Predicting Occupational Strain and Job Satisfaction: The Role of Stress, Coping,

Personality, and Affectivity Variables

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Abstract

Four studies employed path analysis to examine how measures of occupational stressors, coping resources, and negative affectivity (NA) and positive affectivity (PA) interact to predict occupational strain. The Occupational Stress Inventory (Osipow & Spokane, 1987) was used to measure stress, strain, and coping. The Positive and Negative Affectivity Schedule (Watson, Clark, & Tellegen, 1988) was used for the affectivity variables. The hypothesised model showed NA and PA as background dispositional variables that influenced relations among stress, strain, and coping while still allowing stress and coping to have a direct influence on strain. Goodness of fit indices were acceptable with the model predicting 15% of the variance in stress, 24% of coping, and 70% of strain. Study 2 replicated these findings. Study 3 added a positive outcome variable, job satisfaction (JSI: Brayfield & Rothe, 1951) to the model. The expanded model again fit the data well. A fourth study added a global measure of personality (NEO-FFI: Costa & McCrae, 1991) to the model tested in Study 3. Results indicated that personality measures did not add anything to the prediction of job satisfaction and strain in a model that already included measures of stressors, coping resources, NA and PA. The series of four studies yielded a reliable structural model that highlights the influence of organizational and dispositional variables on occupational strain and job satisfaction.

Predicting Occupational Strain and Job Satisfaction: The Role of Stress, Coping, Personality, and Affectivity Variables

Occupational stress is an important topic in organizational psychology. The dramatic 20% annual increase in stress-related Workers' Compensation claims accepted by Comcare Australia since its inception in 1989/90 has resulted in payouts of about $50 million in 1994/95 (Bull, 1996). When hidden costs such as loss of productivity, benefits and fees paid by other Government Departments, and personal and family hardship are taken into account, the real cost is closer to $150 million (Fisher, 1996). Reports from other Western societies indicate that they are experiencing similar problems (Sauter, Murphy, & Hurrell, 1991). As the stress epidemic has advanced in Australia, the nature of the problem has also changed. Latest figures reveal that in 1994/95 only 17% of stress claims were made for workplace trauma, aggression and assault (Bull, 1996), with the remainder being based on more pervasive and chronic causes, including interpersonal conflicts, and organizational factors such as change and pressure to meet deadlines. It is not surprising, therefore, that the search for causes of occupational strain and its link with other important outcome variables such as job satisfaction has become a high priority in this country.

The present research program aimed to establish a reliable model for predicting both strain and job satisfaction using a combination of organizational and individual differences variables. Using a cross-sectional methodology, we conducted a series of four studies. The first study tested a basic model for predicting occupational strain. The remaining studies sought to validate and to extend the model by including additional predictor and outcome variables. The model of occupational stress developed by Osipow and Spokane (1983, 1987) provided the main vehicle for studying occupational stress in the present research. The model describes a system in which the work environment contains stressors (stress) for individuals who then use various coping methods to deal with these stressors. The success of these methods, in combination with the intensity of the stress as well as a number of personal variables, interact to produce a level of strain.

In addition, however, we have included the dispositional variables of positive and negative affectivity as important additional explanatory constructs in stress research. The last two studies in the series sought to broaden the model further by including a positive outcome variable, job satisfaction, and a global measure of personality traits.

Stress, Strain, Coping, Positive and Negative Affectivity

There are a number of elements within the work environment that can be classified as stressors. Factors that are intrinsic to the job include poor working conditions, work overload and underload, time pressures, physical danger, and shift work (Cooper, 1987). Sources of stress pertaining to the employee's role in the organisation include responsibility for lives, role ambiguity, and role conflict (Sutherland & Cooper, 1988). Other sources of stress may come from relationships with coworkers or management, dissatisfaction with career development opportunities, and a lack of job security (Parker & DeCotiis, 1983). The structure of the organization itself can also be a source of stress for employees. For example, hierarchical, top-down management structures that provide workers with little or no say in the decision-making process, restrictions on behaviour, office politics, lack of effective consultation (Cooper & Marshall, 1976), and erratic working hours (Greenhaus & Parasuraman, 1987) can all have detrimental effects on workers' well-

being.

Events such as those described above make up the work environmental stressors in Osipow and Spokane's (1987) model which stipulates that once a stressor has been identified, individuals will strive to restore stability within their lives. The success of these efforts depends on the individual's coping resources. Osipow and Spokane (1983) identified a number of coping behaviours believed to be important in moderating the stress-strain relationship. These behaviours include recreational activities, which distract the individual from stressful events and provide a source of satisfaction outside the work environment; self-care behaviours, particularly participation in healthy activities; social support systems, focused on relationships with family and friends, as well as participation in social groups; and rational/cognitive skills, which facilitate the effective management of time, effort, and reaction.

The extent to which individuals engage in strategies to deal with stress and the success of those strategies depends largely upon characteristics of the individual. Negative affectivity (NA) is possibly the individual differences variable that has the most potential to influence self-report measures of occupational stressors and subsequent perceptions of strain (Brief, Burke, George, Robinson, & Webster, 1988; Schaubroeck, Ganster, & Fox, 1992). The construct is defined by Watson and Clark (1984) as a mood-dispositional dimension that reflects individual differences in negative emotionality. Watson and Clark conclude that individuals high in NA are more likely to experience distress and dissatisfaction, focus on their failures, and dwell on the negative side of life in general. High NA reflects a wide range of negative states including fear, anger, guilt, disgust, loneliness, and self-dissatisfaction (Watson & Kendall, 1989). The empirical evidence favouring the inclusion of measures of NA in stress research is strong. Decker and Borgen (1993) demonstrated that NA relates positively to psychological distress. Watson and Pennebaker (1989) found that NA was significantly related to self-reports of physical complaints, however it did not appear to be related to long-term health problems. Similarly, NA has been found to be negatively related to coping resources (Parkes, 1990). Perhaps because of its seemingly pervasive nature, NA has been claimed as a nuisance variable in stress research (Brief et al., 1988; Elliott, Chartrand, & Harkins, 1994). The claim is that individuals who tend to experience aversive mood states are more likely to interpret stimuli negatively. Their self-reports of stressors and strain are therefore likely to reflect a negative bias, and correlations among self-report stress measures may be inflated. Evidence supporting this position was reported by Brief et al. (1988) and by Payne (1988). When attempting to replicate the findings of Brief et al., however, Chen and Spector (1991) found that there is still a reliable relationship between stress and strain even after NA is partialled out. Similar conclusions have been reached by other researchers (e.g., Decker and Borgen, 1993; Korotkov & Hannah, 1994; Spector & O'Connell, 1994). Moyle (1995), who reviewed of much of the empirical evidence relating to NA, concluded that it could have a direct effect on strain as well as a moderating and a confounding role.

Researchers have provided a number of explanations for these inconsistent findings. First, the different measures available to assess NA and PA make comparisons between studies extremely difficult (Fisher, 1988). Second, a number of researchers have focused their attention on chronic stressors (e.g., Chen & Spector, 1991), while comparatively few studies have concentrated on acute stressors (Brief et al., 1988). Thirdly, NA can be measured as a state (i.e., fluctuations in mood), or as a trait (i.e., stable individual differences). Finally, methodological shortcomings in the

partial correlation approach to controlling for NA have been identified as a possible cause for the inconsistent findings (Williams, Gavin, & Williams, 1996). The research reported here sought to address the question of inconsistency by using the same variables over a series of studies and cross-validating the findings, rather than exhaustively analysing data from a single study.

A related individual characteristic that has received comparatively little attention in research is positive affectivity (PA). High PA reflects enthusiasm, high energy, concentration, and determination (McIntyre, Watson, Clark, & Cross, 1991). Individuals high in PA view the world in a more positive light and report leading full and interesting lives (Watson & Pennebaker, 1989). It is reasonable to expect that if NA interacts with cognitive appraisal to contribute to strain, then PA may buffer the individual from the potentially detrimental effects of stress. One might expect PA to be negatively correlated with both stress and strain. Some evidence for this is found in research showing that higher levels of positive affect enhance creative problem solving (Isen, Daubman, & Nowicki, 1987) and that PA is associated with positive problem solving approaches (Elliott, Sherwin, Harkins, & Marmaroush, 1995). Cropanzano, James, and Konovsky (1993) studied the effects of both PA and NA on organizational commitment, turnover, job satisfaction, and performance. They reported that NA and PA both related to work attitudes. Moyle (1995), however, did not report any association between PA and levels of reported strain. Given the importance attached to NA, it is surprising that so few studies have included PA in their models.

Constructing A Model to Predict Occupational Strain

The probable nature of the relationships among PA, NA, stress, strain, and coping can best be determined by taking a core set of variables, defining the pathways among this subset, and then adding other variables to the model. The three main constructs of stress, strain, and coping can be measured by a single instrument, the Occupational Stress Inventory (OSI: Osipow & Spokane, 1987). The theoretical underpinnings of this instrument provide a rather simple framework for predicting and explaining occupational strain. Osipow and Spokane (1983) intended a causal link when they made a distinction between stress and strain, the former indicating environmental states, the latter personal reactions. The separation of stress and strain made it quite clear that individuals deal with stressors in some way before any strain response occurs. The first pathway in our structural model is therefore a direct path from stress to strain, with an expectation that the two constructs will relate positively. Coping resources enable an individual to encounter a stimulus, appraise it as stressful, yet deal with it in such a way that less strain results. Thus, it is clear that there should also be a pathway from coping to strain, with an expected negative relationship. The link between coping and stress is not quite so easy to specify. The description by Osipow and Spokane suggests that coping is a reaction to encountering stressors and that a causal pathway, with a negative sign, can be drawn from stress to coping and thence to strain. However, as other researchers have pointed out, coping is not a simple construct and it is possible that some coping strategies will be related to strain while others will not (e.g., Long, 1993). Furthermore, the types of coping mechanisms an individual employs can also have an effect on the individual's exposure to stressors in the first place. The internalized feelings of being socially supported could shield the individual from many potential stressors (McIntosh, 1991; Scheck, Kinicki, & Davy, 1997). There is no doubt, however, that a commonly held view of coping is that it is a response to perceived stress (Lazarus & Folkman, 1984). This is the view taken by

Osipow and Spokane (1987) and the one that will be tested here.

Both PA and NA are described as pervasive cognitive states that influence responses to a wide range of situations (Clark & Watson, 1991). In theory, the constructs are independent but in practice they have often been shown to have a low negative correlation (e.g., Elliott et al., 1994), so the first element in our hypothetical model allows for a covariance pathway between NA and PA. In some of the stress research involving NA and PA, they have been cast as mediating variables (e.g., Elliott et al., 1994). As such, they can be represented in structural models as variables that appear between stress and strain. However, it is clear from these regression studies that the mediation role is too narrow a view of how PA and NA affect strain. Moyle (1995), for example, reported that NA could have a mediating, moderating, and a confounding role when predicting strain. The hypothetical model that we arrived at depicts NA as a confounding variable that influences reports of stressors, strains, and coping mechanisms. Williams et al. (1996) depicted NA in such a fashion when predicting some of the same stress variables used in the present study. The small number of studies that have used measures of PA have indicated that its effect is weak in comparison with NA (e.g., Elliott et al., 1994). Nevertheless, on theoretical grounds, the influence of PA should be much the same as NA, and we have given it equal status in the hypothetical model depicted in Figure 1. It can be seen that NA is expected to have a direct positive effect on stress and strain and an indirect negative effect on coping. The model also depicts NA as having indirect effects on coping (via stress) and on strain (via stress and coping). PA is expected to have a direct positive effect on coping and direct negative effects on stress and strain. It has indirect effects on strain via stress and coping. Stress is shown as having a direct positive effect on strain and an indirect effect via coping. Coping has a direct negative effect on strain.

Aims of Study 1

Although the model shown in Figure 1 has sound theoretical foundations and some empirical support, it was in some senses also exploratory. The inclusion of PA made it possible to test not only for a "pervasive negative orientation" (Burke, Brief, & George, 1993, p. 403) but also to test for a corresponding tendency for some people to view everything in a positive light. The depiction of NA and PA as broad background dispositional variables in a structural model of this type, while it is compatible with regression findings, is uncommon. The use of a structural modeling approach, however, allowed a test of whether or not the relations among stress, coping, and strain are due entirely to the confounding effects of NA and PA. Such an outcome would be indicated by the presence of non-significant paths among the stress, strain, and coping variables. The structural model also allowed us to see what proportion of the variance of the three endogeneous variables (stress, strain, and coping) can be predicted with this set of measures. A secondary aim of Study 1 was to test whether the relations between these variables is best described as linear and whether there is evidence of interaction among the variables. Hierarchical regression analysis was used for this purpose.

Method

Sample

A total of 153 participants (75 females), most of whom were members of a local Rotary club, responded to requests to participate in a survey on occupational stress. The only restriction placed on respondents was that they had to have been employed fulltime for at least six months. No information was collected on the type of employment, the expectation being that this would vary widely among members of a Rotary club. The average age of the participants was 35.14 years ($\underline{SD}$ = 9.15) with a range between 18 and 58 years.

Measures

The 140-item Occupational Stress Inventory (OSI; Osipow & Spokane, 1987) contains three sections designed to measure occupational stress, strain, and coping resources. The Occupational Roles Questionnaire (ORQ) assesses stress and contains six subscales measuring role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment. The Personal Strain Questionnaire (PSQ) assesses occupational strain and contains four subscales measuring vocational strain, psychological strain, interpersonal strain, and physical strain. Finally, the Personal Resources Questionnaire (PRQ) assesses coping skills and contains four subscales measuring recreation, self-care, social support, and rational/cognitive coping resources. The subscales within each section of the OSI can be summed to yield scores for stress, strain, and coping. All items in the OSI employ a 5-point Likert-style response format ranging from "rarely or never true" (1) to "true most of the time" (5). Internal consistency estimates for the 14 subscales range from .71 to .94 (Osipow & Spokane, 1987). Total scores obtained from the ORQ, PRQ, and PSQ were used for subsequent regression and path analyses.

Positive and Negative Affectivity Schedule (PANAS)

Positive and negative affectivity were measured using the PANAS (Watson et al., 1988). The schedule consists of 10 positive and 10 negative adjectives that respondents rate on a 5-point Likert scale, in terms of how they have felt over the last six weeks. High scores on each scale denote higher levels of affectivity. Watson et al. (1988) reported internal consistency reliabilities for positive affectivity (PA) and negative affectivity (NA) of .87 and .88 respectively. Eight week test-retest reliabilities were .68 for PA and .71 for NA. Total scores were again the measures used in subsequent analyses.

Procedure

One of the experimenters approached members of various Rotary clubs attending scheduled meetings and sought volunteers who met the fulltime employment criterion to participate in a survey on stress. A package containing the questionnaires and a consent form was given to the participants and they were requested to complete the questionnaires in their own time and return them using reply-paid mail. Approximately 77% of the packages were returned. All participants were given feedback on their stress, strain, and coping scores.

Results

Means, standard deviations, reliability estimates, and correlations for all psychometric variables appear in Table 1. The statistics for the OSI resemble those reported in the manual (Osipow & Spokane, 1987). This Australian sample, however, scored a point or two lower on all subscales, including those from the coping resources questionnaire. The scores were somewhere between those reported for the normative sample and those reported by Decker and Borgen (1993) for their U.S. university faculty sample. Internal consistency reliability estimates (Cronbach's alpha) were satisfactory for all variables.

Table 1

Descriptive Statistics and Correlations for OSI and PANAS Scales (N = 153)

Variable	Mean	SD	Alpha	Stress	Coping	Strain	NA	PA
Stress	140.89	25.69	.89	1.00				
Coping	122.35	20.48	.86	-.27	1.00			
Strain	85.54	23.33	.93	.69	-.47	1.00		
Negaff	20.67	7.18	.85	.33	-.29	.57	1.00	
Posaff	35.15	7.14	.89	-.25	.42	-.49	-.19	1.00

Note. All correlations significant at .05 level.

The correlations among the different variables were all significant ($p < .05$) and in line with expectations. Stress and strain variables correlated positively, NA related positively to both stress and strain, PA showed a similar pattern of correlations as NA, albeit with the opposite sign. The correlation between NA and PA was only -.19. The relative independence of these two dimensions and their strong associations with strain support the view that PA is likely to be a useful variable in the prediction of strain. Although not shown in Table 1, a check was also made on the the relationship of the external variables age and gender with strain. As in the Decker and Borgen (1993) study, no correlations were observed.

Before concluding this section of the analysis, tests were conducted for the presence of non-linear relationships between the criterion and predictor variables. Quadratic terms were computed for NA, PA, stress and coping. In step one of a hierarchical regression analysis, the independent variables NA, PA, stress, and coping were entered as a block to predict strain. The R^2 value for this equation was .69 with all four variables making a contribution to the prediction of strain. In the second block, second-order polynomials were entered for these same four variables but their addition did not increase the variance explained. These findings, coupled with inspection of residual plots, indicated that a linear model was suitable for mapping the relations between strain and the predictor variables.

Testing a Model Linking Stress, Strain, Coping, NA and PA

The main aim of Study 1 was to test a hypothetical model (see Figure 1) of how the four independent variables influence each other and combine to predict strain. The Amos (Arbuckle, 1997) structural equation modelling package was used for this purpose. The model, with parameter estimates, is shown in Figure 2. It can be seen

that the model contains three dependent variables: stress, coping, and strain. The model is saturated, that is, it requires the estimation of 15 parameters using 15 sample moments. To create a degree of freedom needed for model testing, we set the variance of NA at 52, its actual value in this sample. We chose to set the variance for NA rather than the other measured exogeneous variable (PA) because of evidence from the literature and our own research that the variance of NA is consistently in the low 50's.

Note that all the path coefficients were significant ($p < .05$, one-tailed). As hypothesized, the direct effect of NA on stress was positive ($\underline{b} = .30$), indicating that people with high NA tended to report more stressors in the workplace. Conversely, the direct effect of PA on stress was negative ($\underline{b} = -.20$), indicating that people with high PA were less likely to report experiencing occupational stressors. Negative affectivity and positive affectivity together explained 15.5% of the variance in stress ($p < .05$). The relationship between affectivity and coping was stronger where NA was observed to have a negative direct effect on coping ($\underline{b} = -.19$) and PA observed to have a positive direct effect ($\underline{b} = .35$). Together, and with some assistance from stress, NA and PA accounted for 24% of the variance in coping scores. Finally, the model was very successful in predicting self-reports of strain. NA had a direct effect on strain ($\underline{b} = .33$) and indirect effects through both stress (path = .30 x .48) and coping (path = -.19 x -.14). Positive affectivity also had a direct effect on strain ($\underline{b} = -.24$) and indirect effects through both stress (path = -.20 x .48) and coping (path = .35 x -.14). Stress had a strong direct effect on strain ($\underline{b} = .48$) while coping had a negative direct effect ($\underline{b} = -.14$). The whole model predicted 70.4% of the variance in strain.

Fit statistics for the model were all acceptable. The traditional chi-square test was satisfactory (χ^2 , 1 = .38, $\underline{p} > .05$). The Non-Normed Fit Index (NNFI), also known as the Tucker-Lewis coefficient (TLI), and recommended by McDonald and Marsh (1990) was 1.00, well above the recommended minimum of .90. The Adjusted Goodness of Fit Index (AGFI) was .99, also well above the recommended minimum of .90. The root mean square error of approximation (RMSEA) recommended by Browne and Cudeck (1993) was also used as a measure of fit. Browne and Cudeck suggest that an RMSEA value below .05 indicates a close fit and that values up to .08 are still acceptable. The value in the present case was zero, indicating good fit. Given these very satisfactory fit indices, no other models were tested.

Discussion

Taken individually, most of the findings that emerged in this study were predictable on the basis of previous research. The correlations among the OSI variables resembled those reported by Decker and Borgen (1993) who reported that stress and coping predicted 57% of the variance in strain. Here, they predicted 55%. The confirmation that stress has both a direct effect on strain and an indirect effect via coping also follows from the theoretical model on which the OSI is based. Similarly, the evidence supporting the importance of NA as a source of variance in stress, coping, and strain has been well documented (e.g., Moyle, 1995). The important role of PA, however, although expected on theoretical grounds, has not often been noted in previous research. In the present study, unreported hierarchical regression analyses indicated that PA explained an additional 15% of the variance in strain after NA had been partialled out and 16% of the variance in coping. Elliott et al. (1994) suggested that the contribution of PA to the prediction of occupational strain may be overshadowed by NA and that it might be more fruitful for future research to examine

relations between PA and "more positively valenced indices in the workplace, such as job satisfaction, help offering, constructive commenting about the organization, and other pro-social behaviours" (p. 198). It could be argued that the role of PA is to predict positive indices, such as coping behavior, and the role of NA is to predict negative indices, such as stress and strain. However, these findings are tentative and need further confirmation. What is clear from the present study is that PA can covary with both negative and positive indices (strain: $\underline{r}$ = -.49; coping: $\underline{r}$ = .42).

Study 2

Although there are a number of studies that have examined the relations among stress, coping, NA, and strain, few have included PA as an additional explanatory variable. For this reason, the findings reported above were regarded as tentative until they could be replicated. One of the major problems in stress research is that different studies have not succeeded in replicating previous findings, with the result that competing claims about the relations among key variables are left "hanging in the air", so to speak. We addressed this issue in the current research program by collecting new data to test the reliability of the initial findings and to extend the range of variables included in the model. Accordingly, Study 2 replicated Study 1 in a different employment context.

Participants

A total of 98 adults (72 females), most of whom were nursing staff working full-time in a private hospital participated in this study. The average age of the participants was 34.9 years.

Measures

The test materials consisted of the OSI and the PANAS and an information sheet containing questions relating to age, gender, job title, and a brief description of duties. A consent form was also included.

Procedure

One of the researchers was employed as an administrator by the hospital concerned and obtained permission to administer the tests as a mail survey to all hospital employees. Written instructions on the purpose of the survey, which was described as concerned with occupational stress, were included with each package. Subjects were encouraged to participate by offering personal feedback. Completed questionnaires were mailed or delivered in person to the researcher. Approximately 70% of the questionnaires were returned.

Results

Data screening located two multivariate outliers (Mahalanobis distance: $\underline{p}$ < .001) which were deleted from the dataset, leaving 96 cases for analysis. Descriptive statistics and correlations appear in Table 2. The values are much the same as those obtained in Study 1. Hierarchical regression analyses were again used to check assumptions of linearity and to test for interactions and moderating effects. As was the case with Study 1, there was no evidence of interactions or moderation effects among the variables. A visual check of scatterplots for non-linearity found some evidence of curvilinear relationships between coping and strain with strain scores decreasing in a nonlinear fashion once coping resources reached a certain level. A similar tendency

was noted between stress and strain with strain scores increasing in a nonlinear fashion once stressors reached a certain level. However, regression analyses showed that the amount of variance accounted for by the second order polynomials was less than 2%. For this reason, a linear model was once again chosen to describe the relations among the five variables. When the model shown in Figure 1 was fitted to the data from this second study, the fit indices were all within acceptable ranges (χ^2, 1 = 0.00, p > .05; AGFI = 1.00; TLI = 1.00; RMSEA = .00). The model predicted 20% of the variance in coping, 38% of the variance in stress, and 58% of the variance in strain. Parameter estimates for all pathways in the model were significant (p < .05).

Table 2

Descriptive Statistics and Correlations for OSI and PANAS Scales (N = 96)

Variable	Mean	SD	Alpha	Stress	Coping	Strain	Negaff
Stress	130.01	23.86	.86	1.00			
Coping	121.15	18.84	.83	-.35	1.00		
Strain	80.16	21.78	.93	.66	-.53	1.00	
Negaff	20.45	7.46	.85	.59	-.38	.58	1.00
Posaff	35.30	7.14	.89	-.20	.23	-.31	-.05

Note: All correlations significant at .05 level, except that between Negaff and Posaff.

Discussion

Study 2 added support for a model that described NA and PA as background dispositional variables that influenced both coping resources and environmental stressors. These, in turn, influenced the outcome variable, occupational strain. Together, the two studies have shown that a significant amount of self-reported strain can be predicted on the basis of personal dispositions, coping skills, and environmental factors (stressors). A limitation of these two studies, however, was that they focused on the prediction of a negative outcome, strain. In keeping with recent trends to focus on positive as well as negative outcomes (Seeman, 1989), a third study was designed in which a positive outcome measure, job satisfaction, was incorporated in the model developed in the first two studies.

Study 3

Two possibilities were considered when extending the model to include job satisfaction. Some have suggested that strain and morale are separate independent measures (O'Halloran & Hart, 1996). To accommodate this viewpoint, job satisfaction needs to be added alongside strain as an outcome variable with direct pathways from NA, PA, coping, and stress. There is some support for this model in the literature. Moyle (1996) developed a structural model that included variables somewhat similar to those used in the present research and found that poor mental health and job satisfaction were both influenced by variables such as neuroticism, social support, job demands, and role clarity but that the two outcome variables were not associated in any way. Decker and Borgen (1993) conducted a study that used the same set of variables as the present study, albeit with different instruments for job satisfaction and negative affectivity. They found that stress predicted strain and job satisfaction, as did coping and NA. These researchers did not explore the connection between strain and satisfaction, nor did they include a measure of PA or develop a structural model of how all these variables influence each other.

A second possible model is suggested by researchers who have used job satisfaction to measure the impact of occupational strain (Brief & Atieh, 1987; Jackson & Schuler, 1985), implying a direct causal connection between the two variables. To test this model, a pathway needs to be added from strain to job satisfaction. This model actually incorporates the first because if there is no connection between the two outcome variables, the parameter for the pathway linking the two will have a value of zero. Accordingly, this second model was the one put forward for testing. Thus, the third study in this series aimed to further replicate the model developed in Study 1 and tested in Study 2, and to test an extended model that includes job satisfaction.

Method

Participants

A total of 106 adults (90 males) all of whom were members of the Australian Army were surveyed as part of an investigation of stress levels in a particular organizational unit at the local army base. The mean age of the sample was 38 ($\underline{SD}$ = 8.11). The length of time respondents had been working in their current positions ranged from 1 month to 20 years with an average of just over two years. The army base is far removed from any conflict zone and none of the respondents had experienced combat conditions in the preceding six months.

Measures

Measures were the same as those used in Study 1 and Study 2: OSI and PANAS. In addition, the Job Satisfaction Inventory (JSI: Brayfield & Rothe, 1951) was used. The JSI has good reliability (α = .87) and employs a 5-point Likert scale to assess responses to 18 statements about work-related attitudes (e.g., Most days I am enthusiastic about my work). Half of the items are negatively keyed. Total scores were obtained from all scales.

Procedure

Two of the researchers visited the base to administer the tests. All members of the unit, including officers, completed the forms in a group testing session. Participants were informed that a feedback session would be held later in the year, when all data were analyzed.

Results

The descriptive statistics and correlations for all variables appear in Table 3. The statistics relating to the variables used in the first two studies were much the same as reported in Tables 1 and 2. The results were also identical in other respects: each variable made a unique contribution to the prediction of strain and there was a weak indication of a non-linear relationship between stress and strain with the quadratic component explaining an additional 3% of the variance in strain ($\underline{p}$ < .05). The model shown in Figure 1 again fit the data almost perfectly (χ^2, 1 = 1.23, $\underline{p}$ > .05; AGFI = .94; TLI = 0.99; RMSEA = .05), providing further support for the validity of the model. Again, all path coefficients were significant ($\underline{p}$ < .05)

Table 3
Descriptive Statistics and Correlations for OSI, PANAS, and JSI Scales (N = 114)

| Variable	Mean	SD	Alpha	Stress	Coping	Strain	NA	PA
Stress	136.11	22.48	.88	1.00				
Coping	127.72	18.13	.88	-.38	1.00			
Strain	80.91	19.65	.91	.59	-.58	1.00		
Negaff	18.57	7.00	.85	.26	-.42	.58	1.00	
Posaff	35.40	6.22	.89	-.29	.49	-.46	-.28	1.00
Satisfac	60.81	10.84	.93	-.46	.27	-.51	-.21	.42

Note: All correlations significant at .05 level.

Apart from replicating previous findings, Study 3 introduced a positive outcome variable, job satisfaction. Its relations with the other variables were in line with expectations. It had a negative correlation with stress, NA, and strain, and positive correlations with coping and PA. To evaluate its place in a model comprising these variables, it was placed alongside strain as an outcome variable with all other variables, including strain, having a direct influence on satisfaction. As in the earlier studies, the variance of NA was set at 52 to provide a degree of freedom for goodness of fit tests. The resulting model, with parameter estimates, appears in Figure 3.

All pathways shown in this figure were significant, except for that leading from coping to satisfaction, where there was some evidence of a suppressor variable effect, and from NA to satisfaction. The fit statistics for the model were acceptable (χ^2, 1 = 1.23, $\underline{p}$ > .05; AGFI = .93; TLI = .98; RMSEA = .05) and the model accounted for 12% of the variance in stress, 38% of coping, 63% of strain, and 36% of the variance in job satisfaction. The three major predictors of satisfaction were strain, stress, and PA. Together, these three variables predicted 32% of the variance in job satisfaction.

Discussion

Study 3 added further support to the model shown in Figure 1 as a reliable description of the relationship among stress, strain, coping, and the background dispositional variables of PA and NA. It also demonstrated a strong link between job satisfaction and strain ($\underline{r}$ = -.51), with people experiencing high strain likely to report low job satisfaction. This is not surprising because strain, by definition, is itself an unpleasant outcome and likely to lower satisfaction. Moyle (1996), however, did not connect these two variables, leaving them as separate outcome variables. Hart, Griffin, Wearing, and Cooper (1996) noted that very few researchers have addressed the link between strain and well-being. We have shown here that strain can be regarded as part of the causal chain for job satisfaction. The strong relationship between stress, a measure of environmental factors, and job satisfaction ($\underline{r}$ = -.46), demonstrates that work conditions also have a direct negative impact on job satisfaction.
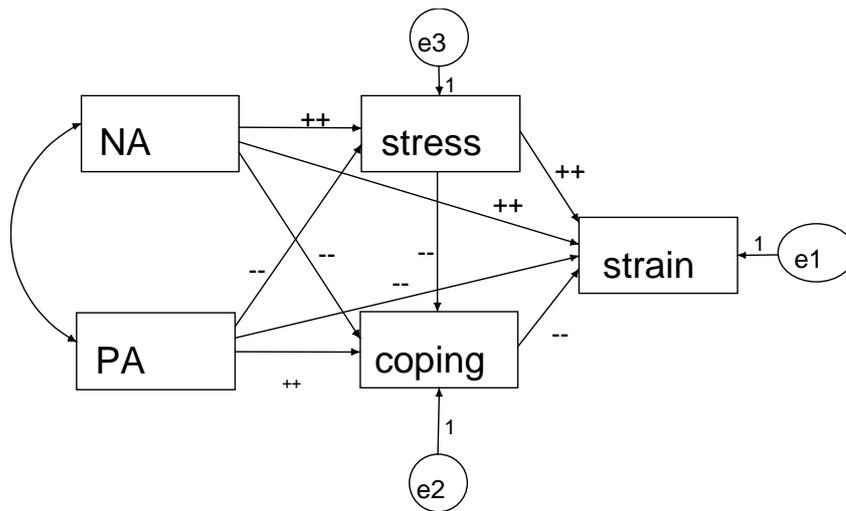
Figure 1 Structural Model Depicting Relations Among Variables Used to Measure Stress

One of the more interesting outcomes of Study 3 was the relative importance of PA compared to NA when predicting satisfaction. The link between PA and satisfaction in Study 3 suggested to us that other personality variables may also be important in predicting these two outcomes. Previous research has indicated that certain personality types are more prone to experiencing stress. Type A individuals, being more competitive, may see a passive, low pressured environment as a constraint, while Type B individuals may perceive it as an opportunity (Beehr & Schuler, 1982). Other characteristics of the individual identified as influencing responses to stress include locus of control (Beehr & Schuler, 1982), attitudes, needs, values, and ability (Sutherland & Cooper, 1988), and hardiness (Parkes, 1994). In keeping with the emphasis placed on replication in this research programme, and to explore the link between job satisfaction, occupational strain, and personality factors more thoroughly, a fourth study was designed wherein a global measure of personality was included with the variables used in Study 3. The personality measure was based on the Big-Five model, which has broad acceptance in occupational settings (Hogan, Hogan & Roberts, 1996). The Big-Five personality factors - Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C) - provide an indication of individual differences in patterns of interpersonal relationships and experiential style (Costa & McCrae, 1991).

Considerable research evidence exists for relationships between some of the five dimensions and stress outcomes. Neuroticism (N) is related to NA. It has even been suggested that they are alternative labels for the same construct (Burke et al., 1993). Much of what has been found to apply in the relationship between NA and stress can be similarly attributed to N, which is regarded as a measure of a person's vulnerability to stress (Costa & McCrae, 1980; Walsh, Wilding, & Eysenck, 1994). The personality dimension Extraversion (E) defines a person's sociability and the tendency to prefer either engaging with others or focusing on thoughts and ideas. The construct of PA is related to E, but this relationship is not as well-defined as that which has been demonstrated between N and NA. Costa and McCrae (1980) found that E contributes to PA, while others have found E is correlated with planful problem solving (Dorn & Matthews, 1992), success at work (Hogan et al., 1996), and job satisfaction (Moyle, 1995). These relationships tend to suggest that E is likely to have some impact, albeit

lesser than N, on stress/strain.

Very little, if any, evidence exists to link Openness (O) with stress. Strutton, Pelton, and Lumpkin (1995) found a relationship between O and the use of problem-focused coping. They suggested that persons who scored high on O were more open to new experiences and would therefore be less likely to feel threatened by change. However, it appears the O dimension has little impact on the stress-strain relationship. Agreeableness (A) measures a person's preference for competition or cooperation, but as is the case for Openness, there appears to be little evidence of the influence of A on stress. Conscientiousness (C) can be described as a person's need to achieve. It also measures traits such as punctuality and organization which are significant work attributes, and as such, high scores on C predict success at work (Hogan et al., 1996). Studies have found that people with a high need for achievement often place themselves in situations of high work demands. However, as they are dispositionally suited to this type of work, a high score on C predicts stress but not strain (Costa & McCrae, 1991; Spector & O'Connell, 1994). This study will seek to clarify the role of C in occupational stress.

Thus, the aims of Study 4 were to: a) replicate the basic model linking affectivity, stress, coping, and strain; b) replicate the model shown in Figure 3 which shows stress, strain, and PA as the main predictors of job satisfaction; c) to assess the contribution of a global measure of personality to the prediction of occupational strain and job satisfaction.

Study 4

Method

Participants

Participants in this study were 120 Australian Defence Force and Public Service personnel. The sample consisted of 84 males with a mean age of 40.0 years (SD = 7.4), and 36 females with a mean age of 35.8 years (SD = 9.6). Thirty-eight subjects were members of the Australian Army, 21 were Royal Australian Air Force (RAAF) personnel, and 61 were employed in the Australian Public Service, working in the Department of Defence (DD) and the Department of Employment, Education, Training and Youth Affairs (DEETYA). Subjects had been working for their current employer for periods ranging from 1 month to 384 months (M = 145.2, SD = 109.4), and the time spent in their current positions ranged from 1 month to 168 months (M = 17.8, SD = 20.5).

Measures

Measures included the OSI, the PANAS, the JSI, and the NEO-FFI, a short (60-item) version of the Revised NEO Personality Inventory (NEO PI-R) (Costa & McCrae, 1991). The 60 questions of the NEO-FFI were presented in 12 blocks of five questions, with each of the five domain scales being sampled in each block. Respondents indicated their level of agreement with each statement using a five-point scale (Strongly disagree, Disagree, Neutral, Agree, Strongly agree). Total scores were obtained on all five measures.

Procedure

Data from Defence Force and Department of Defence personnel were collected when participants attended one of three compulsory group sessions conducted at their

workplace over three consecutive days. Some people who were absent on those days completed the forms individually. It was explained to each group that the purpose of the survey was to provide information about occupational stress. Participants were advised that completion of the questionnaire was voluntary and that individual results were confidential. Group data were to be collated and provided to the Officer in Charge for information and possible follow-up action. Most respondents completed the four questionnaires within thirty minutes.

Results

Data screening resulted in the deletion of two cases with missing data on more than two tests. Descriptive statistics and correlations for all variables appear in Table 4. Satisfactory alpha coefficients were obtained for all measures (see Table 4), with values at least as high as those reported by the authors of the scales.

Contrary to previous research (Costa & McCrae, 1980; Watson et al., 1988) and to the earlier studies in this series where correlations between the subscales of the PANAS were very low, NA and PA were significantly negatively correlated (r = -.48, p < .01). The table also reveals a strong positive relationship between NA and neuroticism (r = .75, p < .01), suggesting that the two measures could almost be considered to be collinear, and a positive but slightly weaker relationship between PA and extraversion (r = .63, p < .01). N was also significantly related to agreeableness (r = -.23, p < .05), and to conscientiousness (r = -.55, p < .01). Additional correlations were found between conscientiousness and extraversion (r = .46, p < .01), and conscientiousness and agreeableness (r = .23, p < .05).

To assess the role of personality variables in a model that already includes measures of PA and NA, the unique contributions of the seven variables NA, PA, neuroticism, extraversion, openness, agreeableness, and conscientiousness as predictors of strain were assessed by entering them together in a standard regression analysis. The analysis revealed that NA (β = .56, p < .0001) and agreeableness (β = -.15, p < .05) were the only two variables which contributed significantly to the prediction of 51% of strain, F(7,108) = 16.35, p < .001. When coping was added to the equation, agreeableness, no longer made a contribution. A model consisting of NA, coping and stress, was able to predict 69% of strain. When assessing the role of the same set of seven personality variables in predicting job satisfaction, none were significant.

Given that the personality variables could not add to the prediction of either outcome variable, the model shown in Figure 3 was fitted to the data from Study 4. Fit statistics were satisfactory (χ^2, 1 = 1 .14, p > .05; AGFI = .93; TLI = .99; RMSEA = .03) although not all pathways were significant. The non-significant pathways were from PA to stress, strain, and satisfaction. The paths from coping and NA to satisfaction were also non-significant, as was the case in Study 3. All other pathways in the model were significant. The model predicted 9% of stress, 43% of coping, 66% of strain, and 35% of job satisfaction.

Discussion

The first aim of Study 4 was to replicate the basic model linking affectivity, stress, coping, and strain. This aim was achieved because the basic model was nested within the larger model shown in Figure 2, which was shown to have acceptable fit indices, thus also satisfying the second aim of the study. The third aim of the study

concerned the role of personality variables in the prediction of strain and job satisfaction. The inclusion of the NEO-FFI answered a call for researchers to include separate measures of personality, stress, coping, NA, and PA as part of a more integrated and systematic approach to explaining the relationship between people and work (Hart et al., 1996). The data from this study, however, suggests that broad personality variables may not be important when the outcome variables are strain and job satisfaction. When considered in the absence of NA, PA, coping and stress measures, the N and E subscales from the NEO-FFI emerged as the best two predictors of strain, with C and A also playing a significant role. When these other predictor variables were included, however, the NEO-FFI was shown to be a less efficient predictor of strain than the PANAS, which has the added advantages of relative structural simplicity and ease of administration. As far as job satisfaction was concerned, none of the personality variables was able to predict this outcome variable. As suggested by previous research (Bogg & Cooper, 1995; Hart et al., 1996) satisfaction was determined primarily by factors within the work environment. The stress questionnaire (ORQ) from the OSI measures some of these environmental factors and, apart from strain, was the only variable in the study to directly predict satisfaction.

General Discussion

The main aim of the series of studies reported here was to examine relations among the constructs of stress, coping, strain, job satisfaction, and the dispositional variables positive and negative affectivity. Age and gender were also included as predictor variables but, despite suggestions in the literature (e.g., Selye, 1983) that age and gender are important internal conditioning factors that influence responses to stress, no relationships were found between these two variables and strain in any of the four studies described in this paper. The discussion will therefore focus on the other variables in the study.

The first two studies in the series used age, gender, and the OSI and PANAS variables to predict occupational strain. The model shown in Figure 1 describes NA and PA as dispositional variables that are important in predicting variance in stress, coping, and strain and also in explaining the correlations among the variables of the OSI. An important feature of this model in the current research program is that it was successfully fitted to three subsequent data sets collected over a period of four years. In the model, NA is shown as having a significant positive impact on stress. Bolger and Zuckerman (1995) referred to this as a differential exposure model wherein people with high NA place themselves in situations where they encounter more stressors. Our findings show that PA also acts in this way but in the reverse direction: people high in PA either do not encounter as many stressors or do not notice them.

The role of PA has been somewhat neglected in the literature, so this finding is of some interest. However, it should be pointed out that NA and PA account for only 16% of the variance in stress. Such a low prediction is understandable when one recalls that stress, as measured by the OSI, is really a measure of environmental pressures. It would be somewhat surprising if a personality variable predicted a large amount of variance in exposure to environmental stressors. Some relationship is understandable given the probable effect of personality dispositions on perceptions of the environment, yet it is unlikely to ever be a very strong relationship.

The second dependent variable in this model, coping, is better predicted by the two personality variables, with NA and PA accounting for 24% of the variance (see

Figure 2). It is probable that this estimate would be higher if coping strategies were divided into emotion based versus problem based, or engagement versus disengagement (Long, 1993). There is already evidence in the literature that NA is associated with emotion- based strategies and PA with problem based strategies (Elliott et al., 1995). The OSI has four coping subscales - recreation, self-care, social support, rational/cognitive - which cannot easily be separated into these two categories. The rational/cognitive subscale, however, measures the individual's ability to use cognitive skills such as reorganizing work, setting priorities, and using problem-focused behaviour (Osipow & Spokane, 1987). It is interesting to note that in all four studies here, NA was significantly negatively related with rational/cognitive coping strategies and PA had an almost equal positive association (e.g., NA = -.42 and PA = .43 in Study 4). When one considers that NA and PA measures themselves tend to share little variance, the role of PA in predicting coping is another strong argument for its inclusion in stress research.

The final dependent variable in Figure 1 was occupational strain. All four predictor variables had significant direct pathways to strain. NA and PA also exerted some influence on strain via indirect pathways but these influences were relatively minor and will not be discussed further. It can be seen from Figure 2 that the major influences on strain were environmental stressors and NA, with PA and coping making a significant but smaller contribution. Together, the four variables predicted 70% of the variance in strain. Figure 2 also clarifies what is known about the role of NA and PA as confounding variables, more than is possible with regression analysis. We can see that PA , as well as NA, acts as a confound in the stress-strain relationship. Furthermore, they act as confounds in the relations between stress and coping and between coping and strain. It is likely, as some researchers have claimed (e.g., Brief et al., 1988), that they will act as confounds in any self-report data. What is equally evident in Figure 2 is that the relations between stress and strain and between coping and strain are not due entirely to this confounding influence. If this were the case, the path coefficients from stress to strain and coping to strain would be non-significant. In fact, both paths remained significant, especially that connecting stress to strain. These findings are not compatible with claims that the stress-strain relationship disappears if NA is partialled out (e.g., Schroeder & Costa, 1984; Elliott et al., 1994) and are more in line with claims that correlations are simply reduced (e.g., Moyle, 1995).
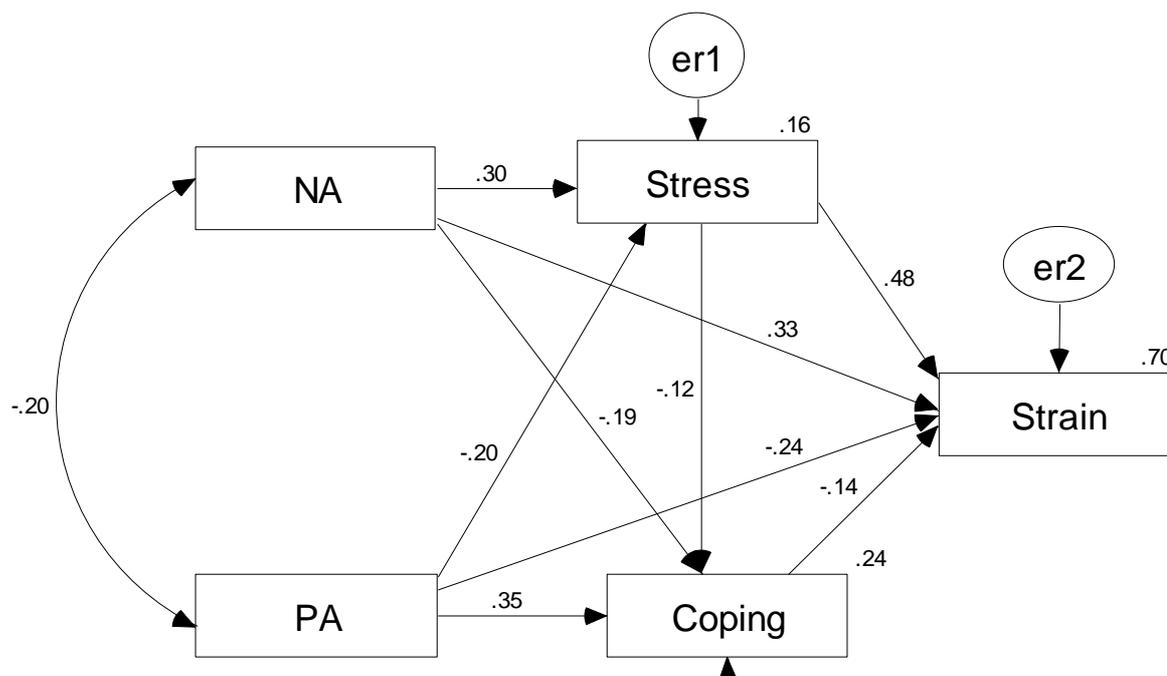
Figure 2 Structural Model Linking NA, PA, Coping, Stress, and Strain

The third study introduced a positive outcome variable, job satisfaction, which was thought to be influenced by all five variables used in the first two studies. Figure 3 shows the model parameter estimates obtained from Study 3. The model predicted 13% of stress, 38% of coping, 63% of strain, and 36% of job satisfaction. The findings in relation to stress, strain, and coping replicate the findings of studies one and two, so we will confine our remarks in this section to job satisfaction. The structural model shows that most of the variables in the model had some direct impact on job satisfaction, although the paths from NA and coping were not significant. The main contributors to the prediction of job satisfaction, however, were stress, strain, and PA which together accounted for 34% of the variance. Stress and strain by themselves explained 29% of the variance. The implications are clear for organizational research: positive indicators of well-being such as PA and coping skills are not as important for predicting job satisfaction as are indicators of exposure to occupational stressors and resulting occupational strain. The relative unimportance of indices of well-being in predicting job satisfaction received further confirmation in Study 4, where paths from PA and coping to job satisfaction were non-significant. Stress and strain explained 35% of the variance in satisfaction, with PA making no additional contribution. The most important role of PA throughout this research has been in its prediction of coping, where it certainly overshadows NA. As pointed out earlier, however, coping is a complex construct and both NA and PA can have strong associations with different types of coping strategies (Long, 1993). We were not able to explore these associations using the OSI.

Study 4 served to pinpoint the personality variables of most interest in studies of occupational strain and job satisfaction. The basic OSI model was expanded to incorporate personality variables. Direct and indirect influences of the two PANAS dimensions and the NEO-FFI factors were investigated to assess their comparative value as predictors. These analyses indicated that the addition of the NEO-FFI, an instrument that is claimed to measure the major dimensions of personality, failed to add anything to the model shown in Figure 3. Neuroticism and extraversion, the two variables that were most related to the outcome variables, explained much the same

variance as NA and PA respectively. Other researchers have noted the close parallel between NA and neuroticism (e.g., Burke et al., 1993) and it seems that there is a weaker but still highly significant relationship between extraversion and PA.

The findings relating to NA and neuroticism are no surprise. The term "neuroticism" has been found to be consistent with the NA concept (Costa & McCrae, 1987). In fact, researchers have proposed that NA is a higher-order construct that encompasses neuroticism, trait anxiety, low self esteem, and other emotionally related personality constructs (Watson & Clark, 1984). Consequently, a number of common instruments, for example the Taylor Manifest Anxiety Scale (TMAS; Taylor, 1953) and the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) have been proposed as alternative measures of NA (Burke et al, 1993). Our findings offer some support for this position but also suggest that the relationship between NA and strain may be stronger (.67, see Table 4) than the relationship between neuroticism and strain (.56). The relationship between PA and strain (-.44), however, is much the same as that between extraversion and strain (-.42).
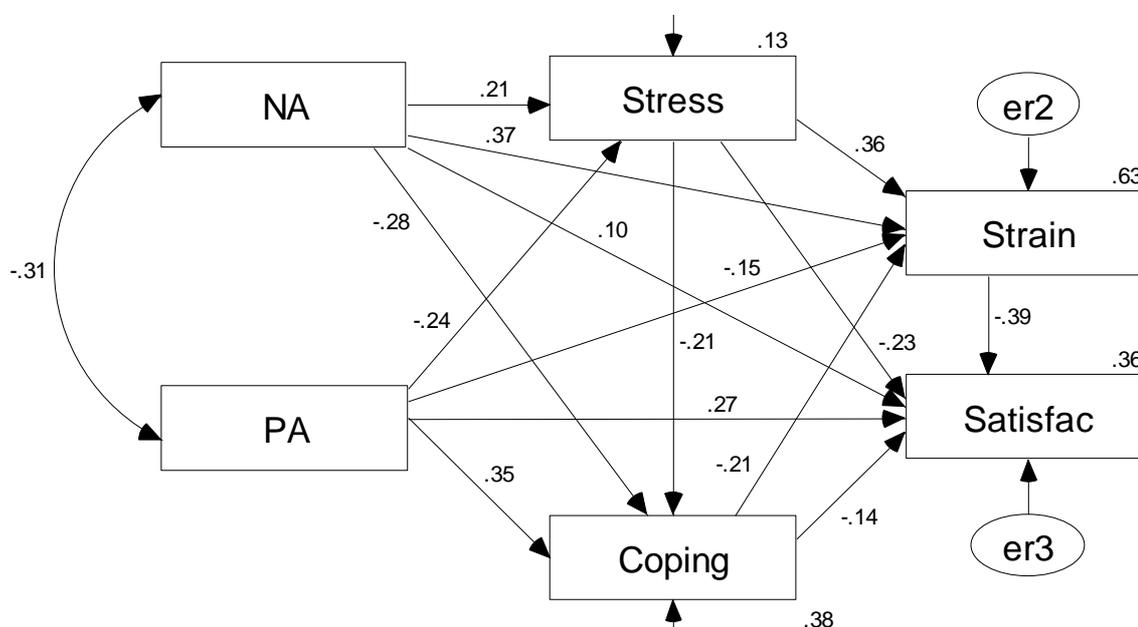

Figure 3 Structural Model Linking NA, PA, Coping, Stress, Strain and Job Satisfaction.

Table 4

Descriptive Statistics and Correlations for OSI, PANAS, JSI, and NEO-FFI Variables (N = 118)

Variables	M	SD	α	1	2	3	4	5	6	7	8	9	10
1. Stress	142.75	26.61	.90	1.00									
2. Coping	124.19	19.64	.87	-.41	1.00								
3. Strain	86.98	24.08	.94	.63	-.62	1.00							
4. NA	20.30	7.98	.88	.32	-.51	.67							
5. PA	34.05	7.30	.90	-.21	.56	-.44	-.48	1.00					
6. Satisfac	62.73	10.96	.91	-.51	.36	-.55	-.28	.25	1.00				
7. Neurot	18.92	9.39	.88	.20	-.51	.56	.75	-.55	-.33	1.00			
8. Extrav	27.66	6.82	.78	-.10	.46	-.42	-.49	.63	.30	-.61	1.00		
9. Open	24.80	6.21	.78	-.03	.15	-.03	.05	-.02	.11	-.03	.00	1.00	
10. Agree	31.11	5.99	.74	-.35	.34	-.30	-.21	.19	.15	-.23	.10	.10	1.00
11. Consci	34.57	6.19	.81	-.15	.50	-.37	-.50	.51	.23	-.55	.46	-.10	.23

Note. Correlations above .17 significant at .05 level

Before concluding, it is important to draw attention to some of the limitations of this research and to suggest ways in which these might be overcome. The main limitation is in the use of a cross-sectional methodology: the measures of stress, strain, coping, and affectivity were all taken simultaneously, making it more difficult to establish causality. A number of recent studies have allowed some time separation between the measures of stress and strain (e.g., Long & Schutz, 1995), making it possible to not only trace the stability of relationships over time but also to assess the impact of current stressors on later experiences of strain. In our defence, we put forward two counterarguments. The first is that the stressors measured by the OSI tend to be chronic, rather than acute. Thus, when a person is asked a question such as "I have to take work home with me" (OSI: Q4 in ORQ), there is no reason why that person should not already be feeling strain, especially as the instructions for the OSI ask the person to respond according to how often the person experiences a particular stressor. It follows that someone who receives a high score on the ORQ (stressor) section of the OSI has been exposed to a range of stressors for some time. There is no need to await a strain response. The second argument we would advance in our favor is that repeatedly testing structural models with successive data sets, as we have done, introduces an element of reliability that is otherwise missing in cross-sectional studies.

A limitation that is less easily addressed has to do with the use of measuring instruments that employ a similar question and response format. The measures of stress, strain, and coping all come from the OSI, and the formats of the PANAS and JSI are not dissimilar. Method variance is undoubtedly a contributor to the common variance among all measures used here. Inclusion of multiple indicators of stress, strain, coping, and affectivity would lead to better measurement of the constructs themselves and also allow assessment of method variance (Williams et al., 1996).

In conclusion, the studies reported here highlight the importance of individual as well as organizational variables in reducing strain and improving morale. Individual variables such as NA, PA, and coping may not have a direct effect on job satisfaction, but they do have an appreciable effect on strain, which in turn has an effect on satisfaction. Psychologists who suggest an organizational rather than individual approach to workplace health programs can take encouragement from the findings that the strongest predictors in all four studies were the negative indicator variables. However, merely reducing negative symptoms is not enough. Proactive interventions that initiate improvements in the organizational environment are also essential if maximum results are to be achieved.

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