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**SWP 6/93 OCCUPATIONAL STRESS, SOCIAL SUPPORT, JOB
CONTROL AND PSYCHOLOGICAL WELL-BEING**

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ABSTRACT

The effects of social support, job control, locus of control and predictability upon the relationship between occupational stress and psychological well-being have been well discussed and researched. In order to synthesize these areas of research, a one month follow-up study of 244 accountants was conducted. The results indicated complex interactions between stressors, locus of control, predictability of the organisational environment and social support or job control in predicting psychological well-being, controlling for initial measures of well-being. These interactions reveal that an internal locus of control, predictability and social support/job control synergistically buffer the effects of stressors upon well-being. The results were also found to support a main effects model of generalized perceived control upon well-being.

KEY WORDS: Stress, well-being, social support, job control, locus of control.

INTRODUCTION

Many variables have been hypothesized to impinge upon the relationship between occupational stress and well-being, both of a personal cognitive nature and of a social/organisational nature (eg. Beehr & Newman, 1978), leading to a large and diverse literature. It is clearly important to bring these diverse areas of research together, in order to make sense of the occupational stress literature.

Among variables thought to influence the occupational stress process are worker control (Spector, 1986), social support (House, 1981) and locus of control (Spector, 1982, Parkes, 1989). Typically, however, these variables have been treated as either having a direct effect on well-being, or examined as simple buffers of the effect of stress on well-being. Experimental psychologists have also identified predictability as being important to the stress process (Miller, 1980, 1981), but predictability has received very little direct attention in the occupational stress literature.

The general aims of this paper are to empirically synthesize current models of social support, worker control and locus of control with predictability, and to show how they relate to well-being in the work place. In order to gain a rationale for studying these variables in unison, it is necessary to examine current theoretical expositions of the occupational stress process.

Transactional Models of Stress.

Modern theories of stress are usually transactional in nature (eg. Cox, 1978, Schuler, 1982, Edwards, 1992). Transactional models see the stress process as a continual transaction between external demands and constraints, external supplies and supports, personal resources and internal needs and values, in which the

individual strives to maintain balance (Cox & MacKay, 1981). Moreover, transactional theorists recognize that different stimuli have different characteristics and each individual has different levels of perceived ability to cope with these stimuli, different perceptions of the demands of these stimuli and different perceptions of the importance of meeting those demands (McGrath, 1976, Beehr & Bhagat, 1985).

Therefore, transactional models place the phenomenon of stress firmly within the cognitions of the individual. Nevertheless, it is clear that transactional models imply complex relationships between environmental variables, individual cognitions and stressors in their relationship with well-being. Thus, transactional models indicate that individual variables and social/organisational variables should be studied together in order to determine the relationship between occupational stressors and well-being.

In the following sections, models of the relationship between worker control, social support, occupational stressors and well-being will be discussed. However, these models have not taken individual difference variables into account, and thus may have incorrectly specified the essentially transactional nature of stress. Thus, locus of control will be introduced as an individual difference variable that has implications for models of stress, social support, worker control and employee well-being. Hypotheses concerning all these variables will be proposed and tested in the remainder of the paper.

Karasek's job demand-control model.

One of the most widely researched models of job control and occupational stress is an interactionist model known as the job demands-control model (Karasek, 1979). This model suggests that when the psychological demands of a job are high and

control over the job is low, health status and well-being are lowered. However, when demands and control are high, the individual will experience an increased motivation to perform.

Although Karasek (1979, 1989, 1990) and Bromet *et al* (1988) present evidence in favour of the model, other field studies have not been supportive (Payne & Fletcher, 1983, Spector 1987, McLaney and Hurrell, 1988, Sauter, 1989, Warr, 1990a). A laboratory study also failed to provide any evidence for the model (Perrewe & Ganster, 1989). Equivocal evidence for the model is supplied by Landsbergis (1988). Nevertheless, the idea that control interacts with stressors to lessen their impact upon well-being has a certain intuitive appeal, and would seem to have a logical basis (Fisher, 1989, Frese, 1989), as well as some experimental support from animal studies (Weiss, 1972). However, Karasek's model does not specify any role for individual cognitions in the determination of well-being. Thus, Karasek's model may need to be refined to include individual cognitions.

Social support and the buffering hypothesis.

Social support may be considered to be a flow of communication between people involving emotional concern, caring, information and instrumental help (Williams & House, 1985). Henderson (1984) has noted that research on the effects of social support has been dominated by two hypotheses. The first suggests that social support has a direct effect upon well-being. The second hypothesis, known as the buffering hypothesis, suggests that social support interacts with stressors, such that social support buffers the effects of stressors upon well-being.

This second hypothesis has attracted the most attention. In their extensive review, Cohen & Wills (1985) found evidence for both the direct effect and buffering hypotheses. However, studies of support in the work place have been equivocal

with regard to the buffering hypothesis; some studies providing evidence in favour (eg. LaRocco *et al*, 1980, Kirmeyer & Dougherty, 1988, Buunk *et al*, 1989); other studies finding little or no evidence in favour of the buffering hypothesis (eg. Ganster *et al*, 1986, Dooley *et al*, 1987, Kaufman & Beehr, 1989).

The buffering hypothesis is similar in concept to Karasek's job-demands-control model. Both models indicate that some variable (worker control or social support) interacts with stressors such that the effect of stressors upon well-being is lessened. Both social support and worker control are therefore hypothesized to provide resources by which the nature of the environment can be changed, thus lessening the impact of stressors. Therefore, social support, in some circumstances, may provide a means of controlling the work environment. Also, like Karasek's job demands-control model, the buffering hypothesis may be overly simplistic since it does not acknowledge the influence of cognitive variables.

Predictability, control and stress.

As applied to the study of stress, predictability may be defined as the extent to which the nature, onset and outcome of a stressful event is known before the event. Thus predictability may be considered to be the provision of information about an event. Laboratory studies have demonstrated that although control is impossible without predictability, merely being able to predict the nature, onset or outcomes of stressors attenuates arousal, both behavioural and physiological (Miller, 1980, 1981). However, Averill *et al* (1979) demonstrated that control is preferred to predictability alone, even if there is only a slight chance to avoid the stressor. Folkman *et al* (1979) maintain that all 'real life' events are unpredictable in some way. This view is shared by Seligman (1975), who states that predictability is probabilistic. However, as predictability in the environment to increases, then the potential for control over that environment should also increase.

Studies in organisations also lend support to the notion that predictability is associated with well-being. Indeed, Warr's vitamin model (1987) posits that the related construct of 'environmental clarity' of the organisational environment is one of several important determinants of work related well-being. In organisational studies, predictability may be seen to have been assessed through surrogate variables, that are concerned with the amount and adequacy of information that one receives in the work place. One such surrogate variable is role ambiguity, which occurs when there is not enough information required to fulfil a particular role in that organisation (Kahn *et al*, 1964). This has been consistently shown to be negatively related to employee well-being (Jackson & Schuler, 1985).

Another surrogate variable for predictability is organisational communication; that is the provision of adequate information to organisational members. Eisenburg & Witten (1987) found that results of empirical studies examining openness of communication and job satisfaction provided inconsistent results, although some studies may have used ambiguous communications. Indeed, humanistic management theory (Likert, 1961, 1967) and job characteristics theory (Hackman & Oldham, 1975, 1980) both posit that information provision increases job satisfaction. Therefore, it may be argued that open communication in organisations is only effective if it provides accurate information, thus increasing the predictability of the working environment.

Perceived control and its relation to actual control.

Parkes (1989) has presented a model showing how perceived control and actual control inter-relate to each other. In this model, individual differences in perceived control beliefs alter the perception of objective work characteristics. A reciprocal relationship exists where the perception of objective work characteristics influences

generalized perceptions of control. Thus, according to the Parkes' model perceived control is a function of objective control and generalized perceived control.

Generalized perceived control can be operationalized through the locus of control construct. The person with an internal locus of control sees that s/he is the prime determinant of what happens to him/her in the environment. The person with an external locus of control views extra-personal factors such as luck and powerful others as the determinants of what happens to him/her (Rotter, 1966). Thus, according to Parkes' model, control is more likely to be perceived when objective control is high and locus of control is internal.

Formulating hypotheses concerning locus of control, predictability, actual control and stress.

Control, whether provided by social support or worker autonomy, may be thought to have a beneficial effect upon well-being since it allows the individual to change the nature of the environment in order to cope with stressors. Therefore, it may be proposed that control buffers the effects of stressors upon well-being. However, as indicated above, buffering models of worker control, social support, occupational stress and well-being have not always been supported in the literature.

One possibility is that simple buffering models have been specified incorrectly. Therefore, the full contingencies surrounding these models may not have been explored. The following relationships were noted in the preceding sections: a) control is not possible without predictability; b) generalized perceptions of control influence perceptions of control in a given instance. Hence, the perception of control and therefore its implementation may be dependent upon an internal locus of

control and predictability in the environment. Therefore, it is possible to propose the following hypothesis:

Control, whether in the form of worker autonomy or work place social support, buffers the effect of occupational stressors upon well-being, under conditions of predictability and an internal locus of control.

According this hypothesis, a significant four-way interaction is expected between locus of control, control or social support, occupational stress and predictability that predicts well-being.

Lower order interactions using component variables have been examined in the literature prior to this study mainly using social support as the key variable. Some studies examining the joint effects of support, perceived control, locus of control and stressors have generally found joint buffering effects of high perceived control and high social support, as expected (Cummins, 1988, 1989, using locus of control, Johnson, 1989, using perceived work control, also Kobasa & Puccetti, 1984 using hardiness {a concept related to locus of control - Maddi and Kobasa, 1984}). However, two studies have not been supportive (Fusilier *et al*, 1987, Arney, 1988). Thus, although results have generally been supportive of the hypothesis, all the studies cited tested three-way interactions, thus ignoring the effect of predictability, and all six studies were cross-sectional.

In order to investigate the hypothesis, a one month follow-up study of accountants was conducted. A repeated measures design was used in order to be able to make stronger inferences regarding causality (Contrada & Krantz, 1987, Leventhal & Tomarken, 1987).

METHODS

Procedure and participants.

One thousand five hundred names were selected at random from the List of Members of the Institute of Chartered Accountants of England and Wales. The reason for choosing accountants was methodological. Accountants represent an unusual working population, in that they work in a variety of organisational settings (Burt, 1988), but their work, although complex (Hopwood, 1974), varies little from organisation to organisation (Oldham, 1981). Therefore, extraneous variance due to differing jobs may be minimized, whilst variance in constructs such as task autonomy and participation in decision making is large.

Two anonymous self-completion questionnaires were mailed to the sample at a period of one month apart (questionnaires were matched by serial numbers). Thus, measurements were taken at two points in time across a wide range of values for psychological well-being in a 'slice of life' design (Kasl, 1983). The timing of measurement in this design is important. An interval is needed that allows stressors and well-being enough time to change, but also which is short enough to allow some constancy in the working lives of those sampled.

A time period of one month is a lag that intuitively seems to meet these requirements. Moreover, Kanner *et al* (1981) found an average test-re-test correlation over a one month period of 0.48 for (23.0% of the variance accounted for) for intensity of chronic stressors, measured by a scale which has been demonstrated to have good internal reliability (Lu, 1991). Therefore, Kanner *et al's* results indicate that although there is some constancy in the intensity of stressors, change is indeed possible and very likely over a one month period.

Ninety seven of the individuals targeted had their questionnaires returned uncompleted (due to retirement, unemployment, death). Three hundred and ninety nine usable questionnaires were returned from the first administration (28.4% response rate). Of these 399, 244 returned the second questionnaire (follow-up response rate of 61.2%). Although these response rates may be considered to be low, it should be remembered that both questionnaires were very long. Also, discriminant function analysis (DFA) indicated that there were no differences between the sample and those accountants who responded at the second administration only (correct classification = 11.4%). This result indicates that there may be no bias in the sample due to non-response at the first administration. Similarly, DFA indicated no differences between the sample and those accountants who responded at the first administration only (correct classification rate = 5.2%). This result indicates there may be no bias in the sample due to sample attrition. Both these analyses were conducted with all the variables measured in the study, including demographics.

Members of the sample were predominantly male (86.1%), with a mean age of 39.4 years (std dev = 9.4). On average, members of the sample had been a chartered accountant for 14.5 years (std dev = 9.6), had been working for their present organisation for 7.8 years (std dev = 7.1 years) and had been working in their current position for 5.1 years (std dev = 6.1).

Instrumentation.

The two questionnaires used in this study consisted of the same scales, measuring locus of control, social support, stressors and psychological well-being. In addition, the first questionnaire administered consisted of a job/organisational characteristics scale, that measured task autonomy, participation in decision making and predictability in the organisational environment. Since these organisational

variables were considered to change only very slowly, they were measured once since the time span of the study was short. Each of these scales will be described in turn below.

Work Locus of Control Scale. Locus of control is thought to be a domain specific construct (Mischel & Mischel, 1979). Therefore, in order to measure the locus of control construct as it relates to the work context, Spector (1988) presented the Work Locus of Control Scale (WLCS), which has been demonstrated by Spector to be both reliable and valid. This sixteen item scale consists of a number of statements relating to agents of control (self, powerful others, luck), to which the respondent indicates his/her agreement on a six point Likert type scale. Eight of the items are reversed scored. High scores on the scale indicate an external locus of control.

Measurement of stressors and social support. Stressors and social support were measured by instruments designed especially for a population of British accountants. Items were derived from twenty semi-structured interviews conducted with British accountants in a variety of organisational settings (details available from the authors). The support and stressor scales were derived in this way since stress in homogeneous employment populations is best measured by specialized questionnaire (Dewe, 1989).

Stressors were measured by an eighteen item scale measuring the extent to which the respondent had found each particular event stressful over the preceding two weeks on a fully anchored five point scale. Social support was measured by a fifteen item scale relating to support as received in the work place over the preceding two weeks. Responses were measured on a six point fully anchored scale. Enacted support was chosen since it is close to how the individual deals with stressors (Winnubst *et al*, 1988). Thus the scale is a functional measure, and may

demonstrate the proposed buffering effect more readily (Cohen & Wills, 1985). Items from the interviews were supplemented with other items, such that House's (1981) four aspects of support were represented (emotional support, appraisal support, informational support, instrumental support). In addition, two reverse scored items were included that represented negative support, or being 'let down' (Brown *et al*, 1986).

Measurement of psychological well-being. Given that the time span of the study was short, a dependent variable was needed that would show relatively quick changes in response to stress. Unlike physical health status and mental illness, psychological well-being is thought to meet these criteria (Frese & Zapf, 1988).

Psychological well-being was measured by four scales of good validity and reliability: Warr's (1990b) measures of job related pleasure, job related anxiety-contentment and job related depression-enthusiasm and the twelve item version of the General Health Questionnaire (GHQ12, Goldberg & Williams, 1988). Warr's measure of job pleasure requires the respondent to rate his/her feelings on three fully anchored five point items. Warr's measures of anxiety-contentment and depression-enthusiasm each require the respondent to rate his/her feelings on six fully anchored six point items. High scores on all of Warr's scales indicate good well-being.

The GHQ12 is a twelve item unidimensional context free measure of well-being. Items are rated on a fully anchored four point scale. High scores on this scale indicate poor well-being. The GHQ12 was used in conjunction with Warr's scales since Warr's scales measure affect, but the GHQ12 measures symptoms. Thus, by using these different approaches, a more accurate assessment of psychological well-being may be made.

Measurement of job/organisational characteristics. Two major aspects of worker control can be identified in the literature, participation in decision making and job autonomy (Macy *et al*, 1989). Job autonomy was measured by the task independence and closeness of supervision scales proposed by Haywood-Farmer & Stuart (1990) for use with professional samples, such as accountants. The task independence scale consists of four items concerned with the extent to which the respondent can adopt his/her own approach to his/her work. The closeness of supervision scale requires the respondent to rate the extent to which his/her job is determined, on a day to day basis, by his/her line manager. Both are four item scales, with items being rated on a seven point Likert type scale (strongly disagree = 1, strongly agree = 7). For professionals, job autonomy is thought to be a uni-dimensional construct (Brady *et al*, 1990). Therefore, the two scales were summed to give an overall index of autonomy (closeness of supervision items reversed scored).

Participation in decision making was measured by a short scale derived by Aiken & Hage (1968, Hage & Aiken, 1969). This is a four item scale which asks the respondent how often s/he participates in decisions relating to, for example, the adoption of new policies. The items are rated on a four point fully anchored scale (never to always).

Predictability was measured as it pertains to the organisational environment as a whole. Two scales were used to assess predictability in this way, reflecting information from the organisational environment and knowledge of what one's job requires. Firstly, House & Rizzo's Communication Adequacy Scale (1972) was used. This scale measures the extent to which work related information is transmitted through the organisation in a clear manner (eg. 'communications are accurate'). The scale consists of eight items that are rated on a seven point Likert type scale. The second index was a two item 'rules and regulations' scale

developed by Haywood-Farmer & Stuart (1990). This scale measures the extent to which the respondent knows exactly what to do in order to fulfil his/her job role, with items being rated on a seven point Likert type scale. The scale was supplemented with a third item 'I have a specific job to do', in order to reflect the standardisation of skills required of professionals (Mintzberg, 1979).

A principal components analysis of items from the five scales used to measure job/organisational characteristics was conducted (details available from the authors). The application of Cattell's scree plot (Cattell, 1966) indicated a three factor solution: Items from the index of participation in decision making emerged as a separate factor (accounting for 7.9% of the variance); items from the closeness of supervision and task independence scales emerged as a separate job autonomy factor as predicted (accounting for 32.4% of the variance); six items from the Communication Adequacy Scale and all three items from the modified rules and regulations scale also emerged as a separate factor (accounting for 13.2% of the variance). Therefore, predictability in the organisation was measured by summing the unit values of these six items from the Communication Adequacy scale and the three items from the modified rules and regulations scale.

RESULTS

Descriptive statistics.

The means, standard deviations and reliabilities for the variables are shown in table 1. As can be seen, the internal reliabilities for all the scales are good. Table 2. shows the Pearson product-moment correlations between the variables. The interview derived scales measuring work related social support (12,13) and stressors (14,15) are generally significantly correlated with measures of well-being (1-8), in

directions suggested by prior research (ie. social support is associated with good well-being, stressors with poor well-being). The measure of organisational predictability (10) is also shown to be associated positively with good well-being. Thus, these new scales have evidence supporting their validity.

INSERT TABLES 1 AND 2 HERE

High correlations between all the measures of well-being suggested that the measurements from the second administration could be combined into one measure of overall well-being. A principal components analysis of the four well-being scales measured at the second administration revealed only one factor with an eigenvalue greater than one, accounting for 73.9% of the variance. Thus, the four scales were combined into one measure by summing their standardized scores, weighted by their factor score coefficient. High scores on this measure are indicative of good psychological well-being.

Inferential statistics.

By using a repeated measures design, levels of affect measured at the first administration can be controlled statistically in equations predicting levels of affect at the second administration. Therefore, any significant effects of stress, social support etc. upon well-being can be assumed to be causative (Kasl, 1983). In this study, regression analysis is used to test the hypothesis. Since ordinary least squares analysis is inappropriate for use with repeated measures data such as here, two stage least squares regression analysis (2SLS) was used to construct the equations, by the estimation of levels of well-being at the initial measurement (see Markus, 1979 for a full explanation of the technique in its application to repeated measures data). All the equations constructed were shown to meet the criteria of identification through the rank and order conditions (Asher, 1983, Berry, 1984).

These criteria are necessary and sufficient for the solution of 2SLS regression equations.

The interactive hypothesis of the study was tested via moderator analysis. In moderator analysis, the interaction is represented by the multiple of all the variables involved in the interaction (Cohen & Cohen, 1983). In this study therefore, the interaction to be tested is the multiple of the stressor, WLCS, organisational predictability and control variable (task autonomy, participation in decision making or social support).

The interaction is usually tested in a hierarchical multiple regression predicting psychological well-being (Cohen & Cohen, 1983). In this study, at the first step, initial measures of well-being were entered. At the second step, the simple linear effects that made up the interaction term were added. At the third step, the interaction term was added. The hypothesis would be seen to be supported if the interaction contributes a significant amount of variance to the variance explained by the equation.

It is normal to enter lower order interactions before adding higher order interactions in moderated regression analysis. However, in this study, this procedure was not adhered to for four reasons; a) previous research using similar variables but testing lower order interactions have produced equivocal results; b) there are theoretical reasons outlined in the introduction to expect a four way interaction; c) despite taking precautions against problems of multicollinearity (ie. the means of the variables used in the interactions were zeroed, see Cohen & Cohen, 1983, Finney *et al*, 1984), high correlations between lower order and the four way interaction are to be expected; d) moderated regression is a conservative procedure (Champoux & Peters, 1987), thus the inclusion of correlated lower order interactions might hide the significance of a true four way interaction.

Initial levels of well-being were estimated through 2SLS (see above). Measurements of stressors, social support and the WLCS were used from the second administration, since it is supposed that the stress process will have an almost immediate effect upon well-being (Frese & Zapf, 1988). Three equations were constructed to test the hypothesis. The three equations tested the joint effects of intensity of stressors, work locus of control and organisational predictability and participation, task autonomy or social support. These equations are summarized in table 3. As can be seen, in all three of the equations, the four way interaction was found to be significant. Also, it may be seen that WLCS had a significant main effect upon well-being for every equation.

INSERT TABLE 3 HERE

It will be recalled from the introduction that the hypothesis indicates that the proposed interaction should be significant (as is shown all three equations), but also that the effects of stress upon well-being will be less for internals with high control and predictability. In order to test for the form, rather than the significance of the interaction, WLCS score, predictability, and control variable (social support, participation in decision making or task autonomy) were divided at the median. Two cells were created for each control variable. One cell was created that contained all those respondents that had greater than median levels of control, greater than median levels of predictability and an internal locus of control as defined by the median split. A second cell was created that contained all the other respondents. In each of these cells, stressors were regressed upon well-being, controlling for initial levels of affect via 2SLS. The beta coefficients for each of these analyses are shown in table 4., along with the average beta coefficient across all controlling responses.

INSERT TABLE 4 HERE

As can be seen from table 4., the cell corresponding to an internal locus of control, predictability and the presence of a controlling response demonstrated a buffering effect. That is, the beta coefficient of stress in its relation to well-being was small, non-significant and positive across all controlling responses. In contrast, for the other cell, all beta coefficients were negative and significant, indicating stress may have deleterious effects for people with an external locus of control, without a controlling response or without predictability. Thus, the hypothesis forwarded in the introduction is supported by the data.

DISCUSSION

The results of analyses support the hypothesis forwarded earlier in the paper. That is, an internal locus of control, predictability and the presence of a controlling response synergistically buffer the effects of stressors upon psychological well-being. The results also indicated a consistent main effect of work locus of control upon psychological well-being. Each of these results will be discussed in turn below.

The main effect of locus of control.

One consistent result which emerged across all the equations was the main effect of work locus of control upon well-being, after controlling for initial measures of well-being. This result lends strong support for a main effects model of generalized perceived control upon well-being, that is complementary to the interactive model that has also been supported by the results of this study.

Fisher's (1989) discrepancy reduction model can successfully integrate both main effects and interactive models of generalized perceived control. Fisher suggests that control is beneficial since it allows the individual to reduce discrepancies between reality and the desired state of reality. Thus, in line with the interactive effects model supported by the data, control buffers the effects of stressors upon well-being. However, Fishers' model suggests that discrepancy reduction has effects over and above those provided by facilitating effective coping. It is posited that executing control can lead, in itself, to feelings of well-being. Thus internal locus of control is directly related to psychological well-being, since the individual believes that s/he can execute control over that environment (Thompson, 1981).

An internal locus of control, a controlling response and predictability: The determinants of effective problem focused coping ?

The results that support the hypothesis presented earlier in the paper indicate that the effects of stressors upon well-being are synergistically buffered by an internal locus of control, predictability and the presence of a controlling response. The results indicate that potential controlling responses available in the organisational environment are social support, participation in decision making and task autonomy.

The hypothesis was based on research that indicates that control is impossible without predictability (Miller, 1980, 1981) and that control is more likely to be perceived when generalized perceptions of control are high (Parkes, 1989). Thus, given these contingencies occurring together, the hypothesis predicted that the individual would be better able to control and change the nature of the stressor. Hence, the impact of a stressor upon well-being is buffered since the stressor is changed so it does not have a negative effect.

Many typologies of coping behaviour include a category of behaviours that are directed at changing aspects of the environment. Folkman & Lazarus (1980) and Billings & Moos (1982) call this problem focused coping. Latack (1986) refers to this type of coping behaviour as 'control'. Indeed, Folkman & Lazarus (1980) found that problem focused coping was more likely to be used for coping with stressors appraised as changeable. Other researchers have found that some of the concepts examined in this paper are associated with problem focused coping: An internal locus of control has been found to be associated with problem-focused coping (Parkes, 1984). Similarly, social support has also been found to be associated with problem focused coping (Fondarco & Moos, 1986, Parkes, 1986, Kirmeyer & Dougherty, 1988, Manne & Zautra, 1989).

Given the results of previous research, and the theoretical work upon which this study has been based, it is therefore possible that the results of this study indicate when problem focused coping is most effective: That is, extrapolating from previous research, as well as the results of this study, it is proposed that an internal locus of control, the presence of a controlling response and predictability jointly facilitate effective problem-focused coping with a stressor. In this way, it is possible to explain the joint buffering effects of an internal locus of control, predictability and controlling responses.

Summary and conclusions.

The results presented in this paper have demonstrated the role of complex interactions between control, locus of control, and predictability in determining the effect that stressors have on psychological well-being. Specifically, an internal locus of control, the availability of a controlling response and predictability were found to jointly buffer the effects of stressors upon well-being. It was suggested that these conditions, which favour the perception and use of control, facilitate

effective problem focused coping, since control allows the nature of the stressor to be changed.

A consistent main effect for work locus of control upon well-being across all three equations tested supports a main effects model of generalized perceived control that is complementary to the interactive model that is also supported in this study. Fisher's (1989) discrepancy reduction model was cited as a framework in which both main effects and interactive models could be incorporated.

Apart from the main effect of locus of control upon well-being, neither job/organisational characteristics, social support nor stressors demonstrated consistent significant main effects upon well-being. These results indicate the limitations of studying simple main effects and simple buffering models of the stress-well-being relationship (cf. Dewe, 1991, 1992). Instead, the results indicate that more complex models of the stress process should be studied, as suggested by transactional theorists (eg. Cox, 1978, Schuler, 1982, Edwards, 1992). Moreover, by studying more complex models, there is potential for greater integration of a wide and diverse literature on occupational stress. Indeed, this study has brought together, in one set of research findings, the concepts of locus of control, participation in decision making, worker autonomy, social support and predictability. Moreover, the study has integrated these concepts in a study employing a repeated measures design. Thus the study has been able to make stronger causal statements than many other studies of occupational stress, that have employed cross-sectional designs.

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TABLE I. Means, standard deviations and alpha coefficients of reliability.

Variable	Mean	Std dev	Alpha
GHQ ¹	10.50	4.79	0.87
GHQ ²	10.75	4.85	0.87
Pleasure ¹	3.02	0.90	0.91
Pleasure ²	2.97	0.87	0.93
Depression-enthusiasm ¹	4.46	0.84	0.86
Depression-enthusiasm ²	4.42	0.88	0.86
Anxiety-contentment ¹	3.79	0.94	0.88
Anxiety-contentment ²	3.80	0.96	0.89
Task autonomy	48.04	7.49	0.85
Predictability	38.20	9.36	0.82
Participation	11.96	3.54	0.89
Social support ¹	27.22	8.40	0.75
Social support ²	27.90	8.38	0.73
Stressors ¹	18.45	9.64	0.86
Stressors ²	18.83	9.49	0.86
WLCS ¹	39.27	9.48	0.82
WLCS ²	41.20	9.41	0.83

(Variables suffixed with ¹ indicate measurement at first administration, variables suffixed ² indicate variables measured at second administration.)

TABLE II. Correlation matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.GHQ ¹	1.00																
2.GHQ ²	.68**	1.00															
3.Pleasure ¹	-.54**	-.41**	1.00														
4.Pleasure ²	-.53**	-.51**	.79**	1.00													
5.Depression-enthusiasm ¹	-.72**	-.58**	.67**	.64**	1.00												
6.Depression-enthusiasm ²	-.66**	-.72**	.63**	.70**	.80**	1.00											
7.Anxiety-contentment ¹	-.68**	-.56**	.62**	.60**	.73**	.69**	1.00										
8.Anxiety-contentment ²	-.60**	-.67**	.50**	.59**	.61**	.72**	.77**	1.00									
9.Task autonomy	-.21**	-.16*	.27**	.28**	.20*	.21**	.20*	.20*	1.00								
10.Predictability	-.23**	-.12	.39**	.35**	.30**	.25**	.32**	.27**	.40**	1.00							
11.Participation	-.04	.00	.23**	.21**	.13	.09	.04	.06	.49**	.29**	1.00						
12.Social support ¹	-.21**	-.15	.28**	.32**	.26**	.24**	.20*	.12	.15	.10	.08	1.00					
13.Social support ²	-.18*	-.20*	.34**	.38**	.31**	.33**	.28**	.21**	.16*	.22**	.06	.70**	1.00				
14.Stressors ¹	.47**	.41**	-.29**	-.33**	-.36**	-.33**	-.55**	-.52**	-.07	-.09	.14	-.06	-.08	1.00			
15.Stressors ²	.45**	.44**	-.25**	-.31**	-.31**	-.34**	-.48**	-.57**	-.11	-.09	.12	-.03	-.03	.81**	1.00		
16.WLCS ¹	.34**	.31**	-.34**	-.40**	-.42**	-.37**	-.28**	-.28**	-.36**	-.28**	-.28**	-.18*	-.18*	.20*	.22**	1.00	
17.WLCS ²	.30**	.32**	-.29**	-.35**	-.38**	-.41**	-.24**	-.29**	-.27**	-.22**	-.16*	-.18*	-.18*	.16*	.17*	.76**	1.00

* p < 0.01 ** p < 0.001 n = 244

TABLE III. Summarized moderated regression analyses on well-being.

Regression analysis with participation in decision making.

	R ²	(p)	Beta	t	(p)
Step one. Initial well-being scores ⁺	0.74	.001			
GHQ ¹			-.37	-2.72	.01
Depression-enthusiasm ¹			0.43	4.34	.001
Anxiety-contentment ¹			0.45	2.88	.001
Pleasure ¹			-.40	-2.33	.05
Step two. Main effects	0.76	.001			
Stressors ²			0.08	1.25	ns
WLCS ²			-.10	-2.31	.05
Predictability			0.09	1.44	ns
Participation			0.10	2.12	.05
Step three. Four way interaction	0.76	.001			
Stressors ² * WLCS ² * predictability * participation			-.07	-1.88	.06

df for final equation = 9/194

TABLE III. continued.

Regression analysis with task autonomy.

	R ²	(p)	Beta	t	(p)
Step one. Initial well-being scores ⁺	0.74	.001			
GHQ ¹			-.28	-2.12	.05
Depression-enthusiasm ¹			0.42	4.23	.01
Anxiety-contentment ¹			0.41	2.66	.01
Pleasure ¹			-.24	-1.60	ns
Step two. Main effects	0.75	.001			
Stressors ²			0.07	1.17	ns
WLCS ²			-.10	-2.23	.05
Predictability			0.05	0.83	ns
Task autonomy			0.03	0.82	ns
Step three. Four way interaction	0.76	.001			
Stressors ² * WLCS ² * predictability * task autonomy			-.08	-2.10	.05

df for final equation = 9/194

TABLE III. continued.

Regression analysis with social support.

	R ²	(p)	Beta	t	(p)
Step one. Initial well-being scores ⁺	0.74	.001			
GHQ ¹			-.36	-2.70	.01
Depression-enthusiasm ¹			0.40	4.09	.01
Anxiety-contentment ¹			0.34	2.22	.05
Pleasure ¹			-.27	-1.78	ns
Step two. Main effects	0.75	.001			
Stressors ²			0.05	0.74	ns
WLCS ²			-.12	-2.63	.01
Predictability			0.09	1.47	ns
Social support ²			0.03	0.73	ns
Step three. Four way interaction	0.76	.001			
Stressors ² * WLCS ² * predictability * social support ²			0.08	2.12	.05

df for final equation = 9/194

⁺ Values for these variables are estimated by the two stage least squares regression procedure.

TABLE IV. Beta coefficients for stressors upon well-being to detect form of interactions. *

Cell	Participation	Task	Social	Average
		autonomy	support	
Internal locus of control, high predictability, high control	0.146 (n=45)	0.053 (n=50)	0.001 (n=37)	0.07
All other cells	-.157 ** (n=161)	-.144 ** (n=156)	-.154 ** (n=169)	-.15

* These beta coefficients are based on regressions where initial levels of well-being were controlled for via two stage least squares regression estimation.

** $p < .01$

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