

basis of the semantic differential technique.

The prison personnel as a whole perceived themselves as quiet and calm rather than as enthusiastic and lively and as more common than original. They preferred a steady, secure life to change and excitement and felt themselves to be in control, even in difficult situations, rather than as easily losing control. Strong-willedness in contrast to weak-willedness and steady nerves in contrast to sensitive nerves were also their perceived qualities. Responsibilities were taken seriously. Jealousy was not perceived as a characteristic feature. The intelligence level was considered average and more practically than theoretically oriented. In social relations extroversion was more typical than introversion.

Occupational differences in the profiles of the self concept were statistically significant. Those closest to each other were the profiles of the principal guards, the administrators, and the foremen. The profiles of the educational and nursing staff, clerical staff, and junior guards differed considerably, both from each other and from the other groups.

The educational and nursing staff differed the most from the other groups with respect to the self-concept profiles, especially on the basis of their relatively high self-esteem. Remarkable differences were found between the profiles of the junior and the senior guards. There were differences also between the male clerical staff and the other men in the sample. The clerical staff, as the group including the largest proportion of females, differed from the others primarily by their stronger tendency to submit rather than dominate.

DATA REDUCTION

Work characteristics

To reduce the data describing work characteristics and to determine their basic dimensions, a factor analysis was carried out on the basis of the intercorrelations (appendix II, table 1) of the work characteristics.

A five-factor solution was chosen as final on the basis of the criteria described

in the presentation of the statistical techniques (part V). The rotated factors were based on a varimax rotation with orthogonal factors. Only variables with a loading of 0.40 or higher are reported in this section. The total rotated factor matrix is presented in appendix II, table 2.

The first factor covered variables describing relations with prisoners, especially problems with them and perceived insecurity.

Factor I Problems with prisoners

<i>Variable</i>	<i>Loading</i>
73 Hostility from prisoners	0.67
60 Trouble with prisoners	0.65
69 Responding to different prisoners (problematic)	0.61
75 Contact difficulties with prisoners	0.57
74 Unreliability of prisoners	0.55
65 Difficulties with discipline	0.52
68 Alertness at work	0.51
59 Distrust from prisoners	0.50
56 Poor employee-prisoner relations	0.50
63 Insecurity	0.46

Factor II covered variables describing various aspects typically belonging to the so-called organizational climate, ie, information, feedback, decision making, recognition, etc.

Factor II Organizational climate

<i>Variable</i>	<i>Loading</i>
43 Information about changes	0.69
41 Correction of grievances	0.69
44 Participation in decision making	0.62
42 Feedback	0.62
50 Work arrangement (general)	0.57
58 Recognition	0.55
91 Administration's attitude towards well-being of staff	0.52
46 Information about shifts	0.51
52 Influence on work arrangement	0.50
45 Information about prisoners	0.50
57 Tolerance of deviating opinions	0.49
51 Work arrangement (own)	0.48
83 Appreciation by institution	0.45
49 Administrators' knowledge of practice	0.41
87 Further education	0.40

Factor III covered variables describing the variability of work content, challenge of work, and appreciation of work.

Factor III Work variability and challenge

<i>Variable</i>	<i>Loading</i>
36 Work versatility	0.66
40 Work variability	0.63
89 Challenge	0.54

90 Mental satisfaction from work	0.49
85 Appreciation by prisoners	0.46
84 Social appreciation	0.40

Factor IV included somewhat heterogeneous items. Relations with the prisoners included an aspect of frustration in rehabilitative motives. Thus it had a somewhat different content from contact problems in relation to co-workers, which was also loaded on this factor.

Factor IV Social relations in work

<i>Variable</i>	<i>Loading</i>
77 No time to converse with prisoners	0.71
76 Limited possibility to help	0.69
78 No time to converse with co-workers	0.55
72 Differences of staff opinions	0.46
75 Contact difficulties with prisoners	0.45
70 Surveillance by superiors	0.41

The variables on factor V described the feelings of security of the personnel. Also an item reflecting demands of physical effort at work loaded on this factor.

Factor V Insecurity

<i>Variable</i>	<i>Loading</i>
30 Accident risk	0.65
31 Accident risk due prisoners	0.56
32 Physical effort	0.49
64 Responsibility for others	0.46
63 Insecurity	0.43

The variables grouped on factor VI were items measuring primarily the mental load in work, both qualitative and quantitative.

Factor VI Mental load

<i>Variable</i>	<i>Loading</i>
37 Responsibility (general)	0.54
38 Quantity of work	0.48
61 Hurry	0.48
33 Mental effort	0.47
35 Independent judgement	0.45
66 Understaffing	0.44

In summary, the variables describing work characteristics and the work environment formed dimensions which described the physical and mental load of work, organizational climate, social relations, and work content (primarily the variability and challenge in work). In addition, due to the special nature of prison work and items measuring such characteristics, one factor was formed of the problems related to prison work.

The factor structure corresponded roughly with the basic dimensions of the work environment in various studies, with added special features of prison care, especially interaction with the prisoners (56, 85, 158).

Symptoms and illnesses

The study covered a large number of perceived symptoms and both perceived and earlier diagnosed illnesses. In order to reduce the data and group the symptoms and illnesses which appeared together, a correlation analysis was carried out on the individual variables. A factor analysis was made as a next step to determine the dimensions of these indicators.

Altogether 71 variables, ie, perceived symptoms, illnesses, positive health indicators, and results of the laboratory examinations, were included in the correlation analysis (appendix II, table 3).

Most of the intercorrelations of the perceived psychological symptoms were statistically significant. A majority of the physical symptoms had a moderate to high correlation to each other. Part of them correlated noteworthy also with the psychological symptoms, and some of them remained as separate, uncorrelating variables. Especially those physical symptoms known to be regulated directly by the autonomic nervous system correlated with the psychological symptoms.

Most of the anamnestic illnesses had only a low correlation with perceived symptoms. Also the results of the laboratory measurements correlated only weakly with earlier illnesses and present symptoms. This phenomenon may have been partly due to the fact that a majority of the illnesses inquired about were separate diagnostic categories. Another possible explanation was that the information on the anamnestic illnesses were acquired from the total life span of the respondents. The report of symptoms, in turn, was based on recent (12 months) experience. A technically affecting aspect may be that the number of illnesses was much smaller than the number of symptoms in the study groups (skewed distributions).

The varimax rotation of the principal axis matrix of the variables by applied criteria (part V) produced five factors.

The rotated factor matrix is given in appendix II, table 4.

The psychological symptoms, especially indicators of depression and anxiety, had the strongest loadings on the first factor. Also sleep disturbances and some physical symptoms, particularly perceived disturbances in the function of the heart, loaded on this factor. The factor loadings of the physical symptoms remained, however, below 0.40, which makes their interpretation somewhat weaker. As they did not have loadings of comparable size on any other factors and their relation to psychological symptoms is known, their interpretation in this connection can be considered adequate. On the whole the first factor covered typical functional characteristics of the stress reaction.

Factor I Perceived symptoms

<i>Variable</i>	<i>Loading</i>
118 Tension	0.58
120 Worriedness	0.57
117 Depression	0.53
128 Tendency to get depressed	0.53
116 Concentration difficulties	0.51
125 Irritability	0.51
122 Disturbed sleep	0.48
115 Memory difficulties	0.43
121 Difficulty in falling asleep	0.40
(126 Getting easily angry	0.38)
(108 Stomach pain	0.38)
(129 Feelings of loneliness	0.34)
(103 Irregular heart beating	0.33)
(123 Continuous fatigue	0.32)
(110 Sweating	0.30)

Factor II can be characterized as a blood pressure factor. Both diastolic and systolic blood pressure loaded on it. Also overweight, expressed as an index formed of body weight and height, loaded on this factor. The correlation of blood pressure and overweight is generally well known. A technical correlation was behind the fact that the variable of follow-up recommendations loaded on this factor. The recommendations for a follow-up examination were the most often given on the basis of a suspicion of developing hypertension.

Factor II Blood pressure

<i>Variable</i>	<i>Loading</i>
160 Diastolic blood pressure	0.79
159 Systolic blood pressure	0.77
164 Follow-up recommendation	0.56
158 Obesity	0.44

The variables on factor III mainly described disturbances in physical health. While the physical symptoms on the first factor were mainly indicators of functional, hypothetically short-term disorders, the variables of the third factor represented more chronic and severe health disturbances. Unspecific indicators of health (eg, perceived general health status, use of medicines, and partial inability to work) had loadings on this factor. The content of the factor was also characterized by diagnosed anamnestic cardiovascular disorders and general fatigue and a perceived lack of health resources.

Factor III Chronic illness

<i>Variable</i>	<i>Loading</i>
139 Lowered perceived health status	0.57
173 Lack of resources compared to age mates	0.52
136 Vertigo	0.52
130 Use of medicines	0.49
140 Partial inability to work	0.46
141 Chest pain	0.42
103 Irregular heart beating	0.42
152 Electrocardiographic changes (anamnestic)	0.42
(135 Headache	0.38)
(123 Continuous fatigue	0.32)
(150 Heart insufficiency	0.31)
(137 Back pain	0.31)
(113 Lack of appetite	0.30)

The variables indicating social activity, participation, and perceived resources and feelings of competence loaded on factor IV. In the theoretical framework of the study these variables represented positive indicators of health. The positive indicators of health thus differed from the symptoms and illnesses and formed a separate dimension. A corresponding result has been acquired also in other studies (230).

Factor IV Social activeness

<i>Variable</i>	<i>Loading</i>
167 Going to visit pleasant	0.43
174 Initiatives in contacts	0.42
166 Group discussions pleasant	0.42
127 No contact difficulties	0.42
171 Energy for hobbies	0.41
(172 Participation in organizations	0.38)
(165 Going to work pleasant	0.36)
(129 No feelings of loneliness	0.35)
(168 Planning for future pleasant	0.33)
(169 Activities deviating from routine pleasant	0.33)
(170 Discussing own profession pleasant	0.30)
(173 Resources compared to age mates	0.30)

The variables describing allergy and skin sensitivity loaded on factor V.

Factor V Allergy and skin diseases

<i>Variable</i>	<i>Loading</i>
157 Allergic diseases	0.60
149 Dermatologic diseases	0.56
111 Sensitivity of skin	0.45

Outside the factor structure (loadings below 0.30 on all factors) remained 28 variables measuring illnesses and certain symptoms. These illnesses seemed to appear as separate health problems, or the reliability of the indicators was low.

Self concept

The characteristics of self concept revealed by the self-concept test have been previously reported in detail in a separate report (242). In the present communication only the factor structure of the self-concept items, on which the selection of the dimensions in the explanatory analyses was based, are presented.

The five factors extracted from the original 20 items of the self-concept test follow. Only those items on each factor are mentioned which had equal or higher loadings than 0.40.

The first factor primarily described an inclination to submit to or dominate others. It also covered a feature indicating either a positive or negative anticipation of future events.

Factor I Dominance

<i>Variable</i>	<i>Loading</i>
185 Dominating	0.76
183 Willing to lead others	0.70
192 Strong-willed	0.57
184 Optimistic	0.48

The second factor primarily described psychological stability and ego strength in maintaining control of one's behavior.

Factor II Ego strength

<i>Variable</i>	<i>Loading</i>
175 Calm	0.66
178 Able to control self	0.65
191 Able to control anger	0.53
193 Strong nerves	0.44
177 Desires security	0.40

The third factor covered items of introversion-extroversion. Also items describing an altruistic social-mindedness loaded on this factor.

Factor III Introversion

<i>Variable</i>	<i>Loading</i>
182 Self-centered	0.56
188 Not socially oriented	0.51
181 Introvert	0.50
195 Less fond of children	0.49

The fourth factor reflected characteristics which can be regarded as forms of trait anxiety.

Factor IV Trait anxiety

<i>Variable</i>	<i>Loading</i>
196 Takes duties seriously	0.62
197 Pedantic	0.55
184 Pessimistic	0.42

Factor V included items reflecting self-esteem, although the content remained rather narrow. The third item on this factor was "more practical than theoretical ability." Its factor loading remained only just below the interpretational limit (0.39) and can thus be regarded as an additional item supportive of the interpretation of this factor.

Factor V Self-esteem

<i>Variable</i>	<i>Loading</i>
190 Intelligent	0.55
186 Sexually attractive	0.42

The factors can be considered logical by content. One item, "brave, does not worry over things beforehand — worries over things beforehand" loaded on two factors. It was associated with each of the two factors logically in certain aspects of its content.

The factor structure in this study (242) corresponds closely to that of a representative sample of Finnish people (248) and a sample of Finnish seamen (65).

EXPLANATORY ANALYSES

Analytical scheme

The aim of the explanatory analyses was to study the relations of stress reactions and health indicators to work stressors. At the same time the intervening effect

of the individual factors and social support was to be studied. Job satisfaction was treated as an intervening phase mediating the effects of the work stressors on the stress reactions and health status.

The selection of the dependent variables was based on the theoretical framework of the study. Variables were chosen to represent psychological and physiological stress reactions, health problems, and positive aspects of health. Six dependent variables were studied. The selection of the variables was technically based on the factor analysis of the symptoms and health indicators. The predictors were demographic data, work characteristics, and dimensions of the self concept.

An introductory correlation analysis was first done to find the work-related determinants of job satisfaction. In later preliminary multivariate analyses (AID) job satisfaction was treated as a phase mediating the effects of those work characteristics that correlated strongly with job satisfaction. Other characteristics of the work environment and personality, demographic data, and one attitudinal variable were applied as additional predictors in the AID analyses. The aim of the AID analyses was to determine the relative explanatory power and the interactive explanatory combinations of the various groups of the studied predictors.

After the preliminary explanatory analyses more elaborate analyses of the interrelations of the specific work stressors, the stress reactions, and the health indicators were carried out with the GLM. Those personality variables found to be the most powerful in the introductory analyses and social support were treated as intervening or moderating variables.

Correlation analysis of the determinants of job satisfaction

Variables

The explanation of the variation in job satisfaction was not a primary task in this study, in which the main interest was the study of stress and health indicators. As job satisfaction was, however, considered one possible predictor of stress and health variation, its relation to basic work factors was studied as the first step of the explanatory analyses.

A variable of general job satisfaction was used as the indicator of job satisfaction. In the selection of the work variables to the correlational analysis two bases were applied. On one hand, the aim was to select the items which presented the known factors in the taxonomies of the determinants of job satisfaction (62, 168, 249, 267). On the other, stressor variables were selected so that their relation to job satisfaction could be determined before further multivariate analysis.

The selection of variables was technically based on the factor analysis of work characteristics. From each factor one or more variables were selected to represent the whole dimension. The aim was to select the variables which would cover the crucial content of the factors as widely as possible. In addition to the variables in the factor analysis certain other variables were also included in the correlational analysis.

To represent factor I (problems with prisoners), two variables were chosen: "employee-prisoner relations" and "excitement in work," both of which was assumed to reflect widely the problems perceived in the interrelations with the prisoners. From factor II (organizational climate) the variable with the highest loading was selected, ie, "information about changes." From factor III (work variability and challenge) the variables "work variation," "versatility" and "social appreciation of work" were chosen. From factor IV (social relations in work), which was rather heterogeneous by content, the variable with the highest loading was selected, ie, "no time to converse with prisoners." This variable described one of the central problems in prison service, ie, restricted possibilities to help. The variable "accident risk" was the item with the highest loading on factor V (insecurity), and it was selected to represent the factor as an item covering a potential danger because of prisoner relations and other reasons. As the generally perceived mental load in work appeared to be a common problem in this field, several variables were selected from factor V, ie, "responsibility," "hurry," "understaffing," and "conflicting demands."

A variable indicating a perceived recent increase in work demands, which had re-

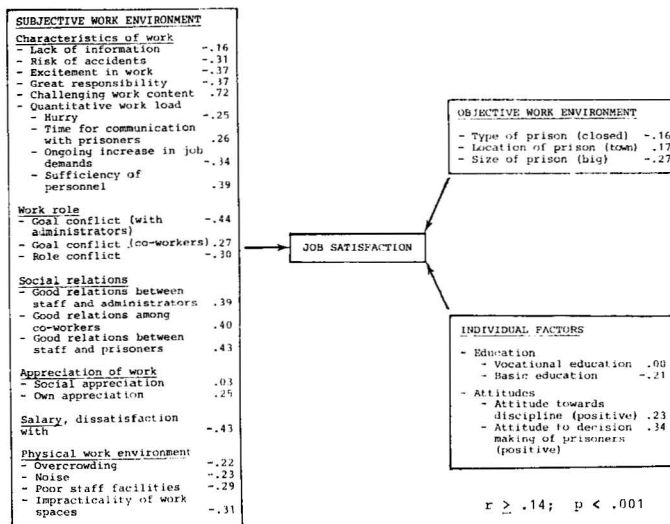


Fig 16. Correlations of work and individual factors with job satisfaction.

mained outside the interpretable factor structure, was also selected because of its expected relation to job satisfaction. The following other items outside the factor structure were thought to reflect primary work stressors and were added to the correlation analysis: "goal conflict with colleagues" and "goal conflict with administrators" and two variables measuring attitudes towards the principles of the care of prisoners, "attitude towards discipline" and "attitude towards the decision making of prisoners."

To reflect the relations of the staff, the following variables were selected: "superior-subordinate relations" and "employee-employee relations."

Extrinsic characteristics of the physical work environment, important hygiene factors (110), were also included in the analysis, ie, "impracticability of work spaces," "poor staff facilities," "overcrowding," and from the special physical stressors "noise."

The following variables represented the institution: "security of prison," "size," and "location." (Security of prison is denoted in fig 16 as "type of prison" and "closed" refers to maximum-security).

From several possible items concerning salary, the variable indicating general satisfaction with salary was included.

The variables describing levels of both basic and vocational education were selected from the data describing individual background.

Results

The results of the correlation analysis are given in fig 16, where the work variables are grouped on the basis of their contents.

Almost all of the correlation coefficients were statistically significant but not absolutely very high. The variable "interesting and challenging work content" had the highest correlation with job satisfaction, as could be expected. Variables indicating much responsibility and safety risks were in a moderately negative relation to satisfaction (coefficients around -0.30). Variables indicating quantitative work load were on about the same correlational level. Hurry and perceived increase in work demands were negatively related, while perceived personnel resources was positively related to job satisfaction. Conflicts in work role correlated negatively with job satisfaction, while, on the other hand, a correspondence of own and administrators' views on the care of prisoners, ie, lack of goal conflict, had a moderately positive correlation with job satisfaction. It was also higher among those who rated the social relations between various parties in prisons positively. Personal appreciation of work had a rather low positive correlation with job satisfaction, while its correlation with the perceived appreciation by other people outside the prisons was close to zero. Dissatisfaction with physical work environment

and salary correlated moderately with general job dissatisfaction. The correlations of objective data on prisons as a work environment with job satisfaction were rather low except for a moderate correlation with the size of prison; this result indicated a more positive situation in small prisons. Personal attitudes towards discipline and a recent increase in the participation of the prisoners in decision making were positively related to job satisfaction. The level of education was related to job satisfaction only with respect to basic education.

Discussion

The correlations of job satisfaction with work variables and the few individual variables included in the analysis are for the most part congruent with the taxonomies of the determinants of job satisfaction. Intrinsic work characteristics, and interesting and challenging work content are the most effective determinants, as found repeatedly (50, 149).

Two items of the quantitative work load, ie, "sufficiency of personnel" and "time available to discuss with prisoners" can to some extent be regarded as intrinsic work characteristics because they seem to be related to a rehabilitation-oriented view of the work. Thus the correlations could be partly interpreted so that satisfaction with rehabilitative motives is an intrinsic work characteristic increasing general job satisfaction.

Correspondence of one's own views on the care of prisoners with those of other parties in prisons and the prison administration comprised two important variables reflecting the level of goal congruence in the field. Goal congruence increased satisfaction, while a more immediate and concrete conflict in work role, reflected by a perceived discrepancy in what is expected from an employee, was related to job dissatisfaction.

Employer-employee relations, as well as co-worker relations, are often considered dissatisfaction producing when negative and satisfaction increasing when positive — as in the results of this study. In work such as the care of prisoners, interindividual relations play a crucial role in defining the successfulness of the work, and, on the other hand, they are

under such a risk to become disturbed that they perhaps really create feelings of satisfaction whenever found warm and close. In this study the wording makes these variables close correspondents of the variables interpreted as indicators of social support received by colleagues or superiors in some other studies (71).

One unexpected result, on the basis of earlier studies, was that perceived social appreciation of work did not correlate with job satisfaction (211). The low correlation was a result of a low level of perceived social appreciation and a relatively high level of job satisfaction in general among prison personnel. Thus the distributions of the responses to these two variables did not overlap. Own appreciation had however an expected positive relation to job satisfaction. The purest extrinsic work variables, physical environment and salary, were, expectedly, related to dissatisfaction when negatively evaluated.

The relation of the size of the institution to job satisfaction was negative, as usual (262). In client-oriented work a big workplace size is particularly unfavorable for job satisfaction (227). The rather low correlation of prison type (security) was in the expected direction. Job satisfaction is lower in maximum-security prisons, perhaps partly as a result of more difficult inmates with concomitant work demands and responsibility. Important in this respect are probably also the physical inconveniences of maximum-security prisons. To the expected direction also was the relatively low correlation of the location of the prison in town versus rural areas with job satisfaction. The most satisfied employees worked in city prisons. This result hypothetically reflects, at least partly, differences in the general surrounding of a workplace, eg, in regard to cultural and living opportunities.

The direct relation of the level of education to job satisfaction has been repeatedly recognized. This relationship was found only with regard to basic education in the present study. It is likely that this result reflects also the differences between the work of various occupational groups in prisons.

The attitudes towards discipline indicate, in spite of authoritarianism, an adapta-

tion to that particular function of prisons which is sometimes considered their main task. Adaptation to the situation at hand was also reflected by a positive attitude towards an increase in the prisoners' opportunities to participate in decision making. The correspondence of individual attitudes with the actual situation in prisons increased satisfaction.

Relation of stress and health to background factors: Automatic interaction detector analyses

Dependent variables

The basis of selection of the dependent variables for the AID analyses was the theoretical framework of the study. Both psychological, physical, and social indicators of stress and health were represented in the analysis. The selection of the variables was technically based on the results of the factor analysis of the stress and health indicators. Psychological and physiological symptoms in the form of a sum scale (appendix I), perceived health status, diastolic blood pressure, and a positive indicator of health, ie, social activeness, were treated as dependent variables.

Predictors

Altogether 19 variables were chosen to be used as the predictors on the basis of the theoretical model. They represented the objective work environment, conception of work and the work environment (subjective work environment), job satisfaction, and individual background and personality variables (individual characteristics). The same independent variables were used in the explanatory analysis of all the aforementioned indicators of stress reactions and health.

From the data describing objective work conditions, the following variables were selected: size of prison, security of prison (maximum security, medium security, minimum security, subsidiary) and overcrowding (relation of the number of prisoners to the official number of beds). The variables describing the institution were expected to have an effect on the work and work stress. These data were also reliable and easily available from the statistics on prisons.

Certain aspects of the occupational background of the employees can be compared to the variables describing the objective work conditions. Such variables are occupational group, length of work experience in the care of prisoners, and living in or outside the prison grounds.

Many job characteristics were expected to be related to the stress reactions and health indicators. Practical methodological reasons restricted, however, their inclusion in the AID analyses. Therefore, general job satisfaction was selected as an intermediary state reflecting also the effect of those work characteristics that were its determinants.

From the single perceived aspects of work which did not highly correlate with job satisfaction, "perceived social appreciation of work" was selected. Also "role conflicts" was included because of its great theoretical importance, in spite of the moderate correlation of this variable with job satisfaction.

The most central background variables, such as sex, age, and vocational education, were chosen to be used as moderating individual factors.

Six variables were included in the analysis of the self-concept test to describe the personality characteristics. On the basis of a factor analysis of the items one variable was selected to represent each of the five factors. As the criterion for selection was either the factor loading of the variable or the meaningfulness of its content or both. The following variables were selected: self-control, introversion/extroversion, dominance, self-esteem, and pedantism. In addition, a variable indicating the characteristic type of anticipation, ie, pessimistic/optimistic, was selected. This variable was loaded both on the factor of dominance and on the factor reflecting trait anxiety. The latter factor corresponds to the Eysencks' (68) dimension of neurotism. Typical of it is a worrying attitude regarding the future and an expectation of problems which one cannot cope with.

The attitudes towards the care of the prisoners were represented in the analysis by a variable indicating the attitude towards discipline. This variable expectedly reflects the level of authoritarianism with regard to the treatment of the