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RAIJA KALIMO ^a; KRISTA PAHKIN ^a; PERTTI MUTANEN ^a; SALLA TOPIPINEN-TANNER ^a

^a Finnish Institute of Occupational Health, Topeliuksenkatu 41 a A, FIN-00250 Helsinki, Finland.

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Staying well or burning out at work: work characteristics and personal resources as long-term predictors

RAIJA KALIMO, KRISTA PAHKIN*,
PERTTI MUTANEN and SALLA TOPPINEN-TANNER

Finnish Institute of Occupational Health, Topeliuksenkatu 41 a A, FIN-00250 Helsinki, Finland

Keywords: Burnout; Self-esteem; Sense of coherence; Sense of competence; Work characteristics.

The aim of this longitudinal study was to recognize the work characteristics and personal resources that are associated with burnout symptoms in the long term. The empirical analyses are based on sample data ($n = 174$) from a larger survey in 1986 and from a 10-year follow up in 1996 conducted in an international industrial forestry enterprise. The participants were drawn from those workers in Finland, the home country of the enterprise, who responded to the questionnaires at both times. The participants were classified into those having no burnout and those with serious burnout. In order to compare the groups a multivariate analysis of variance and t -tests for two independent groups were used. Four job-related and five organizational factors, 10 work environment hazards and three individual variables were used as predictors. Change variables were formed from the predictors. All the significant changes in work and personal resources during 10 years had shifted to the positive direction in the no-burnout group, and to the negative direction in the serious burnout group. Discriminant analysis was used to identify linear combinations of quantitative predictor variables that best characterized the differences between the groups. Both the cross-sectional and the longitudinal predictors showed that factors related to the social processes at work seem to be crucial to burnout. Of the individual resources, a strong sense of coherence seems to be of particular importance.

1. Introduction

Burnout can be defined as a severe consequence of prolonged stress at work, which develops when the demands of work and individual capacities are in imbalance for a long period of time. Energy depletion (exhaustion), increased mental distance from one's job (cynicism), and reduced professional efficacy are considered to be the most characteristic components of burnout (Schaufeli & Enzmann, 1998).

Burnout was originally regarded as a problem only in human services work, where it develops as a result of long-term emotionally-involving interaction with the clients, and related overtaxing demands (Maslach & Jackson, 1981). For almost two decades, the research on burnout was based on this assumption, which was further strengthened by repetitive findings indicating that burnout is, indeed, a problem in the human services.

*Author for correspondence. e-mail: krista.pahkin@ttl.fi

However, it became evident over the years that burnout may develop in all kinds of work situations where the coping resources of individuals are exceeded. Even though doubts about the specificity of the syndrome have been expressed, research in other sectors lagged behind because of a lack of suitable methodology for the assessment of burnout. Since the Maslach Burnout Inventory-General Scale (MBI-GS) was published, more research has been focused on various other sectors of work (Schaufeli, Leiter, Maslach, & Jackson, 1996). There are still relatively few published reports of studies into burnout other than in human services work. Longitudinal studies especially are scarce, even in the human services sector, and they are mostly based on relatively short follow-up periods (van Dierendonck, Schaufeli, & Buunk, 2001). There has been one recent study on industrial employees, followed up for 8 years, that shed light on the sequential process of burnout (Toppinen-Tanner, Kalimo, & Mutanen, 2002).

The psychosocial factors that contribute to stress problems at work are reasonably well known and documented in the work stress literature. Among the most often recognized psychosocial work characteristics associated with stress experienced and well-being at work are job complexity, autonomy, role ambiguity, and work load, which is often associated with time pressure (Cox & Griffiths, 1995; Jex & Beehr, 1991; Sauter, Murphy, & Hurrell, 1990). The same factors have been found to contribute to burnout. Social environment and interpersonal problems at work have also been found to be related to burnout (Schaufeli & Buunk, 1996).

The picture of the work-related contributors of burnout is complicated by the fact that the three components of burnout seem to be related to different kinds of factors (for reviews see Schaufeli & Buunk, 1996; Schaufeli & Enzmann, 1998; Schaufeli *et al.*, 1996). Efforts have been made to classify the scattered findings by typifying the factors that are associated with each of the dimensions (see Cordes, Dougherty, & Blum, 1997; Hobfoll & Freedy, 1993; Lee & Ashforth, 1996; Shirom, 1989). Although some consistency has been noted, the ambiguity regarding many of the findings on the causation of burnout has not been fully eliminated.

The reasons for this ambiguity may be partly due to the different use of concepts and measures in assessing job stressors. Another possible reason is more fundamental and serious in the burnout research. By definition, burnout is a multifaceted three-dimensional syndrome and, therefore, none of the factors alone indicate burnout. Thus, each of the dimensions is, as such, unspecific to burnout. Therefore, it is only natural that the predictors of these states differ from each other. Consequently, it is difficult to draw unanimous conclusions on the causes of burnout on the basis of the separate correlates of exhaustion, cynicism and lack of efficacy.

Our argument is that the three contributors of burnout should be investigated at the syndrome level. There have, indeed, been early efforts to form a syndrome indicator by simply summing the scores in each of the dimensions. However, this cannot be adequate, because the three components are not believed to be equally important in the syndrome pattern. Instead, exhaustion is considered to be dominant in the symptomatology of burnout in relation to the two other components. For this reason, and because the three dimensions have been found to have different contributors, some authors have recommended that burnout be empirically investigated by studying each of the components separately (Taris, Schreurs, & Schaufeli, 1999).

We argue that a syndrome indicator is needed for the study of fully developed burnout. It must correspond to the conceptual definition and understanding of burnout as a three-dimensional syndrome at its fully developed stage. This does not exclude the fact that the

component-specific approach may be relevant when studying the successive development of burnout, where different contributing factors may appear at different points in time.

Although burnout is generally regarded as primarily a work-related disorder, individual factors can play a role in its development, as in all problems of well-being. In fact, individual susceptibility and the contributors to burnout have often been considered to be central in the characterizations of burnout (see, for example, Schaufeli & Enzmann, 1998). However, there has been little empirical research on individual resources in burnout.

It can be presumed that having individual resources that are important to health in general would decrease the risk of burnout as well. Antonovsky (1987a) has proposed the concept of sense of coherence (SOC) to characterize an overall, general resource for health. It is assumed to be a significant determinant of an individual's position and movement on the health-disease continuum. SOC is interpreted as a stress resistance resource, a key factor in maintaining health and preventing breakdown.

The theory that a strong SOC contributes directly and positively to well-being and health has been clearly supported in several studies (see e.g. Feldt, 1997; Kalimo & Vuori, 1991). However, there is no firm evidence of the persistence of SOC along one's life course. In some studies, SOC has been found to strengthen with increasing age (Smith & Meyer, 1997), and in others to weaken with increasing age (Larsson & Setterlind, 1990). Even though SOC is mainly formed in early adult life, it is supposed to be modified by more recent experiences, such as working life.

Another personal resource with health implications is self-esteem. Clear support for the moderating effects of self-esteem in the causation of burnout has not been found (Jex & Elacqua, 1999), but it is evident that self-esteem is related to burnout (Jansen, Schaufeli, & Houkes, 1999; Rosse, Boss, Johnson, & Crown, 1991). By definition, self-esteem indicates the extent to which one believes oneself to be capable, significant, successful and worthy (Coopersmith, 1967). Originally self-esteem was thought to be a relatively stable personality trait, which only extremely stressful life events, such as losing one's job, could alter. However, there is evidence suggesting that, for example, job stressors and work characteristics affect the global self-esteem level (for review see Tharenou, 1979).

The sense of competence is one of the resources that is regarded as an important determinant of how an individual can cope with stressful experiences. Work-related sense of competence can be defined as an individual's feelings of confidence that he/she has the necessary work-related skills and abilities (Wagner & Morse, 1975). When sense of competence is related to actual work performance, it is strengthened by feelings of confidence and feedback coming from the job (Steel, Mento, Davis, & Wilson, 1989; Wagner & Morse, 1975). There is research evidence that associates sense of competence with sources of strain at work, i.e. persons who experience their sense of competence as weak, more frequently reported sources of strain at work (Toppinen & Kalimo, 1996).

The rationale behind the present study is that a variety of occupational stressors, when present for a long period of time, expose workers to burnout, while individual resources may have an important protecting role. The study seeks answers to questions on what are the most important job stressors contributing to burnout in the long term, and what is the relative importance of known individual health resources in preventing burnout. More specifically, the study questions are as follows.

1. Which work characteristics and personal resources best characterize the differences between workers who currently do not have burnout and those with serious burnout?

2. Are there differences between those with no burnout and those with serious burnout as regards previous changes in work and in their personal resources?
3. How do previous and present work characteristics and personal resources discriminate the present two burnout groups from each other?
4. How do changes in work characteristics and personal resources predict burnout?

2. Material and methods

2.1. Participants and procedure

A company-wide survey was carried out for the first time in Finland, the home country of a large international forestry industrial enterprise in 1986 (T_1), and again in 1996 (T_2) (Kalimo & Toppinen, 1999). The questionnaire items on work and working conditions were similar in both surveys. In the latter, several validated measures on work ability, sense of competence, innovativeness and burnout were added. In both surveys the questionnaire was distributed to every worker at his/her workplace. For the analysis the workers were divided into two broad occupational categories according to company practices: salaried staff (managers, office personnel, foremen and technical staff) and labourers. At T_1 74% of the personnel (9350) responded and at T_2 63% (9704) from Finland responded.

The participants of the present study were drawn from those workers in the home country of the enterprise who responded to the questionnaires at both T_1 and T_2 ($N = 2144$). The original sample was first divided into three groups on the basis of burnout at T_2 . Group 1: no burnout; group 2: some burnout symptoms; and group 3: serious burnout. The study is based on groups 1 (no burnout) and 3 (serious burnout). The participants were unevenly distributed in the groups. In order to render the groups about equal in size for further analyses, approximately 10% of the no-burnout group cases were selected randomly. After the selection, both groups consisted of 87 cases, and the final total number of participants was 174 (Figure 1).

Of the participants, 119 were men, with a mean age of 48 (SD = 6.4) years, and 55 were women, with a mean of 50 (SD = 5.4). Workers from all personnel groups in the company were included. Of them 72 were salaried staff and 102 were labourers. A total of 61% of the salaried staff and 74% of the labourers were men. The mean age of the salaried staff was 49 (SD = 5.1) years and that of the labourers was 48 (SD = 6.9) years.

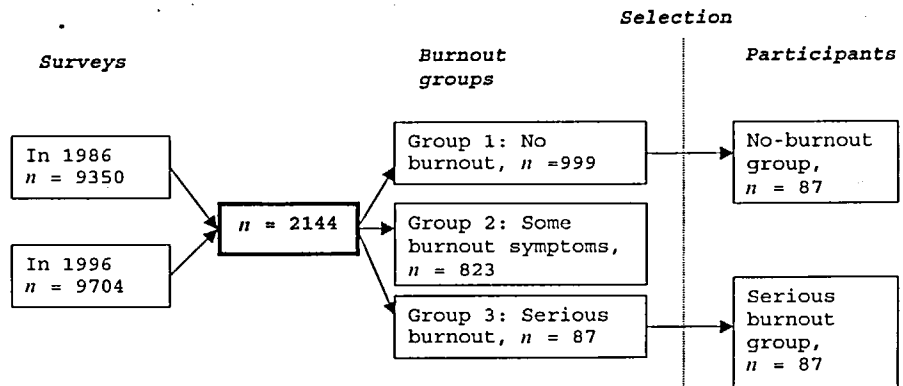


Figure 1. The sampling procedure.

The mean age of the participants, the personnel distribution, as well as the mean age of the personnel groups did not differ from those in the original sample ($n = 2144$). There were more female workers in the study sample than in the original sample, in which 68% of the salaried staff and 83% of the labourers were men. In the study sample, 84% in the no-burnout group were men (83% in the original sample), and 53% of the serious burnout group. The above description is based on the situation of the participants at T_2 .

2.2. Measures

2.2.1. Burnout: Burnout was measured with the Maslach Burnout Inventory-General Scale (MBI-GS) at T_2 only (Schaufeli *et al.*, 1996). The MBI-GS includes 16 items for measuring the three dimensions of burnout: exhaustion, cynicism and reduced professional efficacy. The response scale of each item is a 7-point Likert scale indicating the frequency of experiencing each symptom (0 = never, 6 = daily; $\alpha_{T_2} = .95$). Sum scales were formed for each dimension of burnout and their reliability was assessed using Cronbach's alpha (α). It was .96 for exhaustion, .90 for cynicism and .87 for reduced professional efficacy at T_2 .

To avoid the problems mentioned earlier that related to the use of the three burnout dimensions separately, our aim was to use a syndrome indicator. As no existing syndrome indicator was available, we developed one based on the notion that exhaustion, cynicism and lack of efficacy have different weights in the syndrome. Data based on a nation-wide representative sample of Finnish working people ($n = 3300$) were used for the construction of the weighted sum score for each dimension.

The weighted sum score was created by discriminant analysis, in which the three dimensions of burnout were used as independent variables. Various health-related indicators that can be presumed to be associated with burnout (e.g. work ability, perceived stress) were used as dependent variables. As a result, a variable drawn from the Work Ability Index (Tuomi, Ilmarinen, Jahkola, Katajarinne, and Tulkki, 1998), i.e. a person's assessment of his/her work capacity compared with the mental demands of work, appeared to be the best for use as the dependent variable. On this basis, coefficients were formed for weighting each dimension so that the scores corresponded to the original response scale ($.40 \times \text{Exhaustion} + .30 \times \text{Cynicism} + .30 \times \text{Reduced professional efficacy}$; Kalimo & Toppinen, 1997).

The participants were divided into three groups on the basis of their syndrome score (range 0–6). Group 1: No burnout (scores 0–1.49); group 2: Some burnout symptoms (scores 1.50–3.49), and group 3: Serious burnout (scores 3.50–6). The categorization means that the symptoms in group 1 were experienced on average a few times per year or never, in group 2 a few times per month or nearly weekly, and in group 3 several times per week or daily.

2.2.2. Work characteristics: Most of the items on work characteristics were identical with or modified from the Occupational Stress Questionnaire (OSQ; Elo, Leppänen, Lindström, & Ropponen, 1992). The OSQ is used to assess the perceived work environment and its effects. The predictive validity of the OSQ and other items has been found to be satisfactory in Finnish studies (Elo, 1994; Elo *et al.*, 1992; Kalimo, Olkkonen, & Toppinen, 1993).

The questionnaire consisted of items on work characteristics, of which the following sum scales were formed: *Job complexity* ($\alpha_{T_1} = .83$, $\alpha_{T_2} = .86$), e.g. 'Can you use your knowledge and skills in your work?', *Autonomy* ($\alpha_{T_1} = .78$, $\alpha_{T_2} = .83$) e.g. 'Can you plan your work yourself?', *Role clarity* ($\alpha_{T_1} = .67$, $\alpha_{T_2} = .83$), e.g. 'How well are you aware of what you have to accomplish in your work?', and *Support from superior* ($\alpha_{T_1} = .78$, $\alpha_{T_2} =$

.86), e.g. 'Does your superior provide support and help when needed?', were measured by a 5-item scale. *Organizational climate* was measured by an 8-item scale ($\alpha_{T1} = .72$, $\alpha_{T2} = .82$), e.g. 'Are you informed of important matters concerning your work?', *Co-operation* ($\alpha_{T1} = .76$, $\alpha_{T2} = .80$) by a 4-item scale, e.g. 'What is cooperation like in your close working environment?', *Work appreciation* by a 3-item scale ($\alpha_{T1} = .83$, $\alpha_{T2} = .86$), e.g. 'Is your work appreciated outside the workplace?', and *Work hazards* by a 10-item scale ($\alpha_{T1} = .91$, $\alpha_{T2} = .91$) which covered different elements of work environment, e.g. noise.

Feedback 'Are you informed how you have succeeded in your work?' and *Time pressure* 'Do you feel that you can't achieve good enough quality in your work within the allotted time?' were measured by a single item. The format for answering most of the individual items was a Likert-type scale, ranging from 1 (rarely or never) to 5 (very often).

2.2.3. Personal resources: Three different personality factors were used as personal resources. *Sense of coherence* (SOC) was measured with the 13-item scale of Antonovsky (1987b), e.g. 'Do you have the feeling that you don't really care about what goes around you?'. The response scale is a 7-point semantic differential scale ($\alpha_{T1} = .86$, $\alpha_{T2} = .91$). For further psychometric characteristics, see Antonovsky (1993). *Self-esteem* was measured with the Rosenberg (1965) self-esteem scale. The scale consists of 10, four-option items ($\alpha_{T1} = .85$, $\alpha_{T2} = .90$), e.g. 'I feel that I have a number of good qualities'. This scale is a well-validated measure of global self-worth and one of the most widely used self-esteem measures (Wayment & Taylor, 1995; Wylie, 1974). *Sense of competence* was measured only at T_2 with the scale of Wagner and Morse (1975). The selected scale consists of 15, five-option items ($\alpha_{T2} = .85$), e.g. 'I meet my own personal expectations for expertise in doing this job'. Sense of competence at work is a measure used to assess how well the worker can perform in his/her work and cope with the working conditions.

2.3. Statistical methods

As a preliminary means for comparing the study groups, we conducted a multivariate analysis of variance (MANOVA) and t -tests for two independent groups. The change variables (T_2 value minus T_1 value) were formed to compare the changes over time in the two study groups. The MANOVA and the paired t -test were used for testing the change for both study groups and the MANOVA was used to test the difference of the change between the study groups. The hypothesized value in the paired t -test was 0 (zero), meaning that there was no change from T_1 to T_2 .

Discriminant analysis was used to identify a linear combination or different combinations of quantitative predictor variables that best characterized the differences among the study groups. We checked the normality assumptions for all predictors and the equality of the covariance matrix assumption of the discriminant analyses. These analyses showed that the equality of the covariance matrix assumption was not fulfilled. The analyses done with ranked explanatory variables showed that the departure from the normality of the original variables was not so large that it would have an effect on the results. All the reported test results are thus based on the original variables in the analysis.

In the discriminant analysis we used, first, the stepwise selection method. In this method the program selected the first most important predictor variable and then added more, if they were statistically important. Second, every explanatory variable was studied by the single-variable discriminant analysis model and by using the so-called hierarchical model. The classification results, indicating to what extent the participants could be correctly classified into the two groups on the basis of the analysis, are reported for the stepwise

selection method only. The results are reported as cross-validated percentages of those correctly classified. In general these cross-validated percentage results are not over-optimistic (Statistical Package for Social Sciences [SPSS], 1998, p. 260).

3. Results

3.1. Differences between the two study groups

The MANOVA tests for the comparison of burnout groups were statistically significant (Wilks' Lambda, $\lambda = .640$, $p < .001$ and $\lambda = .343$, $p < .001$, for time T_1 and T_2 , respectively). All the means of the variables in the no-burnout group differed considerably from those in the serious burnout group at both measurement times (Table 1). The trend in the mean values was the same at both times: those who had no burnout experienced their work characteristics and personal resources more positively, on average, than those with serious burnout.

Differences between the groups were also analysed by using the change variables, i.e. the change over 10 years. All the MANOVA tests for the change variables were statistically significant: between the groups ($p < .001$), in the no-burnout group ($p < .001$) and in the serious burnout group ($p < .010$). In the no-burnout group the statistically significant changes were all in a positive direction, whereas in the serious burnout group all the statistically significant changes were in a negative direction (Figure 2).

3.2. The discriminant analysis

The cross-sectional stepwise selection of personal resources measured at T_2 resulted in a model that contained Sense of Coherence (SOC) and Sense of Competence. The overall percentage of cases successfully classified into the two groups by the above variables was 89.7. In the work characteristics measured at T_2 , the stepwise selection of variables produced a model that contained the following variables in the order of selection: Work appreciation, Feedback, and Co-operation. The overall percentage of successfully classified cases by these variables was 78.3 (Table 2). The other approaches (single-variable and hierarchical) used in the study also gave support for these variables as discriminating factors, but raised Support from Superior as one of the discriminating factors.

To get a longitudinal perspective, we first tested the power of personal resources and work characteristics measured at T_1 in the differentiation of the levels of burnout at T_2 using step-wise models. The analyses gave results similar to those of the above cross-sectional models. Personal resources, i.e. SOC and Self-esteem, measured 10 years earlier at T_1 , still discriminated the burnout groups 10 years later, at T_2 . It must be noted that sense of competence was not measured at T_1 and could not be included therefore in the longitudinal analyses.

The stepwise model of the work characteristics at T_1 discriminating the burnout groups at T_2 included Organizational climate, Time pressure and Job complexity. The other models based on single variable analysis and hierarchical analysis gave somewhat different results. They also included Co-operation, Work appreciation, Feedback and Support from superior at T_1 as discriminating factors. In all the cases the current (T_2) cross-sectional work characteristics and personal resources were better discriminating factors than the situation at T_1 , 10 years earlier.

The predictive power of work and personal resources was further confirmed by the changes in these variables between T_1 and T_2 . The overall best predictors of burnout were

Table 1. Means and variances of work characteristics and personal resources at T₁ and T₂ in the groups of no burnout and serious burnout at T₂.

Burnout group	Mean						Variance					
	No		Serious		Significance [†]		No		Serious		Significance [‡]	
	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
Job complexity	3.53	3.77	2.98	2.95	.001	.001	0.65	0.57	0.72	0.70	.507	.369
Autonomy	3.77	3.73	3.34	3.01	.001	.001	0.59	0.48	0.73	0.94	.160	.001
Role clarity	4.00	4.27	3.59	3.69	.001	.001	0.32	0.21	0.44	0.52	.250	.001
Time pressure	2.71	2.90	3.13	3.32	.006	.005	0.81	0.84	1.09	1.15	.461	.064
Organizational climate	3.46	3.53	3.07	2.83	.001	.001	0.35	0.31	0.40	0.47	.913	.154
Support from superior	3.52	3.51	3.08	2.56	.001	.001	0.55	0.51	0.58	0.71	.885	.153
Co-operation	3.91	3.89	3.52	3.01	.001	.001	0.34	0.33	0.68	0.74	.002	.001
Work appreciation	3.35	3.75	2.83	2.87	.001	.001	0.40	0.41	0.50	0.61	.276	.080
Feedback	3.15	3.48	2.45	2.36	.001	.001	1.16	0.79	1.13	1.05	.942	.321
Work hazards	1.63	1.61	1.81	1.85	.054	.003	0.23	0.25	0.33	0.27	.055	.832
Sense of Coherence	5.23	5.45	4.09	3.79	.001	.001	0.53	0.38	0.83	0.73	.095	.014
Self-esteem	3.30	3.40	2.68	2.65	.001	.001	0.17	0.13	0.39	0.35	.002	.001
Sense of Competence	-	3.81	-	2.94	-	.001	-	0.19	-	0.26	-	.167

[†]t-test for equality of means. The test result of equality of variance was used to select either the separate-variance t-test or pooled-variance t-test for means. The pooled-variance t-test was used when the p value for the variance equality test was > .05.
[‡]Levene's test for equality of variances.

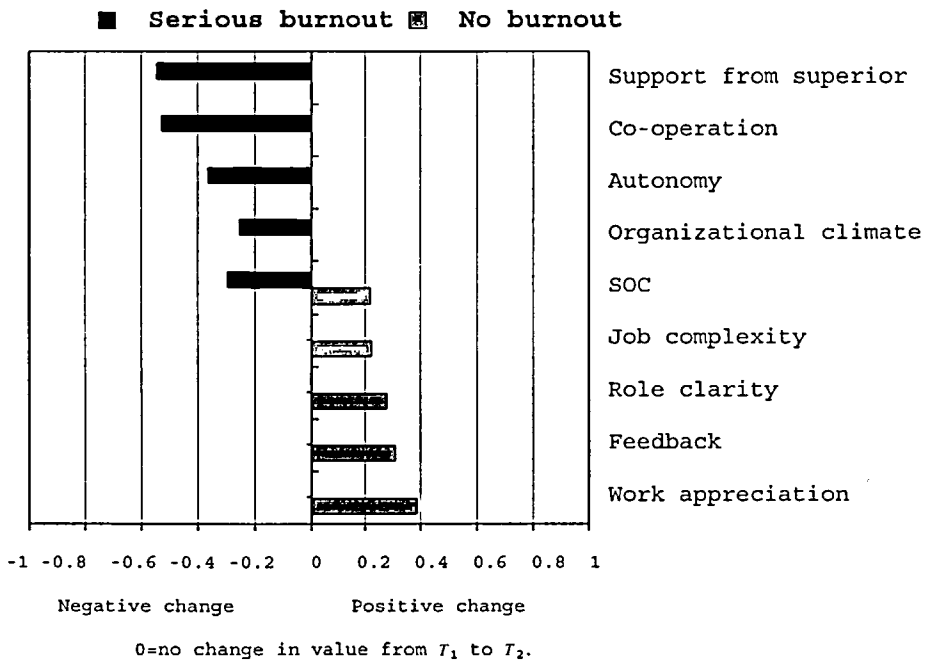


Figure 2. The statistically significant changes ($T_2 - T_1$) in work characteristics and personal resources over 10 years in the no-burnout and serious burnout groups (paired *t*-tests). Note that Sense of Coherence (SOC) changed in both groups, but in different directions.

the changes in Support from superior and SOC in the stepwise models. The changes in Co-operation and Work appreciation were good predictors, too.

4. Discussion

4.1. Essential findings

The first main finding of the study was that workers suffering from serious burnout seemed to have worked in considerably worse working conditions (compared with people with good well-being) for 10 years. Similarly, their personal resources were weaker at T_2 and had also been weaker at T_1 . The no-burnout group had a more positive situation in most of the measured features of their working conditions, and all three personal resource indicators, both at T_2 and 10 years earlier. The most powerful current work characteristics in the differentiation of those with no burnout from those with serious burnout were work appreciation, co-operation, support from superior and feedback, when all the different analyses carried out in the study were considered. Of the personal resources, strong sense of coherence turned out to be the most important determinant of the differences between those with serious burnout and those with no burnout.

The second notable finding of this study was the demonstration of the prognostic importance of job stressors for burnout over a long period of time. At T_2 , those individuals with serious burnout differed drastically from those with no burnout as regards significant changes over the 10-year period of the study. For the workers with serious burnout, support from superior, co-operation and autonomy had decreased, and organizational climate had worsened. For workers with no burnout on the other hand, appreciation of work, feedback, role clarity as well as job complexity had improved.

Table 2. Classification results of the discriminant analysis with personal resources and work characteristics.

	Stepwise model % ^a		Structure coefficient ^b		Stepwise model % ^a		Structure coefficient ^b		Stepwise model % ^a		Structure coefficient ^b	
	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂	T ₁	T ₂
<i>Personal resources</i>												
Sense of Coherence	1 ^c		.95		1 ^c		.90		1 ^c		1.00	
Self-esteem	2 ^c		.80		—		.45 ^d		—		.38 ^d	
Sense of Competence	—		—		2 ^c		.72		—		—	
	77.0				89.7				63.0			
<i>Work characteristics</i>												
Support from superior	—		.49 ^d		—		.55 ^d		1 ^c		.85	
Work appreciation	—		.51 ^d		1 ^c		.75		—		.54 ^d	
Co-operation	—		.38 ^d		3 ^c		.73		—		.35 ^d	
Organizational climate	1 ^c		.71		—		.53 ^d		—		.48 ^d	
Role clarity	—		.43 ^d		—		.51 ^d		2 ^c		.61	
Feedback	—		.34 ^d		—		.71		—		.29 ^d	
Job complexity	3 ^c		.61		—		.59 ^d		—		.26 ^d	
Autonomy	—		.45 ^d		—		.51 ^d		—		.46 ^d	
Work environment	—		-.34 ^d		—		-.23 ^d		—		-.18 ^d	
Time pressure	2 ^c		-.53		—		.03 ^d		—		-.07 ^d	
	68.4				78.3				56.6			

^aStepwise selection model, percentage correctly classified.

^bStructure correlation. Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions, all variables in the model.

^cThe running number for variables which are entered in the analysis.

^dVariable not used in the analysis.

Furthermore, the development of SOC had been in a positive direction during the 10 years of follow-up in those without burnout, while it had weakened in the group with serious burnout. When all the different analyses done in the study were considered, the most powerful discriminating factors of the burnout groups were organizational climate, co-operation, work appreciation and job complexity. Of the personal resources, sense of coherence turned out to be the most important determinant of the differences.

In summary, as anticipated, the various kinds of personal resources and work characteristics that are considered to be features of so-called healthy work, seemed to prevent workers from burning out within a lengthy time period. The power of SOC seems to support Antonovsky's view of SOC as a key to successful coping. According to Antonovsky (1987a), strong SOC can effectively neutralize the deleterious effects of stress. Strong SOC also enables the worker to evaluate potential stressors as benign or irrelevant, and thus supports problem-solving in stressful situations, which prevents mental breakdown at work.

As with SOC, strong self-esteem and sense of competence seemed to prevent the workers from burning out. Thus the results support the view that they too are health-maintaining resources. Strong self-esteem and perceived competence can be seen as forces that strengthen the worker's belief in his/her own capability and significance, and thus support active coping in stressful situations. According to another interpretation, persons with low self-esteem, in turn, are supposed to be influenced by their environment more than persons with high self-esteem. Evidence of this plasticity hypothesis is, however, still meagre and contradictory (Jex & Elacqua, 1999).

At work, particularly factors related to the social processes, such as social support from one's colleagues and supervisor, feedback, and appreciation, seem to act as resources against burning out. The lack of support from one's colleagues and supervisor over time seem to expose one to the process of burning out, whereas positive changes in feedback and appreciation seem to promote the process of staying well.

In our investigation, the role of different work and personal resources as long-term predictors of burnout was studied, considering them as equal discriminating factors. No hypothesis was proposed concerning the moderator and mediator effects that these variables may have on each other and in relation to burnout. According to Antonovsky (1987a), variation in SOC may occur throughout life as a result of major changes. Antonovsky also proposed that the central work characteristics, which serve as generalized stress resistance resources, are influence at work, good load balance, and good social relations at work. In our study, the change in both SOC and the variables related to social processes at work were significant, and also predicted the person's inclusion in either the healthy group or the burnout group. The questions of whether the change in SOC had occurred as a result of a decline in the support from one's colleagues and supervisor, and in the organizational climate, or whether workers with serious burnout experienced the social processes at work as not supportive and encouraging, and thus reported weaker SOC, remain open.

4.2. *Methodological aspects*

This study had some limitations. First, since the study relied on self-reports, the results may have been contaminated by common method variance. For instance, 'burned out' workers may have underestimated their autonomy, thus resulting in higher correlations between the independent and dependent variables. Personal constructs, SOC, sense of competence and self-esteem, may have overlapped to some extent with burnout, especially its efficacy component. At the measurement level this probably caused technical correlation of some of

the items. This may partly explain why their predictive power was stronger than that of the working conditions.

The assumptions regarding the variables in the discriminant analysis were not entirely fulfilled. We decided to use the original variables because differences in the usefulness of the original variables and the ranked explanatory variables were not found. The original variables also fulfilled the assumption of normal distribution fairly well (see section 2.3). The different approaches to analysis used in the study gave mainly similar results to each other. The small differences between the results achieved by different approaches to analysis were due to the way in which the stepwise method selects the variables for the model. Compared with the other methods used, in the stepwise method the 'second' variable selected is more clearly different from the 'first' one, which in itself explains most of the variance of the dependent variable. It is possible that variables that are more close to each other, and thus explain the same dimension, are selected in the hierarchical models.

The study design must also be considered. Although the study was longitudinal, the study groups were formed at the end of the study period at Time 2, because burnout was measured only then. For the same reason, possible changes in burnout during the 10 years could not be studied. The groups were formed on the basis of a weighted burnout sum score. The use of a combined burnout sum score has also been criticized (Koeske & Koeske, 1989). It can be agreed that a simple linear sum score should not be used. On the other hand, as burnout is considered to be a syndrome with three components, it would be logical also to develop also some kind of a syndrome indicator. We attempted this, and used a composite indicator based on the three components weighted according to their relation with a criterion variable that is commonly linked with burnout.

The sample comprised workers who had stayed in the company for at least 10 years, and this increased the mean age of the participants. The proportion of those who had serious burnout was also overrepresented in the study sample. This was due to our efforts to have enough cases in both study groups for the statistical analyses. In the survey at Time 2, from which the present sample was drawn, only 3% of the workers had serious burnout.

To check the correspondence of the present results of the study sample with the whole study population, we repeated the different discriminant analyses with variables measured in the Time 2 survey. The percentages of the correctly classified cases increased, especially in work characteristics, in all the models done in this way. In general, these test results supported our main findings.

5. Conclusions

From the results of our study it would seem that the paths to burnout and to well-being are drastically different. It appears that weaknesses in organizational climate and unrewarding work contribute to the development of burnout, which is rooted also in a person's lack of feelings of worth and competence. The indications are that the path to well-being is based on strong internal personal resources and challenging work, and is guided by a supportive atmosphere at work. Therefore, we conclude that the prevention of burnout should include both enhancement of the possibilities for developing the employees' personal resources and improvement of the social processes at work.

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