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The role of HR practices in reducing occupational stress and strain: An examination of employees in Singapore.

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ABSTRACT: *The current study examined the occupational stress-strain relationship among a sample of 109 white-collar employees in Singapore. Participants completed a survey that assessed the presence of eight human resource practices (job training, communication, job redesign, promotional opportunities, employee involvement, family-friendly policies, pay systems, and individual-focused stress interventions [SMIs]), two major stressors (role overload and responsibility), two types of strain (vocational and interpersonal), and organisational commitment. Results indicate that human resource (HR) practices did not reduce the sources of stress (role overload and responsibility) within the workplace. However, there was a direct negative relationship between HR practices and interpersonal strain. In particular, family-friendly practices, job training, and SMIs reduced interpersonal strain. An examination of vocational strain showed that it was negatively associated with SMIs and job training. In addition, organisational commitment mediated the relationship between HR practices and vocational strain. It was concluded that HR practices may be effective as part of a symptom-directed approach to stress intervention and that further replication of these results in both Asian and western samples is required.*

Key words: occupational stress, stressors, strains, human resource practices, and organisational commitment.

Introduction

Hurrell (1989) defined occupational stress as an event or situation in which one or more job stressors interact with the worker and lead to an acute disruption of psychological or

behavioural homeostasis. There is now considerable evidence to show that occupational stress is negatively related to employee health (Sargent & Terry, 1998; Smit & Schabracq, 1997; Rees, 1995; Winefield, 2000), employee performance (Motowidlo, Manning & Packard,

1986), and employee morale (Siu & Cooper, 1997; Siu & Cooper, 1998); as well as being positively related to absenteeism (Ulleberg & Rundmo, 1997) and employee turnover (Hemingway & Smith, 1999). The aim of the current study is to examine the relationships between occupational stress, strain, HR practices, and organisational commitment in a sample of white-collar employees.

A major contribution of this paper lies in the fact that the investigation is conducted within an Asia-Pacific context where, in comparison to the large body of western literature on occupational stress, comparatively little is known about the impact of stress (Bond, 1996; Lau, Yung, Mak, & Wallace, 1997). More specifically, in the current study's targeted country of Singapore, the stress literature is still in its relatively infancy (Chan, Lai, Ko, & Boey, 2000; Wyatt, 1990). However, the evidence that has been collected to date indicates that occupational stress in Singapore is associated with similar negative outcomes as those found in the western literature. For example, research conducted by Boey (1998; 1991), Lin and Yuen (1997), and Lim (1995) within teaching and nursing professions in Singapore found that occupational stress was related to job dissatisfaction, job-induced tension, intention to quit, mental dysfunction, and physical ill-health.

Given that the small number of studies conducted in Singapore have typically used specific professions, we cannot be certain that these consequences of occupational stress are experienced more generally by white-collar workers from a range of occupations in Singapore and further research is, therefore, required. However, even with this limited evidence, it is reasonable to believe that occupational stress is a relatively important issue for most Singaporean organisations. As such, research is needed that examines ways in which occupational stressors and strains can be reduced. The current study will, therefore, empirically test the relationship between eight human resources practices (job training, employee communication, job redesign, promotional opportunities, employee involvement, family-friendly policies, pay systems, and indi-

vidual-focused stress interventions), two prominent workplaces stressors (role overload and responsibility), two common forms of occupational strain (vocational and interpersonal), and the level of organisational commitment reported by Singaporean employees from a range of white-collar professions.

The essential argument of this paper is that a supportive Human Resource (HR) environment (i.e. an organisational environment where a high number of the employee-friendly HR practices listed above are present) will reduce the occupational stressors of role overload and responsibility directly, will reduce levels of vocational strain and interpersonal strain directly, and will decrease these forms of strain indirectly through its positive influence upon levels of organisational commitment (see Figure 1).

Insert Figure 1 about here

The argument presented above is intuitively appealing and certainly there is a widely held expectation that a supportive HR environment will protect employees against occupational stress/strain (Elkin & Rosch, 1990; Worley, 1991). However, perhaps because the contention above is so self-evident, there has only been limited empirical testing of the relationship between HR practices and the reduction of stress and strain. As such, there is very little concrete evidence to inform managers on how to successfully use HR practices to reduce stress and/or strain. The current paper aims to partially overcome this gap in the literature.

A stressor-strain approach to occupational stress is adopted in this study (Quick, Quick, Nelson, & Hurrell, 1997). This approach has proposed two major components in the stress process: 1) stressors and 2) strains (Arnold, Cooper, & Roberston, 1995; Greenberg, & Baron, 1995). Stressors are the physical or psychological stimulus to which an individual responds (e.g. role overload and responsibility) (Quick et. al., 1997). Strain is conceptualised as the physical or psychological symptom resulting from a perceived stressor and the coping resources the individual possesses to

deal with those stressors (e.g vocational strain and interpersonal strain) (Decker & Borgen, 1993). A consideration of these two components of occupational stress suggests that HR practices may follow two interrelated, yet different, pathways in stress intervention. Firstly, HR practices can aim to remove occupational stressors from the work environment (a primary, stressor-directed approach of prevention). Secondly, HR practices may assist employees to reduce the strain that is associated with these stressors (a secondary, symptom-directed approach of reduction) (Quick et al., 1997).

To date, the research has all but ignored the ability of HR practices to remove/reduce organisational stressors from the workplace itself (stressor-directed approach). One exception to this is Jackson (1983) who found that employee involvement in participative decision-making schemes decreased the stressors of role conflict and role ambiguity. Jackson's findings suggest that HR practices can be used to decrease levels of occupational stress by altering the work environment and reducing the number, and degree, of certain job stressors. However, in order to obtain a clearer understanding of the ability of HR practices to facilitate a stressor-directed approach to stress management, more empirical research is needed. Moreover, as Jackson's study was conducted using a western sample of employees, research is required to examine whether HR practices can assist in stressor-directed approaches in Singaporean companies. As such, hypothesis one of the current study examines the relationship between the HR environment and particular stressors and predicts that 'Singaporean employee perceptions of a supportive HR environment will be negatively related to their perceptions of role overload and responsibility'.

Research on the symptom-directed approach to HR can be seen in the work conducted by Terra (1995) who empirically tested the role of employee participation in reducing strain. Terra (1995) found that employee participation, through the implementation of self-regulating teams, had a positive effect on western workers health and

motivation. Another empirical study by Wall and Clegg (1981) focused on work redesign and found that there were significant improvements in job satisfaction and emotional distress/strain when the jobs were redesigned to provide employees with greater autonomy. Again, these studies were conducted in a western context and research needs to establish whether such findings would be replicated in Singapore. Moreover, because these studies considered the effect of relatively singular and isolated HR practices, they were unable to provide information about the role of HR as part of a systematic bundle of management practices designed to reduce strain. Barney (1995) and Huselid's (1995) work could be used to suggest that HR practices implemented in isolation will have limited effectiveness in stress intervention. Instead, they will be more effective when they form part of an overall supportive HR environment that includes a range of HR practices which are combined to prevent or reduce stress/strain. As such, the current study aims to examine the role of the combined effect of eight HR practices in stress/strain reduction. It is predicted in hypothesis two that 'employee perceptions of a supportive HR environment will be negatively related to their self-reported levels of vocational strain and interpersonal strain'.

In addition to examining the direct role of HR practices upon the reduction of strain, the current study also contends that a supportive HR environment may indirectly decrease occupational strain by improving levels of organisational commitment (see Figure 1). Organisational commitment has been defined by Mowday, Porter, and Steers (1982) as "the relative strength of an individual's identification with, and involvement in, a particular organization" (p. 27). Kobasa (1982) and Antonovsky (1979) argue that commitment is a crucial personal resource that acts as a stress-buffer by enabling individuals to attach direction and meaning to their work and to resist the effects of tension in their environments. Kao and Sek-Hong (1993) argued that the high levels of trust, loyalty, and altruism ingrained in Oriental cultures mean that Asian employees often display high levels of commitment to their organi-

sation. In the current study then, we propose that organisational commitment may act as a stress-buffer. In particular, we are interested in examining the relationships between HR environment, organisational commitment, and strain. As such, hypothesis three states that 'employee perceptions of a supportive HR environment will be indirectly related to their levels of vocational strain and interpersonal strain through their effect upon organisational commitment'.

In summary, the current study will examine the combined effect of eight HR practices in creating a supportive HR environment that may help to reduce workplace stressors through a primary, stressor-prevention approach and may also assist in the reduction of workplace strain through a secondary, symptom-reduction approach. In addition, the role of a supportive HR environment in reducing strain, via its positive association with organisational commitment, will be investigated.

METHOD

Design and Sample

A field study, using a cross-sectional design, was undertaken for the purposes of this research (Heiman, 1995; Mitchell & Jolley, 1992; Shaugnessy, & Zechmeister, 1994). Given that the two stressors under study (i.e. role overload and responsibility) are particularly salient in white-collar samples (Ho, 1995; Gillespie, Walsh, Winefield, Dua, Stough, 2001; Sargent & Terry, 1998), the current study targeted a sample of white-collar employees in Singapore. With this particular population in mind, probability sampling was not used. Instead a convenience sample using the snowball method was used to target the sample for the study. The snowballing method consists of first establishing a few main contacts at the site where the sample will be drawn and then asking these contacts to distribute as many questionnaires as possible (Hieman, 1995). In the current study, two white-collar professionals in Singapore were invited to participate in the study and to distribute the questionnaires to their white-collar networks on behalf of the researcher. By this means, it was hoped that the initial small sample would build up, or 'snow-

ball', into a larger one (Fife-shaw, 1995; Green, Tull & Albaum, 1995; Hieman, 1995). This technique has been successfully used in past empirical research conducted in the management domain (e.g. Rajadhyaksha, & Bhatnagar, 2000).

A total of 300 questionnaires were sent out and 109 questionnaires were received (response rate = 36.3%). This rate is similar to the response rates of other studies on occupational stress (e.g. Chan et. al, 2000 [32%]; Revicki, Whitley & Gallery, 1993 [32%]; Osipow & Davis, 1988 [35.5%]). The average age of respondents was 35.88 years, with a standard deviation of 11.7 years. There were 58% female and 42% male.

The sample displayed heterogeneity in terms of occupational status. For example, 18.9 % were legislators, senior officials or managers; 61.3% were professionals; 6.6% were associate professionals, 5.7% were clerical workers; and 7.5% were sales workers. These classifications were taken from the Singapore Standard Occupational Classifications (SSOC) 2000. The majority of the respondents worked in the private sector (80%) and the other 20% worked in the public sector. Ninety percent of the sample worked full time and 93% of the respondents were in permanent positions. In terms of education level, the majority of the sample received a tertiary education (84.1%); 4.7% completed junior college ('A' Levels); and 11.2 % completed secondary school ('O' Levels).

Insert Table 1 here

Table 1 reports the descriptive statistics for demographic variables such as age, marital status, sex, education level, and occupational status for the sample and for the Singaporean population. Figures for the Singaporean population were obtained from the Singapore Department of Statistics (2001). A comparison of the figures shows that the demographic characteristics of the current sample are reasonably similar to the Singaporean population with respect to age, marital status, and gender balance. However, the current sample differs from the Singaporean population in terms of occupational status and

education level. This can be explained by the fact that a white-collar sample was targeted for this study and as such, one would expect the study sample to be more educated than the general Singaporean working population. By making an explicit comparison of sample characteristics with the Singaporean population the case for the representativeness of the current convenience sample is strengthened (Wilkinson, 1999; Fife-shaw, 1995).

Measures

Occupational Stress Inventory – Revised

Four sub-scales of the Occupational Stress Inventory Revised edition (OSI-R) (Osipow, 1998) were separately used to assess role overload (e.g. “I feel that my job responsibilities are increasing”), responsibility (e.g. “I spend time concerned with the problems others at work bring to me”), vocational strain (e.g. “I don’t seem to be able to get much done at work”) and interpersonal strain (e.g. “Lately, my relationships with people are good”). Each of these four subscales was measured using ten items. All of the items are rated on a 5-point Likert-scale ranging from (1) ‘Rarely or never true’ to (5) ‘True most of the time’.

Organisational Commitment

Organisational Commitment was operationalised using the shortened version of Porter, Steers, Mowday, and Boulian (1974) scale. It comprised 9 items (e.g. “I am willing to put in a great deal of effort beyond that normally required in order to help my employer be successful”) rated on a 5-point Likert-scale ranging from (1) ‘Strongly disagree’ to (5) ‘Strongly agree’.

HR Environment

The HR environment was assessed using an adaptation of a scale developed by Guest and Conway (1997) and Guest (1999). This is a relatively straightforward scale that measures the HR environment by taking a simple count of the number of HR practices available to employees within their organisation. Guest and Conway developed this scale as a response to the criticism by Clarke, Mabey and Skinner (1998) that the worker’s viewpoint of HRM is rarely considered (instead researchers’ often measure the

HR environment through reports from HR managers). The scale contained a total of eight practices: job training (e.g. “Your employer provides you with sufficient opportunities for training and development”), employee communication, job redesign, promotional opportunities, employee involvement, family-friendly practices, pay equity, and stress management interventions. All items were rated on a 3-point scale: (1) Don’t know, (2) No, and (3) Yes.

Demographic Items

Participants were asked to respond to items on age, sex, marital status, number of dependents, employment situation (full-time/part-time/casual), employment position (permanent/contract), type of job, level of education (‘O’ Levels/ ‘A’ Levels/ tertiary), size of the organisation they work for, and type of sector they work in (public/private).

1. RESULTS

Before the hypotheses were tested the data set was screened. There was no significant skewness or kurtosis found. No multivariate outliers were identified. A test of alpha reliability for each scale was also conducted and any item-test correlation that was below .4 was removed to improve the reliability of the scale. Two items each were removed from the role overload scale (final alpha = .88) and responsibility (final alpha = .81) and three items were removed from the interpersonal strain scale (final alpha = .78). No items were removed from the vocational strain scale (alpha = .80), the organisational commitment scale (alpha = .91), and the HR environment scale (alpha = .76).

Table two displays the means and standard deviations for the study variables. The sample reported reasonably moderate levels of role overload and responsibility and low-to-moderate levels of strain. In particular, interpersonal strain had a mean score of only 15.20 (4.78) out of a maximum of 50. Participants reported reasonably high levels of organisational commitment, however, the HR environment was only considered to be moderately supportive.

Insert Table 2 about here

Correlation analysis was conducted in order to examine the relationships between demographic variables, HR environment (combined score of the eight practices), stressors, strains, and organisational commitment (see table 2). The HR environment was unrelated to role overload and responsibility. However, it was negatively correlated with both vocational strain and interpersonal strain. In addition, the HR environment was positively correlated with organisational commitment. Organisational commitment was also negatively correlated with role overload and vocational strain. Role overload was positively correlated with vocational strain and interpersonal strain. Responsibility was positively correlated with interpersonal strain.

These correlations were then used to test the hypothesised model (see Figure 1) using Structural Equation Modeling (SEM) with AMOS (Version 4) (Arbuckle & Wothke, 1999). Structural Equation Modeling is a comprehensive statistical approach that allows an examination of a series of dependence relationships to occur simultaneously (Hair, Anderson, Tatham & Black, 1995; Hoyle, 1995). The benefit of using SEM in this study was that we were able to test the relationship of the HR environment with occupational stressors while simultaneously testing the influence of the HR environment upon vocational and interpersonal strains. In this way, we were able to test whether the influence of the HR environment upon stressors outweighed, or made redundant, the influence of the HR environment upon strains (or vice versa) or whether the HR environment contributed equally to a stressor-directed and symptom-directed approach. In addition, the use of SEM allowed a more sophisticated analysis than multiple regression because we were able to include organisation commitment as an additional variable.

In the first test, the data did not provide a fit to the model ($\chi^2(6) = 79.76$, $p < .05$; Goodness of Fit = .842; Adjusted Goodness of Fit = .380; Root Mean Square Residual = .075) and a number of non-significant pathways were evident: both pathways leading from HR

environment to the stressors (role overload and responsibility) and the pathway leading from HR environment to vocational strain. The non-significant paths were progressively removed from the model to improve the fit of the model. Moreover, the modification indices suggested that there was a direct path from vocational strain to interpersonal strain. As this pathway was consistent with theory it was added to improve the fit of the model. The final model ($\chi^2(9) = 63.69$, $p < .05^1$; Goodness of Fit = .877; Adjusted Goodness of Fit = .713; Root Mean Square Residual = .077) provided an acceptable fit of the data to the model (Figure 2).

The final model explained 28% of the variance in vocational strain and 36% of the variance in interpersonal strain. Hypothesis one, which predicted that the HR environment would be negatively related to role overload and responsibility, was not supported. The prediction of hypothesis two, that the HR environment would be negatively related to vocational strain and interpersonal strain was partially supported through the significant pathway between the HR environment and interpersonal strain ($\beta = -.22$). Hypothesis three, which predicted that employee perceptions of a positive HR environment would be indirectly related to their levels of vocational strain and interpersonal strain through their effect upon employee organisational commitment, was partially supported. HR practices affected vocational strain through influence on organisational commitment ($\beta .34 \times \beta -.38 = -.13$). The data also found a number of other significant relationships. Specifically, responsibility was related to interpersonal strain ($\beta = .33$) and role overload was related to vocational strain ($\beta = .36$). Fi-

¹ Given that sample sizes larger than 100 are likely to produce a false significance in the Chi Square index (Hair et al., 1995) the significant Chi-square found in this study was not of concern and the profile of 'fit' indicators shows a good fit of the data to the model despite the significant Chi-square.

nally, vocational strain had a significant pathway that led into interpersonal strain ($\beta = .43$).²

Insert Figure 2 about here

While the SEM allowed for a test of the combined affect of HR practices on stressors and strains, we were also interested in examining the unique impact of each HR practise upon vocational strain and interpersonal strain. Hence, as a final test of the data set, Stepwise Multiple Regressions were used to determine the unique predictive ability of each specific HR factor on vocational strain and interpersonal strain. Multiple regressions allowed a comparison of the relative impact of the eight separate HR practices upon vocational strain and interpersonal strain (Tabachnick, & Fidell, 1996).

A stepwise regression was used because the correlation analysis revealed that a number of demographic variables were significantly related to strain (see Table 2) and we were interested in controlling for these demographic variables in order to examine the unique effect of HR practices upon strain. The overall regression model for vocational strain was significant ($F_{(12, 91)} = 10.41$, $p < .001$) (see Table 3). The R^2 showed that 58% of the variance in vocational strain was predicted by the independent variables. Step 1 showed that demographic characteristics made a significant contribution ($R^2 = 0.23$; $F_{(4,103)} = 7.52$, $p < .05$). Age ($Sr^2 = 9\%$) and marital status ($Sr^2 = 5\%$) were unique predictors. Step 2 showed that the eight HR practices also made a significant contribution to vocational strain (R^2 change = 0.35; $F_{(12,103)} = 10.40$ $p < .05$). Unique variance was predicted by job training ($Sr^2 = 13\%$) and SMIs ($Sr^2 = 5\%$).

The overall regression model for interpersonal strain was also significant ($F_{(12, 91)} = 4.06$, $p < .001$). The R^2 showed that 34% of the variance in interpersonal strain was predicted by the independent variables. The de-

mographic variables in step 1 did not make a significant contribution (R^2 change = 0.02; $F_{(4,102)} = .45$, $p > .05$). However, significant variance was added at step 2 (R^2 change = 0.34; $F_{(8,94)} = 5.77$, $p < .001$). Unique variance was added by family-friendly policies ($Sr^2 = 10\%$), SMIs ($Sr^2 = 9\%$), and job training ($Sr^2 = 3\%$).

Insert Table 3 about here

DISCUSSION

The aim of the present study was to examine the inter-relationships between occupational stressors, strains, organisational commitment, and the HR environment in a sample of Singaporean white-collar employees. Overall, the results indicate that a supportive HR environment does play some role in reducing occupational strain. Importantly, the current study's distinction between the stressor-directed (primary prevention) versus symptom-directed (secondary reduction) approaches proved to be useful in providing more precise information as to how the HR environment acts to reduce occupational strain.

It was hypothesised that where employees perceived there to be a supportive HR environment they would also report lower levels of perceived stressors (role overload and responsibility). This hypothesis was not supported and the results showed that the HR environment did not facilitate a stressor-directed approach to stress reduction. Indeed, in the current Singaporean sample a supportive HR environment did not act to reduce the stressors that the employees experienced. Even when employees felt that there were a high number of HR practices within their organisations they still reported relatively high levels of role overload and responsibility.

Obviously, the degree of occupational stress experienced in the workplace is influenced by many factors such as external competition, internal resource availability, levels of workplace control, unamenable deadlines, and daily hassles (Sargent & Terry, 2000). It may be that, despite the best intentions of the HR managers, available HR practices are unable to alter, or counteract, the stressors that are inherent in most work environments. However, the authors

² This final model was also tested through Partial Least Squares for small samples and the same factor structure was confirmed.

of this paper do not wish the current results to be used to form the conclusion that HR practices cannot reduce the level of stressors in the workplace. We believe that there is still a strong theoretical basis to suggest that the HR environment may form part of a stressor-directed approach to stress reduction (Bunce, 1997). Certainly, Jackson (1983) found that the HR practice of employee involvement acted directly to decrease role conflict and role ambiguity. The utility of HR practices to support a stressor-directed approach has received inadequate research attention and further study is required before any firm conclusions can be drawn.

Moreover, it must be recognised at this point that the lack of support for a stressor-directed role of HR may have been influenced by the current study's measurement of the HR environment. Guest and Conway's (1997) scale takes a simple count of the number of HR practices available to employees within their organisation. A higher number was taken to reflect a supportive, or high commitment (Guest, 1999), HR environment. Perhaps a more sensitive measure of HR support would be to take into account not only the mere presence of HR practices but also whether these practices were utilised by the individual and the degree of satisfaction that employees have with each HR practice. To date, there is a dearth of scales that measure HR from the worker's perspective and, while Guest and Conway's scale provides a good starting point, more development is required in this area.

Although there was little support for a stressor-directed role in HR, the findings of the current study did show that HR plays a role in a symptom-directed approach to strain reduction. In fact, the HR environment was directly and negatively related to interpersonal strain (see Figure 2). Participants in this study who reported high levels of support from their HR environment were also likely to experience fewer disruptions in their working relationships and in their relationships outside of the workplace. Results showed that family-friendly practices and SMIs were two of the HR practices that had the greatest influence upon reduction of interpersonal strain. This is not a surprising result given that SMIs are specifically designed to

'inoculate' employees against some of the consequences of stressful work conditions such as conflict, frustration, and irritability towards others (Ross & Altmaier, 1994). Family-friendly practices are also developed with the aim of helping employees to reduce the strain associated with incompatible demands from relationships at work and at home (Grover & Crooker, 1995; Kossek & Nichol, 1992) and, therefore, help to reduce the degree of interpersonal strain experienced by employees.

These results suggest that where staff are reporting high levels of interpersonal strain, HR managers in Singapore should implement family-friendly practices and SMIs. However, the results also show that these two practices, if implemented in isolation, will not work as effectively as when they form part of a larger bundle of supportive HR practices. In the current study family-friendly practices accounted for 10% of the variance in interpersonal strain and SMIs accounted for 9%, yet a test of the combined effect of the eight HR practices explained 34% of the variance through the Stepwise regression and 36% through the SEM. These results support the contentions of Barney (1995) and Huselid (1995) that HR practices, used in combination, will provide potentially synergistic benefits through a mutually reinforcing interaction.

A supportive HR environment was also found to be useful in reducing vocational strain. Interestingly, the relationship between the HR environment and vocational strain was not direct. Instead, the HR environment reduced vocational strain through its positive influence on organisational commitment. A supportive HR environment accounted for 11% of the variance in organisational commitment. This finding supports those of Kossek and Nichol (1992), Matthieu (1988), and Oglivie (1986) and shows that when employees feel they are being supported they invest more of their time and effort into their work and their organisation. More importantly to the purpose of this study, the results also show that one of the major benefits of using HR to increase organisational commitment is that this commitment, in turn, partially reduces vocational strain. These results support Kobasa's (1982) perspective that when individ-

uals are able to attach direction and meaning to their work they are better able to reduce the strain experienced as a result of workplace stressors. The findings, therefore, support the notion that organisational commitment is a crucial factor that enables individuals to resist the tensions in their work environments (Antonovsky, 1979).

Given the established relationship of vocational strain with poor job performance and job dissatisfaction (Abramis, 1994; Sullivan & Bhagat, 1992; Jamal, 1984) it is in the interest of HR managers to attempt to reduce vocational strain. The results of this study suggest that HR managers in Singapore can reduce the levels of vocational strain experienced by their employees by providing job training that assists employees to complete their work assignments more effectively (Mathieu, 1988; Mathieu & Zajac, 1990). The provision of SMIs may also play a role in the reduction of vocational strain. The results of this study also show that a reduction in vocational strain will have a positive spill-over effect on interpersonal strain. When employees in the current study were able to complete their job tasks with minimal stress they also had better working relationships.

Of course, HR managers outside of Singapore may also find that levels of vocational strain in their workforce can be reduced through job training and SMIs. This point raises an important issue about the generalisability of the current paper. The authors decided to conduct their investigation in Singapore because of the relative dearth of occupational stress research in this country (Bond, 1996; McCormick & Cooper, 1988). While the study, therefore, fills an important gap in the literature it may also mean that the results are not generalisable in a western context. Siu and Cooper (1998) and Siu, Lu and Cooper (1999) have suggested that Asian samples may have different self-report patterns of occupational stress from their western counterparts. A high work ethic and a reluctance to admit vulnerability may mean that the current Singaporean participants under reported their levels of stress and this might partially explain the lack of relationship between HR practices and stressors.

As we did not have a western sample in the study to compare the Singaporean results, the above explanation remains speculative. However, this speculation suggests that the relationships found in the current study need to be re-tested in a western sample in order to determine whether western employees report similar relationships as those found in the current study.

The role of demographics in the experience of occupational stress and strain

It is important to recognise the role that demographics played in the occupational stress-strain relationship of the current sample (Bunce, 1997). In general, older respondents reported greater levels of responsibility, higher organisational commitment, and lower vocational strain. These findings support that of previous research in western society, which has also found that older respondents, who are more likely to hold positions of seniority, report greater responsibility for other people in the workplace, and greater commitment to their organisation (Chen & Huang, 1982; Osipow et al., 1985). Moreover, the current findings follow Osipow et al.'s (1985) research where older respondents in a western context experienced less vocational strain than younger respondents, most likely because they had developed the ability to deal with occupational stressors.

Gender was also a significant factor in the current study. Females reported less responsibility at work. In a country like Singapore where sexual stereotypes still prevail in the workplace (Lee & Tan, 1993), it is not surprising that women are given less responsibility than men. Finally, marital status was also found to have a significant effect in the current study. In general, married individuals had less vocational strain. Being married may lead to decreased levels of strain because of the support received from one's spouse. The current study indicates that HR managers need to be aware that certain demographic characteristics of their employees may lead to higher (or lower) levels of occupational stress/strain.

Study limitations and future directions

The findings of the current study must also be interpreted with consideration of a number of limitations facing the research. First,

as already mentioned, the scale used to measure HR practices was somewhat limited and further research, using a more comprehensive measure of workers views of the HR environment is required. Second, the data are cross-sectional in nature and, as such, it is not possible to conclude the direction of causality. Future research that traces stress levels before and after the implementation of various HR practices would provide stronger evidence about the role of HR in occupational stress reduction. Third, no environmental assessment was made of stressors in the respondents' workplaces. This would have provided a more behavioural assessment of the respondents' lives at work and the stressors they are subject to, thus providing a more complete picture of the stress process. The sample size of the study was rather small and was concentrated on white-collar employees, which may limit the generalisability of the results to the Singaporean population as a whole. Finally, as already mentioned above, it would seem necessary to examine whether the relationships found in these Asian workers are replicated in western professionals.

Occupational stress is increasingly becoming an issue of concern in Western and Asian organisations (Sargent, 1995; Dollard & Winefield, 1996). By studying the ability of HR to play both a stressor-directed and a symptom-directed role, the current study has been able to provide reasonably specific information to HR managers in Singapore as to how they should approach stress prevention and strain reduction within their organisations. In particular, the results show that HR practices are more effective as part of a symptom-directed approach. In addition, the study suggests that HR practices have a greater impact upon strain reduction when provided in a synergistic bundle and when improving organisational commitment.

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Table 1: Demographic Characteristics of the Current Sample and the Singaporean Population

Demographics	Study sample	Singapore population
Gender		
Male	42%	50%
Female	58%	50%
Marital status		
Married	58.8%	64.7%
Single	39.2%	33.3%
Divorced	1.9%	2.0%
Education level		
Secondary education or above	100%	49.50%
Occupational status		
White-collar	0%	32.6%
Blue-collar		

Table 2: Intercorrelations between Demographic Characteristics, HR Environment, Stressors, Organisational Commitment, and Strain.

	Mean St.D	Max score	1	2	3	4	5	6	7	8	9	* $p < .01$ (2-tailed). ** $p < .05$ (2-tailed). *** $p < .001$ (2-tailed).
1. Age	-	-										
2. Sex 0 = male 1 = female	-	-	-.31***									
3. Marital status 0 = married 1 = single	-	-	.56***	-.10								
4. Educational level 0 = secondary 1 = tertiary	-		-.18	-.10	-.21**							
5. HR environment	15.21 2.59	24	.11	.04	.27***	.01						
6. Org. commitment	30.52 7.19	45	.25***	-.03	.14	-.04	.34***					
7. Role overload	24.30 6.61	50	-.23**	-.09	-.15	.18	-.14	-.26***				
8. Responsibility	23.32 6.64	50	.22**	-.27**	.05	-.13	-.03	.11	.56***			
9. Vocational strain	20.96 6.73	50	-.40***	-.03	-.41***	.13	-.22**	-.46***	.45***	.09		
10. Interpersonal strain	15.29 4.78	50	-.09	-.08	-.15	-.03	-.32***	-.17	.38***	.37***	.50***	

Table 3: Regression Analysis Summarising Predictors of Vocational Strain and Interpersonal Strain

Variables	Vocational strain				Interpersonal strain			
	B	β	Sr^2	Significance	B	β	Sr^2	Significance
<i>Step 1</i>								
Age	-.01	-.34	-.09	.001	-.01	-.11	-.01	.330
Sex	-.01	-.01	-.01	.894	-1.05	-.09	-.01	.370
Marital status	-.13	-.26	-.05	.011	-.19	-.04	-.01	.713
Educational level	.12	.13	.02	.150	-.49	-.05	-.01	.574
<i>Step 2</i>								
Training	-.37	-.45	-.13	.001	-1.63	-.21	-.03	.043
Communication	-.11	-.13	-.01	.114	-.31	-.04	-.01	.664
Job redesign	-.01	-.12	-.01	.126	-.56	-.07	-.01	.422
Promotional opportunities	-.01	-.03	-.01	.739	-.11	-.02	-.01	.856
Employee involvement	-.01	-.06	-.01	.432	-.51	.07	-.01	.454
Family friendly practices	-.01	-.12	-.01	.155	-2.57	-.34	-.10	.001
Pay equity	-.01	-.11	-.01	.183	-.95	-.13	-.01	.180
SIMs	-.21	-.26	-.05	.001	-2.54	-.34	-.09	.001

Note. Dichotomous demographic variables were coded the same way as in the correlation analysis (see Table 2)

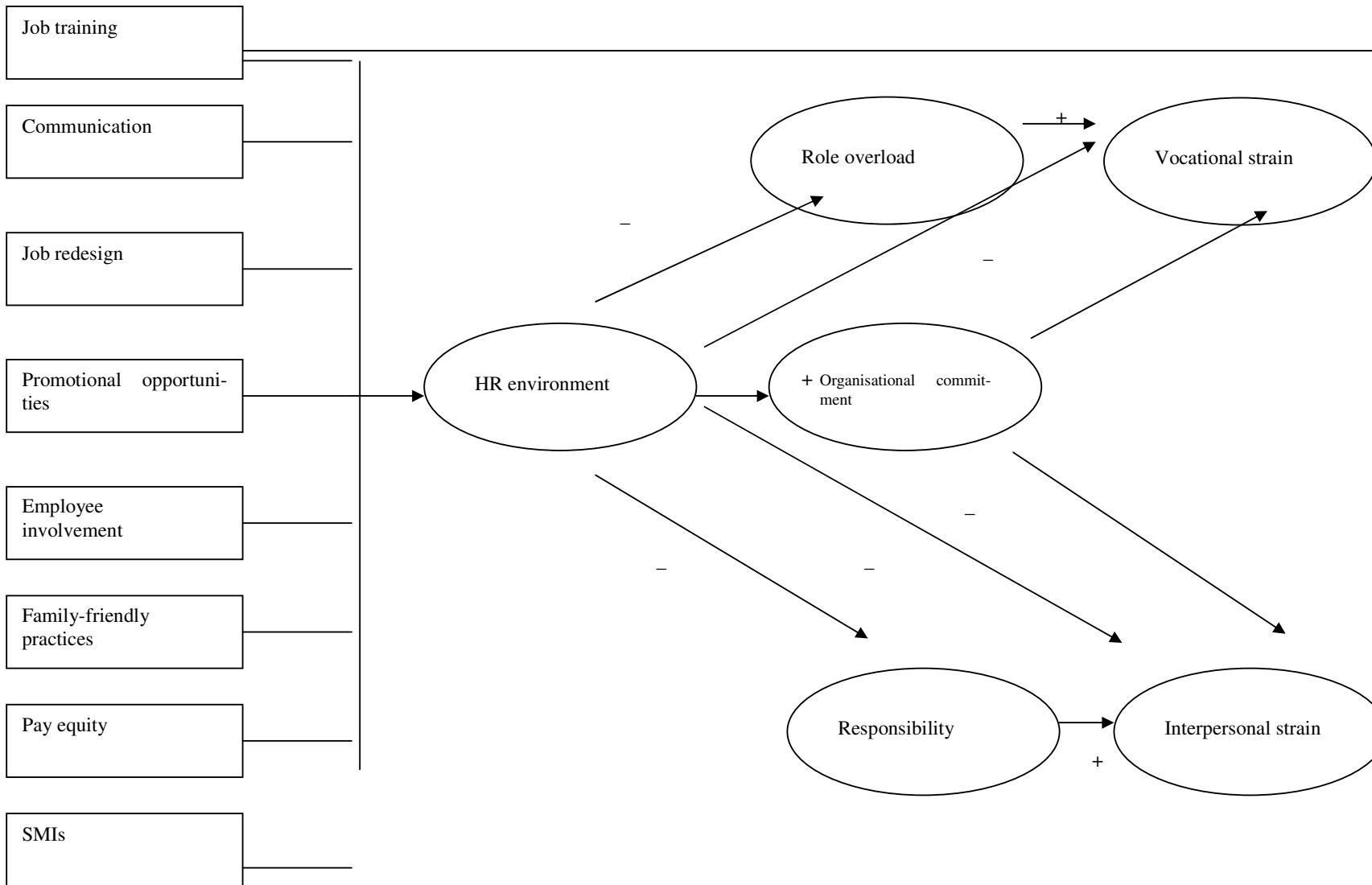


Figure 1: Hypothesised model depicting the inter-relationships between HR environment, stressors, organisational commitment and strain.

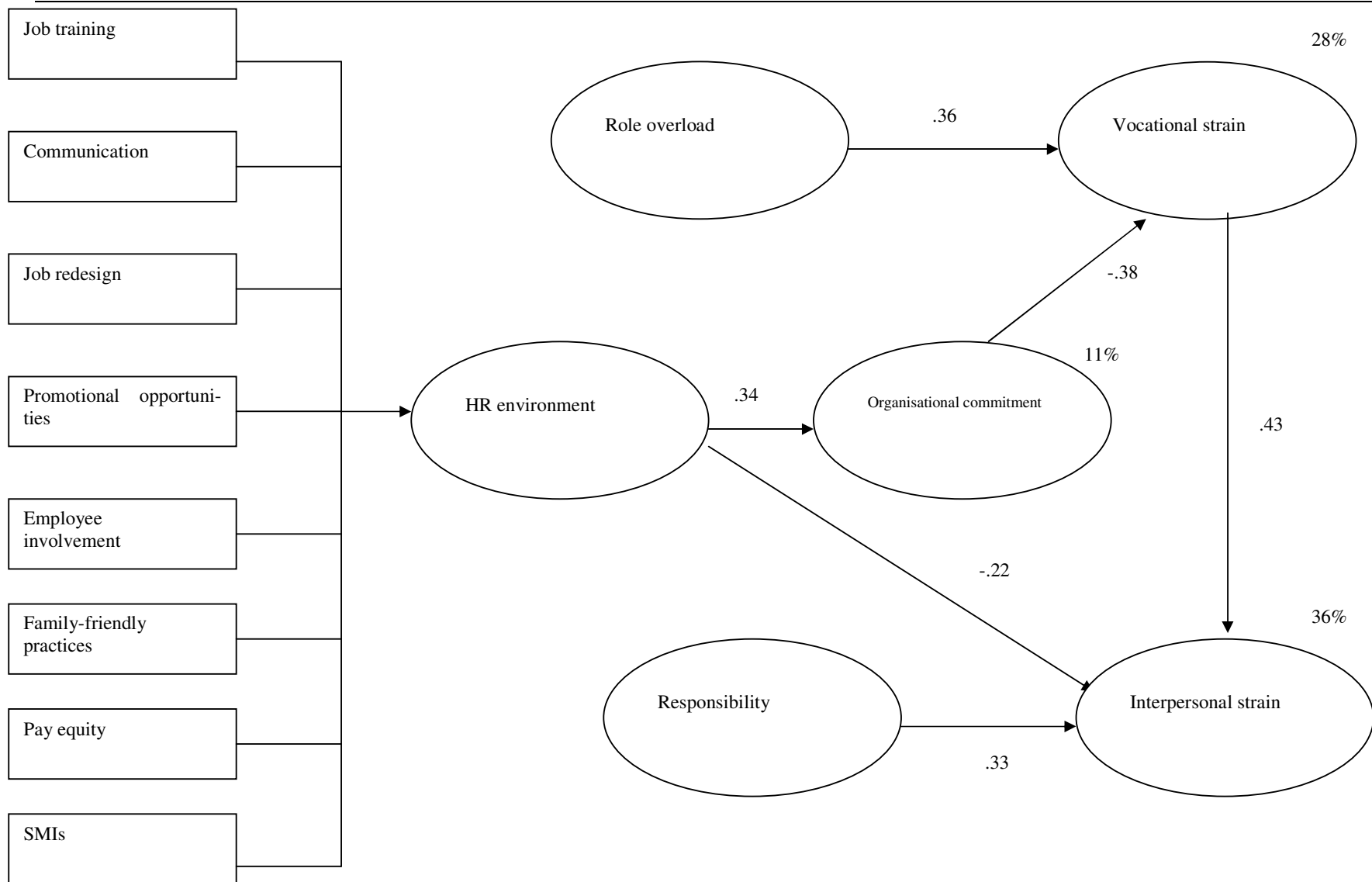


Figure 2: Final model depicting the inter-relationships between HR environment, stressors, organisational commitment and strain.

