g. when changing values), sometimes not (e.g. when reducing intelligence).

• **training**

Training works via assessment of training needs, the training design, transfer and evaluation. Two training designs are behaviour modelling and action training.

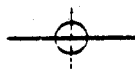
• **selection**

Selection is done with tests which have a certain reliability and validity. Interviews can be improved by having two interviewers or structured interviews. Assessment centres and intelligence tests are also valid selection procedures

• **organizational structure**

The organizational structure can be described in different ways; some of the more prominent configurations

Box continued



**Case study**

**Resistance to change**

Coch and French (1948) observed that many employees were less productive after a new technology was introduced than before. There was also aggression towards management. To reduce this resistance, they suggested participation in decision-making. Three groups were formed:

- direct participation in the decisions of how to introduce a new technology
- indirect participation with elected representatives talking to management about how to introduce the new technology

- no participation (which was similar to how changes are 'normally' introduced in companies).

The group without participation showed resistance to change; after 30 days they were still 12 per cent below the work rate they had achieved before. There was aggression, lack of co-operation, and high absenteeism. The group with indirect participation was much more co-operative. After 14 days they had reached their normal work rate again; after 30 days, their productivity was 10 per cent higher than before. The group with direct participation showed the best results. They reached the same work rate as before after 5 days and they were 14 per cent more productive after 30 days.

- We make more errors in our new behaviours than in our old habits.
- There is a feeling of reactance when we cannot apply our old habits any longer with the concomitant feeling of frustration and negative emotions.

**Comparing different interventions at the workplace**

Organizational change interventions are frequently unsuccessful (Porras and Robertson 1992), but companies have to change to adjust to new demands by the market, by technological development, by society, and by employees. Therefore, it is an important question which change concepts are more successful than others. Two meta-analyses help us to answer this question. In one, the effects of organizational development interventions on satisfaction are described (Neumann *et al.* 1989) and the other one looks at productivity of the workers (Guzzo *et al.* 1985). Tables 20.7 and 20.8 describe their results. Table 20.7 (Neumann) presents correlations and Table 20.8 (Guzzo) shows effect sizes. The correlations have to be read as relationships whereby a correlation of 0.30 is sizeable. Effect sizes have to be read as differences between the intervention group and the non-intervention group. An effect size of 0.40 is sizeable.

Tables 20.7 and 20.8 suggest that some methods work better on attitudes while others produce better

productivity enhancement. The most effective methods to increase productivity are goal-setting (that is giving high and concrete goals to the employees), sociotechnical improvements (which is a mixed bag of several procedures including autonomous work groups to improve the technological and social demands at work) and increasing qualifications (training). Financial incentives also have an effect size above 0.50; however, its variance is very high which means that in many cases it works very well but in other cases it may lead to negative effects (Guzzo *et al.* 1985). Also note that chang-

**Table 20.7 Corrected correlations of interventions and satisfaction and other attitudes combined**

	Correlation
<b>Specific human process interventions</b>	
• laboratory training	0.587
• participation	0.254
• goal-setting/management by objectives	0.436
• realistic job preview	0.204
• survey feedback	0.324
• team building	0.579
<b>Sociotechnical interventions</b>	
• job enlargement	0.219
• job enrichment	0.183
• flexible working hours	0.239

Source: adapted from Neumann *et al.* (1989)



tions are simply structure, machine bureaucracy, professional bureaucracy, divisionalized form, adhoc-racy, prospector, defender, analyser and reactor. There are many attempts to understand the relationship of the organizational structure with business success. It seems most likely that interactions with the environment are most crucial.

- **performance**

Performance falls into two parts: task and contextual performance. Performance can be analysed according to the action process and the levels of regulation. Performance appraisal is the systematic appraisal of employees. Action errors are not just to be seen as negative events, although they may lead to accidents.

- **stress and health at work**

Stressors at work interact with lack of resources to bring about ill-health. The most important theories are by Selye and Lazarus.

- **leadership and management**

It is important to distinguish between emergent and effective leadership. There are various theories of effective leadership: behavioural, contingency, and charismatic leadership.

- **work and organizational design**

Job and organizational design can be done from a Tayloristic, human relations, sociotechnical, job enrichment, or lean production perspective. Change processes always lead to some difficulties in the way.

### Further reading

- *Work and Personality* (special issue editor: Nicholson, N.) *Applied Psychology: An International Review* (1996, vol. 45, issue 3). A good overview of the issues of organizational socialization is given in this edition of the journal.
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