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A Study of the Job Stress and its Effect of the Information Systems Professional in Taiwan

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Abstract

This study conducts a survey to investigate the information systems professional's job stress and its outcomes in Taiwan's companies. The analysis is based on an organizational stress model. The results of this study indicate that (1) statistically significant difference exists between most of the job stressor and some items of the outcomes, (2) some moderating variables, such as type A personality and SDLC stage, are statistically significant in affecting the job stressor and the outcomes, and (3) statistically significant positive correlation exists between job satisfaction and psychological effects of the job stress.

Introduction

Stress is a psychological reaction to the demands inherent in a stressor that has the potential to make a person feel tense or anxious (Jones, 1996). A large portion of the work force report that their jobs are highly stressful. In 1990, A Gallup survey of personnel and medical directors at over two hundred big and small companies in the United States showed that, on average, twenty-five percent of their companies' employees suffered from anxiety or stress-related disorders (Stewart, 1990). In another survey, the American Academy of Family Physicians estimates that two-thirds office visits to its members are attributable to stress-related symptoms (Wallis, 1983). Ivancevich et al. (1983) examined occupational stress among information personnel of 580 respondents in 18 large corporations in the midwestern and southwestern sections of the United States, and found that various job factors are perceived stressful by respondents.

In Taiwan, there are many information systems personnel in various companies. Unfortunately, little is known about their stress levels and health consequences of working in the information systems area. One important question is whether work in information systems is stressful and ultimately harmful to one's health. Intuitively, one might propose that information systems is a high-stress occupation due to such factors as long work hours, insatiable user demand, unmet deadlines, newly acquired skills constantly become obsolete, shortage of personnel, high turnover, and user resistance to change (Ivancevich et al, 1983). In Taiwan, according to the survey conducted by the Institute of Information Systems, the turnover rate of programmer is 25%. There has not been a study done by researchers in terms of stressors,

stress, and outcome interactions. Therefore, it is important to scientifically examine stress and its consequences among information systems personnel in Taiwan. The purpose of this study is to investigate the information systems professional's job stress and the outcomes (meaning the effects or responses to the job stress) in Taiwan's companies.

Research Model

The research framework of this study is based on Robbins's stress model (Robbins, 1993), which is shown in figure 1. In comparison with Ivancevich and Matteson's stress model (1987), we decide to adopt Robbins's model because it is more integrative. The model identifies three sets of factors-environmental, organizational, and individual- that act as potential sources of stress. Whether they become actual stress depends on individual differences such as gender, age, job experience, and personality. When an individual experiences stress, its symptoms can surface as physiological, psychological, and behavioral outcomes.

Among the potential sources of stress (independent variables), technological uncertainty is chosen as environmental factor. Task demands, role demands, interpersonal demands, and organizational leadership are chosen as organizational factor. Finally, family problems and economic problems are chosen as individual factors.

The research model suggests that various factors can moderate the relationship between stressor, stress, and consequences. Numerous conditions, behaviors, and characteristics may act as stress moderators in this study, including such variables as age, gender, job experience, type A behavior (Friedman and Rosenman, 1974) , and what SDLC(systems development life cycle) stages the people is working.

The outcomes of the job stress of information systems personnel can be subsumed under three general categories: physiological, psychological, and behavioral symptoms. Headache, high blood pressure, and heart disease are chosen for physiological symptoms. The psychological symptoms caused by stress included in this study are job-related dissatisfaction, anxiety, depression, and low self-esteem. The behavioral symptoms studied here include absenteeism, turnover rate, and health-related behavior (number of hospital visited, number of aspirin taken, etc.).

Methodology

This study was conducted by survey research. A total of 153 information systems personnel in Taiwan's major companies completed the anonymous, multiple-item, self-report survey. A Job Stress Scale (JSS) instrument was devised by Chen (1981) to assess the psychological symptoms, such as anxiety, fatigue, depression, and low self-esteem. This study adopted the Job Descriptive Index (JDI, Smith et al., 1969) to assess the subjects' job satisfaction. The JDI measures the work, promotion, salary, supervision, and co-worker satisfaction. Five point Likert scale was used to measure the response of the subjects about the (1) technological uncertainty (environmental factor), (2) task demands, role demands, interpersonal demands, and organizational leadership (organizational factors), (3) family problems and economic problems (individual factors). Type A behavior questionnaire was used to assess the subjects' personality. The subjects self-report the conditions concerning the physiological symptoms (headache, high blood pressure, and heart disease) and the frequencies of the health-related behavior. The SDLC stage is roughly divided into three parts: system analysis/system design, programming, and system maintenance, the subjects were asked to choose one which he was working. All the instruments adopted in this research were well-validated for reliability and validity test. In this study, all Cronbach alpha ranged from 0.81 to 0.95. The result of factor analysis also demonstrates that discriminant validity and convergent validity are satisfied. SAS modules such as, one-way MANOVA and canonical analysis were employed to analyze the data.

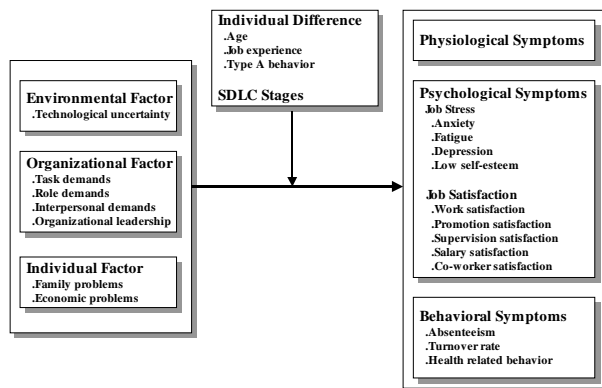


Figure 1. Research framework

Research Finding and Discussion

Table 1 shows the result of MANOVA test. Family problems cause the subjects to have more responses than other stressors. It makes sense that marital difficulties plague anyone when he or she arrives at work especially in the Chinese society. According to the study result, the relative importance of each of the independent variables is

ranked as follows: family problems, tasks demands, organizational leadership, technological uncertainty, interpersonal demands, and economic problems. Companies should pay more attention to those stressors listed in table 1 to reduce the stress and outcomes caused by them.

Table 2 and table 3 show the moderating analysis for the "type A behavior" and "SDLC stages" variables. Some of the stressors have impact on both high "type A behavior" subjects and low "type A behavior" subjects. Both of the subjects have different outcomes to the stressors. Regarding the SDLC stages, the study found that system design/system analysis stage has no effect for the subjects to feel stressful. Programming and system maintenance stages are stressful jobs for the subjects, and the subjects also have different outcomes to different stressors. The findings are reasonable because the coding and system maintenance both are hard work jobs for IS professional.

Table 1. Result of MANOVA Test

Independent variables	Dependent variables*
Technological uncertainty	Absenteeism, Anxiety, Depression
Task demands	Absenteeism, Depression, Low self-esteem, Salary satisfaction, Promotion satisfaction
Interpersonal demands	Anxiety, Supervision satisfaction
Organizational leadership	Anxiety, Fatigue, Supervision satisfaction, Co-worker satisfaction
Family problems	Anxiety, Fatigue, Low self-esteem, Work satisfaction, Salary satisfaction, Co-worker satisfaction
Economic problems	Salary satisfaction, Health behavior

*Only significant variables (p-value<0.05) are presented.

Table 4 provides the results from the canonical correlation analysis. Wilks Lambda with is equivalent "F" distribution is chosen for testing the significance of the null hypothesis that there is no relationship between the criterion and predictor variable sets. Table 4 presents that the canonical variate has a significant canonical correlation ($r=0.954843$; $p\text{-value}<0.001$) with an eigen value of 10.3282. Canonical loadings, which indicate the correlation between the canonical variate and each variable in their respective sets, are preferred for interpretation of the relative importance of variables in the two sets. While there are no definitive guidelines for assessing these statistics, a loading of about 0.3 and above is generally acceptable. Table 4 shows that the canonical loadings of fatigue, depression, job satisfaction, and promotion satisfaction are greater than 0.3. The F value of table 4 rejects the null hypothesis. The results of canonical correlation analysis implies that there is highly statistically significant positive correlation between job satisfaction (in terms of work satisfaction, promotion

Table 2 Moderating Analysis: Type A Behavior

Moderator variables		Independent variables	Dependent variables*
Type A Behavior	High	Economic problems	Salary satisfaction, Health related behavior
		Interpersonal demands	Anxiety, Fatigue, Health related behavior
		Organizational leadership	Supervision satisfaction, Co-worker satisfaction
	Low	Economic problems	Anxiety, Salary satisfaction, Health related behavior
		Technological uncertainty	Fatigue
		Task demands	Fatigue, Depression, Low self-esteem, Health related behavior
	Organizational leadership	Anxiety, Salary satisfaction	

*Only significant variables (p-value<0.05) are presented.

Table 3. Moderating Analysis: SDLC stages

Moderator variables		Independent variables	Dependent variables*
SDLC	Programming	Task demands	Turnover rate, absenteeism, Work satisfaction, Salary satisfaction, Co-worker satisfaction
		Role demands	Turnover rate, Depression, Low self-esteem, Promotion satisfaction
	System maintenance	Interpersonal demands	Anxiety, Health related behavior
		Organizational leadership	Fatigue, Work satisfaction, Co-worker satisfaction
		Technological uncertainty	Anxiety
		Task demands	Turnover rate, absenteeism

*Only significant variables (p-value<0.05) are presented.

Table 4. Canonical correlation analysis

Variables	Canonical loading	Remark
Predictor Set (job stress - psychological symptoms)		
Anxiety	0.0537	
Fatigue	0.8481	#1
Depression	0.8455	#2
Low self-esteem	0.2909	
Criterion Set (job satisfaction)		
Work satisfaction	0.9757	#1
Promotion satisfaction	0.3022	#2
Supervision satisfaction	0.0841	
Salary satisfaction	0.0633	
Co-worker satisfaction	0.2598	
Wilks Lambda	0.074532	
F-Value	28.42	0.0001**

Note: **P-Value<0.01; #1 and #2 indicated that canonical loading is greater than 0.3.

satisfaction, supervision satisfaction, salary satisfaction, co-worker satisfaction) and the psychological effects of the job stress (in terms of anxiety, fatigue, depression, low self-esteem).

Conclusions

Due to the first exploratory study of the job stress and its effect of the information systems professional in Taiwan, the contribution of this study is to empirically find the job stressor and its outcome among IS professionals. The result shows that some of the stressors really affect the information system personnel, and they suffer from anxiety, depression, fatigue, low self-esteem, low job satisfaction, and some health-related problems... etc. Those factors contributing to on-the-job stress among IT professional are (1) fast IT technological innovation (technological uncertainty), (2) long working hours and heavy duty demands (task demands), (3) lack of social support from colleagues and poor interpersonal relationship with users (interpersonal demands), (4) the

managerial style of information systems department's manager (organizational leadership), (5) personal marital difficulties (family problem), and (6) personal financial troubles (economic problem) .

The results of this study will be presented to the managers of the information systems department in Taiwan's companies. The IS managers should focus on the stressor, find some ways to solve them, and lessen the turnover rate of the information system personnel. The companies can help the IS personnel by using clear goal setting, increasing employee participation in decision making, and improving organizational communication to reduce the stress of task demands, interpersonal demands, and organizational leadership. Besides, the companies should also provide continuous education opportunity for IS people to overcome the problem of technological uncertainty, provide the social support to the employee who encounters marital difficulties, and raise the pay to avoid the economic problem of IS professionals.

References available upon request from Szu-Yuan Sun