The impact of new forms of work organisation on working conditions and health

Background paper to the European Union Presidency Conference 'For a better quality of work'

on the same subject (Dhondt et al, 2001, Daubas-Letourneux et al, 2001, Oeij et al, forthcoming). It was written by TNO Work & Employment (Noortje Wiezer, Steven Dhondt and Peter Oeij) for the European Foundation for the Improvement of Working and Living Conditions.

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Introduction

To improve the competitiveness of European companies, the European Commission's Green Paper, *Partnership for a new organisation of work* (1997), states that a focus on 'a better organisation of work at the workplace, based on high skills, high trust and high quality' is a key priority for European companies. These so-called 'flexible firms' should be better capable of operating in an environment that is becoming increasingly unstable and complex. However, the assumption that these flexible firms both result in a high quality of work and bring about a decrease of work-related health problems needs to be examined. First we should define what we mean by new forms of work organisation and the flexible firm. Several new organisations can be typified as 'flexible firms' but they do not all have the same impact on working conditions. It should also be borne in mind that not only work organisation but also organisational policies need to be taken into consideration. Organisational policies, especially those that are related to the human factor, can contribute (positively or negatively) to working conditions and health.

This leaflet summarises the results of a literature review and two analyses of the findings of the Third European Survey on Working Conditions concerning the relationship between organisations, working conditions and health outcomes (Daubas-Letourneux et al, 2001; Dhondt et al, 2001; Oeij et al, forthcoming). According to these studies, different forms of work organisation ('old' and 'new' forms) are structured along two dimensions. This approach makes it possible to distinguish between four types of work organisation. For each of these forms of work organisation, the potential impact on working conditions and workers' health is assessed using the results of the two surveys and other published research. Finally, moderators which have a positive impact on working conditions and health will be identified.

One remark is important at the beginning. There are only a few studies which examine the relationship between different forms of work organisation and health. Furthermore, these studies use different conceptualisations for the same topic. However, considerable research into the relationship between working conditions and health has already been carried out (by the Foundation and other institutions). This leaflet presents the relationship between forms of work organisation and health in two steps:

1. What are the working conditions arising from the different forms of work organisation?

2. What are the effects on health and working conditions?

The evidence to prove the double relationship is at best only of a secondary nature. More systematic research on this subject is required. In the conclusion at the end, we formulate some recommendations on how this situation could be improved.

Four forms of work organisation

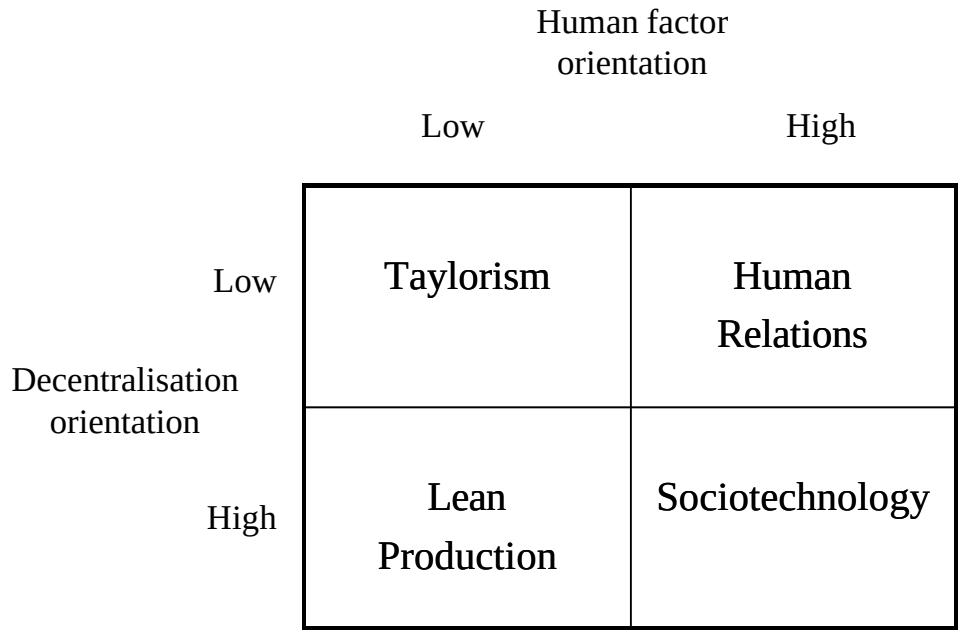
When looking at different forms of work organisation, it is important to start with the following two questions: first, to what degree are all management issues and decisions within an organisation centralised? and, secondly, to what degree does management use a 'human factor orientation' in its decision-making?

The dimension 'central-decentralised orientation' refers to the management structure in organisations. A *central orientation* can be characterised by a strict division of tasks, many hierarchical layers, and a distinction between several activities concerning personnel, financial and communication matters. Decisions are only taken at the top of the organisation. Problems are also solved at the top. When using a *decentralized orientation,* we see that work is often organised in team-like structures. Decisions are made by teams. Production and quality problems are solved where they occur, and that is ideally on the shop floor.

The dimension 'human factor orientation' describes the degree to which management concerns itself in its organisational decisions primarily with workers and their knowledge as a key resource (*high human factor orientation*) or, at the opposite end of this dimension, when management thinks of workers mainly in terms of costs and efficiency (*low human factor orientation*). The question which is important here is whether human capital is seen by management as an indispensable factor for (high) production or rather as an expense item. In organisations with a low human factor orientation, the organisation of work is such that efficiency is reached even if workers are not committed to the goals of the organisation. In organisations with a high human factor orientation, work is organised to reach efficiency through the commitment of workers.

If these two dimensions are combined, four organisational types can be distinguished: Taylorism, human relations, lean production and sociotechnology (Figure 1).

Figure 1: *'Decentralisation – human factor orientation' model*



The emphasis of the *Taylorism model* is on efficiency and productivity. To achieve this, work is divided into small, narrowly defined tasks. Workers concentrate on the operational tasks while managers 'do the thinking' and the staff is often only concerned with personnel or financial matters. Decisions are taken at the top. The Taylorism model can be characterised by a central orientation and a low human factor orientation.

In the *human relations* model, the emphasis is on the individual in the working environment. In this approach, it is recognised that productivity also depends on the motivation of workers. Organisational behaviour is not solely driven by financial incentives, but also by the meaning of work and by shop floor social relations. Tasks are still narrowly defined, but the working conditions are taken into account. While worker needs are considered when making decisions, the decisions are still taken at the top. The human relations model can be characterised by a high human factor orientation but with a central orientation.

The two latter organisational forms, lean production and sociotechnology, have only recently come to attention. They are perceived to be able to cope with new market demands such as quality, flexibility and innovativeness.

In the *lean production* model, efficiency is combined with flexibility. Lean production is an attempt to reduce impediments to the smooth flow of production through continuous improvements in productivity and quality, just-in-time (JIT) systems and elimination of wasted time and motions (Landsbergis et al., 1999). Work is organised in teams, and workers meet regularly in quality circles to solve quality and productivity problems. The orientation of the lean production model is decentralised, but the human factor orientation is low.

In the *sociotechnology* model, both quality of work and flexibility and productivity are taken into account. The basic idea behind this model is that organisations should try to achieve flexibility not by creating a lot of simple tasks, but by creating complex tasks. Such a measure helps to make the organisation itself more simple. These complex tasks are performed by autonomous workgroups that are empowered to make managerial decisions. The sociotechnology model can be characterised by a decentralised orientation and a high human factor orientation.

Work organisation, working conditions and health

The four organisational models do not treat human effort in the same way. So it is clear that the impact on working conditions and health will be different in the four organisational models. The relationship between the organisational model used and health is, however, not a direct one. The way to see this relationship is in terms of probabilities. Because each of the organisational models gives rise to different kinds of jobs with certain working conditions, health situations will differ from one job to another. It is important to understand that each of the organisational models has a higher probability for certain kinds of jobs or working conditions. Therefore, we need to first clarify the relationship between working conditions and health. This will be done in the first section below. The following section returns to the relationship between work organisation and health. Some results from national surveys show the kind of impact on health might be expected from the different forms of work organisation.

Impact on working conditions and health

To assess the different possible working conditions, the Karasek-model is a useful starting point (Karasek, 1979; Karasek & Theorell, 1991). In this model, two dimensions of working conditions are important. One must look at the balance between the psychological and physical job demands on the one hand and the job control on the other hand. Job control refers to the possibility a worker has to decide for him or herself about how to go on with the job and the possibility to use his or her skills.

Combining these two dimensions, four types of working conditions can be distinguished:

- Active working conditions: in these working conditions, workers experience high levels of demands but enjoy at the same time enough possibilities to control these demands;

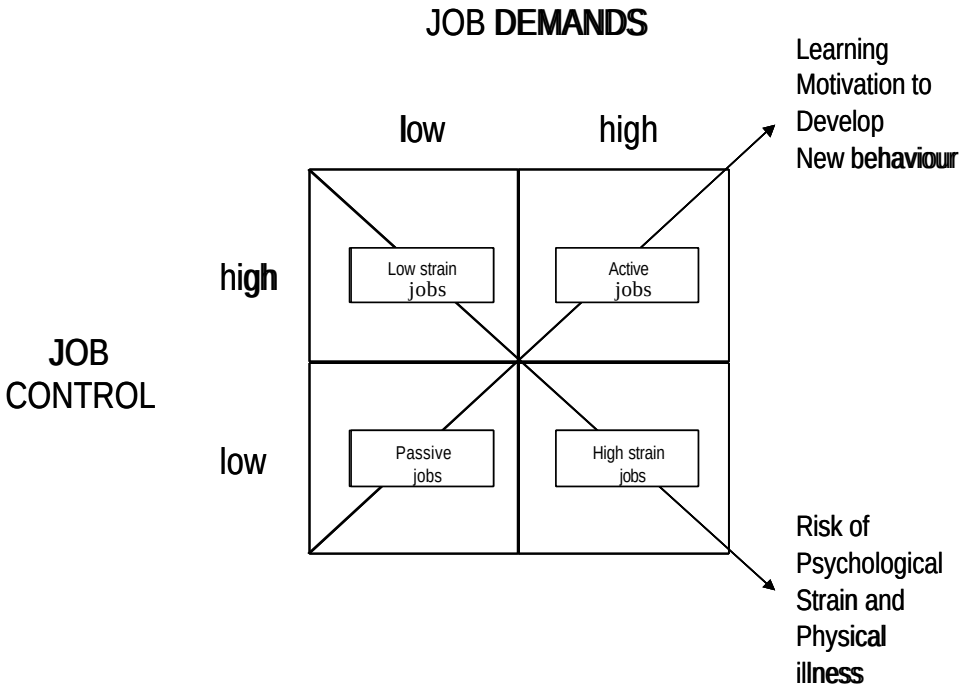
- Passive working conditions: in these working conditions, workers experience no job demands and have no control over possibly changing features of the work situation;

- High strain working conditions: in these working conditions, workers experience high demands but have no way of controlling what happens. They have to adapt passively to ever changing and possibly conflicting demands;

- Low strain working conditions: in these working conditions, workers experience low demands and have an excess capacity of control to deal with problems.

These working conditions are not the same as organisational conditions, but they are influenced by them. Figure 2 summarises the types of working conditions that result from the different combinations of time constraints and job autonomy. It also shows how working conditions are related to health.

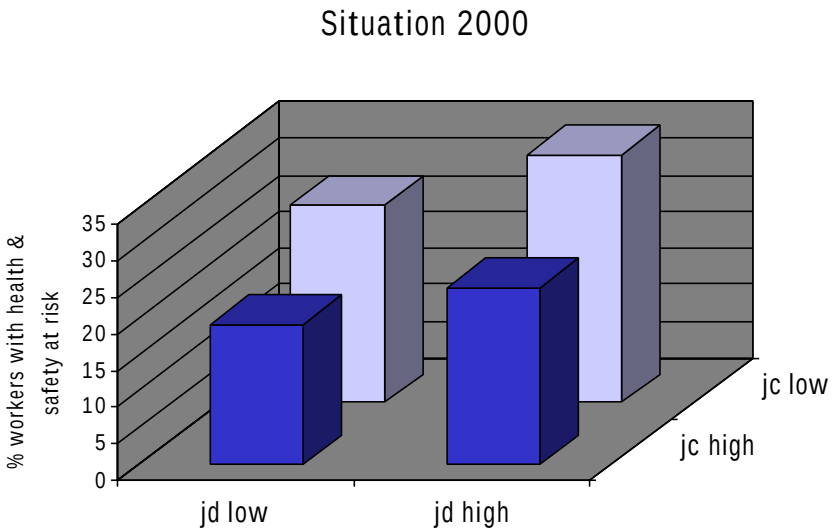
Figure 2: *The job control-job demands model*



As is shown in Figure 2, high strain jobs are predicted to have high risks for psychological strain and physical illness. Active jobs are predicted to have more opportunities for competence development. Figure 3, based on an analysis of the findings of the Third European survey on working conditions, shows that these predictions are valid. The low strain jobs show the lowest percentage of workers who reported health and safety risks and the high strain jobs show the highest percentage of workers which such reported risks. High strain jobs

are also positively related to self-reported stress, musculoskeletal problems and less job satisfaction (Dhondt et al, 2001).

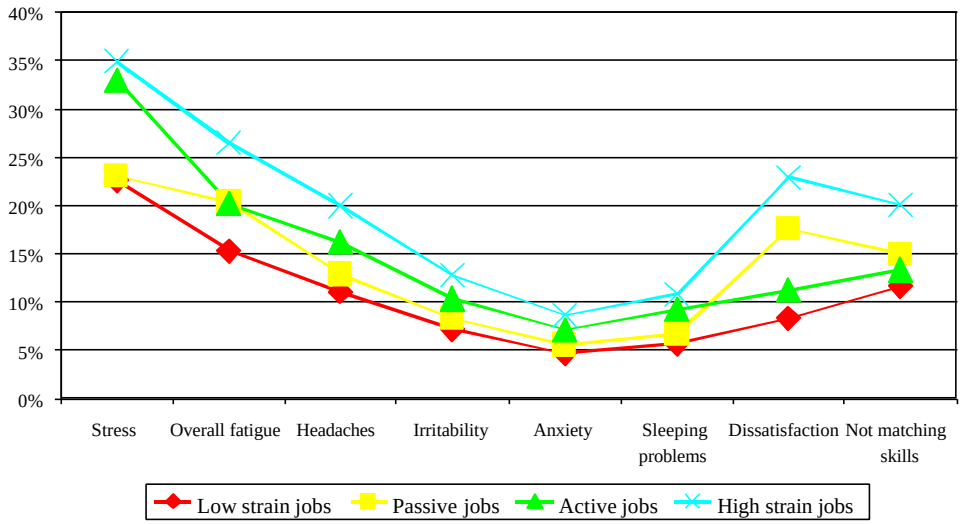
Figure 3: *Percentage of workers with health and safety at risk according to the four working conditions in the Third European Survey on Working Conditions*



(jd = job demands; jc = job control)
Source: Dhondt et al, 2001.

These predictions are also supported by the results of the analysis of Daubas-Letourneux et al (2001). We have used her approach to create psychological profiles for groups of workers in the following graph. Figure 4 shows the health situations of the four working conditions. Workers in high strain working conditions report the highest level of psychological complaints among the four groups. Workers with active working conditions generally have more self-reported health problems, but at the same time enjoy higher job satisfaction and a better use of their skills than, for example, high strain jobs. Workers in passive working conditions mainly show poor scores for job satisfaction, even though job demands in these jobs are clearly lower. Low job demands are not sufficient for a good job: workers need to be challenged by their jobs.

Figure 4: *Psychological health profiles, jobs satisfaction and job fit according to working conditi*ons



To sum up, workers with active working conditions (autonomous work) have low risks for psychological strain and workers with high strain working conditions have the highest psychological strain. To see what the impact is of work organisation on health we have to look at the working conditions in the four types of work organisation.

Working conditions in the four types of work organisation

We can now review the relationship between work organisation and working conditions. As was stated above in the literature review, four forms of work organisation are structured along two dimensions; the dimension 'central or decentralised orientation' and the dimension 'human factor orientation'. These dimensions have an impact on the separate dimensions of the working conditions, job control and job demands. The first work organisation dimension refers to the place where in the organisation problems tend to be solved and decisions are taken. Each task generates its own problems. Such problems need to be solved. For those jobs which have the responsibility to solve these problems, psychological job demands will increase. The possibility to take such decisions increases the control options in these jobs.

The second dimension refers to the perception of the input of workers in day-to-day matters in the company. Is worker input seen as a risk that needs to be minimised (mostly through standardisation of work)? or is worker input seen as an opportunity that needs to be maximised? Control options increase when worker input is maximised.

The Taylorism model has a highly central orientation and a low human factor orientation. Most of the workers experience low control possibilities and autonomy. The consequence is that psychological demands in general will also be low for these workers. In most cases, Tayloristic organisations will contain a majority of passive jobs. For a small part of the workforce, however, demands can be high, for example because work pace is high or quantitative norms are high (due to standardisation). These jobs will have high strain risks. Tayloristic organisations also contain managerial and staff jobs which are oriented at decision

making and problem solving. These jobs will certainly enjoy active working conditions and hence positive health outcomes. The number of workers in such situations will be rather low.

As was shown, the *human relations* model supports centralised decision-making. This reduces control options for workers, so we may find that psychological demands will be low too. On the other hand, the investment in the human factor lets a great deal of room for the input of the worker. This approach should increase the control options of workers. We expect that most of the jobs in this model will most likely be passive jobs. This means that such jobs will experience low strain risks, but at the other hand their jobs will not be very challenging. This could result in lower motivation and hence lower job satisfaction.

The *lean production* model has a decentralised orientation. Problems are (to be) solved at the shop floor. Such an approach increases the psychological demands on workers. But the downside of this model is the priority given to cost reduction. Worker input is minimized through forms of standardisation (by just-in-time systems for example). Control options for workers are therefore low. Most workers are subjected to high strain risks. Standardisation can also increase the physical demands. This is supported by the research of Landsbergis e.a. (1999). They state that 'the studies reviewed provide little evidence to support the hypothesis that auto manufacturing workers are empowered under Lean Production'. Lean Production intensifies work pace and demands. Increased decision authority and skills are very modest or temporary, and decision latitude remains low. Thus this work can be considered to have high job strain. In jobs with physical ergonomic stressors (such as manufacturing) intensification of labour may lead to increased rates of musculoskeletal disorders.

As discussed above, the *sociotechnical* model shows a decentralised orientation as well. In this model too, problems are solved on the shop floor. This increases the psychological demands for workers. Worker input is seen as an opportunity that needs to be maximised. Workers should therefore have high control options. Most of the jobs would have to be characterised as active jobs. Greenan (2000) as well as Dhondt & Kraan (2001), however, find that sociotechnical organisational improvement does not always guarantee better working conditions and health situation for workers. Dhondt & Kraan (2001) found that about a quarter of Dutch companies can be described as sociotechnical in nature. Surprisingly, sociotechnical companies are precisely those companies which report the highest stress levels among their workers. The workers in these companies also report the highest levels of job demands and burnout among Dutch workers. Apparently, the organisational improvement is not sufficient to guarantee better working conditions and a more favourable health situation for workers. Greenan shows with the French combined employer/employee survey (1997) why this is the case (Favre e.a., 1998). About a third of French companies are experimenting with all kinds of new measures such as just-in-time (JIT) policies, quality management and different types of work groups. Companies with the sociotechnical appoach based on teamwork do not always result in good working conditions. Greenan reports that among these companies, those which introduce quality improvement or project teams bring about better working conditions for workers. But many companies reporting the introduction of JIT, autonomous work groups and problem- solving groups do not bring about better working conditions. These companies face more complaints from their workers.

Three factors are important in this context. A first explanation for this result is that such organisational solutions (JIT, autonomous work groups, problem-solving groups) do not always give enough possibilities for control to all workers in the working groups. The experience of the French companies shows that only the project groups engage the effort of all

the workers in a positive way. A second explanation is that work organisation can be used to improve working conditions, but in order to achieve this, workers need to have the required skills in decision-making. If groups are made responsible for the group outcome, then group pressure (or social pressure) can lead to undesired consequences. Social pressure can increase job demands and decrease the control options for each of the individuals within the work group. In this case too, strain risks will increase. Finally, companies which use new organisational forms see rising job demands. In the Dutch situation, sociotechnically inspired companies appear to be so successful on the market that they are not capable of limiting the demands on their workers. Without sufficient organisational measures, such developments can increase strain risks (Dhondt & Kraan, 2001).

The impact of moderators on working conditions and health

While the previous chapters have shown how complex the organisational reality can become, the day-to-day practice of companies is shown to be even more complex. In general, organisational policies can only influence productivity outcomes if they are supportive of the organisational model (see McDuffie, 1995). In the reality of company policy, it is clear that managers have the possibility to use other measures to alleviate certain health outcomes, regardless of the organisational form used by the company. It is important to be alert to such actions.

'Social' human resource policies can be seen as a 'moderator' for the relationship between work organisation and health outcomes. Human resource (HR) policies can protect workers from high (physical) demands. HR policies can also be oriented at more training, proper hiring and proper payment systems. Occupational safety and health policies can influence health outcomes as well.

Moderators can influence working conditions and the effects of working conditions in different ways. They can decrease job demands or they can increase control options and in that way improve the working conditions. Whether an individual in a high strain job will get health problems depends partly on the characteristics of this individual. Some individuals are better capable in coping with high job demands than others. Moderators can also increase the capability of individuals to cope. These moderators will influence the effect of the working conditions on health. Table 1 summarises moderators with positive impacts, as cited in current research.

Table 1: *Measures which can help to improve health conditions at the company level*

(decrease) job demands – increase number of employees – adjust the quantitative or qualitative demands or norms – adjust the payment system to reduce the possibility of social pressure – occupational health policy – supportive leadership style
(increase) control options – more training – hiring employees with acquired skills – participation programmes – information management – more control options through social support – supportive leadership style – supportive climate – use of computers
Individual characteristics – stress management programmes – time management programmes – programme on 'coping with work pressure' – hiring employees with required skills

Such moderators can have an impact on the health outcomes reported at the company level. But it may be clear that the impact of separate measures will be limited. For example, Dhondt & Kraan (2001) have tried to find an impact of 'good' occupational health policies on the health situation of workers. 'Good' was defined as a planned system in which health risks were systematically detected and evaluated, and sufficient measures were developed to counter these risks. An overall positive result of such a policy could not be proven. The organisational context appears to be more dominant than the separate measure. Occupational health policy cannot itself alleviate the high job demands put onto workers (Dhondt & Kraan, 2001).

Conclusion

To improve the competitiveness of European companies, the European Commission's Green Paper states that a focus on 'a better organisation of work at the workplace, based on high skills, high trust and high quality' is a key priority for European companies to compete in the new economy. However, the discussed research results shows that such a relationship is somewhat more complex than this swift statement. It is not always the case that flexible firms show higher quality of work and a decrease of work related health problems. Several new forms of work organisation (like lean production and sociotechnology) can be typified as flexible firms. Working conditions, however, differ between these models. Jobs in the lean production firm bear high strain risks, while most jobs in sociotechnical firms can be characterised as active jobs. There is a substantial risk that the working conditions in lean production firms will have a negative impact on health. Our analysis has shown that human resource policies do not always alleviate a possible negative impact of working conditions on health. The impact of organisational form on health remains dominant. There are only a few studies that examine the relationship between forms of work organisation and health and they

all use different conceptualisations for the same topic. In this leaflet, we have shown that the presumed relationship between organisation and health needs a two step approach in which organisation determines working conditions and working conditions have an impact on health. The current research shows that most organisational changes tend towards lean production. Such flexibility brings a lot of health risks to workers. Research also shows that most sociotechnical experiments are not always bringing the promised improvement for workers either. This is mainly because of poorly designed organisational structures. Companies need more information about such models and ways to examine the degree in which such measures have been well introduced. Because of the complexity of the subject, sufficient support is required for the reorganising company. Otherwise, a lot of companies and organisations will miss the opportunity to increase flexibility where both the need from the individuals and employers are taken on board.

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