

MANAGERIAL STRESS, JOB SATISFACTION AND HEALTH IN TAIWAN

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SUMMARY

This study tested an integrative work stress model using data from a heterogeneous sample of Taiwanese managers. Results indicated that these managers were under considerable work stress and were at risk of mental and physical ill-health. Internal control was related to higher job satisfaction and was beneficial to mental health; however, its interaction with work stress was detrimental to psychological well-being. A specific facet of Type A behaviour pattern was also related to poorer physical health. These results were discussed with an *emic* emphasis, taking account of some distinctive characteristics of the Chinese culture. Copyright © 1999 John Wiley & Sons, Ltd.

KEY WORDS — managerial stress; job satisfaction; health

Stress has become one of the most serious health issues of the twentieth century — a problem not just for individuals in terms of physical and mental morbidity but also for employers, governments and society at large, who have started to assess its financial damage.¹ Matteson and Ivancevich² estimate that stress causes half of absenteeism, 40 percent of turnover, and that 5 percent of the total workforce covers for reduced productivity due to preventable stress-related illnesses (\$60 billion for the US economy annually). Although other sources may quote different figures, it is obvious that occupational stress has serious consequences for both individual employees and organizations.

The problem of occupational stress is particularly relevant for countries undergoing enormous economic and social changes. Taiwan is one such society, with a transformation of the industrial structure from labour-intensive to high-tech, as well as rapid westernization in both work and lifestyle. In this context, recent empirical evidence has already shown that compared to British industrial

workers, a large random sample of their Taiwanese counterparts ($N=1054$) has suffered worse physical health and reported better mental health and a similar level of job satisfaction.³ This strain pattern fits well with the somatization thesis for illness behaviour among Chinese.⁴ In a culture of 'face', complaints of stress-related physical illness are less stigmatized and hence more socially acceptable than those of psychological problems.^{5,6} In another study, a very considerable proportion of Taiwanese clinical nurses suffered mental (one in 11) and physical ill-health (one in four) at a level comparable to British psychiatric patients.⁷ Once again, the pattern is similar. It seems that workers in Taiwan are suffering from occupational stress just like their Western counterparts, hence more concerted research efforts concerning work stress in Taiwan are clearly worthwhile.

Interestingly, few studies have examined the occupational stress of managers in Taiwan, particularly at the level of middle and upper management, and its impact on job satisfaction and health outcomes. This is surprising given the fact that increasing numbers of multinational companies are joining the rapidly developing Asian region and need to achieve multinational efficacy. There is no doubt that managers are arguably the most important human resource, who play a crucial role in the success or failure of any organization. A recent survey⁸ jointly conducted by

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the *Far Eastern Economic Review* and the *Asian Business News* interviewed executives of top companies in 10 Asian countries. Half of them (50.6 percent) conceded that they did not have sufficient numbers of qualified managers to meet the needs of organizations in their own countries. Training for more candidate managers is certainly one way to close this demand–supply gap; effective managerial work stress reduction is another way to develop and improve existing managerial human resources. To develop suitable prophylactic measures, it is necessary to identify the sources and effects of job-related pressures.

One of the very few studies investigating managerial stress in non-western countries was in Hong Kong. Researchers⁹ identified six sources of stress among 1000 business executives: 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. Although Hong Kong and Taiwan are both industrialized Chinese societies, there might still be differences as well as similarities in managerial stress, due to different historical/political/social forces at work in two places. For instance, Hong Kong has long been exposed to the western style of management, while Taiwan remains paternalistic and autocratic in its organizational life. Therefore, it is worthwhile obtaining data from Taiwanese managers to identify sources of managerial stress, which in turn, might affect managers' work morale, health and behavioural outcomes (such as smoking, drinking and absenteeism).

It was with this in mind that we adopted the widely used diagnostic instrument the Occupational Stress Indicator (OSI)¹⁰ to examine managerial stress in Taiwan. The OSI is still a relatively new test, but its reliability and validity in a Taiwanese work context have been established and are generally satisfactory.^{11,12} The instrument was originally developed based on a comprehensive theoretical framework which adopts a transactional view of occupational stress and emphasizes not only stressors and outcomes, but also potential moderating variables such as personality (Type A and internal control) and coping strategies. Fig. 1 presents a modified theoretical framework for this study.

The primary purpose of this article was to present results of a study investigating the sources of stress,

job satisfaction and health among a heterogeneous sample of managers in Taiwan. As such, the present study is perhaps the first attempt in investigating managerial stress and health in diverse organizations in a Chinese context. Another purpose of the study was to test the moderating effects of personality and coping strategies.

METHODS

Subjects

A purposive sampling strategy was adopted, intended to recruit a heterogeneous population of Taiwanese managers working for various types of organizations (public vs private, indigenous vs multinational, large vs small) and ranked at different levels within the organizations. We also attempted to cover major sections of the economy, including manufacturing, construction, banking and financing, social and personal services, commerce and trading. Participants were contacted: (1) through social organizations, such as the Rotary Clubs ($N = 125$), (2) through commercial associations, such as the local Association of Import and Export Dealers ($N = 125$), (3) through educational classes offered to managers by the local universities ($N = 52$), (4) through personal social networks ($N = 51$). Questionnaires were distributed to potential respondents, yielding a response rate of 50 percent. After discarding those questionnaires with excessive missing data, the final sample was 347. Those managers were all based in central and southern Taiwan.

Measurement

The questionnaire battery included:

1. Demographic and work information: age, gender, education, marital status, occupation, tenure, rank, size of organization, personal health habits, absenteeism, etc.
2. The Chinese OSI-2. Seven of the scales were:
 - (a) Job satisfaction scale (12 items): two subscales measuring 'satisfaction with the job itself' and 'satisfaction with the organization'.
 - (b) Stressors scale (40 items): eight subscales measuring 'workload', 'relationships', 'home/work balance', 'managerial role', 'personal responsibility', 'hassles', 'recognition' and 'organizational climate'.

- (c) Coping strategies scale (10 items): two subscales measuring 'control' and 'seeking support'.
 - (d) Physical health scale (6 items): two subscales measuring 'calmness' and 'energy'. Higher scores indicated better physical health.
 - (e) Mental health scale (12 items): three subscales measuring 'contentment', 'resilience' and 'peace of mind'. Higher scores indicated better mental health.
 - (f) Type A behaviour scale (6 items): two subscales measuring 'patience' and 'drive'.
 - (g) Control (4 items): measuring perceived influence at work.
3. Work locus of control: Spector's¹³ 16-item Work Locus of Control Scale (WLCS) was used to measure the belief that work is under one's own control (internal) or under the control of chance, fate or powerful others (external). In the present study, the WLCS was scored in the direction of 'internal' control.

RESULTS

The final sample of 347 managers was drawn from a wide variety of organizations, including manufacturing, construction and real estate, commerce and trading, financing, industrial and business services, and social services. The contents of their work were also diverse, including personnel and administration, sales, production, research, financing and accounting, as well as medical care. There were roughly equal ratios of males and females (these ratios did not change significantly when managers from the medical services, mainly nursing officers, were excluded). Overall, this sample was middle-aged, well-educated, married with youngish children, long-serving, middle-level managers, who worked in companies with fewer than 100 employees and for slightly longer hours (the statutory working hour in Taiwan is 44 hours per week). In terms of demographic and work-related characteristics, this sample was quite representative of Taiwanese middle-range managers. Detailed sample characteristics are presented in Table 1.

Reliability of scales

Table 2 presents the reliability of scales used in the study. One item (4) in the OSI — control scale

was deleted due to its low item–total correlation (ITC) coefficient ($r = 0.06$), to improve scale parsimony and consistency. Overall, aggregated scales yielded higher reliabilities than their subscales and stress–strain scales were more reliable than personality scales. With the exception of the Type A scale, all of the scales were acceptably reliable.

Managerial stress and strain

Among the eight categories of work stressors measured by the OSI, Taiwanese managers reported 'personal responsibility' as the most stressful (item mean = 4.33 on a six-point scale), followed by 'workload' (item mean = 4.05), 'relationships (item mean = 4.04), 'organizational climate' (item mean = 3.96), 'recognition' (item mean = 3.95), 'home/work balance' (item mean = 3.89), 'hassles' (item mean = 3.82) and finally, 'managerial role' (item mean = 3.68). The overall level of work stress for managers was significantly higher than for the general workforce in Taiwan¹¹ ($t = 16.41, p < 0.001$).

There were three broad indices of work strain: work morale (job satisfaction and turnover intentions), health (physical and mental) and finally, behavioural outcomes (smoking, drinking, exercise, absenteeism). Overall, the Taiwanese managers were 'satisfied' with their jobs (item mean = 3.95 on a six-point scale); furthermore, this level of job satisfaction was significantly higher than the general workforce in Taiwan¹¹ ($t = 6.04, p < 0.001$). As can be seen in Table 1, most managers (40.2 percent) only 'sometimes' considered quitting the present job, indicating no strong turnover intentions. Both avowed mental and physical health were near the midpoint tilting towards the better ends on six-point scales (item means = 3.97 and 4.19). However, these levels were significantly poorer than the general workforce in Taiwan¹¹ ($t = 3.40$ and $3.61, p < 0.001$). As for behavioural outcomes, results were more encouraging: by far the majority of managers did not smoke or drink, managed an 'ideal' exercise programme and had very few days off due to personal sickness (Table 1).

When demographic differentials were examined, a series of chi-square tests demonstrated that there were significantly more male managers in the top and senior ranks than female managers; the trend was reversed in the middle and junior positions (chi-square = 12.90, $df = 3, p < 0.01$). There were more male managers who smoked or drank than females

Table 1 — Sample characteristics

Variables	<i>N</i>	%	Mean & SD
Age	320		37.87 5.69 (21–76)
<i>Gender</i>			
Male	191	55.0%	
Female	151	43.5%	
Missing	5	1.4%	
<i>Education</i>			
Primary	1	0.3%	(yr of education)
Junior	2	0.6%	15.60 1.90
Senior	52	15%	
College	242	69.7%	
Postgraduate	50	14.4%	
Missing	0		
<i>Marital status</i>			
Single	86	24.8%	
Married	254	73.2%	
Separated, divorced, widowed	5	1.5%	
Missing	2	0.6%	
Age of youngest child (for those with children)	215		9.27 6.92 (0.5–36)
Tenure (yr)	328		10.22 7.91 (0.25–40)
<i>Rank</i>			
Top	60	17.3%	
Senior	39	11.2%	
Middle	86	24.8%	
Junior	159	45.8%	
Missing	4	0.9%	
<i>Work content</i>			
Sales	68	19.6%	
Administrative	34	9.8%	
Production	54	15.6%	
Finance	39	11.2%	
Medical	47	13.5%	
Others	47	13.5%	
Missing	10	16.7%	
<i>Occupation</i>			
Manufacturing	62	17.9%	
Commerce	64	18.4%	
Finance	41	11.8%	
Industrial service	48	13.8%	
Social service	103	29.7%	
Others	19	5.5%	
Missing	10	2.9%	
<i>No. of employees</i>			
< 100	138	39.8%	
100–500	73	21.0%	
500–1000	35	10.1%	
1000–5000	76	21.9%	
> 5000	21	6.1%	
Missing	4	1.2%	

Table 1. Continued over page.

Table 1 — Continued

Variables	<i>N</i>	%	Mean & SD
Working hours (per week)			46.36 12.89 (5–120)
<i>Turnover intention</i>			
Never	70	20.2%	
Rarely	96	27.7%	
Sometimes	140	40.3%	
Quite often	26	7.5%	
Extremely often	9	2.6%	
Missing	6	1.7%	
<i>Exercise</i>			
Always	26	7.5%	
Usually	66	19%	
Sometimes	70	20.2%	
Occasionally	125	36%	
Never	56	16.1%	
Missing	4	1.2%	
<i>Smoking</i>			
Yes	55	15.9%	
No	287	82.7%	
Missing	5	1.4%	
<i>Drinking</i>			
Yes	88	25.4%	
No	253	72.9%	
Missing	6	1.7%	
<i>Sick leave</i>			
Never	303	87.3%	
Yes	44	12.7%	
Sick days			1.98 1.59 (1–10)

Note: Ranges are shown in brackets.

(chi-square = 47.30 and 65.20, $df = 1$, $p < 0.001$). A number of *t*-tests also revealed that female managers reported more 'managerial role' stress than their male counterparts ($t = 2.49$, $p < 0.05$).

Another series of *t*-tests was conducted to see if there were any differences on stress and strain at different levels of management. Top and senior managers were pooled to contrast with pooled middle and junior managers. Results showed that compared with the lower-rank managers, the higher-rank managers were more satisfied with their jobs ($t = 3.18$, $p < 0.01$) and reported better mental health ($t = 2.36$, $p < 0.05$).

Moderators

In the present study, three potential moderators were considered: Type A behaviour pattern,

internal locus of control and coping efforts. Overall, the Taiwanese managers were not particularly Type A, as indicated by the item mean of 3.49 on a six-point scale. However, this level was already significantly higher than the general workforce in Taiwan ($t = 14.10$, $p < 0.001$). Similarly, they were not particularly internally controlled either, as indicated by the item mean of 3.90 on a six-point work locus of control scale; they even scored significantly lower than the general workforce ($t = 26.36$, $p < 0.001$), as measured by the OSI — control scale.

Managers, however, reported relatively high levels of coping efforts, significantly higher than the general workforce ($t = 11.71$, $p < 0.001$). Interestingly, 'control' (item mean = 4.48 on a six-point scale) seemed more often adopted than 'seeking support' (item mean = 4.17).

Table 2 — Reliability of all scales

Scales	Mean	SD	Item no.	Alpha
Job satisfaction	47.42	9.24	12	0.92
Job itself	24.68	4.94	6	0.88
Organization	22.77	5.10	6	0.88
Mental health	47.62	8.47	12	0.81
Contentment	19.41	4.63	5	0.74
Resilience	17.61	3.04	4	0.64
Peace of mind	10.55	2.94	3	0.57
Physical health	25.14	5.49	6	0.82
Calmness	13.38	3.04	3	0.77
Energy	11.77	3.10	3	0.71
Type A behaviour	20.94	3.05	6	0.46
Impatience	10.79	5.11	3	0.62
Drive	10.13	2.26	3	0.69
OSI — control	8.95	2.10	3	0.72
WLCS (Work Locus of Control)	62.33	5.78	16	0.73
Coping	43.56	5.15	10	0.76
Control	26.86	3.52	6	0.79
Seeking support	16.68	2.61	4	0.51
Stressors	159.00	24.69	40	0.94
Workload	24.30	4.77	6	0.78
Relationships	32.29	6.10	8	0.86
Home/work balance	23.35	4.69	6	0.74
Managerial role	14.72	3.04	4	0.54
Personal responsibility	17.30	3.40	4	0.74
Hassles	15.29	2.95	4	0.61
Recognition	15.78	3.18	4	0.75
Organizational climate	15.83	3.10	4	0.69

Stress-moderators-strain relationships

Table 3 presents the relationships among demographics, work experiences, stress, Type A, internal control, coping, job satisfaction, mental and physical health, smoking, drinking, exercise, absenteeism and turnover intentions. Regarding stress-strain relationships, work stress positively correlated with turnover intentions and negatively correlated with job satisfaction, mental health and physical health. Regarding stress-moderators relationships, control was the only and negative correlate of work stress. Regarding moderators-strain relationships, control positively correlated with job satisfaction and mental and physical health, and negatively correlated with turnover intentions, absenteeism and smoking. Coping, on the other hand, positively correlated with job satisfaction and mental health.

A series of further correlation analyses was carried out to examine intercorrelations among all the OSI scales, their subscales and the WLCS. Results are summarized below, while more details are available from the authors. First, significant

intercorrelations within a particular construct ranged from 0.17 (OSI — control/WLCS) to 0.72 ('relationship stress'/'workload stress'). The only non-significant correlation was between the two Type A subscales ('patience'/'drive'). Secondly, 'resilience' was the worst mental health indicator, which produced the fewest significant correlations with the stress measures. Similarly, 'calmness' was the worst physical health indicator, which produced the fewest significant correlations with the stress measures. Thirdly, 'drive' as a Type A characteristic was not associated with any of the strain measures. Fourthly, OSI — control and the WLCS produced comparable results pertaining to the strain measures. Finally, 'seeking support' as a coping strategy did not correlate with the strain measures.

Predicting job strain

In order to test statistically the proposed relationships among demographics, work experiences, work stress, moderators and job strain, as

Table 3 — Correlations among demographics, work experiences, health habits, absenteeism, turnover intentions and other aggregated scales

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Sex	1																	
2. Age	-0.24***	1																
3. Edu.	0.02	-0.10	1															
4. Mar.	-0.21***	0.42***	-0.01	1														
5. Tenure	0.01	0.70***	-0.07	0.28***	1													
6. Rank	0.17***	-0.37***	0.05	-0.25***	-0.20***	1												
7. Smoking	0.38***	0.10	0.16**	0.08	0.11	0.06	1											
8. Drinking	0.44***	-0.06	-0.04	-0.06	0.04	0.19***	0.44***	1										
9. Exercise	0.19***	-0.16**	-0.04	-0.03	-0.16**	0.11*	0.06	0.07	1									
10. Leave	-0.10	-0.03	-0.07	-0.08	-0.10	-0.07	-0.09	0.07	0.03	1								
11. Quit	0.06	-0.18**	0.06	-0.24***	-0.18***	0.29***	-0.03	-0.04	0.03	0.09	1							
12. JS	0.00	0.12*	-0.10	0.17**	0.05	-0.17**	-0.03	-0.07	0.11	-0.07	-0.34***	1						
13. MH	-0.04	0.24***	0.02	0.18***	0.19***	-0.13*	0.04	-0.04	-0.09	-0.15**	-0.29***	0.30***	1					
14. PH	-0.04	0.26***	0.01	0.19***	0.17**	-0.10	0.19***	0.06	-0.07	-0.21***	-0.18***	0.24***	0.59***	1				
15. Stress	0.07	-0.05	0.08	0.03	0.02	0.11	0.01	0.05	0	-0.01	0.12*	-0.23***	-0.33***	-0.18***	1			
16. Type A	-0.15**	0.01	0.06	0.12*	-0.02	-0.09	-0.03	-0.04	-0.02	0.06	0	-0.07	-0.05	-0.12	0.03	1		
17. Control	0.03	0.09	-0.13*	0.08	0.14*	-0.15**	0.03	0.08	-0.02	0.08	-0.17***	0.30***	0.25***	0.17***	-0.25***	0.04	1	
18. WLCS	0.09	0.07	0.10	-0.07	0.01	-0.18***	0.11*	0.07	-0.01	-0.19***	-0.16**	0.26***	0.24***	0.17**	-0.02	0.03	0.17**	1
19. Coping	0.04	0.11	0.15**	0.06	0.08	-0.14*	-0.02	-0.06	-0.03	0.02	-0.10	0.15**	0.13*	0.06	0.08	0.03	-0.02	0.14*

Sex, 1 = M, 2 = F; Edu., years of education; Mar., 1 = single, 2 = married; Rank, 1 = high-level, 2 = low-level; Smoking, 1 = smokers, 2 = non-smokers; Drinking, 1 = drinkers, 2 = non-drinkers; Leave, days of sick leave; JS, job satisfaction; MH, mental health; PH, physical health.
 * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

depicted in Fig.1, a series of hierarchical regression analyses was conducted to predict job satisfaction, mental health and physical health separately. Significant zero-order Pearson's correlation coefficients between pairs of independent and dependent variables, as presented in Table 3, formed the initial criterion for the inclusion of potential predictors. In each case, demographics were entered first into the equation, followed by work-related experiences at the second step, to statistically control their influences. At the third step, work stress was entered into the equation, followed by moderators at the fourth step. Finally, the interactions between work stress and moderators were included in the regression. In predicting physical health, as smoking was significantly correlated with global physical health, it was also included in the equation to partial out its potential effects on the dependent variable. In an attempt to achieve model parsimony, those initially included independent variables which made no significant contribution to the R-square were deleted and the analysis repeated. Table 4 presents the final results of the three regression analyses.

When predicting job satisfaction, four out of five layers of independent variables were presented in the final equation, and a total of 19 per cent of the variance in the dependent variables was accounted for by the five predictors. Among them, internal control demonstrated the strongest (positive) influence on job satisfaction, whereas work stress demonstrated the strongest (negative) influence. None of the interaction terms reached statistical significance. In other words, there was no evidence of the buffering effects of internal control as a moderator of the stress-strain relationship.

When predicting mental health, four predictors remained significant in the final equation, accounting for a total of 23 percent of the variance in mental health. Age and internal control were positively related to mental health, whereas work stress was negatively related to it. Interestingly, the interaction term between work stress and internal control retained its statistical significance, indicating a vulnerability effect of internal control on the stress-strain relationship.

When predicting physical health, four predictors remained significant in the final equation, accounting for a total of 14 percent of the variance in physical health. Age and being married were positively related to mental health, whereas

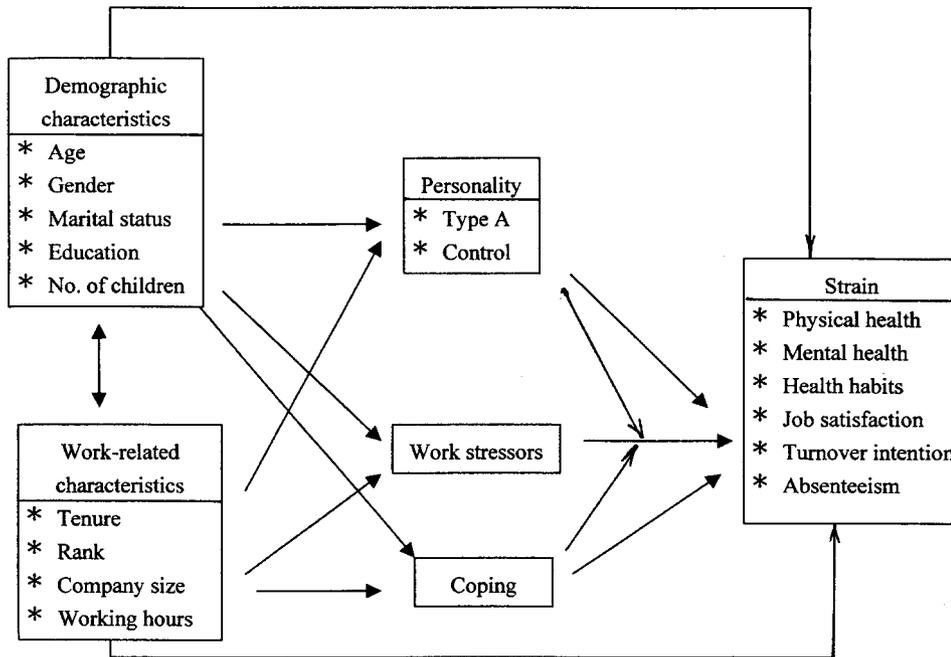


Fig. 1. — Relationships among work stressors, moderators and job strain

Table 4 — Predicting job strain

Variables	β	R^2	$R^2\Delta$	F	Constant
<i>Job satisfaction</i>					
+ Marital status	0.14*	0.03	0.03**		
+ Rank	-0.04	0.05	0.02*		
+ Stress	-0.16***	0.09	0.04***		
+ WLCS	0.20***	0.19	0.10***		
OSI — Control	0.22***				
Total		0.19		12.23***	23.46
<i>Mental health</i>					
+ Age	0.21***	0.05	0.05***		
+ Stress	-0.13***	0.16	0.11***		
+ WLCS	0.33***	0.20	0.04***		
+ Stress \times WLCS	-1.14***	0.23	0.03**		
Total				13.65***	35.88
<i>Physical health</i>					
+ Age	0.19**	0.07	0.07***		
Marital status	0.12*				
+ Smoking	-0.17*	0.09	0.03**		
+ Type A — impatience	-0.22***	0.14	0.05***		
Total				12.50***	19.28

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

smoking and the 'impatient' characteristic of the Type A behaviour pattern were negatively related to it. The interaction between impatience and work

stress did not reach statistical significance, indicating no evidence of Type A as a moderator for the stress-strain relationship.

DISCUSSION

The impact of managerial stress

Being one of the very few concerted efforts investigating managerial stress across the barriers of a single organization, a single occupation or a section of the national economy, and in a non-western country, this study generated valuable evidence of the impact of managerial stress in a rapidly industrializing society. Among the top three work stressors reported by the Taiwanese managers, 'personal responsibility' and 'relationships' may be particularly interesting and relevant in a Chinese culture. In Hofstede's¹⁴ seminal work on the cross-cultural comparison of work-related values, Taiwan was identified as moderate in power distance (ranked 29/30 among 53 countries), low in individualism (ranked 44 among 53 countries), and moderate in uncertainty avoidance (ranked 26 among 53 countries). Corroborating this general description of the Taiwanese culture, managers would be distressed in taking personal responsibilities, which often involve exercising power and tolerating uncertainties; Taiwanese managers would also be rather concerned about the interpersonal relationships at work. The empirical evidence seemed quite consistent with this theoretical reasoning. As noted by other researchers,^{15,16} Chinese workers, especially managers, value *guangxi*, the affiliative relationship between superiors and coworkers, which is a characteristic of the large power distance culture. Although empirical evidence was inconclusive¹⁶ and not particularly strong, it did point to the value of conducting more cross-cultural comparative studies to map out universality as well as specificity in the work stress experiences in different societies.

On the quantitative aspects of the experience of managerial stress, Taiwanese managers perceived more stress than the general workforce in the country and were also more stressed than managers in Hong Kong¹⁷ ($t = 3.78$, $p < 0.001$), the UK and Germany¹⁸ ($t = 13.10$ and $t = 8.69$, $p < 0.001$). This level of work stress was related to job satisfaction, mental health, physical health and turnover intentions (Table 3). Furthermore, work stress was a powerful predictor of job satisfaction (accounting for 4 percent of the variance) and mental health (accounting for 11 percent of the variance). These results are consistent with previous findings.^{18,19} The problems of smoking, drinking, lack of exercise and absenteeism were not

severe among this sample of managers (Table 1). While the behavioural symptoms of stress were not particularly evident, due to the Chinese cultural censorship of excessive smoking or drinking, the self-reported health indicators were rather clear: Taiwanese managers disclosed worse mental and physical health than the general workforce in the country. Although the comparison method adopted may warrant some methodological concerns — simply comparing the work stress and health of managers in this study with other samples in the literature — the cross-sectional data suggest that Taiwan managers may be under stress and risk of ill-health.

In recent years, some research has demonstrated that female managers are under higher stress than their male counterparts,^{20–22} whereas other research yielded inconclusive results.²³ In this study, a *t*-test revealed that Taiwanese female managers did report *more* stress related to the 'managerial role' than their male counterparts (mean = 15.20 vs 14.37, $t = 2.49$, $p < 0.05$), thus partially corroborating the previous studies. 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, unresponsive 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.^{24,25} Hopefully, these findings will serve to raise awareness of the unduly high work stress endured by these Chinese female managers and, in turn, facilitate steps to reduce its detrimental effects on health and work morale.

Structural relationships among work stress, moderators and strain

The structural relationships depicted in Fig. 1 were largely borne out by correlational and regression analyses. More specifically, most of the

stress-strain relationships were significant, except those involving personal health habits. Taking into account the previously mentioned characteristics of the Chinese culture, these results corroborate previous findings.²⁰⁻²² Furthermore, the relationship between perceived work stress and turnover intentions warrants attention from managerial practitioners. As mentioned earlier, there exists a substantial shortage of adequately trained managers in the fast-growing Eastern Asian countries, and the turnover rate within the managerial community has remained rather high. Reducing work stress may be a promising approach to containing the high turnover rate, which, in turn, will save considerable resources for the organizations.

In this study, there was no significant relationship found between job stress or job strain and the global Type A behaviour pattern, nor with its 'drive' subscale (hard-driving and competitiveness). However, the 'impatience' facet (rushed behaviour and abrupt manner) was significantly correlated with both mental and physical health ($r = -0.22$, $p < 0.001$ and $r = -0.14$, $p < 0.01$ respectively). 'Impatience' was even a significant predictor of physical health (Table 4), explaining about 5 percent of the variance. These results are consistent with the existing evidence indicating that the speed-impatience component, and not the competitive drive, is associated with psychological distress.²⁶ These findings also underline the importance of treating Type A behaviour as a multidimensional construct, with some of its characteristics relating directly to work strain without moderating the stress-strain nexus. Some researchers even claim that certain specific components of the Type A behaviour pattern may even be beneficial to psychological well-being among executives.¹⁸ Furthermore, the Type A behaviour pattern may possess desirable characteristics and healthy attitudes,^{27,28} so that Type A persons are perceived as better performers and are more likely to be promoted to managerial positions. This may partially explain the fact that this sample of Taiwanese managers was more Type-A-like than their counterparts in the general workforce, yet significantly less Type A-like compared to the British or German managers ($t = -5.23$ and $t = -4.29$, $p < 0.001$).¹⁸ However, caution must be exercised when generalizing across measures as the components of Type A behaviour are not themselves highly interrelated (ref. 26 and the present study).

Internal control was associated with lower levels of personal work stress. It was also related to a wide range of strain indicators, both behavioural (smoking, absenteeism and turnover intentions) and psychological (job satisfaction and health). It presented the only significant moderating effect on the stress-strain nexus (Table 4). However, these results defy a simple proposal of the underlying mechanism. On the one hand, the main effects of internal control on reduced stress and strain were consistent with previous research in both organizational contexts^{3,7,18,29} and were congruent with the characteristics of internal control as feeling confident and in control of what happens to oneself, and in the potency of one's decisions and action for personal outcomes. On the other hand, the moderating effects of control have been inconsistent in the work context.^{3,18} The present study, unexpectedly, found a vulnerability effect of internal control on the stress-mental health nexus. Explanations may be found within the characteristics of the Chinese culture pertaining to organizational life. In fact, in most Taiwanese organizations traditional authoritarian rather than democratic, paternalistic rather than egalitarian, culture still prevails. Workers, blue-collar, white-collar and middle-level managers alike, have virtually no control and influence with regard to the organizational processes: decisions are made at the top, implemented with top-down communication, and only very recently have some companies opened channels for workers to express complaints and discontent. Also in accordance with the traditional Chinese ethic of respect for the elder, job promotion is again unrelated to performance, but rather to seniority within the organization. If nothing drastic happens (when work stress is low), internal control may serve to safeguard one's personal confidence and psychological well-being; however, if work stress is high, preserving one's beliefs in personal control and actually striving for it, as persons of internal control habitually do, may be counterproductive in a paternalistic and autocratic work scene like that of Taiwan. This *emic* interpretation is consistent with other empirical evidence collected in Taiwanese organizations.^{12,25} Once again, the importance and necessity of conducting cross-cultural comparisons on occupational stress and strain to qualify the generalizability of western theories and findings and to discover new patterns and meanings from a different culture's vantage point are highlighted.

Cross-cultural reliability and validity of the OSI-2

As far as the use of OSI-2 (a brief version used in the present study) in Taiwan is concerned, the internal consistency of its various scales was acceptably high, except the global Type A behaviour pattern (Table 2). This pattern of results is consistent with previous findings using a longer version of the OSI in Taiwan^{3,7} and Hong Kong.^{16,17} Furthermore, the pattern of structural relationships among the OSI scales is rather similar across Taiwan, Hong Kong, Britain¹⁰ and Germany.¹⁸ In the present study, the work stress scale demonstrated good predictive validity (Table 4) and criterion validity (Table 3), whereas the control scale showed good convergent validity with another established work locus of control scale (Table 3). The available OSI data for front-line employees accord with the findings of managerial figures reported in the literature.^{3,7,10,16} Overall, these results indicate that the OSI-2 is a promising and relatively brief instrument in measuring work stress and its related factors in a Chinese organizational context.

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