The quality of working life revisited: the changing interface between work and family

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SOM-theme A Primary processes

Abstract Since the early years of this century the characteristics of work and work circumstances in the Netherlands, like in other European countries, changed dramatically. The development of a 24 hour economy, the flexibilisation of work, and a greater participation of women in the labour force are relevant examples in this context. As a consequence of these changes of work and work circumstances, it is no longer evident that the quality of work can be studied from an isolated work perspective. In our view it is worthwhile to study the determinants of well-being at work not only from the perspective of the quality of work, but from an interrelated approach consisting of both a work and life course perspective. Based on data derived from three surveys in three different organisations (in total 483 respondents), we carefully conclude that the definition of the quality of work has to be redefined. Defining the quality of work only in terms of the characteristics of work seems to be outdated. In studies of labour it is time to incorporate the family, too.

1. LABOUR MARKET DEVELOPMENTS IN THE NETHERLANDS: A BIRD'S EYE VIEW

In this report we want to contribute to the discussion of well-being at work from the perspective of two different points of view. First we want to contribute to the discussion from the perspective of different theoretical frameworks, such as the Sociotechnical Systems Theory and the Job Characteristics Model. Second, we want to introduce a more dynamic approach than is commonly used in this discussion. Before we state our research questions in section 3, we will describe the Dutch labour market developments (this section) and the Dutch discussion on the quality of work (section 2). This discussion is rather different from the discussion in other European countries, because the concept of well-being at work plays a more explicit role in the Dutch Work Circumstances Act than it does in most other countries. We come back to this later, first we present a bird's eye view on labour market developments in the Netherlands.

1.1 Employment and unemployment

Since the early years of this century the characteristics of work and work circumstances have changed dramatically. First, the employment structure changed from highly agrarian to a service economy. In the agricultural sector the employment rate declined from 31% in 1899 to 4% in 1992[1]. In the services sector, on the other hand, the employment rate increased from 36% in 1899 to 70% in 1992. The employment rate within the industrial sector did not change dramatically. It decreased from 25% in 1899 to 19% in 1992. Over the whole period employment rose quantitatively in terms of man-years, although between 1970 and 1993 the number of man-years did not or hardly increase in the Netherlands (Schmid 1997).

From the beginning of the seventies the unemployment rate rose steadily in the Netherlands. In 1970 the number of unemployed people was 440,000, in 1984 this number rose to 591,000, to diminish in 1996 again to 440,000. The official unem-

[1] In percentages of the total employment in all sectors.

ployment rate in 1996 is less than 6 percent[2]. Most striking is the structural character of this unemployment. Since 1984 more than half of the unemployed have been without a job for more than one year. In the second half of the eighties half of all long-term unemployed were in this position for more than three years. Within the total number of unemployed, the share of women, workers between 25 and 54 years of age, people from ethnic minorities and employees with intermediate and higher education have increased strongly (SCP 1998).

1.2 Flexibilisation

The above mentioned (limited) quantitative growth of the employment in the Netherlands was largely produced by the increase in part-time work and the reduction of working hours. To start with the latter, the length of the working week decreased from 60 hours per week in 1910, to 38 hours a week in 1996 (Smulders 1995). In 1998 even a further reduction was an issue on the political agenda. In some sectors a 36 hours working week is already realised and plans for a reduction to 34 hours a week are being discussed.

Like in most industrial countries the number of workers with a flexible labour contract is increasing in the Netherlands (Delsen 1995). Although still more than 80% of Dutch workers hold a job on a permanent contract, the number of flexible workers is growing. When we compare the figures between 1985 and 1996 this is true for all categories (part-time workers, specific flexible workers, temping agency workers and temporary workers), but especially true for specific flexible and temping agency workers (Steijn 1998). The turnover of employment agencies has set record after record. This often involves externalisation of permanent staff. A mobility policy mainly addressing external outflow and flanked by provisions regarding out-placement and a focus on employability is becoming common property (Oeij et al. 1998). It is important to note that in general women, younger people and the lower educated are overrepresented within the various categories of flexible workers (Dekker and Doorenbos 1997). From these indicators the conclusion can be drawn that in general the Dutch labour market has become more flexible.

[2] Using the broad unemployment definition of the OECD the unemployment rate even rises to 24%. More than 2 million people (out of a labour force of 6.7 million) receive social welfare benefits or are active in subsidised jobs.

1.3 Participation of women

Next to flexibilisation, another major change is the growing participation of women in the labour force, which increased from 23% in 1899 up to 36% in 1987 and 45% in 1996. Between 1985 and 1996 the participation rates for men have grown from 67% to 72%, only 5%. For the year 2000 a participation rate of women of more than 50% has been forecast. Even the number of working mothers increased significantly. In 1988 27% of mothers with minor children had a job. In 1996 already 42% of them worked outdoors (Min. SZW/CBS 1998). Not only the participation rate of women is lower than for men, they work less hours as well. In 1996 the average number of working hours for Dutch men is 36.6 hours a week and the average for Dutch women is 26.5 hours a week. Women are concentrated in a couple of branches of industry. In the not-for-profit service sector (especially health care and public services) more than half of the employees are female. After 1987 the differences between the branches of industry in this respect did not change (Min. SZW/CBS 1998). As an effect of the participation of women in the labour force the number of double-income households is increasing.

1.4 Increasing workloads

Most analysts interpret the above-mentioned changes as improvements of the quality of work and the conditions of the working life. However, this does not mean that there are no problems left concerning health and work circumstances (Smulders 1995). There are some serious drawbacks as well. One of the most obvious is the increasing workload. The crisis of the Tayloristic labour organisation implies a search for new organisational concepts focussing on guidelines such as flexibility, quality and efficiency (Oeij et al. 1998). Apart from altering the psychological contract between employer and employee, workers run the risk of workloads exceeding the limits (Van Klaveren & Tom 1995, Nijhuis 1995, Kompier 1996).

There are serious indications that this is already the case. A survey of the working conditions of the Statistics Netherlands (CBS), held since 1974, shows minimal reductions of the exposure to physical hazards (noise, polluted air, heat, cold, vibrations, carrying heavy loads and tiring positions). Remarkable, however, is the growing number of employees reporting of working at high speeds and to

tight deadlines. In 1977 this was reported by 39%, in 1992 this percentage rose to 56% and in 1997 this was reported by 59% of the workforce. Furthermore, 10% of the workforce shows symptoms of serious psychological fatigue. Especially policemen, teaching staff and people working in the printing industry and health care suffer from high workloads.

Increasing workloads are of course related to the development of the 24 hours economy. The flexibilisation of working hours (even by law) resulted in a more dispersed working day. In 1995 already 55% of the Dutch labour force is confronted with working hours outside the normal '9 to 5' regime, and 48% is confronted with evening, night and weekend shifts (Breedveld 1998).

Another reason for demanding workloads is the increasing employment in the service and knowledge sectors. One of the biggest problems in these sectors is the difficulty in defining the output parameters. When are clients sufficiently satisfied? When is the quality of a policy document, a marketing plan, or a research proposal satisfactory enough? Empowered employees, negotiating with independent and emancipated internal or external clients, have to set their own goals and increasingly determine the quality level of the required output themselves. Because most professionals are intrinsically motivated this determination of output becomes even more problematic. Work that is rewarding produces energy and is at the same time demanding, at least in terms of working hours. With the help of the latest information and communication technology (e.g. faxes, lap top computers, cellular phones) many workers are even no longer constrained by their working place and working time. They can work whenever and wherever they like, which of course blurs the demarcation between working and leisure time, between work and family. A fine example of these trends is of course the growing number of teleworking employees. In this type of work home is the workplace and of course the source of many social pressures. Problems in controlling the natural borders between work and family result in an increasing work pressure.

Although many recent labour developments can be interpreted as improvements of the quality of work and the conditions of the working life, increased workloads is one of the obvious drawbacks. In our view this quality of work and especially the changing interface between work and family needs attention. In the next section we first turn to the debate on the quality of work.

2. THE 'WORK CIRCUMSTANCES ACT', THE QUALITY OF WORK AND THE WORK-FAMILY INTERFACE

2.1 The Work Circumstances Act

As stated, paying attention to work, work circumstances and the workers' health is still called for. This is one of the reasons why the 'Arbowet' (Work Circumstances Act) was introduced in the Netherlands in 1980 and has been renewed several times since then. This Act prescribes attention to, and improvement of safety, health and well-being at work. It obliges Dutch companies to audit risks related to the workers' safety, health and well-being at work.

Safety and health at work have been widely studied. Well-being at work, on the other hand, is a more complex and less well-known concept. In this field there is not much experience. There are still many questions about the definition of well-being at work, how it can be measured (risk audits), and how it can be improved. In the Dutch research literature the topic of well-being at work is unique and relatively young[3]. Only since the introduction of the 'Arbowet' (in 1980) has the subject of well-being at work aroused interest, although its theoretical background is the same as that of the better known (and older) subject of the quality of work. Therefore, we will use these concepts as synonyms coinciding with the definition of well-being in the 'Arbowet'.

The introduction of the 'Arbowet' in the Netherlands can be seen as a contribution of the Dutch government to the historical trends to improve the quality of work and as an interpretation of the directives of the European Community (89/391/EEG). The basic assumption of the 'Arbowet' is that well-being at work, besides safety and health at work, is an independent part of work circumstances (Jol et al. 1987). Well-being should be treated in the same way as health and safety are dealt with: prevent the occurrence of risks and eliminate existing risks. Standards about work conditions are formulated, and jobs should meet these standards or should alternatively be subject to measures to eliminate the existing risks. In this way well-being becomes a rather normative and prescriptive concept: independent

[3] Most other European countries do not use the concept of well-being at work in their attempt to improve the work conditions. They just use the concepts of safety and health at work.

of the worker, jobs are evaluated on risks concerning the well-being at work (Projectgroep WEBA, 1989).

2.2 The quality of work

In the assumptions of the 'Arbowet' a sociotechnical background is recognisable. After all, one of the basic assumptions with regard to sociotechnical interpretation of the quality of work is that it is determined by the characteristics of the work itself. The Sociotechnical Systems Theory is one of the theoretical frameworks frequently used in the Dutch discussion on the quality of work. It states that jobs and organisations that are designed according to certain principles improve the quality of the organisation and the quality of work. These principles are based on the striving for balance between problems in the work (also called control need) and possibilities to deal with these problems (also called control capacity)[4]. To deal with problems an employee should have enough possibilities to solve them conclusively. So there should be enough control capacity located there where the need for control arises[5]. According to the (Modern) Sociotechnical Systems Theory this balance can be achieved by designing the organisation into task groups (teams) which perform 'whole tasks' (a coherent set of tasks within a production cycle). Within these task groups the members have enough control capacity to deal with the problems which can occur during the work. In other words, there is a balance between control need and control capacity (Van der Zwaan 1994). Then control is both effective and efficient. With regard to well-being the benefit of a sociotechnically designed organisation is that the workers perform not just one small, monotonous task in the whole production process (as in Taylorised organisations), but that they perform, and are responsible for, a coherent set of tasks within a production cycle.

This brief sketch illustrates that within a sociotechnical interpretation of the quality of work the focus is on the characteristics of the work and the organisation of labour itself. In these so-called objective evaluations of the quality of work the opinions of those who actually do the jobs are left out.

Other (more psychological) theories frequently used in the Dutch discussion on the quality of work, state that next to characteristics of the job characteristics of the

[4] This is the same balance Karasek (1979) described between job demands and decision latitude.

worker and the fit between the individual and the job are also important to explain the motivation and satisfaction of employees. The fit model that has received the widest attention is the Job Characteristics Model, proposed by Hackman and Oldham (1980). The model identifies five core job characteristics (skill variety, task identity, task significance, autonomy, feedback from the work) that influence critical psychological states, such as the experienced meaningfulness of work, the experienced responsibility for the work, and feedback relating to knowledge of results of work activities. Collectively, these critical psychological states affect five outcomes, namely work satisfaction, internal work motivation, work performance, absenteeism and turnover. The central focus of the model is the individual's attitudinal response to the work. In many studies the mediating (intervening) role of the psychological states between job characteristics and personal outcomes is supported (Fried and Ferris 1987).

Existing Dutch risk audit instruments for well-being, such as WEBA and NOVA-WEBA (Dhondt and Houtman 1992; 1996; Vaas et al. 1995) are developed under the authority of the Ministry of Social Affairs and Employment in order to measure the well-being at work as mentioned in the 'Arbowet'. Since the assumptions in the 'Arbowet' have a sociotechnical background as well, the same applies for WEBA and NOVA-WEBA. Accordingly these instruments focus only on the characteristics of the work itself, and not on the characteristics of the worker or the fit between work and worker. This one-sided interpretation is subject to a great deal of discussion, because apart from the balance between control need and control capacity in the work itself, some analysts state that the balance between the work and the worker is equally important. The goal of this report is partly to contribute to this discussion by analysing simultaneously determinants derived from the (Modern) Sociotechnical Systems Theory and the Job Characteristics Model. This results in our first research question: In what way is well-being at work determined by the characteristics of work, the characteristics of the worker and/or the fit between the work and the worker?

[5] Based on Ashby's Law of Requisite Variety (Ashby 1969).

2.3 The work-family interface

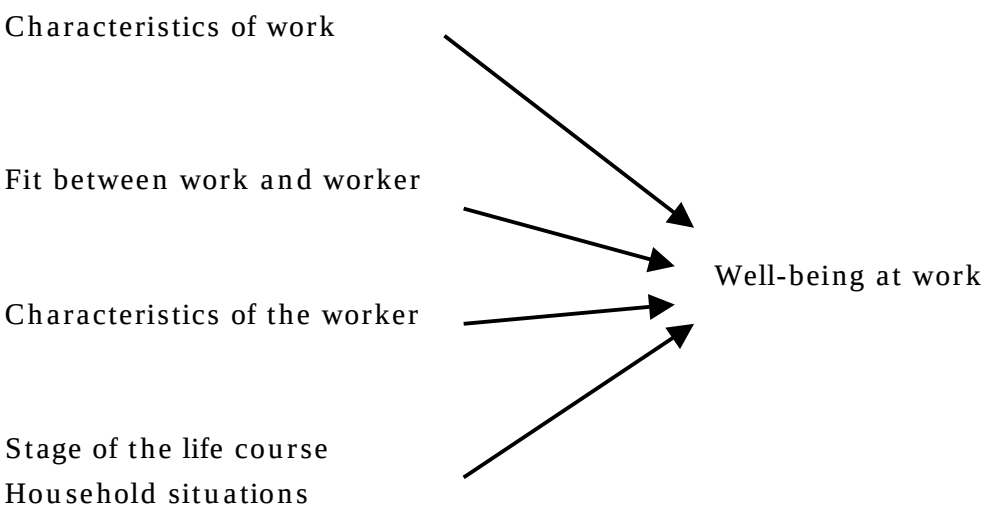
Because of the changes of work and work circumstances (described in the first section), it is no longer evident that questions of labour are being studied from an isolated work perspective. Next to labour the total number of activities of workers have to be considered, such as leisure time and the care for family members. The need of workers to adapt their work and leisure time to their private circumstances is growing. The sharp division between work and private, originated in the second half of the 19th century, will disappear and become more diffuse. That is why workers increasingly make great demands upon their work in terms of conditions, content and hours. In this sense there is no longer a clear distinction between the quality of work and the quality of life.

This explains the recent debates on the interface between labour and care activities. In general, studies on the quality of work are directed at one field of activity, although recent developments on the labour market point at the increasing inter-relatedness of work and the other fields of activity. As far as we know such an approach to the study of the quality of work does not (yet) exist. At the same time such a new perspective would mean a less static approach. Connecting the study of the quality of labour to, what can be called, a life course perspective implies a more dynamic point of view. What can be considered as highly qualitative work could depend on the stages of life workers are in. The content of a job, the working conditions and the conditions of employment under which the work is executed are traded off differently in alternative stages of life. Highly qualitative work in the beginning of the career can be very stressful in a later stage of the life course, for instance while having a working partner or having responsibilities for the upbringing of children. So, in our view it is worthwhile to study the determinants of well-being not only from the perspective of the quality of work but from an interrelated dynamical approach between work and other fields of activity, e.g. care. Therefore our second research question is: In what way are the determinants of well-being influenced by the stages of life workers are in?

3. CONCEPTUAL MODEL AND RESEARCH QUESTIONS

As mentioned in the previous sections, the goal of this report is twofold. First we want to contribute to the discussion on well-being at work by analysing simultaneously determinants derived from the (Modern) Sociotechnical Systems Theory and from the Job Characteristics Model. Next to this, we want to investigate in what ways these determinants are influenced by the stages of life workers are in. So, to gain knowledge about the determinants of well-being at work the conceptual model focuses on the characteristics of work, the characteristics of the worker, the fit between work and worker and the stage of life of workers (see figure 1). First, we analyse the relations between the characteristics of the work, the characteristics of the worker and the fit between work and worker as independent variables and the experienced well-being at work as dependent variables. Here the assumptions of the Modern Sociotechnical Systems Theory are confronted with those derived from a more psychological point of view. Subsequently, we add the determinants of the stages of the life course into our analysis. Since this report is one of our first attempts to analyse the well-being at work from a life-course perspective, the concept ‘stage of life’ is predominantly limited to the household situation. We come back to this when we discuss the measurement of the different concepts.

Figure 1: Conceptual model for this report



To analyse the assumed relations this report addresses the following research questions:

1. In what way is well-being at work determined by the characteristics of work, the characteristics of the worker and/or the fit between the work and the worker?
2. In what way are these determinants influenced by the stages of life workers are in? In other words, does the household situation add extra explaining power compared to a model in which the characteristics of work, the worker and the fit between work and worker are taken into account?

4. METHODS: DESIGN AND MEASUREMENT

4.1 Design

Ideally, our research questions presume a longitudinal design. This kind of design is best suited for connecting studies of the quality of labour to a life course perspective. In essence we want to know whether respondents executing the same jobs judge the well-being at work differently once their life situations have been changed. Since longitudinal data were not available, we had to use a cross-sectional design: varying the different household situations of our respondents. In this way we compared the well-being at work for respondents working in the same jobs with

different household situations. The assumption is that these different household situations indicate the effects of the different stages in the life course. So we assume that cross sectional household situations capture a synthetic cohort of changes of the life course. This is a contestable assumption but, considering the available data, the next best solution.

To answer our research questions we analysed data gathered in three Dutch organisations. The first one is an organisation for domiciliary care. This case is interesting because the majority of workers are female (see table 1) and it is often found that women value their family more than work. Women especially view work as a means to attain family well-being, or at least both family and work are similarly highly valued (Inglehart 1990, Tausky 1992, Voydanoff 1987, Raabe 1998). Furthermore, most nurses and home helps have flexible working hours, not working from nine to five, but working at early morning hours, evening hours and regularly in the night and in weekends. Reviewing these circumstances the case seems suitable to test our ideas regarding the quality of work from a life course perspective.

The respondents in this organisation work in caring jobs, because management and staff were not included in the risk audit.

As a contrast to the organisation for domiciliary care, the second organisation is a bicycle manufacturer. In this organisation most respondents are men and the working hours are mainly from 8 to 5. Most workers (62%) work at an assembly line. This is a kind of conveyer belt on which every worker assembles one or more parts to the bicycle that passes by in a slow pace. Only 3 respondents (4%) do not work in the production department. They work in the office.

The third organisation is, such as the first organisation, in the services sector. It is a central organisation for playgroups[6]. This is an umbrella organisation with which 34 playgroups in one city are affiliated. About 1500 pre-schoolers visit these playgroups.

Some characteristics of the respondents in the three organisations are shown in the next tables.

[6] These data were gathered by Karin Delger, student at the faculty of Management and Organisation of the University of Groningen. She used the same questionnaire for her thesis research as we did for this research. So we combined the data.

Table 1: Characteristics of the three organisations

	Domiciliary care	Bicycles	Playgroups
Number of respondents	309	73	101
Response rate	58%	41%	85%
Men	3	51	1
Women	304	22	100
Average length of the working week	20.4	41.0	25.4

Table 2: Age of the respondents

Age	Number of respondents	
Younger than 26	34	(13, 18, 3)
Between 26 and 35	161	(101, 27, 33)
Between 36 and 45	161	(95, 18, 48)
Between 46 and 55	81	(81, 10, 15)
Between 56 and 65	44	(18, 0, 1)

N=483

Between brackets the figures of the three different organisations. The first is for the organisation for domiciliary care, the second for the bicycle manufacturer end the third for the central organisation playgroups

Table 3: Educational level of the respondents

Educational level	Numb. of respondents	
Primary education	22	(14, 6, 2)
Lower vocational training	101	(69, 26, 6)
Secondary education general level	66	(42, 15, 9)
Secondary vocational training	177	(129, 15, 33)
Secondary education advanced level	30	(13, 6, 11)
Higher professional education	77	(40, 3, 34)
Academic education	5	(0, 3, 2)

N=483

Between brackets the figures of the three different organisations. The first is for the organisation for domiciliary care, the second for the bicycle manufacturer end the third for the central organisation playgroups

4.2 Measures

In order to measure the concepts within the conceptual model, we studied a great diversity of instruments based on the different theoretical backgrounds of the

model. From these instruments we derived a new questionnaire consisting of already existing and validated scales. In the next sections we present the measures used in this report.

Characteristics of work.

Since one of our goals for this report is to test the sociotechnical assumptions on the quality of work, the characteristics of work are measured using the NOVA-WEBA questionnaire, which has a sociotechnical background. Scales from other questionnaires that focus more on work circumstances and terms of employment supplement this NOVA-WEBA questionnaire. Therefore the characteristics of work are measured with the following scales (and the instruments the scales are derived from):

1. difficulty of the work (NOVA WEBA),
2. variety in the work (VBBA*)
3. completeness of the work (NOVA WEBA),
4. monotony of work (NOVA WEBA),
5. autonomy (NOVA WEBA),
6. interaction potential (NOVA WEBA),
7. organising tasks (NOVA WEBA),
8. work organisation (VAG[+]),
9. information (NOVA WEBA),
10. task changes (VBBA),
11. executives and colleagues (VAG)
12. physical work circumstances (VAG)
13. physical strain (VBBA)
14. terms of employment (JCQ[#])

** VBBA = Vragenlijst Beleving en Beoordeling van de Arbeid (Questionnaire Experience and Judgement of Work; Van Veldhoven and Meijman 1994)*

[+] *VAG = Vragenlijst Arbeid en Gezondheid (Questionnaire Work and Health; see Kompier and Marcelissen 1993)*

[#] *JCQ = Job Content Questionnaire (Karasek and Theorell 1990)*

Characteristics of the worker.

To measure the characteristics of the workers, some questions were asked regarding educational level, age, marital status, care for children, and job experience. In

addition to these variables, and most important, we measured the workers' orientations (need strength) on job content, work circumstances, work relations, or terms of employment (van der Parre 1996). The orientations are measured by asking how important certain characteristics of the work are. The answer gives an impression of which categories of scales are important in the workers' jobs (according to those workers) (Ten Horn 1989). Therefore the characteristics of the worker are measured with the following scales: 1. orientation on job content, 2. orientation on work circumstances, 3. orientation on work relations, and 4. orientation on terms of employment. The same categories are used to measure the characteristics of the relation (fit) between the work and the worker. The next section describes how we measured this and what the differences are.

The fit between work and worker.

As said, to measure the characteristics of the relation between the work and the worker the same categories are used as we used to measure the characteristics of the worker. But here the question was not how important a certain characteristic is, but the worker's satisfaction with the present work situation with regard to that characteristic. This is a question about how the worker experiences the characteristics of the work. It reflects the worker's perception of the work. Two examples of questions in the questionnaire can explain the difference between a measurement of a characteristic of the worker and a measurement of a characteristic of the relation between work and worker. The following questions from the questionnaire are questions 173 and 174.

173. How important is good co-operation with your colleagues?

174. How satisfying is the co-operation with your colleagues?

The first question is about someone's need strength for good co-operation. This can be seen as a personal characteristic. The second question asks how someone's need strength is satisfied in the present work situation. This is a measurement of the relation between the work (how is the situation) and the worker (what is important). In our conceptual model for this report only the second type of questions with regard to the job content are used in the analysis.

Furthermore the fit is measured by looking at the utilisation of the workers' educational level and the workers' job experience. So the following scales measure the fit between work and worker: 1. perception of the job content, 2. perception of work circumstances, 3. perception of work relations, 3. perception of terms of em-

ployment, 5. utilisation of the worker's educational level, and 6. utilisation of the worker's job experience.

Household situation.

To measure the characteristics of the household situation we constructed three variables: 1. stage of life, 2. regularity of working hours of the respondents and their partners, and 3. the total amount of working hours of the respondents and their partners.

Following Tijdens et al. (1994), we distinguished 6 stages of life:

1. Living alone (88 respondents)
2. Living together with a partner and no children (160)
3. Living together with partner and youngest child 0-4 (77)
4. Living together with partner and youngest child 5-12 (69)
5. Living together with partner and youngest child 13-18 (52)
6. Living together with partner and youngest child 19 or older (18)

To measure the regularity of working hours of the respondents and their partners, we asked whether the respondents and their partners work at hours between 8 am and 5 pm. This leads to a division of four categories:

1. Both work at regular working hours (140 respondents)
2. The respondent works at irregular hours and the partner at regular hours (55)
3. The respondent works at regular hours and the partner at irregular hours (73)
4. Both work at irregular working hours (51)

In an attempt to diminish the number of variables in the analysis, we grouped some of the categories. With regard to the stages of life we grouped categories 3 and 4 (Living together with partner and youngest child 0-12) and we grouped categories 5 and 6 (Living together with partner and youngest child 13 or older). With regard to the regularity of working hours we grouped categories 2 and 3 (One of both partners works at irregular hours).

The third variable, used as an indicator for the household situation, is the total amount of working hours of the respondents and their partners. This variable is constructed simply by adding the respondents working hours to those of their partners.

Well-being at work.

Finally, the effects of well-being were measured with scales from different already existing and validated questionnaires. The different scales used are (between brackets the name of the instrument the scale is derived from) 1. workload (NOVA WEBA) 2. need for recovery after work (VBBA), 3. work satisfaction (VBBA), 4. commitment (VBBA), 5. intention to turnover (VBBA), 6. health (VOS-D[7]), and 7. mental and physical state during work (VOS-D).

Since the use of many (dependent) variables in a regression analysis is not useful, a reduction of the variables is desirable. There are two ways to do this, a theoretical way and a statistical one. A disadvantage of the statistical way is that the results need to be interpreted, which can become very difficult. However, a factor analysis on the dependent variables, being the effects of well-being, distinguished four factors. Table 4 shows the results of the principal axis factoring with varimax rotation and Kaiser normalisation. This analysis was executed with the data gathered in the organisation for domiciliary care (see Schouteten and De Witte 1999).

Table 4: Results of the factor analysis

	Factor			
	1	2	3	4
Need for recovery	.073	-.131	**.295**	.152
Satisfaction	-.020	.069	-.075	**.716**
Commitment	-.071	**.536**	-.020	-.134
Intention to turnover	-.107	**.330**	.001	.067
Health	**.194**	-.134	.059	.094
Mental/physical effects	**.763**	.097	-.195	-.208
Workload	-.106	.053	**.654**	-.125

These factors can be interpreted as follows. The first factor is ‘mental and physical effects of work’. It contains the scales ‘health’ and ‘mental and physical state during work’. The second factor can be called ‘commitment’. It contains the scales ‘commitment’ and ‘intention to turnover’. The third factor is ‘workload’. It contains the scales ‘workload’ and ‘need for recovery after work’. The fourth fac-

[7] VOS-D = Vragenlijst Organisatie Stress-Doetichem (Questionnaire Organisational Stress-Doetichem; see Kompier and Marcelissen 1993).

tor is ‘job satisfaction’ and consists of the scale with that name. Since these factors can well be interpreted we used the same factors in this research.

However, the skewness of all four factors is rather high. This is probably due to a lack of variance in the scores per scale, e.g. most respondents report that they are (very) satisfied with their work. To reduce these skewness problems we constructed a variable ‘overall effects’ in which all dependent variables are added together. This results in a more normal (or Gaussian) distribution. For the first analysis, we used only this variable (‘overall effects’) as dependent variable. To construct this variable the scores on the dependent variables were recoded to a score between 0 and 1 and added together. This gives an impression of the overall effects the work has on the person.

4.3 The reliability of the scales

The reliability of the scales is assessed by Cronbach’s alpha. Apart from means and standard deviations we present in table 5 the reliability coefficients per scale. Although only validated existing scales were used, Chronbach’s α yielded some reliability coefficients that are only just reasonable. The reasons for this need to be investigated further. One of the possible reasons is that the respondents are mostly women in caring jobs. This is not a representative sample of all working people and this may cause the deviation in the reliability of the scales.

Table 5: Means, standard deviations and Chronbach’s alpha per scale

Scale	Mean	Std. Deviation	Cronbach’s α
Characteristics of work			
Difficulty of the work	.593	.279	.79
Variety in the work	.412	.192	.74
Completeness of the work	.371	.229	.79
Interaction potential	.304	.249	.63
Work organisation	.241	.298	.74
Monotony of work	.344	.300	.53
Autonomy	.356	.251	.71
Organising tasks	.300	.325	.76
Information	.280	.215	.70
Task changes	.273	.137	.64
Executives and colleagues	.250	.303	.75
Physical work circumstances	.230	.220	.60
Physical strain	.556	.215	.86
Terms of employment	.425	.156	.32

Characteristics of the worker			
Orientation on job content	2.311	.813	.84
Orientation on work circumstances	4.360	1.362	.80
Orientation on work relations	1.445	.747	.81
Orientation on terms of employment	1.708	.801	.72
Fit between work and worker			
Perception of job content	3.160	1.033	.89
Perception of work circumstances	2.826	1.128	.79
Perception of work relations	2.854	1.277	.86
Perception of terms of employment	3.134	1.149	.76
Utilisation of educational level	.247	.432	(1 question)
Utilisation of job experience	.186	.390	(1 question)
Well-being at work			
Work load	.366	.232	.77
Recovery need after work	.332	.311	.88
Work satisfaction	.113	.182	.78
Commitment	.366	.262	.77
Intention to turnover	.261	.328	.80
Health	.077	.099	.86
Ment./physical effort	.255	.126	.81
Overall effects	1.782	1.044	.65

Explanation: the scores for the characteristics of the work and the effects of well-being are standardised between 0 and 1. A high score (close to 1) indicates a risk on that characteristic. The score for the orientations and perceptions can range between 1 and 7. A high score (close to 7) indicates a low orientation or a low satisfaction (perception) with regard to that characteristic. The score for the overall effects can range between 0 and 4. A high score (close to 4) indicates a great deal of problems concerning the overall effects of well-being at work.

With regard to the effects of well-being at work the scores are excellent. None of the scales gives reason to expect high risks for the well-being of the employees. If we look at the scales representing the characteristics of the work, we can see two scales with rather high scores (> .5): difficulty of the work and physical strain. This may indicate that the work is mentally and physically exhausting. The workers have to work hard and fast, and the work demands a great deal of attention and attentiveness. But until now this has not led to high scores on the scales that measure the well-being effects.

5. ANALYSIS

To answer our research questions we executed several regression analyses in SPSS. To find out what variables are the most important determinants of well-being we

executed stepwise regression analyses to test four different models. In the first step we entered the characteristics of work. The model then consists of well-being as dependent variable and work characteristics as independent variables. This is the sociotechnical model in which only characteristics of work are important determinants of well-being. In the second step we entered, following the framework of the Job Characteristics Model, the characteristics of the fit (as additional independent variables in model 2). In model 3 we entered the characteristics of the workers as additional independent variables. In the final step we entered the variables regarding the household situation as additional independent variables (model 4). This fourth model is meant as a test of our ideas about the fundamental change of the work-family interface. It should be noticed that the indicators of the household situation are entered as dummy variables.

Earlier regression analyses showed that the household situation is more important than the characteristics of the worker. Therefore we changed the order of the third and fourth model. Hence, in step three the household situation will be added to the model and in the fourth step the characteristics of the worker will be entered.

As mentioned, within the first analysis we used 'overall effects' as dependent variable. The results of this regression analysis are shown in table 6. The results of the regression analyses on the other dependent variables are not fully presented in this report, because they show similar, however less significant, outcomes. The tables presenting these results can be obtained from the authors.

Furthermore, we checked for interaction effects of the household situation with the other independent variables. But using general linear modelling did not result in significant interaction effects. So these are not taken into consideration in the regression analysis. Therefore, only the direct relations between household situation and well-being are used in the analysis.

Table 6: Regression analysis of different independent variables on 'overall effects'

Variables	**Model 1** Beta	**Model 2** Beta	**Model 3** Beta	**Model 4** Beta
Characteristics of work				
Difficulty of the work	.201***	.181**	.157**	.144*
Variety in the work	.218***	.147*	.136*	.123*
Completeness of the work	-.176***	-.168***	-.149**	-.160***
Interaction potential	-.052	-.031	-.015	-.027

Work organisation	.265***	.232***	.210***	.205***
Monotony of work	-.007	-.013	-.010	-.033
Autonomy	.063	.032	.027	.034
Organising tasks	.095	.059	.052	.066
Information	.098	.062	.081	.088
Task changes	.230***	.206***	.208***	.214***
Executives and colleagues	.142*	.121*	.116#	.135*
Physical work circumstances	.050	.026	.017	.027
Physical strain	.068	.024	.023	.012
Terms of employment	.084	.038	.027	.005
Fit work-worker				
Perception of job content		.203***	.204***	.290***
Perception of work relations		-.025	-.028	-.078
Perception of terms of employment		.108#	.095#	.098#
Perception of work circumstances		.087#	.107*	.096#
Utilisation of educational level		.140**	.133**	.140**
Utilisation of job experience		-.060	-.059	-.075
Household situation				
Household situation = living alone			(ref)	(ref)
Household situation = living together			-.003	.006
Household situation = youngest child < 12			-.049	-.048
Household situation = youngest child > 12			-.110*	-.114*
Working at regular hours = both regular			(ref)	(ref)
Working at regular hours = one of both irregular			-.041	-.017
Working at regular hours = both irregular			.074	.087#
Amount of working hours of both partners			.089#	.077#
Characteristics of the worker				
Orientation on job content				-.147*
Orientation on work relations				.105#
Orientation on terms of employment				-.041
Orientation on work circumstances				.045
R^2	.567***	.639***	.666*	.681#
Adjusted R^2	.537	.603	.620	.630
n = 436				

# p < .1 / * p < .05 / ** p < .01 / *** p < .001

Table 6 shows that the characteristics of work are important determinants of the dependent variables in the model. However, the characteristics of the fit and the household situation add extra explanatory power. This is shown by the values of R^2 that increased significantly by adding these variables to the model. Although R^2 increased in the fourth model, this increase is not significant (but it is close to significance ($p < .1$, see Wanous 1974)). The values of Adjusted R^2 show similar results. These values increase when more variables are added to the model. This

means that their explaining power is not caused by chance. Although the change of R^2 of the fourth model is not significant, values of beta in table 6 show that there are variables (orientation on job content) that have significant influence on the dependent variables. With these result we are able to answer our research questions.

The first question was: in what way is well-being at work determined by the work characteristics, by the characteristics of the worker and/or by the characteristics of the fit between work and worker? From the comparison between model 1 and model 2 we can conclude that adding the characteristics of the fit increases the model fit (R^2) significantly. The increase of the model fit due to the adding of characteristics of the worker to the model is not significant[8] (model 4). So, using a model that consists of characteristics of work and characteristics of the fit between work and worker can give significant information about the well-being at work. This is also shown in earlier analyses on a major part of these data. These analyses showed that the characteristics of the work are the most important determinants of well-being at work (this confirms the sociotechnical assumption), but that the characteristics of the fit are important as well. Especially the perception of control capacity (a characteristic of fit in the first analysis) is important, even more important than control capacity (as a work characteristic) (Schouteten 1998, Schouteten and De Witte 1999). From this we can conclude that risk audits on well-being at work should at least pay attention to the characteristics of work and the characteristics of the fit between work and worker.

The second question was whether the household situation would add extra explanatory power to model 2. Comparing models 2 and 3 shows that adding the household situation to the model significantly increases the model fit. So these are also important determinants of well-being at work. This is an important conclusion because it confirms our idea that the sharp division between work and family is disappearing and that it is worthwhile to study the determinants of well-being not only from the perspective of the quality of work but from an interrelated dynamical approach between work and other fields of activity.

However this conclusion can not be verified by looking at the different dependent variables (see table 7).

[8] However, the orientation on job content is still an important variable in explaining the well-being at work (its beta value is significant). This needs some further investigation on these matters.

Table 7: Model fit (R^2) of the different models.

R^2	Overall effects	Satisfaction	Workload	Commitment	Ment./ phys. Effects
Model 1	.567***	.231***	.488***	.286***	.337***
Model 2	.639***	.262#	.531**	.343***	.373*
Model 3	.666*	.269	.546	.360	.396
Model 4	.681#	.277	.562#	.368	.404

Explanation: in Model 1 only characteristics of the work are included, in Model 2 characteristics of the fit are added to Model 1, in Model 3 characteristics of the household situation are added to Model 2, and in Model 4 characteristics of the worker are added to Model 3.
# p < .1 / * p < .05 / ** p < .01 / *** p < .001

This table illustrates that for each dependent variable R^2 increases when variables from models 3 and 4 are added to the second (or third) model. Except for 'overall effects' these increases are not significant, although some are close to significance ($p < .1$). This means that for most effects the characteristics of work and the characteristics of the fit are most important. Table 8, in which the values of Adjusted R^2 are presented, shows similar results. When the change of R^2 in table 7 is not significant, Adjusted R^2 decreases (or hardly increases). When Adjusted R^2 decreases, this means that the adding of more variables to the model does not increase the model fit. In fact the increase of R^2 is coincidental and is not determined by the new variables in the model.

Table 8: Adjusted model fit of the different models.

Adjusted R^2	Overall effects	Satisfaction	Workload	Commitment	Ment./ phys. Effects
Model 1	.537	.191	.458	.247	.300
Model 2	.603	.206	.492	.292	.323
Model 3	.620	.195	.496	.292	.332
Model 4	.630	.191	.505	.290	.329

Explanation: in Model 1 only characteristics of the work are included, in Model 2 characteristics of the fit are added to Model 1, in Model 3 characteristics of the household situation are added to Model 2, and in Model 4 characteristics of the worker are added to Model 3.

On the other hand, the values of beta in table 6 show that some variables with respect to the household situation or the characteristics of the worker are significant or close to significance. But we have to be careful in our conclusions because the values of beta in table 6 are quite puzzling. It is remarkable that most values of beta are not significant while R^2 is so high. Although, there are some values that are

close to significance ($p < .1$). This means that the influence of the individual variables in the model is limited. A possible explanation is that the variance within the variables (especially the dependent variables) are limited (see also table 5). This means that there is a small effect size and, hence, that there is not a great amount of variance that can possibly be explained. Therefore it is difficult to find variables that have a significant influence on the dependent variables.

The fact that there is little variance in the dependent variables can be due to the background of the respondents. Most respondents are female and most of them are working in the health care sector. This is not a representative sample of all working people in the Netherlands. Workers in the health care sector are highly intrinsically motivated to perform their jobs. Therefore they hardly complain about problems in their work; they just try to perform as well as possible to serve their clients. Therefore it is advisable to do the same analysis on data gathered in another population in which the variance in the dependent variables is bigger. The number of respondents from the bicycle factory is too little to be of major influence. Also this number is too small to perform the same regression analysis with these data only (none of the variables would have significant values of beta).

6. CONCLUSIONS AND DISCUSSION

In the last decades far-reaching changes have occurred in the labour market situation in the Netherlands. Like in other European countries, the work itself and the work circumstances have changed radically. These transformations can be interpreted, as an improvement of the quality of work and the conditions of the working life in general. Beside improvements some serious drawbacks are easy to mention. One of the most obvious is the quick increasing pressure of work. The development of a 16 hour economy combined with the growing possibilities especially for empowered professionals to work whenever and wherever they like, the work-family interface becomes a field of tension. However, most studies of well-being at work focus merely on the field of paid labour, or to be more specific the characteristics of the work itself. To the best of our knowledge an approach of well-being at work focussing on the work-family interface does not exist. In our view it is worthwhile to study the determinants of well-being from an interrelated dynamical approach between work and family, especially care activities.

The results of our analysis are summarised in table 6. The findings illustrate clearly that the characteristics of work are the most important determinants of well-being. Especially the difficulty of work, the completeness of work and the amount of information are significant factors. To date, this confirms the sociotechnical assumption especially. However, the characteristics of the fit between work and worker are also relevant. Especially the perception of the job content by the worker contributes significantly. Finally, even the household situation of the respondents adds extra explaining power to our model. Remarkable however is that, although the model fit increases significantly, only one of the variables is significant separately. However, the influences of the total amount of working hours of both partners and of both partners working at irregular hours are close to significance.

Summing up, it is not legitimate to conclude that the characteristics of work are the only important determinants of well-being. After all the fit between work and worker and even the household situation of the respondents add extra explaining power to our models. Because this report is one of our first attempts to study well-being at work from an integrated approach focussing on the work-family interface, definite conclusions are rather premature. But we carefully conclude that definitions of well-being at work based solely in terms of job characteristics have to be revisited. Because of the developments within the advanced industrial economies and more specific in modern workplaces, an approach of well-being focussing primarily on job characteristics is outdated. In our view the work-family interface is increasingly important. In studies of labour it is time to bring in the family, as well.

6.1 Future research

Because our data set is not based on a representative sample of the Dutch labour force, we have to be careful in generalising our conclusions. It is necessary to find out whether our conclusions will stand up to future evidence. More analyses, within different organisations, are required to explore the sociotechnical assumptions. And in those case studies we will add also several personal traits of the workers, like the employee growth need strength. In that way a full test of sociotechnical assumptions and for instance assumptions derived from the Job Characteristics Model become possible. To do so, it takes more than just linear regression analysis. It is likely that the personal characteristics of the workers have non-linear

or indirect effects on the well-being at work. In that case LISREL analyses are asked for.

Of course, the work-family interface is relevant for future research. Studying the quality of work from a life course perspective implies a more dynamic approach. This approach asks for longitudinal research designs and data sets that make it possible to measure the well-being at work of the same respondents in different stages of their life course. The demarcation between the life spheres of work and family becomes increasingly blurred. That is why it is worthwhile to study well-being at work starting theoretically and empirically by focusing on the work-family interface. Our first findings suggest that this is indeed an interesting area of future studies.

REFERENCES

Ashby, W.R., 1969, "Self-regulation and requisite variety", in F.E. Emery (ed.), *Systems thinking; selected readings*, Harmondsworth, Penguin Books, pp. 105-124.

Breedveld, K., 1998, Illusies van een 24-uurs economie. Ontwikkelingen in gespreid werken en verschillen in zeggenschap, *Tijdschrift voor Arbeidsvraagstukken,* vol. 14, nr. 1, pp. 23-36.

Dekker, R. and R. Doorenbos, 1997, Flexibel werk aan de onderkant van de arbeidsmarkt, Tijdschrift voor Arbeidsvraagstukken, vol. 13, nr. 2, pp. 103-112.

Delger, R.K., 1999, *Welzijn bij het COP; Een inventarisatie van de welzijnsrisico's bij het Centraal Orgaan Peuterspeelzalen*, Rijksuniversiteit Groningen, doctoraalscriptie.

Delsen, L., 1995, *Atypical Employment: An International Perspective,* Groningen: Wolters Noordhoff.

Dhondt, S. and I. Houtman, 1992, *NIPG onderzoeksvragenlijst arbeidsinhoud: constructie en eerste toets op betrouwbaarheid en validiteit*, Leiden, TNO, rapportnummer 92.088.

Dhondt, S. and I. Houtman, 1996, *De WEBA-Methode. NOVA-WEBA handleiding. Een vragenlijst om welzijnsknelpunten op te sporen*, Leiden, TNO Preventie en Gezondheid, rapportnummer 96.027.

European Community (89/391/EEG), "Richtlijn van de Raad van 12 juni 1989 betreffende de tenuitvoerlegging van maatregelen ter bevordering van de verbetering van de veiligheid en de gezondheid van de werknemers op het werk", in *Publicatieblad van de Europese Gemeenschappen*, nr. L183/1-8, 19.6.89.

Fried, Y. and G.R. Ferris, 1987, The validity of the job characteristics model: a review and meta-analysis, *Personnel Psychology,* vol. 40, pp. 287-322.

Fruytier, B. and A. ter Huurne, 1983, *Kwaliteit van de arbeid als meetprobleem; een vergelijkende literatuurstudie*, Tilburg, IVA.

Hackman, J.R. and G.R. Oldham, 1980, *Work Redesign*, Addison-Wesley Publishing Company.

Horn, L.A. ten , 1989, *Your work…and what you think of it. Questionnaire for the measurement of variables related to the quality of jobs*, Delft, University of Technology.

Inglehart, R., 1990, *Culture shift in advanced industrial society,* Princeton: Princeton University Press.

Jol, J.A. et al., 1987, *De inhoud van het welzijnsbegrip in artikel 3 van de Arbowet*, Voorburg, Directoraat-Generaal van de Arbeid, Directie Sociaal Arbeidsbeleid.

Karasek, R.A., 1979, “Job demands, job decision latitude, and implications for job redesign”, in *Administrative Science Quarterly*, vol. 24, pp. 285-307.
Karasek, R.A. and T. Theorell, 1990, *Healthy Work; Stress, Productivity, and the Reconstruction of Working Life*, New York, Basic Books Inc. Publishers.
Klaveren, M. van and T. Tom, 1995, All-round groepswerk: doen of doen alsof*? Tijdschrift voor Arbeidsvraagstukken,* vol. 11, nr, 1, pp. 21-33.
Kompier, M.A.J. and F.H.G. Marcelissen, 1993, *Handboek werkstress; Systematische aanpak voor de bedrijfspraktijk*, Amsterdam, NIA.
Kompier, 1996, *The best of both worlds. Arbeids- en organisatiepsychologie tussen theorie en praktijk,* Nijmegen: Katholieke Universiteit Nijmegen (oratie).
Ministerie van SZW/CBS, 1998, Jaarboek Emancipatie 1998. Tijd en ruimte voor arbeid en zorg, Den Haag: Vuga.
Nijhuis, F.J.N., 1995, De paradoxale gezondheidseffecten van arbeid. Van gezondheidsbedreiging naar gezondheidsbevordering, Maastricht: Rijksuniversiteit Limburg (oratie).
Oeij, P., B. Fruytier, and I. van den Broek, 1998, Research Into the Quality of Work, in: G. Evers, B. van Hees, J. Schippers, *Work, Organisation and Labour in Dutch Society. A State of the Art of the Research,* Dordrecht/Boston/London: Kluwer Academic Publishers, pp. 105-138.
Parre, P. van der, 1996, *Zonder arbeid geen zegen; kwaliteit van de arbeid, arbeidsoriëntaties, arbeidssatisfactie en het zoekgedrag op de arbeidsmarkt*, Delft, Eburon.
Projectgroep WEBA, 1989, “Functieverbetering en Arbowet”, in *Gedrag & Organisatie*, vol. 2, nr. 4/5, pp. 361-382.
Raabe, P.H., 1998, Women, work, and family in Czech Republic and comparisons with the West, Community, Work & Family, Vol. 1., nr. 1, pp. 51-64.
SCP, 1998, Sociaal en Cultureel Rapport 1998, Rijswijk: Sociaal en Cultureel Planbureau.
Schmid, G., 1997, *Jobwunder Niederlande. Eine Moderne Arbeitsmarkt- und Beschäftigungspolitik,* WZB-Mittielungen, vol. 36, pp. 3-6.
Schouteten, R., 1998, *Determinants of well-being at work: conceptual model, questionnaire and the first results.* Paper for the Weswa Conference 1998, Rotterdam, 25 November.
Schouteten, R.L.J. and M. C. de Witte, 1999, “The quality of work: the work-family interface”, Conference proceedings from Health Hazards and Challenges in the New Working Life, January 1999, Stockholm, in press.
Smulders, P.G.W., 1995, “Arbeid en gezondheid: inleiding”, in P.G.W. Smulders and J.M.J. op de Weegh, *Arbeid en Gezondheid: Risicofactoren*, Utrecht, Lemma, pp. 19-41.
Steijn, A.J., 1998, Career chances to become unemployed of flexible and permanent workers. Proof of a segmented labour market?, Paper Weswa Conferentie, Rotterdam, 25 november 1998.
Tausky, C., 1992, Work is desirable/loathsome, *Work and Occupations,* vol. 19, nr. 1, pp. 3-17.
Tijdens, K., H. Maassen-van den Brink, M. Noom, and W. Groot, 1994, Arbeid en zorg; Maatschappelijke effecten van strategieën van huishoudens om betaalde arbeid en zorg te combineren, Den Haag, OSA.
Vaas, S. et al., 1995, *De WEBA-methode, deel 1: WEBA-analyse handleiding*, Alphen aan den Rijn/Zaventem, Samsom Bedrijfsinformatie.
Veldhoven, M. van, T. Meijman, 1994, *Het meten van psychosociale arbeidsbelasting met een vragenlijst. De Vragenlijst Beleving en Beoordeling van de Arbeid (VBBA)*, Amsterdam, NIA.
Voydanoff, P., 1987, *Work and family life,* Newbury Park, CA: Sage.
Wanous, J.P., 1974, Individual differences and reactions to job characteristics, *Journal of Applied Psychology*, vol. 59, no. 5, pp. 616-622.
Zwaan, A.H. van der, 1994, *Engineering the work organization,* Assen, Van Gorcum.