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# Managerial stress in Hong Kong and Taiwan: a comparative study

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**Abstract** This study investigated occupational stress in managers in Hong Kong and Taiwan using the Occupational Stress Indicator-2 (OSI-2). The results showed the reliabilities and predictive validity of the OSI-2 subscales were reasonably high in both samples. The logical relationships between job satisfaction, mental and physical well-being found in the two samples have provided support to findings obtained in Western countries. Moreover, the direct impacts of coping strategies, Type A behaviour and locus of control on job strains also corroborated previous studies in Western societies. Further, there were gender differences in managerial stress in Hong Kong: female managers scored higher in sources of stress and quitting intention; but had lower job satisfaction, worse mental and physical well-being than male managers. These differences could not be found in Taiwanese managers, yet Taiwanese female managers did report more stress related to the "managerial role" than their male counterparts.

## Introduction

Sources of managerial stress have been well-documented since the late 1970s. Cooper and Marshall (1976, 1978) suggested five categories of work stressors: those intrinsic to the job and those resulting from one's role in the organization, career development, relationships with others and organizational structure and climate. Ivancevich and Matteson (1980) identified four categories of stressors: physical environment, individual level (a mixture of role and career development variables), group level (primarily relationship-based) and organizational level (a mixture of climate, structure, job design and task characteristics). Schuler (1982) also identifies seven categories of work stressors in organizations: job qualities, relationships, organizational structure, physical qualities, career development, change and role in the organization. Quick and Quick (1984) proposed four categories of stressors: task demands, role demands, physical demands and interpersonal demands. Burke (1988) provided a summary of findings for six categories of stressors: physical environment, role stressors, organizational structure and job characteristics, relationships with others, career development and work-family conflict. Recently, Cooper *et al.* (1988) identified six sources of

stress at work: intrinsic to the job, management role, relationship with others, career and achievement, organizational structure and climate, home/work interface.

Recent research revealed that managerial stressors are related to ill health, job dissatisfaction, high absenteeism and turnover (Cooper, 1981; Cooper and Payne, 1978; Davidson and Cooper, 1983, 1992; Quick *et al.*, 1990). Most important of all, work-related stress is costly. It has been estimated that 12 percent of the US's GNP and 10 percent of the UK's GNP is lost due to stress-related absenteeism and turnover (Cartwright and Cooper, 1996; Quick *et al.*, 1990).

There has been an increasing amount of research on stress moderator variables in the work place since the early 1980s. The most important role of coping has been well documented in work stress studies (Bhagat and Beehr, 1985; Cohen, 1987; Lazarus and Folkman, 1984; Lazarus and Launier, 1978). During the 1980s, locus of control (Spector, 1982, 1986) and "Type A" (Ganster, 1986) personality was found to be related to job stressors and job strains. As Spector (1994) defined, locus of control "is a personality variable that concerns people's generalized expectancies that they can or cannot control reinforcements in their lives. People who hold expectancies that they control reinforcements are considered to be internals, and people who hold expectancies that outside forces or luck controls reinforcements are considered to be externals". In a meta-analysis, Spector (1986) reported that there are correlations between locus of control and job strains (job satisfaction, symptoms and emotional distress). Type A behaviour is characterized by competitiveness, time urgency, aggressiveness, hostility, a need to control the environment, striving for achievement and explosiveness of speech (Friedman and Rosenman, 1974). There has been research evidence showing that Type A behaviour pattern correlated with job stressors (Ganster, 1986) and strains (Newton and Keenan, 1990).

As the population of Chinese in the world is about 20 per cent of all humans, it is valuable to obtain data from Chinese managers in order to contribute to generalizability of theories in organizational psychology. Since 1979, China has made great progress in economic reforms, in which Hong Kong and Taiwan have contributed so much that the three economies have been termed as "Greater China". The average annual real growth in Taiwan in 1970-93 was 8.6 percent; and in the same period Hong Kong also achieved 7.4 percent. If the costs of managerial stress estimated for other countries is equally high in Hong Kong and Taiwan, it represents a considerable loss of resource. Therefore it is worthwhile to obtain data from Chinese managers in Hong Kong and Taiwan to see if there is any commonality in sources of managerial stress; and which, in turn, might affect workers' well-being, job satisfaction and behavioural outcomes (such as excessive drinking and smoking, high absenteeism, quitting intention and turnover).

In Hong Kong, it has been demonstrated that work-related stress is generally high (Siu, 1995, 1996; Siu and Donald, 1996; Siu *et al.*, 1997). A study of office

workers by a group of British academics demonstrated that Hong Kong is the most stressful workplace in the world (The Review, *South China Morning Post*, 19 November 1995, p. 4).

Yet, there has previously been little research done on managerial stress in Hong Kong. One of the very few was conducted by Sin and Cheng (1995). They identified six sources of stress among 1,000 business executives in Hong Kong: job-assigned stressor, responsibility stressor, work/organizational climate stressor, career stressor, job-value conflict stressor and role-ambiguity stressor. Each of them was related to respondents' self-reports of physical health, depending on their gender, age and experience in a managerial position.

There has been quite an amount of research done within the workforce in Taiwan. For instance, the inability to maintain a harmonious relationship between co-workers has been rated as a major factor for work-related stress, burnout and resignation (Huang, 1986; Kuo, 1989, 1990). Lu and her associates successfully adopted the British-originated Occupational Stress Indicator (OSI) (Cooper *et al.*, 1988) and found four broad categories of work stress in a large random sample of 1,054 Taiwanese industrial workers. These were: role conflicts and lack of support, lack of stability and work/home conflicts, problems in the job itself and career development and finally, stress of the managerial role (Lu *et al.*, 1995). The Chinese version OSI demonstrates high reliability, good convergent and divergent validity in relation to other established measurements, as well as acceptable criterion validity against objective measures of job strain (Lu *et al.*, 1995, 1997). The OSI has also proven sensitive to occupational differences on work stress and strain. In a comparative study, clinical nurses reported higher work stress, suffered poorer physical and mental health, as well as lower job satisfaction, despite their greater efforts in coping, compared with the aforementioned industrial workers (Lu *et al.*, 1997).

As far as demographics are concerned, male workers have a higher job satisfaction and job commitment than female workers (Su and Huang, 1992). Married workers reported higher job satisfaction and job commitment than single workers (Chen and Huang, 1982; Huang, 1984; Su and Huang, 1992). Single workers even reported more job-related stress than married workers (Hsu and Chen, 1981). Older employees with longer working experience tend to report higher job satisfaction and job commitment (Chen and Huang, 1982; Hsu, 1977; Huang, 1986; Li and Lu, 1982; Su and Huang, 1992).

The purpose of this study is to investigate occupational stress in managers in Hong Kong and Taiwan. In recent years, it has been demonstrated that female managers are under high stress (Davidson and Cooper, 1983, 1992; Langan-Fox and Poole, 1995). Yet Beatty (1996) has provided inconclusive results. She found that successful professional and managerial women did not exhibit high levels of anxiety, depression and hostility. Obviously, there is an enormous opportunity for women in business and management in Hong Kong and Taiwan. Yet, we believe there is gender difference in managerial stress in these two Chinese societies as suggested by previous studies (Davidson and

Cooper, 1983, 1992; Langan-Fox and Poole, 1995). Therefore, another purpose of the study is to test if there is any gender differences in managerial stress in Hong Kong and Taiwan. The theoretical framework for the study is depicted in Figure 1.

In this model, sources of stress are related to employees' reports of health effects and strain effects. Demographic variables only affect the perception of sources of stress and reports of health and strain effects indirectly. Only the direct effects of coping, Type A behaviour and locus of control will be examined in the study.

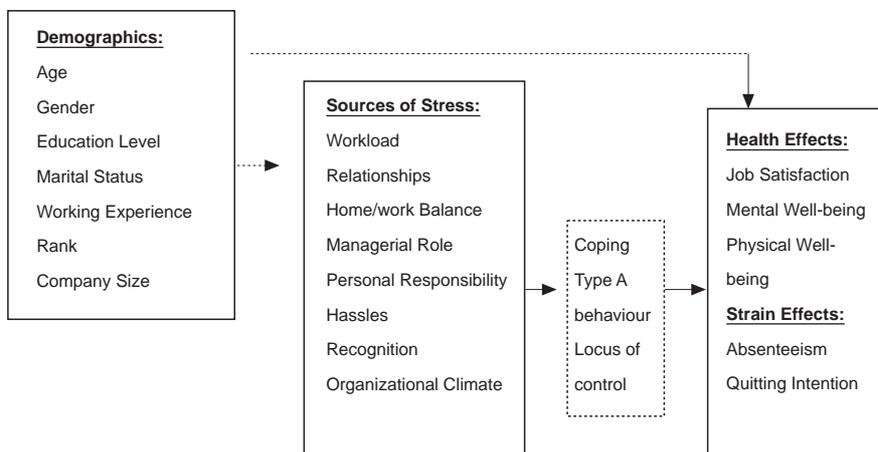
### Method

The self-administered questionnaire survey method was used to collect quantitative data on reports of job stressors and job strains. There is much criticism on self-report measures in work stress research (Frese and Zapf, 1988; House *et al.*, 1986; Spector *et al.*, 1988), and in organizational conditions and job characteristics (Spector and Jex, 1991; Taber and Taylor, 1990). Yet, Spector (1987) demonstrated that method variance was not an artifact in self-reported affect and perceptions at work. Spector (1992) also argued that there is good evidence that self-report measures of job conditions are valid. In order to achieve a higher validity of measures, objective measures, as is strongly recommended by Frese and Zapf (1988), was also used for data collection.

### Sample and procedures

The target population for the study was a broad cross-section of managers in Hong Kong and Taiwan.

*Hong Kong.* The data collection in Hong Kong was conducted from March to June 1997 by random sampling method and purposive sampling method. A total of 1,021 questionnaires were sent to three groups of industrial and commercial managers which were randomly selected from the *Members'*



**Figure 1.**  
Theoretical framework  
for the study

*Business Directory of The Chinese General Chamber of Commerce 1997*. These three groups were “Garment and footwear”, “Finance, insurance and real estate” and “Industrial, commercial and trading services”. Each of the managers was requested to complete and return the questionnaire within three weeks. Follow-up telephone calls were conducted to ensure a higher return rate. The results revealed that 229 letters were returned, out of which, 107 were unattended ones returned to sender (due to change of address or closing down of the business), 29 were incomplete ones and there were only 93 completed ones. This made up a response rate of 10.2 percent.

The other sample of managers participating in the study was recruited from part-time students who were taking courses at Lingnan College, Hong Kong University and The Hong Kong Management Authority; the rest of the sample was accessed from five firms by convenient sampling method. We successfully recruited 187 managers and therefore the total number of respondents in the Hong Kong sample was 280.

*Taiwan*. The data collection in Taiwan was conducted from December 1996 to July 1997. Even though a purposive sampling strategy was adopted, we intended to recruit a heterogeneous sample of Taiwanese managers working for various types of organizations (public vs. private, indigenous vs. multinational, large vs. small), who work in different industries and ranked at different levels within the organizations. Participants were contacted through:

- (1) social organizations such as The Rotary Clubs ( $n = 125$ );
- (2) commercial associations such as the Associations of the Import and Export Dealers ( $n = 125$ );
- (3) educational classes offered to managers by universities in Taiwan ( $n = 52$ );
- (4) personal networks ( $n = 51$ ),.

Questionnaires were distributed to potential respondents, yielding a response rate of 50 percent. By discarding the incomplete ones, the final sample consisted of 347 managers who were all based in central and southern Taiwan.

#### *Instrument*

The Occupational Stress Indicator-2 (OSI-2) (90 items) was adopted as the questionnaire battery for the study. The originally written Occupational Stress Indicator (OSI) (Cooper *et al.*, 1988) has been widely used in the UK and some other countries and has established reliability and both predictive and criterion validity (Cooper and Bramwell, 1992; Kirkcaldy and Cooper, 1993; Langan-Fox and Poole, 1995; Rees and Cooper, 1991; Robertson *et al.*, 1990). The job satisfaction subscale has shown good construct validity with Warr *et al.*'s (1979) “satisfaction with the job itself” scale (Robertson *et al.*, 1990). The mental health subscale has shown good validity correlations with the Crown Crisp Experiential Index (Crown and Crisp, 1979) by Robertson *et al.* (1990). The OSI

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has also been used in Hong Kong and yielded high reliability and predictive validity (Siu *et al.*, 1997),

The OSI-2 is a revised and shortened version of the OSI consisting of: Section 1 – Job satisfaction (12 items measuring job itself and the organization; high scores indicate greater satisfaction); Section 2A – Mental well-being (12 items measuring contentment, resilience and peace of mind; high scores denote greater well-being); Section 2B – Physical well-being (six items measuring calmness and energy; high scores indicate better physical health); Section 3A – Type A behaviour (six items measuring patience and drive; high scores denote greater tendency towards Type A behaviour pattern); Section 3B – Control personality (four items measuring locus of control; high scores denote greater perceived control over one's environment); Section 4 – Sources of stress (40 items measuring workload, relationships, home/work balance, managerial role, personal responsibility, hassles, recognition and organization climate; high scores indicate more sources of stress); and Section 5 – Coping strategies (ten items measuring control and support; high scores denote more frequent use of coping strategies). In addition, 22 bibliographic questions on demographics and objective measures of programmed exercise, absenteeism, drinking and smoking habits were included in the questionnaire.

All of the items in the questionnaire used in the Hong Kong sample were translated into Chinese by the first author and back translated into English by a professional translator. When the OSI was first introduced in Taiwan, the second author followed the strictest translation procedure: back translation, informal interviews, pre-test, item analysis and the sort, to ensure cultural equivalence. However, some items were modified in the result, to better fit the Taiwanese work environment. These procedures were described in Lu *et al.* (1995; 1997b) and Lu (1997).

## Results

### *Sample distribution*

Table I presents a detailed description of the sample distribution in Hong Kong and Taiwan. The distribution of gender, education level, level of job and company size in the two groups are very similar. The mean age, drinking and smoking habits are also very similar. However, there are more married managers than single ones in the Taiwan sample.

Concerning working hours in a week, the mean of number of hours supposed to work per week and the number of hours actually worked per week are more or less the same in the two places. Further, about 50 percent of the managers actually work 41 to 50 hours in a week in the two places. However, even though the range of working hours is wide in both places, the range of actually worked hours in Taiwan is wider (5 to 120) than that in Hong Kong (20 to 100). Table I also shows that the Taiwan group looks healthier, as there were more respondents engaged in regular exercise and showed less quitting intention than the Hong Kong group.

	Hong Kong (%)	Taiwan (%)
<i>Age (in years)</i>		
Mean	34.6	37.97
SD	10.20	8.69
<i>Gender</i>		
Male	159 (57)	191 (55)
Female	120 (43)	151 (43.5)
Did not answer	nil	5 (1.4)
<i>Education level</i>		
Secondary	71 (25.5)	54 (15.6)
College/degree	184 (66.2)	242 (69.7)
Postgraduate	20 (7.2)	50 (14.4)
Others	3 (1.1)	1 (0.3)
<i>Marital status</i>		
Single	132 (47.3)	86 (24.8)
Married	138 (49.5)	254 (73.2)
Others (co-habiting, separated, divorced, widowed)	9 (3.3)	7 (2.1)
Did not answer	1 (0.4)	2 (0.6)
<i>No. of years with present company</i>		
Mean	7.05	10.22
SD	8.13	7.91
<i>Level of job</i>		
Top management	48 (17.1)	60 (17.3)
Senior management	43 (15.4)	39 (11.2)
Middle management	91 (32.5)	86 (24.8)
Junior management	90 (32.1)	159 (45.8)
Others	8 (2.9)	nil
Did not answer	nil	4 (0.9)
<i>Function of job</i>		
Marketing	59 (21.1)	68 (19.6)
Production	16 (5.7)	54 (15.6)
Finance/accounting	24 (8.6)	39 (11.2)
Personnel	12 (4.3)	34 (9.8)
Medical	nil	47 (13.5)
Others	81 (28.9)	47 (13.5)
Did not answer	88 (31.4)	10 (16.7)
<i>No. of hours supposed to work per week</i>		
40 or below	84 (30)	57 (16.6)
41-50	167 (60)	274 (79.6)
51 or above	28 (10)	16 (3.8)
Mean	44.62	43.82
SD	7.32	6.29
Mode	40	44
Range	8-100	8-70
<i>No. of hours actually worked per week</i>		
40 or below	52 (18.9)	59 (17.4)
41-50	151 (47.6)	192 (56.4)

**Table I.**  
Sample distribution in  
Hong Kong and  
Taiwan

(continued)

	Hong Kong (%)	Taiwan (%)
51 or above	92 (33.5)	87 (26.2)
Mean	49.81	47.93
SD	9.95	12.39
Mode	50	44
Range	20-100	5-120
<i>No. of employees in respondent's company</i>		
up to 100	128 (46.5)	138 (39.8)
100-500	56 (20.4)	73 (21)
500-1,000	26 (9.5)	35 (10.1)
1,000-5,000	39 (14.2)	76 (21.9)
over 5,000	26 (9.5)	21 (6.1)
Did not answer	nil	4 (1.2)
<i>Smoking habit</i>		
Yes	26 (9.3)	55 (15.9)
No	253 (90.4)	287 (82.7)
Did not answer	1 (0.4)	5 (1.4)
<i>Drinking habit</i>		
Yes	57 (20.4)	88 (25.4)
No	57 (20.4)	88 (25.4)
Did not answer	221 (78.9)	253 (72.9)
Did not answer	2 (0.7)	6 (1.7)
<i>No. of days of sick leave in the past three weeks<sup>a</sup></i>		
Mean	0.72	1.98
SD	1.32	1.59
<i>Managing in an "ideal" exercise programme</i>		
Always	16 (5.7)	26 (7.5)
Usually	38 (13.6)	66 (19)
Sometimes	68 (24.3)	70 (20.2)
Occasionally	104 (37.1)	125 (36)
Never	51 (18.2)	56 (16.1)
Did not answer	3 (1.1)	4 (1.2)
<i>Quitting intentions<sup>b</sup></i>		
Never	37 (13.3)	70 (20.25)
Rarely	53 (19.0)	96 (27.7)
Sometimes	121 (43.4)	140 (40.3)
Somewhat often	23 (8.2)	26 (7.5)
Quite often	27 (9.7)	9 (2.6)
Extremely often	18 (6.5)	0
Did not answer	2 (0.7)	6 (2.6)

**Note:** <sup>a</sup>No. of days sick was recorded for the past three months in Taiwan sample

<sup>b</sup>A 5-point scale was used in Taiwan sample, excluding "extremely often"

**Table I.**

### *Reliabilities of scales*

Table II presents the reliabilities of scales used in the two samples. All of the scales in the two samples are acceptably reliable.

### *Stressor-strain relationships*

Table III depicts the relationships between sources of stress, job satisfaction, mental well-being, physical well-being, absenteeism, quitting intention, coping,

**Table II.**  
Reliabilities of scales in  
Hong Kong and  
Taiwan

	Mean	Hong Kong SD	Alpha	Mean	Taiwan SD	Alpha
Sources of stress	151.75	25.34	0.93	159.00	24.69	0.94
Workload	23.41	5.20	0.80	24.30	4.77	0.78
Relationships	31.44	6.48	0.74	32.29	6.10	0.86
Home/work balance	21.72	5.32	0.79	23.35	4.69	0.74
Managerial role	13.44	3.02	0.54	14.72	3.04	0.54
Personal responsibility	15.92	3.35	0.73	17.30	3.40	0.74
Hassles	14.67	2.95	0.63	15.29	2.95	0.61
Recognition	15.59	3.91	0.83	15.78	3.18	0.75
Organizational climate	15.23	3.07	0.67	15.83	3.10	0.69
Job satisfaction	42.89	9.70	0.91	47.42	9.24	0.92
Mental well-being	46.41	8.76	0.84	47.62	8.47	0.81
Physical well-being	19.02	4.90	0.74	25.14	5.49	0.82
Coping	40.93	6.30	0.80	43.56	5.15	0.76
Type A behaviour	22.17	3.48	0.50	20.94	3.05	0.46
Locus of control	12.86	2.59	0.54	8.59	2.10	0.72

**Table III.**  
Relationships between  
stressors, health effects,  
strains and coping in  
Hong Kong and  
Taiwan

	1	2	3	4	5	6	7	8	9
<i>Hong Kong</i>									
1 Sources of stress	1								
2 Job satisfaction	-0.22*	1							
3 Mental well-being	-0.12*	0.19**	1						
4 Physical well-being	-0.17**	0.23***	0.25***	1					
5 Absenteeism	0.16**	-0.09	-0.14*	-0.11	1				
6 Quitting intention	0.18**	-0.61***	-0.17**	-0.18**	0.17**	1			
7 Coping	0.14*	0.12*	0.05	0.09	0.07	-0.14*	1		
8 Type A behaviour	0.11	-0.08	-0.15*	0.15*	0.18	-0.11	-0.01	1	
9 Locus of control	-0.23***	0.34***	0.20***	0.14*	-0.02	-0.25***	0.08	0.11	1
<i>Taiwan</i>									
1 Sources of stress	1								
2 Job satisfaction	-0.23***	1							
3 Mental well-being	-0.33***	0.30***	1						
4 Physical well-being	-0.18***	0.24***	0.59***	1					
5 Absenteeism	0.2	0.01	-0.15**	-0.21***	1				
6 Quitting intention	0.12*	-0.34***	-0.29***	-0.18***	0.15**	1			
7 Coping	0.08	0.15**	0.13*	0.06	0.04	-0.10	1		
8 Type A behaviour	0.00	-0.07	-0.05	-0.12*	0.06	0.00	0.02	1	
9 Locus of control	-0.25***	0.03***	0.25***	0.17***	0.08	-0.17***	-0.02	0.04	1

**Note:** \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

Type A behaviour and locus of control in the two samples. Sources of stress was significantly and negatively correlated with job satisfaction, mental and physical well-being; and sources of stress was significantly and positively correlated with absenteeism and quitting intention in Hong Kong managers, but sources of stress was significantly and positively correlated with quitting intention in Taiwan managers.

There were significant and positive correlations between job satisfaction, mental and physical well-being in the two samples. In general, there was an inverse relationship between health effects (job satisfaction, mental well-being, physical well-being) and strain effects (absenteeism and quitting intention). In both samples, absenteeism and quitting intention was significantly and positively related. These provide predictive validity of the scales.

*Stress moderator variables*

The role of coping in the two groups slightly varies. In Hong Kong managers, coping increased job satisfaction and mental well-being, and decreased quitting intention. In Taiwan managers, coping increased physical and mental well-being only. Type A behaviour was found to be associated with mental and physical well-being negatively, and was related to absenteeism positively in Hong Kong managers. Similarly, Type A behaviour was related to physical well-being in a negative fashion in Taiwanese managers. Concerning locus of control, in both places, managers who had more control over their environment reported less sources of stress and quitting intention, yet reported greater job satisfaction, better mental and physical well-being.

*Demographics, health and strain effects*

The relationships between demographics, job satisfaction, mental well-being, physical well-being, absenteeism and quitting intention in the two samples are presented in Table IV.

	Job satisfaction	Mental well-being	Physical well-being	Absenteeism	Quitting intention
<i>Hong Kong</i>					
Age	0.36***	0.15*	0.34***	-0.16**	-0.43***
Education level	0.11	0.11	0.18**	-0.13*	-0.12*
No. of years in present job	0.22***	0.12*	0.20***	-0.07	-0.31***
Company size	-0.24***	-0.09	-0.17**	0.15*	0.11
Exercise	0.11	0.08	0.26***	0.08	-0.11
Workhr1	0.12*	0.08	0.07	-0.09	-0.09
Workhr2	0.06	0.01	-0.03	-0.14*	-0.09
<i>Taiwan</i>					
Age	0.12*	0.24***	0.25**	0.03	-0.18**
Education level	-0.11	0.03	0.01	-0.04	0.07
No. of years in present job	0.70***	0.19***	0.17**	-0.10	-0.18***
Company size	0.06	0.05	-0.01	-0.17**	0.03
Exercise	0.11	0.09	0.07	-0.09	-0.03
Workhr1	-0.03	-0.07	-0.08	-0.00	0.10
Workhr2	0.07	0.05	-0.05	-0.05	-0.06

**Note:** Exercise = managing an “ideal” exercise programme. Workhr1 = no. of hours supposed to work a week. Workhr2 = no. of hours actually worked a week  
\**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001

**Table IV.**  
Relationships between  
demographics, health  
and strain effects in  
Hong Kong and  
Taiwan

The results depicted in Table IV show that health effects increase with age, whereas strain effects decrease with age in the two groups. Concerning educational level, it has no relationship with any health or strain effects in Taiwan managers. But educational level was significantly and positively correlated with physical well-being and significantly and negatively correlated with absenteeism and quitting intention in Hong Kong managers. In both groups, the longer the working experience, the higher were the scores on job satisfaction, physical and mental well-being and also lower were the scores on quitting intention. Further, company size was negatively correlated with job satisfaction and physical well-being, but was positively correlated with absenteeism in Hong Kong managers; whereas company size was found to be negatively correlated with absenteeism only in Taiwan managers. Unexpectedly, the frequency in engaging in regular exercise did not have much effect, it was only related to physical well-being in Hong Kong managers. Working hours in a week also only had a slight effect in Hong Kong managers. The number of working hours supposed to work per week (Workhr1) was only mildly and positively related to job satisfaction; whereas the number of hours actually worked per week (Workhr2) was negatively related to absenteeism. Nevertheless, neither Workhr1 nor Workhr2 had any effect in Taiwanese managers.

Since there is a vast difference in marital status in the Taiwan sample, a series of *t*-tests were conducted to see if there was any difference in OSI scores between male and female managers in the Taiwan sample. Married subjects were significantly higher on job satisfaction (48.19 vs. 44.63,  $t = 2.99$ ,  $p < 0.01$ ), mental well-being (48.50 vs. 44.94,  $t = 3.35$ ,  $p < 0.001$ ), physical well-being (25.69 vs. 23.30,  $t = 3.51$ ,  $p < 0.001$ ) and “personal responsibility” (17.58 vs. 16.55,  $t = 2.37$ ,  $p < 0.05$ ), than their single counterparts.

Further analysis was conducted to see if marital status might have an effect on our dependent variables in the Taiwan group. When “marital status” was coded as a dummy variable (1 = single, 2 = married), it correlated with job satisfaction ( $r = 0.17$ ,  $p < 0.001$ ), mental well-being ( $r = 0.18$ ,  $p < 0.01$ ), physical well-being ( $r = 0.19$ ,  $p < 0.001$ ) and quitting intention ( $r = -0.24$ ,  $p < 0.001$ ), but not with sources of stress. The slight variations in levels of significance for comparable magnitudes of correlation coefficients were due to the different number of missing cases involved in each individual analysis.

We should certainly concede that marital status might have an effect on our dependent variables, however, the magnitudes of these impacts are quite small. After all, marital status was related to age ( $r = 0.42$ ,  $p < 0.001$ ), seniority ( $r = 0.28$ ,  $p < .001$ ) as well as position ( $r = 0.25$ ,  $p < 0.001$ ), therefore the “real factor” might be holding senior positions, instead of being married *per se*.

#### *Differences between male and female managers*

A number of chi-square tests demonstrated that there were significantly more male managers in the top and senior rank than female managers; and there was

a majority of female managers in the middle or junior posts in the two places (see Tables V and VI).

A number of *t*-tests were conducted to test if there was any gender difference in stressors, health effects, strains, coping, Type A behaviour and locus of control in the two groups (see Table VII). As the mean score of absenteeism in the two groups was very small, it was not included in the *t*-tests. The results showed that there were gender differences in job satisfaction, mental well-being, physical well-being and quitting intention in Hong Kong managers. In general, male managers had higher scores on job satisfaction, physical and mental well-being, but lower scores on quitting intention than female managers. Yet, there was no gender difference in Taiwan managers except Type A behaviour pattern (male exhibited more Type A behaviour than female). There was no difference in coping strategies and locus of control in both groups.

*Predictors of health and strain effects*

A number of stepwise regression analyses were conducted to find out the important predictors for the health and strain effects in the two groups of managers. Table VIII shows the summary of the results when the eight sources of stress were entered into the equation as independent variables and indicates R<sup>2</sup>, R<sup>2</sup> change and beta to show the direction of the relationships. As suggested

Count	Rank				Row total
	Top manager	Senior manager	Middle manager	Junior manager	
Male	42	23	39	52	156 (57.6)
Female	6	20	52	37	115 (42.4)
Column total	48 (17.7)	43 (15.9)	91 (33.6)	89 (32.8)	271 (100)

**Note:** chi-square value =10.14; df = 3; *p* < 0.001

**Table V.**  
Relationship between  
gender and rank in  
Hong Kong

Count	Rank				Row total
	Top manager	Senior manager	Middle manager	Junior manager	
Male	40	26	50	75	191 (56.3)
Female	17	11	36	84	148 (43.7)
Column total	57 (16.8)	37 (10.9)	86 (25.4)	159 (46.9)	339 (100)

**Note:** chi-square value =12.90; df = 3; *p* < 0.001

**Table VI.**  
Relationship between  
gender and rank in  
Taiwan

	Male		Female		<i>t</i> -value
	Mean	SD	Mean	SD	
<i>Hong Kong</i>					
Sources of stress	148.46	26.21	155.92	23.50	-2.44*
Job satisfaction	44.03	9.93	41.38	9.25	2.27*
Mental well-being	41.91	5.80	40.33	6.02	2.22*
Physical well-being	24.02	4.99	21.52	4.36	4.35***
Quitting intention	2.72	1.27	3.41	1.32	-4.43***
Coping	40.58	6.26	41.42	6.37	-1.10
Type A behaviour	48.14	8.97	47.53	9.13	0.546
Locus of control	13.03	2.80	12.65	2.30	1.19
<i>Taiwan</i>					
Sources of stress	125.68	20.89	128.54	20.04	-0.19
Job satisfaction	47.38	9.33	47.43	9.20	-0.04
Mental well-being	47.85	8.08	47.20	9.03	0.68
Physical well-being	25.30	5.54	24.85	5.42	0.75
Quitting intention	2.39	1.00	2.52	0.96	-1.16
Coping	43.36	5.48	43.82	4.78	-0.81
Type A behaviour	21.33	3.00	20.44	3.05	2.68**
Locus of control	8.88	2.18	9.01	2.02	-0.54

**Table VII.**  
*t*-tests: gender  
differences in male and  
female managers in  
Hong Kong and  
Taiwan

**Note:** \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

	Predictor	$R^2$	$F$	$R^2$ change	beta
<i>Hong Kong</i>					
Job satisfaction	Organizational climate	0.075	22.53***	0.075	-0.27
Mental well-being	Organizational climate	0.021	6.05*	0.021	-0.15
Physical well-being	Workload	0.036	10.24**	0.036	-0.19
Quitting intention	Relationship	0.066	19.47***	0.066	0.26
	Personal responsibility	0.100	15.41***	0.034	-0.22
	Organizational climate	0.118	12.29***	0.018	0.17
<i>Taiwan</i>					
Job satisfaction	Recognition	0.043	12.41***	0.043	-0.21
Mental well-being	Managerial role	0.126	41.89***	0.126	-0.36
	Hassles	0.147	24.80***	0.021	-0.17
	Hassles	0.039	12.09***	0.039	-0.20
Physical well-being	Personal responsibility	0.057	8.93***	0.018	0.17
	Managerial role	0.084	8.93***	0.027	-0.21
	Organizational climate	0.096	7.77***	0.012	-0.16
Quitting intention	Recognition	0.026	7.81***	0.026	0.16

**Table VIII.**  
Predictors of health  
and strain effects in  
Hong Kong and  
Taiwan managers

**Note:** \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

by Kerlinger and Pedhazzer (1973), predictor variables were considered to be those that contributed a minimum of 1 percent to the variance ( $R^2$  change) and were significant at the 0.05 level or greater. The predictors for each health and strain effect in the two groups are entirely different. For Hong Kong managers,

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organizational climate appeared to be an important predictor for several health or strain effects, whereas in Taiwan managers, “recognition” was a common predictor for job satisfaction and quitting intention and “hassles” and “managerial role” were common predictors for physical and mental well-being. Nevertheless, all of the stressors explained only small percentages of the variance (all below 10 percent) except “managerial role” as a predictor of mental well-being in the Taiwan group (12.6 percent).

## Discussion

Even though Hong Kong and Taiwan are predominantly industrialized Chinese societies, there are similar and different patterns of managerial stress in the two places.

### *Predictive validity*

The reliabilities of all of the subscales of the OSI-2 were reasonably high. The predictive validity of the health and strain effects were also high: there were statistically significant correlations between job satisfaction and mental well-being, job satisfaction and physical well-being and between mental and physical well-being. Further, sources of stress were negatively related to job satisfaction, mental and physical well-being, but were positively related to quitting intention. Concerning strain effects, absenteeism and quitting intention were positively correlated. These results corroborated previous studies in work stress in Hong Kong (Siu, 1996; Siu *et al.*, 1997) and Western societies (e.g. Ganster and Schaubroeck, 1991; Sullivan and Bhagat, 1992) and thus contribute to generalizability of work stress theories.

### *Role of stress moderator variables*

The direct effects of coping, Type A behaviour and locus of control are similar in both groups. In general, coping leads to greater job satisfaction and mental well-being and less quitting intention. These results support previous studies (Bhagat and Beehr, 1985; Cohen, 1987). In the Hong Kong group, Type A behaviour pattern was associated with strain symptoms: worse physical and mental well-being and higher absenteeism. In the Taiwan group, Type A behaviour was only associated with worse physical well-being. These results also corroborated previous studies (e.g. Ganster, 1986). As far as control personality is concerned, both Hong Kong and Taiwanese managers who perceive more control over their environment exhibit greater job satisfaction, better mental and physical well-being and less quitting intention. Again, these results corroborated previous findings (e.g. Spector, 1986). Therefore, the results obtained from the role of the aforementioned moderators contribute to generalizability of theories in organizational psychology.

### *Demographic characteristics*

In both the Hong Kong and Taiwan group, older managers reported greater job satisfaction, better mental and physical well-being and less quitting intention.

These results support previous findings in Taiwan (Chen and Huang, 1982; Hsu, 1977; Huang, 1986; Li and Lu, 1982; Su and Huang, 1992).

In addition to the above account on the similarities in the two groups, there were significant gender differences in Hong Kong managers, but not in Taiwan managers. Female managers had perceived more sources of stress and higher quitting intention than male managers. Conversely, male managers had higher job satisfaction and better physical and mental well-being than their counterparts. A cross-tabulation analysis demonstrated that there were significantly more women managers in lower rank than male managers ( $\chi^2 = 10.14, p < 0.001$ ). Perhaps this explains why female managers reported worse health effects and more strain effects. These results therefore provide support to previous studies in Western societies (Davidson and Cooper, 1983, 1992; Langan-Fox and Poole, 1995). On the other hand, the non-significant gender difference in the Taiwan group provides support to previous findings in Taiwan (e.g. Lu, 1997) and Beatty's (1996) conclusion.

However, a more detailed inspection revealed that Taiwanese female managers did report more stress related to the "managerial role" than their male counterparts (mean = 15.20 vs. 14.37,  $t = 2.49, p < 0.05$ ), hence partially corroborating the Hong Kong phenomenon. This seemingly consistent pattern of female disadvantage in managerial positions is very interesting, as it provides indirect support for the role conflict thesis, which states that the socially approved characteristics of femininity (such as nurturance and submission) may often come into conflict with the requirements of a "masculine" managerial role (such as toughness and assertion). The prevailing hostility against females, the lack of female role models, non-supportive superiors (usually males), long-established business practices with sexual overtures and the dilemma between career commitment and family duties may all compound to produce the high level of work stress encountered by female managers in a paternalistic Chinese society such as Taiwan (Lin and Li, 1996; Lu, 1997). Hopefully, these findings will serve to raise the awareness to the unduly high work stress endured by these Chinese female managers and in turn, to facilitate assistance to reduce its detrimental effects on health and work morale. One interesting result obtained for gender difference in the Taiwan sample is that male managers exhibited higher tendency of Type A behaviour than female managers. One may expect that women would display more Type A behaviour than men, as women tend to be more neurotic than men.

Even though "Weekly working hours" (Workhr1 and Workhr2) did have a large range (e.g. 5 to 120 in the Taiwan group), actually, only one or two managers responded at the extremes. After all, neither Workhr1 nor Workhr2 had any great impact on the dependent variables.

As compared to managers in a UK study (Sutherland and Davidson, 1993), it seems that Chinese managers adopt a healthier life style than managers in Western culture, in terms of smoking habits and engaging in programmed exercise. In Sutherland and Davidson's study, 26 percent of the respondents

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were smokers (9.3 percent and 15.9 percent in Hong Kong and Taiwan samples respectively) and 21 percent of them never engaged in regular exercise (18.2 percent and 16.1 percent in Hong Kong and Taiwan samples respectively). The positive relationship between exercise and physical well-being found in Hong Kong managers corroborated previous findings in Western societies (Kirkcaldy and Shephard, 1990). Kirkcaldy and Shephard (1990) provided evidence to suggest that regular physical activity is of benefit to both physical and psychological health. However, in our study, exercise was not related to job satisfaction or mental well-being. These non-significant relationships corroborated previous European studies (Kirkcaldy and Cooper, 1993; Kirkcaldy *et al.*, 1994). Perhaps the relationship between exercise and psychological well-being needs further investigation in Chinese societies in the future.

#### *Predictors of health and strain effects*

Concerning sources of stress, there were different predictors for job satisfaction, mental and physical well-being and quitting intention in Hong Kong and Taiwan managers. It seems that in Hong Kong managers, “organizational climate” was a strong predictor for health and strain outcomes. This result corroborated previous studies in Hong Kong (Siu, 1996; Siu *et al.*, 1997). One possible explanation could be due to the fact that Hong Kong has long been exposed to Western style of management, employees, in particular managers, are very concerned about organizational climate in their companies.

Among Taiwanese managers, “recognition” seems to be the most important predictor of work morale, i.e. job satisfaction and quitting intentions; whereas “managerial role” and “hassles” seem to be important predictors of personal health. The reasons for this pattern may again lie in the paternalistic and autocratic culture governing most organizations in Taiwan, large and small, public and private (Cheng, 1995; Lu *et al.*, 1997b). Recognition by one’s superior or boss actually determines one’s prospect and status in the organization. It is then easy to imagine the demoralizing effects of lack of it. A related feature of such an autocratic work scene is the lack of clear and legitimate definition of job roles: one has to take on duties outside the “official” realm of a job, in order to maintain the interpersonal harmony or to win recognition of the superior. This often causes work overload as well as role conflicts. As previous research has well-documented, role overload and hassles are related to health outcomes (Broadbent, 1995; Karasek, 1979; Lu, 1991).

#### *Limitations*

There are a number of methodological pitfalls in the present study. First, a static group design method was employed to choose the Taiwan subjects and part of Hong Kong subjects. Second, the data collection procedures in the two places were not conducted in the same period. Third, the sample size in both groups was unequal.

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