

## Specific determinants of intrinsic work motivation, burnout and turnover intentions: a study among nurses

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### Specific determinants of intrinsic work motivation, burnout and turnover intentions: a study among nurses

This study of 156 Dutch general hospital nurses tested a theoretically derived model of specific relationships between work stressors and stress reactions. The model proposes four central domains of the work situation, namely work content, working conditions, social and labour relations, and conditions of employment. In addition, the model proposes three important stress reactions, namely a diminished intrinsic work motivation, occupational burnout and an inclination to leave the job. More specifically, it was hypothesized that (i) intrinsic work motivation is primarily determined by work content variables, (ii) burnout is primarily determined by both work load and limited social support, and (iii) propensity to leave is primarily determined by conditions of employment. All these relationships were simultaneously tested using a structural equations modelling technique. The results of a series of LISREL analyses indicate that the postulated model fits well to the data. The present study used conceptually integrated measures that cover the area of work stress and stress reactions, and provides directions for interventions aimed at preventing or reducing specific negative outcomes of work-related stress in general hospitals.

**Keywords:** burnout, covariance structure modelling, health care, motivation, nurses, turnover, work stress

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### INTRODUCTION

Health care settings are plagued by a wide variety of stressors, such as confrontation with severe illness and

patient deaths, work overload, role ambiguity and limited career opportunities (Gray-Toft & Anderson 1981, Hingley & Cooper 1986, Schaufeli 1990, Schaefer & Moos 1993). Moreover, health care professionals are confronted with increasing job demands due to the introduction of sophisticated technologies, increased competition between institutions (De Vries-Griever 1991) and an increased work load caused by – among other things – budget cuts (De Vries-Griever 1991, Schaufeli *et al.* 1993). Research has shown that such stressors may result in several mental, physical and behavioural stress reactions (cf. Payne & Firth-Cozens 1987, Cooper & Payne 1988). To prevent or reduce these negative outcomes, occupational health services have to assess and monitor the workplace, identify problems and formulate interventions. These preventive efforts may benefit substantially from conceptually integrated measures that cover the area of work-related stressors and stress reactions (Schaefer & Moos 1993). The central aim of the present study is to develop a model that both integrates previous findings in the domain of work stress, and formulates more precisely the relationships between important work-related stressors and stress reactions. These more refined insights are proposed in order to allow for more precise interventions regarding work stress in health care.

#### LIMITATIONS OF CONTEMPORARY MODELS OF WORK-RELATED STRESS

Over the past two decades, several models have been developed wherein work-related stress variables and outcomes are more or less conceptually integrated and ordered into a causal pattern of relationships. Well-known examples of these models are the ‘Michigan model’ (Kahn 1981, van Dijkhuizen & Winnubst 1983), the ‘Model for Work, Stress and Health’ (Kompier & Marcelissen 1990, Kompier & Di Martino 1995), the ‘job demand-control model’ (JD-C model; Karasek & Theorell 1990, Karasek 1979), and an extension of this model named the ‘demand-control-support model’ (DCS model; Johnson & Hall 1988). These models have improved our insights regarding work stress experiences and outcomes substantially, and they have stimulated a large body of research and many interventions.

Each of the models, however, has been shown to have its own limitations. For example, both the Michigan model and the Model for Work, Stress and Health are based upon rather global theoretical frameworks that do not lead to specific hypotheses. As a consequence, it is difficult to falsify these models, since some relationships will always be found when all model variables are taken into account. In addition, regarding the Michigan model, there exists no generally accepted and clear categorization of the many independent variables included in the model. Moreover, a closer inspection of the literature reveals that there exist several different versions of this model (Kleber 1982, Buunk & de Wolff 1988).

The JD-C model and the DCS model have been criticized for their simplicity. Both models oversimplify the work situation by focusing exclusively on job demands (e.g. time pressure, working hard) as the root cause of occupational stress. A second criticism refers to the fact that there is hardly any evidence regarding the hypothesis that jobs combining high job demands with high job control produce well-being, learning and personal growth (motivation). A third criticism is directed to the limited evidence concerning the proposed synergistic or interaction effect of the combination of high job demands, low control and limited social support (Kristensen 1995, de Jonge *et al.* 1996, de Jonge & Kompier 1997).

In order to improve our knowledge regarding the relationships between work-related stressors on the one hand and stress reactions on the other hand, we need a more precise insight into the relationships between these classes of variables. The formulation of more specific relationships will improve existing theoretical models of work-related stress and may result in refined guidelines for investigating and improving work settings. Therefore, the present study introduces an approach to investigate systematically whether or not specific relationships exist between the different characteristics of the work setting and theoretically different outcome variables.

First of all, such a systematic investigation calls for a clear classification of work-related variables. Second, relevant and theoretically distinct outcome variables must be selected. Third, sound theoretical underpinnings of specific relationships between work-related variables and selected outcome variables have to be formulated. Finally, an integral test of a proposed specific pattern of relationships must be carried out.

#### STARTING POINTS FOR A NEW MODEL

The first step in our attempt to formalize the relationships between work stress and stress reactions is to subdivide the characteristics of the work setting into clear categories. For this purpose, the classification framework of work settings proposed by Kompier & Marcelissen (1990) seems to be an adequate starting point. They distinguish four main dimensions of a work situation, namely work content and organization (e.g. skill variety, autonomy and feedback), working conditions (e.g. work load, climatic conditions and safety), social and labour relations (e.g. social support and participation) and conditions of employment (e.g. salary, job security and career opportunities).

Second, several theoretically distinct outcome variables have to be selected that are also being considered as important organizational issues. The three outcomes we selected are work motivation (what aspects of work in particular contribute to the motivation of employees?) (e.g. Hackman & Oldham 1980, Tiegts *et al.* 1992), work-related health and well-being (what aspects of work are

particularly beneficial or detrimental to health) (e.g. Kahn 1981, Warr 1987, 1990, 1994), and job turnover (what aspects of work stimulate people to leave the organization?) (e.g. Porter & Steers 1973, Rosse & Miller 1984, van Breukelen 1988).

Note that the selected outcomes can be measured with different types of measures, namely psychological measures, behavioural measures and — with regard to health — physiological measures. Additionally, the characteristics of a work setting can be measured both subjectively and objectively. In this phase of the research, we are primarily interested in the experience of work and in several psychological outcomes. Therefore, we will focus upon psychological variables in the present study. Moreover, the often registered correspondence between subjective and objective measures (Fried & Ferris 1987, Boumans & Landeweerd 1992, Spector 1992) suggests that subjective measures are meaningful indicators of the characteristics of a work setting, which can be used for this purpose. In addition, the inclusion of physiological or behavioural outcome variables would imply that many quite specific predictor variables would have to be included in any proposed pattern of relationships. This would result in an untestable pattern of relationships. Therefore, physiological and behavioural outcome variables were excluded from our model as well in this phase of our research.

## THEORETICAL UNDERPINNINGS OF THE MODEL

Our first research question is: what particular aspects of work contribute to the motivation of employees? Motivation is an important and complex issue for personnel management in health care settings. It refers to principles that ideally can guide policies in being effective in achieving stated purposes of institutions and at the same time in being consistent with historic professional values (cf. Speedling 1990). Because of the many definitions and operationalizations of the concept of motivation (Moorhead & Griffin 1995), however, it is necessary to select an appropriate concept to start with. This study focuses on the concept of intrinsic work motivation (Cook *et al.* 1981), since it is presumed that people attracted to health care work in general are not primarily driven by external rewards like salary (Speedling 1990). Intrinsic work motivation is defined as 'the degree to which a person wants to work well in his or her job, in order to achieve intrinsic satisfaction' (Warr *et al.* 1979 p. 135). In particular within the framework of the 'job enrichment' tradition (Hackman & Oldham 1976, 1980), many studies have been conducted to predict intrinsic work motivation. Theory suggests that intrinsic work motivation is primarily related to work content variables, such as job autonomy, skill variety and task significance, and the empirical evidence supports the importance of these relationships

(Hackman & Lawler 1971, Hackman & Oldham 1980, Fried & Ferris 1987, Tiegs *et al.* 1992).

Our second research question is: what aspects of work are particularly beneficial or detrimental to health? Mental health and well-being are very broad concepts, encompassing many more or less related variables (Warr 1990). Again, searching for an appropriate starting point, it was burnout in particular that drew our attention. This concept is generally accepted as an important stress reaction among health care professionals, and it has also been the subject of much recent research (cf. Schaufeli *et al.* 1993). The most widely used definition of burnout comes from Maslach & Jackson (1986), who state that burnout is a syndrome of emotional exhaustion, depersonalization and reduced personal accomplishment.

Schaufeli (1990) has conducted an extensive review of the burnout literature, and has shown that burnout is particularly strongly related to work overload, a lack of social support and role stress. These findings also seem theoretically sound. According to 'conservation of resources' (COR) theory (Hobfoll & Freedy 1993), individuals strive to obtain things they value. These are called 'resources'. With regard to work, examples of resources are job security, money, support, satisfied clients or a successful career. Stress exists when resources are threatened by demands (like work overload or role stress), when resources are lost, or when investments of resources do not reap the expected level of return. Using their conservation of resources framework with regard to burnout, Hobfoll & Freedy (1993) argue that demands threaten resources and therefore trigger strain in the form of physical and emotional exhaustion, whereas resources help overcome the need for defensive coping and enhance one's self efficacy. Health care professionals facing a high work load will, for example, have only a little time left to help their clients properly (Cherniss 1993). Time shortages therefore may cause an impairment of the interaction with clients. In terms of COR theory, such a situation translates to losses for the health care professional. Lack of social support in addition may contribute to the development of burnout, because opportunities to benefit from the positive (healthy) social contacts are reduced. Particularly with regard to 'people's work', which often implies intensive emotional experiences, social support from colleagues and superiors may help the health care professional to cope effectively with these experiences (Schaufeli 1990). A recent meta-analytic study (Lee & Ashforth 1996) provides evidence for the relationship between demands (workload) and lack of resources (limited social support) on the one hand, and burnout (i.e. emotional exhaustion) on the other.

Our third research question is: what aspects of work are the most likely to cause a person to leave the job? This issue is a serious problem in Dutch health care, because of the expected shortages of health care workers in the near future (Pool *et al.* 1992a). Job turnover is generally defined as

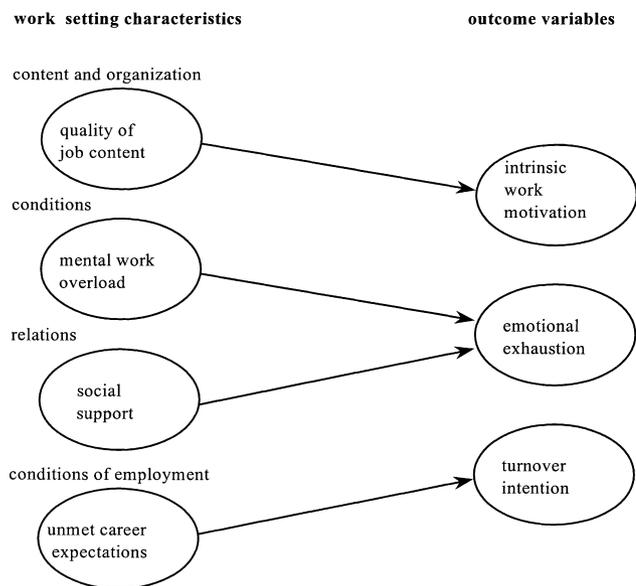
'voluntarily leaving the organization' (van Breukelen 1988). The psychological variable propensity to leave, or turnover intention, is closely related to turnover and is the object of investigation in this study. Literature regarding turnover suggests that its causes have not yet been studied systematically, starting from a framework that contains all core elements of a work-setting (cf. van Breukelen 1988). In general, the literature shows that turnover is related to many different variables: economic, work-related and individual (Muchinsky & Morrow 1980). With regard to the work-related factors, it seems that conditions of employment are particularly important correlates of turnover and propensity to leave; Rosse & Miller (1984) found that, in particular, lack of satisfaction with job aspects like salary, career opportunities and work content were associated with turnover intention. Similar findings were reported by Pool *et al.* (1992a) in Dutch health care settings. In addition, Stremmel (1991) reported in his study of child care workers, that low salary, lack of career opportunities and supervisor support were related to turnover intention. Janssen & Buunk (1990) found that experienced deprivation concerning one's career was a strong predictor of turnover intention, even more so than general work satisfaction. Finally, Lewis & Thomas (1987) reported that growth-related career needs were the most frequently mentioned underlying reasons for occupational change. These findings are theoretically plausible since job insecurity, low opportunities to obtain a better position, low salary or low opportunities to improve knowledge and skills, for example, frustrate important growth needs (cf. De Cenzo & Robbins 1996). In general, lack of growth opportunities is therefore thought of as a plausible reason to leave the organization.

To summarize briefly, this study was carried out to find clusters of independent and dependent work stress variables that are theoretically and empirically more related to each other than to other categories of variables. The central aim of the study is to gain a better insight into the relationships between work-setting characteristics and specific stress reactions. Eventually this should contribute to a more accurate selection of targets with regard to the improvement of work settings. Thus, the central hypotheses of this study are (i) intrinsic work motivation is primarily determined by work content variables, (ii) burnout is primarily determined by both workload and limited social support, and (iii) the intention to leave the job is primarily determined by conditions of employment, like salary and career opportunities. These relationships are graphically presented in Figure 1.

## METHOD

### Participants and procedure

Data were gathered from 175 nurses employed at a general hospital in the Netherlands. Nine departments were



**Figure 1** The hypothesized relationships between work setting characteristics and outcomes.

willing to participate in this study. A self-report questionnaire was administered to all nurses that were employed for more than 2 months. In total, 156 usable questionnaires were returned (89% response). The majority of the respondents (84%) were registered nurses; 5% were head nurses; 4% were nurse aids and 7% were student nurses. Most respondents (91%) were female, and the mean age was 34 years (SD = 8.91). The mean number of years working experience was 14 (SD = 7.58). Forty-five per cent of the sample was full-time employed. Among the part-time employed nurses, only a small group (11.6%) was contracted for less than 18 h a week.

## Measures

Quality of job content variables were derived from Job Characteristics Theory (Lawler & Hall 1970, Hackman & Lawler 1971, Hackman & Oldham 1980). Quality of job content refers to those aspects in the work environment that are considered challenging and worthwhile: (i) skill variety, (ii) skill discretion, (iii) task identity, (iv) autonomy, (v) social contacts, (vi) performance feedback, (vii) task significance, (viii) opportunities to learn, (ix) opportunities to be creative and (x) opportunities to do things one performs best. Respondents were asked to indicate on a 5-point Likert scale to what extent they agreed with statements like 'My job provides me the opportunity to be creative', 'My job provides me the opportunity to utilize a variety of skills' and 'My job permits me to decide how to go about doing my job' (1 = totally disagree, 5 = totally agree). A Principal Component analysis on these nine items revealed one component with an eigenvalue of 2.65.

All items were summed to form an index of quality of job content. Cronbach's alpha was 0.69.

Mental work overload was measured by means of eight items with a 5-point response scale ranging from 1 (never) to 5 (always). This scale was developed by de Jonge *et al.* (1993) and consists of a wide range of quantitative and qualitative demanding aspects in the work situation, like working under time pressure, working hard, and strenuous work. This scale showed good reliability: Cronbach's alpha was 0.86.

Social support from colleagues was measured by means of a 5-item scale, derived from a Dutch questionnaire on organizational stress (Bergers *et al.* 1986). An example item is: 'In case there exist problems at your work, can you discuss them with your colleagues?' The items were scored on a 4-point response scale format, ranging from 1 (never) to 4 (always). Cronbach's alpha was 0.65.

Unmet career expectations were measured by a 5-item questionnaire with a 5-point response scale, ranging from 1 (totally disagree) to 5 (totally agree). This instrument was derived from an existing scale called 'Desire for career progress' (cf. Buunk & Janssen 1992, Janssen 1992). The elements of this scale were based on career expectations noted by Schein (1978) and Hall (1976). Five of the eight items of this scale were selected, these being the unmet expectations regarding (i) salary, (ii) responsibility, (iii) opportunities to develop knowledge and skills, (iv) job security and (v) position. For reasons of item overlap the three remaining items (i.e. unmet expectations regarding support, self determination and creativity) were not included; similar items are included in other resource measures (i.e. quality of job content and social support). Cronbach's alpha of this scale was 0.71.

Intrinsic work motivation was measured with six items derived from a scale developed by Warr *et al.* (1979). Example items are: 'I feel a sense of personal satisfaction when I do my job well', 'My opinion of myself goes down when I do this job badly', and 'I take pride in doing my job as well as I can' (1 = totally disagree, 5 = totally agree). Cronbach's alpha was 0.70.

Burnout, was conceptualized as a syndrome of emotional exhaustion, depersonalization and reduced personal accomplishment (Maslach & Jackson 1986). Of the three dimensions of burnout, emotional exhaustion is generally seen as the core dimension (Cox *et al.* 1993, Maslach 1993). Therefore, in this study, we selected emotional exhaustion to represent the concept of burnout. This concept was measured with the Dutch version of the Maslach Burnout Inventory (Schaufeli & Van Dierendonck 1993). One example of this 9-item scale of 'emotional exhaustion' is 'I feel emotionally drained from my work' (0 = never, 6 = every day). Cronbach's alpha was 0.86.

Turnover intention was measured by one item. Respondents were asked whether they were planning to leave the organization within 1 year. The answers were measured

with a 6-point response scale, ranging from 1 (not at all) to 6 (I surely do).

## Analyses

Testing the above-mentioned hypothesized pattern of relationships implies sifting the wheat from the chaff. Correlational analysis provides some clues in this matter, but structural equations modelling (SEM), with the help of LISREL (Jöreskog & Sörbom 1993), is particularly suited for this purpose. This kind of analysis is primarily confirmatory in nature. With help of SEM one can investigate to what extent the postulated structure (based on a theory) is actually consistent with the data. This is done by computing an estimated covariance matrix implied by the hypothesized model (the hypothesized pattern of relationships) and comparing it with the covariance matrix based on the empirical data. In this study, the pattern of hypothesized relationships between exogenous variables (in this case the independent work-related variables) and endogenous variables (the dependent outcome variables) is compared with the empirical data ('reality').

## RESULTS

### Preliminary analysis

Before all proposed relationships were tested simultaneously, first a correlational analysis was conducted (Pearson correlations) among all variables included in this study. The results show that the hypothesized pattern of relationships largely holds true, and that the relationships point in the expected direction (Table 1). Intrinsic work motivation is clearly and positively related to the quality of job content. In addition, as hypothesized, the nursing professionals report higher levels of emotional exhaustion when their work overload is high and when they receive little social support. Finally, the more career-related expectations remain unrealized, the stronger the intention to leave. The significant relationships between quality of job content and turnover intention, and between unmet career expectations and emotional exhaustion, were not predicted.

Note, however, that the relationship between unmet career expectations and emotional exhaustion is quite weak. On the contrary, the correlation between quality of job content and turnover intention is substantial, and this path may have to be added to our theoretical model. It is indeed plausible that the more one dislikes one's job, the more one is inclined to leave, and evidence exists for this relationship (e.g. Rosse & Miller 1984).

Both for practical and theoretical reasons it may also be relevant to explore the issue of whether or not a pattern of relationships is equal between different categories of

**Table 1** Correlations, means and SD of the model variables (*N* varies between 153 and 140, due to pairwise deletion of missing variables)

Variables	Mean	SD	Correlations							
			1	2	3	4	5	6	7	
1 Quality job content	3.77	0.42	–							
2 Ment. work overload	3.16	0.48	0.07	–						
3 Support colleagues	3.27	0.31	0.25*	–0.13	–					
4 Unmet career expectations	3.24	0.67	–0.18*	0.09	–0.03	–				
5 Intrinsic work motivation	4.02	0.47	0.28**	0.12	0.13	–0.11	–			
6 Emotional exhaustion	1.65	0.86	–0.10	0.45**	–0.31**	0.14*	0.12	–		
7 Turnover intention	2.57	1.27	–0.27**	–0.07	–0.13	0.50**	–0.29**	0.17*	–	

\*  $P \leq 0.05$ , \*\*  $P \leq 0.01$ .

employees. In this study, however, there were two limitations to this: First, it is theoretically unclear what background variables might be of interest with respect to all model variables and their interrelations. Second, splitting the sample into two or more categories would result in relatively small subsamples. This can affect the test results negatively, since multi-sample analysis (required to test differences in patterns of relationships) uses LISREL's (overall) fit-index  $\chi^2$ , which is extremely sensitive regarding sample size (Anderson & Gerbing 1984). Notwithstanding these limitations, one test was carried out. To carry out this test a factor had to be chosen that (i) would be likely to affect many work aspects, and (ii) had categories or levels that would not result in very small subsamples. The factor 'full time' vs. 'part time' employment met these requirements to a certain extent: First, according to theory (Lendfers & Nijhuis 1989), 'flex-work' affects the work situation and the experience of work in many ways. Second, about 45% of our sample is full-time employed and 55% is part-time employed; which leaves us with two modest, but more or less equal sized subsamples.

Multi-sample analyses (using LISREL 8) using two corresponding correlation matrices, however, revealed no significant differences between the interrelationships of the model variables among full-time and part-time employed nurses [ $\chi^2(28) = 28.22, P = 0.45$ ]. This result supports the robustness of the correlations depicted in Table 1.

### LISREL analyses

Before the above-mentioned promising path between 'quality of job content' and 'turnover intentions' is introduced, the original hypothesized relationships are tested with means of structural equations modelling. More specifically, we performed a covariance structure analysis using the LISREL 8 computer program (Jöreskog & Sörbom 1993). Four exogenous variables (quality of job content, work overload, social support and unmet career expecta-

tions) were introduced into the model, followed by the three endogenous (dependent) variables. Their relationships were specified according to the above-mentioned hypotheses. The covariance structure is somewhat simplified by assuming that the latent and observed variables are identical. This procedure is justified because the measures used in the present study have all proven to be reliable and valid both in this study and/or in previous studies. This is called a 'two step approach' (Anderson & Gerbing 1988). In addition, the error variances of the endogenous variables were specified. This decision was made because the model is not likely to be exhaustive. The endogenous variables thus may in part be predicted by (related) variables that are not taken into account (cf. MacCallum *et al.* 1994).

Jöreskog & Sörbom (1993) suggest several fit indices to investigate the overall fit of a model, namely the Chi-square statistic, the adjusted goodness-of-fit index (AGFI), the root mean square error of approximation (RMSEA; Browne & Cudeck 1993), and the non-normed fit index (NNFI; Bentler & Bonett 1980). With regard to specific relationships, LISREL provides, among others, *t* values indicating the significance of the specified relationships and so-called 'modification indices'. The latter provide information about the relationships in a model that should be altered, when theoretically plausible, to improve the fit between the hypothesized model and the empirical data (Hayduk 1987).

The results of the first LISREL analyses show that the  $\chi^2$  overall goodness-of-fit measure is low and not significant [ $\chi^2(8) = 11.09, P = 0.20$ ], which means that the specified model fits to the data. In general, the additional fit measures also indicate an adequate fit of the model. The AGFI is conceived as 'adequate' if its value is equal to or higher than 0.90 (Schumacker & Lomax 1996). In this study, the AGFI is 0.92. Both  $\chi^2$  and AGFI, however, are sensitive to sample size. Therefore we used two additional fit measures that do not suffer from this weakness. The NNFI is an incremental fit index that indicates the extent

to which the hypothesized model fits better to the data compared with a model in which all relationships are assumed to be zero. The NNFI in this model is 0.93, which is rather good. Finally we used the RMSEA as an additional measure of the fit of the model to the data. The RMSEA index is a measure of the discrepancy per degree of freedom of the model. According to Browne & Cudeck (1993), this value must be lower than or equal to 0.05. The results, however, show that this value is 0.055, which is somewhat higher than it should be. In addition, the plain printed numbers in Figure 2 indicate that the hypothesized relationships (gammas) between the predictor variables and criterion variables are substantial. According to the *t*-values, all specified relationships are significant and in the predicted direction.

Although the fit of the model is quite good, it can be improved somewhat if the relationship between quality of job content and turnover intention is relaxed (gamma 3.1).

This extension is plausible (cf. Rosse & Miller 1984, Pool *et al.* 1992a) and corresponds with the correlational results. After this modification (see the bold printed numbers in Figure 2), no additional improvements are justified. All fit measures are almost optimal: the overall goodness-of-fit measure is not significant [ $\chi^2(7) = 8.43, P = 0.30$ ]; the adjusted goodness-of-fit index (AGFI) = 0.93; the non-normed fit index (NNFI) = 0.97; and the root mean square error of approximation (RMSEA) = 0.040. In order to investigate the robustness of an 'ultimate model', Jöreskog & Sörbom (1993) suggest a cross-validation procedure. Considering the relatively small sample size in this study, however, a necessary subdivision of the sample would lead

to an increased overall error and unstable results. To deal with this problem, Browne & Cudeck (1993) suggest the use of single sample cross-validation indices, such as the expected cross-validation index (ECVI). The results showed that the ECVI value of our ultimate model (0.39) was smaller compared with the ECVI values of the first tested model (0.40) and the saturated model ECVI (0.44), respectively. These findings additionally support our final model.

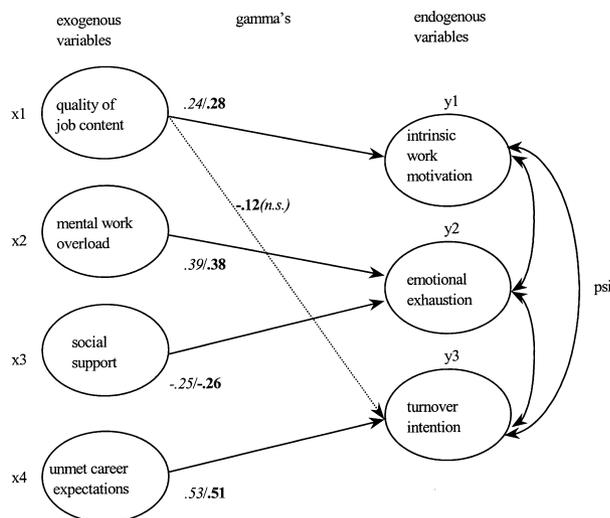
## CONCLUSIONS AND DISCUSSION

### Major findings

In this study of nurses employed at a general hospital, it was investigated whether intrinsic work motivation is primarily determined by work content variables, whether burnout is primarily determined by both workload and social support, and whether turnover intention is primarily determined by conditions of employment. The results confirmed our hypotheses. Intrinsic work motivation proved to be primarily determined by elements of the job that make the work challenging and worthwhile, such as skill variety, autonomy, social contacts and opportunities to learn. Emotional exhaustion was primarily predicted by a lack of social support from colleagues, and by the demanding aspects of work, like working under time pressure and strenuous work (i.e. work overload). Turnover intentions were clearly and mainly determined by the unmet career expectations, such as a higher salary and more responsibility, and to a lesser extent by quality of job content. The latter relationship, however, proved to be slightly below the 5% level of significance.

These results are theoretically interesting: not only because the observed relationships are in line with theory and other empirical findings, but also because the total pattern of relationships holds true, implying that one can 'sift the wheat from the chaff' by excluding theoretically less plausible relationships. This suggests that more accurate predictions regarding the associations between several work factors and different outcomes are indeed possible. These findings thus refine the insights regarding the relationships between work-related factors on the one hand, and employee reactions on the other, generated by models like the 'Michigan model' (Kahn 1981, van Dijkhuizen & Winnubst 1983) or the 'job demand-control model' (JD-C model; Karasek 1979, Karasek & Theorell 1990).

But the findings also have practical implications. The results suggest that if management wants to improve intrinsic work motivation among nurses, attention must be focused on the work content. Job characteristics theory can provide clues to improve job observation. This may, for instance, entail more variety in tasks, more autonomy and more feedback (Hackman & Oldham 1980, Moorhead



**Figure 2** Results of structural equations modelling with the help of LISREL 8,  $N = 133$ . The gammas in italic refer to the initially tested model. The bold gammas refer to the results after modification.

& Griffin 1995). An important example of such a job re-design approach in nursing work is 'primary nursing' (Boumans & Landeweerd 1996). Emotional exhaustion can be reduced or prevented by paying attention to the workload. There exist many programs to investigate workload in hospitals and to spread it more equally among units (Grünveld *et al.* 1988). In addition, several duty roster techniques can be applied in hospitals to realize a more adequate spread of activities during a certain time span (De Vries-Griever 1991). Although these instruments may reduce high workload and some of its effects, however, they do not solve the workload issue entirely, as health care organizations in the Netherlands (in general) face an overall shortage of personnel. Moreover, it is even predicted that this shortage will increase in the near future (van Dijk 1992). To prevent or reduce burnout, it is also important to pay attention to the quality of the social relations in the organization. Social support from colleagues and supervisors can be very helpful in reducing and preventing emotional exhaustion (Schaufeli 1990, Winnubst 1993). Several guidelines and techniques have been developed to improve interpersonal relationships in health care settings (cf. Pines & Maslach 1978, Scully 1983). Finally, the results suggest that job turnover can be prevented by improving opportunities for growth and job security. There exist many options in this area, such as job posting, job rotation, career counselling, career development and more comprehensive integrated human resource management programs (e.g. Schein 1978, Leibowitz *et al.* 1986, Pool *et al.* 1992b, De Cenzo & Robbins 1996). Career development tools cannot, however, solve all nurses' career problems, since many health care organizations are characterized by a relatively low number of posts in higher grades, resulting in limited vertical growth opportunities (Pool *et al.* 1992b).

### Limitations

The approach presented in this study proved to be successful. It seemed possible to both systematically and simultaneously test the *a priori* hypothesized relationships between different work aspects and different psychological outcome variables. LISREL provides a very suitable procedure (SEM) to test the hypothesized relationships. This is, however, only a first exercise with one specific group of employees. In future research, this kind of modelling should be carried out with other samples to find out whether the model can be generalized. The cross-validation results shown in this study are promising. It must also be considered that only a limited number of variables was taken into account. Further research should be directed at determining additional theoretical relationships, using the above-mentioned framework as a starting point. Additionally, one might be interested in, for instance, nonlinear relationships between work characteristics and psycholog-

ical outcomes (Warr 1987, de Jonge 1995). The approach presented in this study is also suitable for determining to what extent nonlinear effects provide a substantial additional explanation regarding the outcome variables. Finally, it must be noted that in this study the results may partly be influenced by common method variance; questionnaires were used to measure (at the same time) both work characteristics and psychological outcome variables. A longitudinal approach, which is planned in the near future, may reduce these limitations. However, since our results are in line with theory and the total pattern of relationships holds true, we think that our results are noteworthy despite the limitations. As such, they might be a promising next step in the refinement of models and guidelines to assess, understand and improve work settings.

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