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Patrick Chang Boon Lee

*Faculty of Business Administration University of Macau, cblee@umac.mo*

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## Perceived Workload and Work Outcomes Among Computer Professionals

Patrick Chang Boon Lee  
Faculty of Business Administration  
University of Macau  
Macao, China  
Email: [cblee@umac.mo](mailto:cblee@umac.mo)

### Abstract

*This research examined the effects of workload on three work outcomes – work exhaustion, job satisfaction, and turnover intention. Data collected from a questionnaire survey were used to test the relationships proposed in this research. The results showed that (a) workload was positively related to work exhaustion and job satisfaction; (b) work exhaustion was positively related to turnover intention and negatively related to job satisfaction, and (c) job satisfaction was negatively related to turnover intention. These results indicate that workload affects turnover intention in different ways, depending on the mediating effects of work exhaustion and job satisfaction. The paper discussed the implications of the effects of workload on computer professionals.*

### Keywords

Workload, job satisfaction, work exhaustion, turnover intention.

### INTRODUCTION

Prior research and industry reports have indicated that computer professionals often experienced heavy workload (Blodgett 2004; Seglin 2001; Li and Shani 1991; Ivancevich et al. 1983). Heavy workload occurs due to many reasons, such as personnel shortages, budget cuts, or tight project schedules and deadlines. Although assigning more work to computer professionals is common in organizations (Konrad 2005), managers and researchers really do not understand how increasing workload is related to the work outcomes of computer personnel. A few studies on workload of non-computer professionals have shown that increasing workload leads to negative consequences, such as lowering job satisfaction (Smith and Burke 1992; Groenewegen and Hutten 1991; Burke 2003; Seo et al. 2004). These results may not be generalisable to computer professionals because prior research suggests that computer professionals belong to an occupational community that is different from communities in other occupations (Ginzberg and Baroudi 1988; Couger et al. 1979; 1992).

There are limited studies that addressed the effects of workload on computer professionals. Workload, however, is an important variable that deserves greater attention as prior studies have consistently shown that it is an antecedent of job burnout (Lieter 1991; Jackson et al. 1987). Burnout is the emotional aspect of exhaustion and it relates to being intensely involved with people. It is especially common among those working in the human service professions such as health care, social services, criminal justice, and education (Malash and Jackson 1984). In the case of computer professionals, Moore (2000) has found that perceived workload is the strongest contributor to work exhaustion, and that work exhaustion – defined simply as the depletion of mental resources to cope with one's work – is an antecedent to turnover intention. Given that turnover of computer personnel is a persistent concern in the industry (Cappelli 2001), it would be beneficial to develop further knowledge about how workload affects various work outcomes. As there is little research that investigates the effects of workload on job satisfaction, the objective of this study, therefore, is to fill this gap in the literature. Specifically, the purpose of this study is to test a model on the effects of perceived workload on three work outcomes – namely, work exhaustion, job satisfaction, and turnover intention. The results derived from this research might provide a better understanding of computer professionals and enable employers to better manage their human resources.

Following the introduction of this paper, the next section presents a review of related literature on workload and job satisfaction. This is followed by a discussion of the research model and the method used to test the model. Next, the results are presented and the paper concludes with a discussion on the implications of the study for research and practice.

### PRIOR RESEARCH ON WORKLOAD AND JOB SATISFACTION

Prior research on the effects of workload has shown that a heavier workload leads to burnout or exhaustion (Moore 2000). However, little is known about how workload affects job satisfaction. As mentioned in the introduction, prior research in the context of non-computer professionals has shown that workload has a negative

impact on job satisfaction (Smith and Burke 1992; Groenewegen and Hutten 1991; Burke 2003; Seo et al. 2004). Nevertheless, there are researchers who feel that the relationship between workload and job satisfaction may not necessarily be negative. Payne and Morrison (1999), for example, have indicated that not all job demands, including heavy workload, are bad or stressful. They suggested that having a higher job demand may arouse or stimulate workers' interest. Based on this premise, it is possible that a higher workload may lead to higher job satisfaction. Indeed, a study by Yperen and Janssen (2002) has found that even though employees felt fatigue due to increasing workload, those with high performance orientation also experienced higher job satisfaction.

Studies that used turnover intention as the dependent variable have shown that job satisfaction is a key determinant of turnover intention (Igarria and Greenhaus 1992; Lee 2000; Lacity et al. 2008). On the other hand, studies that have used workload to explain turnover intention have not explained if there was a relationship between workload and job satisfaction. For example, in examining turnover intention among information technology (IT) road warriors (those who spend most of their workweek away from home at a client site), Ahuja et al. (2007) found that perceived workload affects work exhaustion, and work exhaustion affects turnover intention. Unfortunately, job satisfaction was not included in their study. Therefore, there exists a gap in understanding how workload affects job satisfaction. Also, Rutner et al. (2008) included workload, work exhaustion, job satisfaction, and turnover intention in their study of turnover intention among IT professionals, but they did not hypothesize a relationship between perceived workload and job satisfaction.

Prior research has proposed an inverted-U relationship between job demands and job satisfaction (Scott 1966). The U-shaped relationship is based on the activation theory. According to this theory, an individual is assumed to have a characteristic level of activation that allows the central nervous system to function most efficiently. As the experienced activation level deviates from the characteristic activation level, the efficiency of the central nervous system is diminished. Based on this theory, an increase in job demand is assumed to be beneficial up to a certain level. Beyond that level, however, work outcomes experience less positive affects (Gardner and Cummings 1988). While the explanations for the inverted U-shaped relationship between workload and job satisfaction are compelling, there is limited empirical validation of the theory. According to Cook and Salvendy (1999), it is possible that the relationship exists only when there are extreme conditions of work 'underload' and 'overload'.

## RESEARCH MODEL

This research proposed a model on the effects of perceived workload on computer professionals. Figure 1 presents the model. The model comprises four constructs: perceived workload, work exhaustion, job satisfaction, and turnover intention. The proposed model is an extension of Moore's (2000) work by incorporating job satisfaction as an additional key variable. In the model, turnover intention refers to voluntary turnover intention and job satisfaction refers to the affective reaction to one's job. Consistent with prior research, work exhaustion is defined as the depletion of mental resources to cope with one's work. Perceived workload refers to perceptions that the amount of work exceeds the amount of time available for accomplishing the work. There are six hypotheses in the model. Table 1 provides a list of the hypotheses while the following paragraphs discuss the development of the hypotheses.

The first two hypotheses – namely, (a) perceived workload is positively related to work exhaustion, and (b) work exhaustion is positively related to turnover intention – have been supported in prior research, in the context of both computer and non-computer professionals (Jaskson et al. 1986; Lieter 1991; Firth and Britton 1989; Moore 2000). The two hypotheses were included in the model to reaffirm prior results.

The third hypothesis is the main hypothesis of this study. It proposed a positive relationship between perceived workload and job satisfaction. As alluded earlier, most studies on personnel in non-computer occupations such as teachers, nurses, and doctors have shown that perceived workload is negatively related to job satisfaction. Yperen and Janssen (2002), however, found that individuals with high performance orientation experienced higher job satisfaction when they are met with higher job demand such as increasing workload. The results of their study provide a clue that there might be contextual factor(s) that could impact the relationship between workload and job satisfaction among computer professionals. Given prior findings that IT professionals have, on average, higher growth needs compared to people in other professions (Couger et al. 1979; 1992), it is possible that perceived workload is positively related to job satisfaction.

There are a number of reasons to support the relationship between workload and job satisfaction. For example, IT professionals love the opportunity to be exposed to more work because they want to learn and achieve more. They feel the need to keep up with the progressive pace of technology or else they may become obsolete in their profession (Lee 2000). IT professionals are also constantly looking for more opportunities to upgrade themselves as this will help them to develop a long list of work they have completed (Lee 2002). They can then develop an impressive resume for their prospective employers. It is a career strategy computer professionals used to ensure

their employability. Melymuka (2000) has presented a number of anecdotal evidences to show that IT personnel love the opportunities to learn new skills and they are not afraid of hard work. For IT professionals who have little work to occupy themselves, they are likely to be less satisfied because there is no challenge and their work is boring. Unlike prior research related to non-computer professionals, this study proposed that workload is positively related to job satisfaction.

The fourth hypothesis states that work exhaustion is negatively related to job satisfaction, and the fifth hypothesis states that job satisfaction is negatively related to turnover intention. The fourth hypothesis has been tested in the context of computer professionals and it was found there was indeed a negative relationship between work exhaustion and job satisfaction (Rutner et al. 2008). The fifth hypothesis has extensive support in the context of both computer and non-computer professionals (Cotton and Tuttle 1986; Igbaria et al. 1992; Lee 2000). The fifth hypothesis was included to enable a holistic evaluation of the research model.

The sixth hypothesis states that perceived workload is positively related to turnover intention. If computer professionals perceive their workload is high, it may trigger the notion that their employers are uncaring and taking advantage of them. This, by itself, may cause employees to develop turnover intention. The relationship between workload and turnover intention has not been tested in the context of IT professionals. Although Moore (2000) has reported a direct negative path from workload to turnover intention, her study did not discuss the finding.

In summary, the research model includes four hypotheses where the relationships have been tested in prior research on computer and non-computer professionals. They involve relationships between the following variables: (a) perceived workload and work exhaustion (H1), (b) work exhaustion and turnover intention (H2), (c) job satisfaction and turnover intention (H5), and (d) work exhaustion and job satisfaction (H4). The model also includes two hypotheses involving relationships that have not been tested on computer professionals. They involve relationships between the following variables: (a) perceived workload and job satisfaction (H3) and (b) perceived workload and turnover intention (H6).

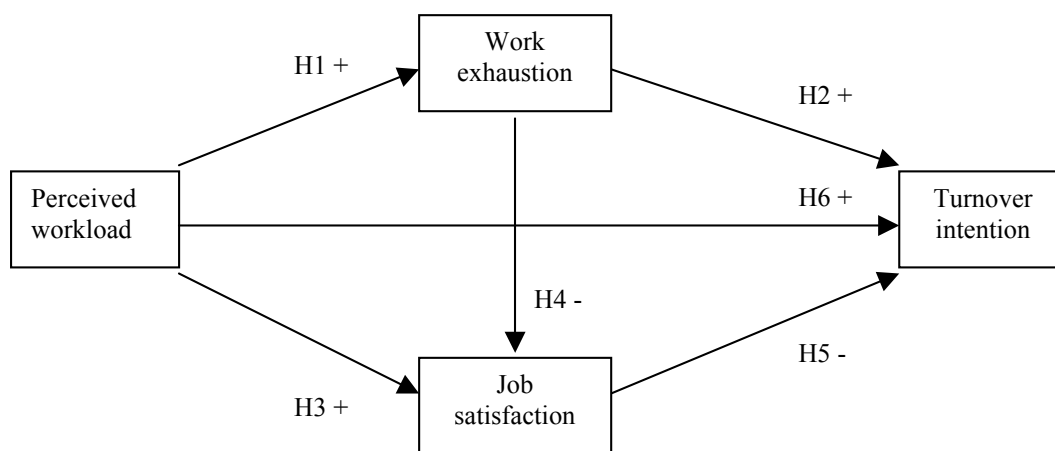


Figure 1. Proposed Model

Table 1. List of Hypotheses

Hypothesis No.	Hypothesis
1	Perceived workload is positively related to work exhaustion
2	Work exhaustion is positively related to turnover intention
3	Perceived workload is positively related to job satisfaction
4	Work exhaustion is negatively related to job satisfaction
5	Job satisfaction is negatively related to turnover intention
6	Perceived workload is positively related to turnover intention

## RESEARCH METHOD

Data for this research were collected from a mailed-questionnaire survey. The questionnaire and a postage-paid return envelope were distributed to 1,900 readers of a publication called E-week (Singapore edition). E-week is a fortnightly publication that contains articles related to technology news. The readers were shortlisted for the survey based on the criteria that they were working in an IT job. They comprised systems executives, computer programmers, systems analysts, systems engineers, and computer managers.

To increase the response rate, the survey did not require respondents to identify themselves. Furthermore, the questionnaire was formatted in such a way to enable respondents to fill in their answers easily. Appendix A shows the items that were used to measure the constructs. All items in the questionnaire used a seven-point Likert-scale in which the responses ranged from strongly disagree to strongly agree. Prior studies that used the items to measure the constructs have established that they have high reliabilities. Perceived workload was measured using four items from Kirmeyer and Dougherty (1988). Work exhaustion was measured using four items from the General Burnout Questionnaire (Schaufeli et al. 1995). Turnover intention was measured using three items from Peters and Jackofsky (1979) and one item from Mobley et al. (1978). Job satisfaction was measured using three items from Hoppock (1935).

Table 2 shows the respondents' characteristics. Three hundred and forty-four complete responses were received for the survey, representing a response rate of about 18 percent. Seventy percent of the respondents were males and the rest females. Slightly more than one-third of the respondents were in the age range from 25 to 30, reflecting the demographics of computer professionals in Singapore, which has a relatively young computer workforce. Given that the survey was anonymous, the researcher could not identify those who failed to respond. Thus, it was not possible to determine whether non-respondents differed systematically from those who responded. As an alternative test of non-response bias, those who responded late were used as proxies for those who did not respond. Using this method to measure non-response bias, the data from the first thirty respondents – categorized based on their postmarked dates in the returned envelopes – were compared to those for the last thirty respondents (Wallace and Mellor 1988). The results indicate there were no significant differences in responses between the early and late respondents.

Table 2. Respondents' Characteristics

Sex		
Males	239	(70%)
Females	105	(30%)
Age		
Under 25	58	(17%)
25 to under 31	123	(36%)
31 to under 36	86	(25%)
36 to under 41	44	(13%)
Over 41	33	(9%)
Organizational tenure		
Under 2 years	142	(41%)
2 to 5 years	130	(38%)
6 to 10 years	45	(13%)
Over 10 years	27	(8%)

## RESULTS

A factor analysis was first conducted to confirm the validity of scales used to measure the constructs used in this study. Table 3 shows the results. They showed that all the items fall neatly into the four constructs used for this study. All the individual item loadings exceeded the 0.7 criterion, and none of the items loaded more highly on another construct than they did on the constructs they were designed to measure. Table 4 shows the descriptive statistics. The table shows that all constructs have moderately high reliabilities. The correlation coefficients show that perceived workload is positively correlated with work exhaustion and turnover intention. There is no correlation, however, between perceived workload and job satisfaction. The correlation coefficients also indicate that work exhaustion is negatively correlated with job satisfaction and positively correlated with turnover intention. As expected, job satisfaction is negatively correlated with turnover intention.

The data were analysed using the AMOS version 7 software. Figure 2 shows the results of the analyses. Six measures of fit were used to determine how well the data fit the model. They were the Chi-square/degree of freedom, goodness of fit index (GFI), adjusted goodness of fit index (AGFI), norm fit index (NFI), comparative

fit index (CFI), and the root mean square error of approximation (RMSEA). The results indicate that the data fit the model. Furthermore, all the parameters are significant and they are in the expected direction. Hence, all the hypotheses are supported.

Table 3. Results of Factor Analysis

Items	Component			
	1	2	3	4
TI2	<b>0.931</b>	0.086	0.06	-0.172
TI4	<b>0.924</b>	0.105	0.083	-0.178
TI1	<b>0.916</b>	0.116	0.031	-0.204
TI3	<b>0.884</b>	0.168	0.094	-0.224
WE2	0.062	<b>0.85</b>	0.289	0.061
WE4	0.141	<b>0.833</b>	0.27	-0.138
WE1	0.083	<b>0.831</b>	0.19	0.016
WE3	0.215	<b>0.752</b>	0.185	-0.311
WL2	0.048	0.205	<b>0.821</b>	0.028
WL3	0.069	0.345	<b>0.803</b>	0.129
WL1	0.008	0.078	<b>0.751</b>	0.028
WL4	0.16	0.407	<b>0.731</b>	-0.023
JS2	-0.242	-0.092	0.031	<b>0.906</b>
JS1	-0.264	-0.158	0.093	<b>0.860</b>
JS3	-0.167	0.022	0.039	<b>0.859</b>

Table 4. Descriptive Statistics

	Mean	S.D.	Alpha	(1)	(2)	(3)
1. Perceived workload	4.95	1.15	0.84			
2. Work exhaustion	4.29	1.38	0.89	0.56**		
3. Job satisfaction	5.00	1.24	0.90	0.05	-0.20**	
4. Turnover intention	3.94	1.80	0.96	0.18**	0.30**	-0.44**

\*\*p<0.01

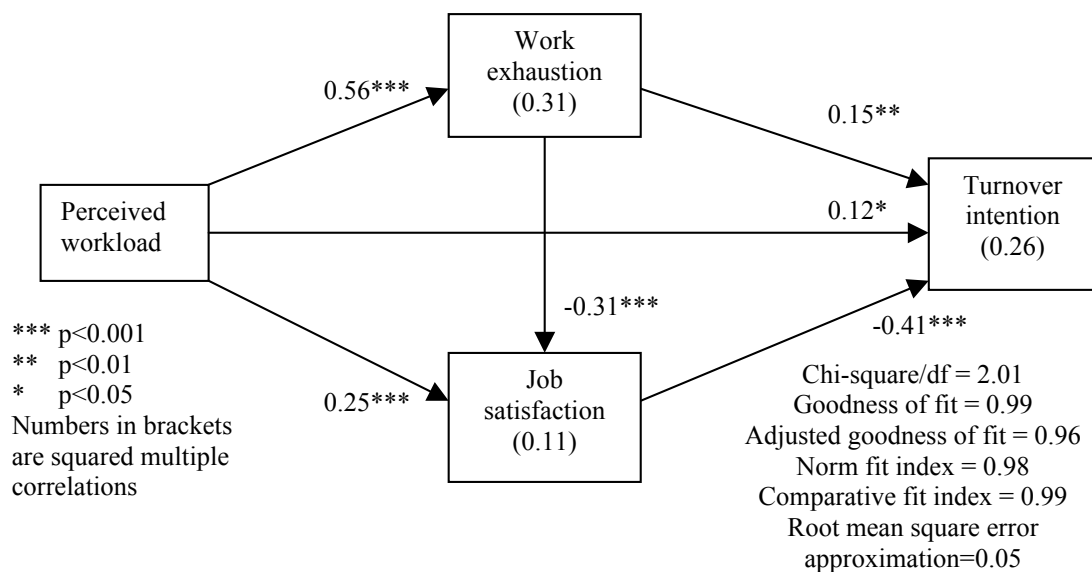


Figure 2. Results of Analysis (Standardised Estimates)

## DISCUSSION AND CONCLUSION

While some results obtained from this study reaffirmed those found previously – for example, perceived workload is positively related to work exhaustion (H1), work exhaustion is positively related to turnover intention (H2), work exhaustion is negatively related to job satisfaction (H4), and job satisfaction is negatively related to turnover intention (H5) – the rest provided new insights. Of significance is the result that showed perceived workload is positively related to job satisfaction. While results from prior studies showed mostly that the relationship between workload and job satisfaction is negative, the results of this research showed that the relationship is positive. As suggested in the section on the research model, the positive relationship might be due to the high growth needs of the computer professionals. It is possible that computer professionals like to be assigned more work so that they can learn more and keep themselves up-to-date with technology. In this way, they can ensure their employability. This is a suggested explanation, however. More exact tests of the explanation for the relationship are needed. Also, another plausible reason for the positive relationship between workload and satisfaction could be that when organizations assign more work to computer professionals, they are actually signalling that they have trust in the computer professionals. Computer professionals, therefore, develop a sense of self-importance and they feel more satisfied. Again, this is a suggested explanation and future research can examine the exact cause of the relationship between workload and satisfaction to determine why the two constructs are positively related.

The results obtained in this research also showed that perceived workload has a direct positive relationship with turnover intention. As explained previously, the positive relationship might be because a heavier workload would indicate that the employer is uncaring and simply dump the work onto the employees. A heavier workload would therefore cause computer professionals to have higher turnover intention. It should be noted, however, Moore (2000) reported a negative relationship between perceived workload and turnover intention. The difference in result could be because Moore (2000) did not include job satisfaction in her model. The negative relationship between perceived workload and turnover intention found in her study could have embedded the indirect effect of workload on turnover intention via job satisfaction.

On the whole, the contribution of this research is that it shows how perceived workload is related to turnover intention. To illustrate, the results show that workload has a direct, positive relationship with job satisfaction, work exhaustion, and turnover intention. Work exhaustion, in turn, has a direct, negative relationship with job satisfaction. These results imply that while workload can indirectly lower job satisfaction by increasing job exhaustion, it can also directly increase job satisfaction. The net effect of workload on job satisfaction, therefore, depends on the magnitude of the opposing (direct and indirect) effects. In the case of the results shown in Figure 2, the total effects of workload on job satisfaction is positive ( $= 0.56 \times -0.31 + 0.25 = 0.08$ ). That is, the negative effect of workload via work exhaustion is offset by a higher direct, positive effect from workload to job satisfaction. It is therefore not surprising to note in table 4 that the correlation between workload and job satisfaction is positive, even though it is not significant. The results of this research show that we should not overlook the insignificant correlation between workload and job satisfaction. Instead, we should tease out the different effects of workload on job satisfaction and explain that workload affects job satisfaction in different ways. This will provide practitioners a richer understanding of the motivations of computer professionals.

Besides the effects of workload on job satisfaction, the results of this study also show that workload can directly increase turnover intention or it can also increase turnover intention through work exhaustion. All these results are useful to personnel practitioners who need to manage computer professionals. They need to understand that workload can have various kinds of effects on turnover intention. They should understand how to optimise the effects of workload so that they can manage IT professionals effectively.

The results of this study, however, are subject to a number of limitations. First, the data used for this study are cross-sectional in nature. It is not possible, therefore, to infer causality. Future studies can use longitudinal data to test the model. Second, the sample used in this research comprised computer professionals in Singapore. While the researcher is not aware of any idiosyncrasies regarding how computer professionals work in Singapore, replication of this research using samples of computer professionals in different countries is useful in helping to verify whether the effects of workload on job satisfaction are similar across countries. There is reason to believe that computer professionals behave similarly across nationalities as prior research has shown that their motivational characteristics are similar (Couger et al. 1979; 1991; 1994). Furthermore, Gomez-Mejia (1984) has shown that work attitudes of professionals are influenced more by their occupational culture than by their societal context. Nevertheless, replication of this research can confirm generality of the results.

To conclude, the results of this study showed that perceived workload has a direct positive relationship with job satisfaction. This is an interesting finding that differs from most results obtained in prior research. The results of the current research provide an impetus for future research to determine the specific explanation for the positive relationship between perceived workload and job satisfaction among computer professionals. The results of this

study also have practical implications for management of computer personnel. Managers need to understand that perceived workload has positive as well as negative effects on job satisfaction. That is, while a heavy workload can lead to higher work exhaustion and consequently lower job satisfaction, it can also directly increase job satisfaction. The findings of this research, therefore, provide researchers and practitioners a richer understanding of the effects of perceived workload on the work outcomes of computer professionals.

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## APPENDIX A

Items for constructs

Perceived workload

1. I feel that the amount of work I do interferes with how well it is done
2. I feel that the number of requests, problems or complaints I deal with is more than expected
3. I often feel busy and rushed
4. I often feel pressured

Work exhaustion

1. I feel emotionally drained from my work
2. I often feel used up at the end of the work day
3. I feel fatigued when I get up in the morning and have to face another day on the job
4. I feel burned out from my work

Job satisfaction

1. I like my job very much
2. I enjoy working in my job most of the time
3. I like my job better than most people like theirs

Turnover intention

1. I intend to leave my job in the next 6 months
2. I will actively look for a new job in the next 6 months
3. I have thoughts of leaving my job in the next 6 months
4. I am likely to be working for another organization in the next 6 months

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