

COPING BEHAVIOURS OF CONSTRUCTION ESTIMATORS IN STRESS MANAGEMENT

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Cost estimation does not only require a precise technical and analytical input from estimators but also involve the use of subjective judgment. The short tendering period together with the accuracy required have induced a great deal of stress to estimators. Some clinical studies have shown that reasonable stress could motivate an individual at work and stimulate the output; however excessive stress might seriously affect the performance. An appropriate coping behaviour can adjust the stress for the optimization of estimating performance. This paper aims to (1) identify the estimators' coping us to stress; and (2) investigate the relationships between stress and coping behaviour in the construction estimation. Based on the extensive literature review, two kinds of coping behaviours are identified: problem focused coping behaviours (direct and control action, instrumental support seeking and preparatory action); and emotion-focused coping behaviours (escape, positive/negative emotional discharge and religious emotional support). A questionnaire survey indicates that various behaviours are applied to cope with the stress by the estimators with different working experiences. Senior estimators normally apply problem-focused coping behaviours to alleviate the stress encountered in the jobs, while junior estimators with limited working experiences prefer to seek emotional support from their religions in order to relieve the stress. Sufficient on-job training and problem-solving skills are thus recommended in order to improve their estimation performance

Keywords: construction estimators, stress, coping behaviours, working experience.

INTRODUCTION

Many people work in high stressful circumstances. People who cannot manage high stress levels at work may harm themselves or others. For example, an Associate Director of Hong Kong Immigration Department committed suicide in the last year due to the extremely high stress level at work (Ming Pao 2002).

In the construction industry, estimators always work under pressure to produce a precise estimate since it can have a significant impact on the success of a project or the profit margin of a company. Some clinical studies have shown that reasonable stress could stimulate the output, but excessive stress might seriously affect individual's performance. There are a lot of studies that have investigated stress in occupational psychology; most of the investigation focuses on relationships between stress and performance (Motowidlow *et al.* 1986; Beehr *et al.* 2000). In Leung and Lam (2002), the factors leading to stress in the estimation process have been examined, and simultaneously, the correlation between stress and performance of estimators has already been established. Moreover, a lot of researchers viewed coping as a major component in the overall stress process (Pearlin and Schooler 1978; Newton and Keenan 1985). Coping behaviours have been largely studied in relation to job-induced stress for different occupations such as managers, engineers, nurses,

pharmacists, teachers and supervisors (Newton and Keenan 1985). Up to the present, there is a lack of research in the identification of stress, coping behaviour and performance in the construction industry.

Relatively little attention has been put into identifying the coping behaviours of estimators in respect to their stressors, stress and performance all together. A study of coping behaviours of estimators is, thus, significant for the improvement of estimating performance.

COPING BEHAVIOURS FOR STRESS

Four stressors for construction estimators including personal, interpersonal, task, and physical stressors had been identified in the study of Leung and Lam (2002) previously.

Personal stressors almost arise from personal characteristics such as Type A behaviours (i.e. extremely competitive, committed to work and strong in time urgency) and the private life style.

Interpersonal stressors represent the poor relationships between the colleagues in the organizations due to conflict and distrust. *Task stressors* is suffered under the situations that the workload is too high or too, the task is out of the estimator's capability, the time allowed for the estimation is limited and/or the objectives of estimating task is vague.

Physical stressors relate to the environment that an estimator works at. Since coping behaviours do not only mediate between stressful events but also improve the performance outcomes, coping act is a major component in the overall stress process (Pearlin and Schooler 1978; Newton and Keenan 1985). Coping behaviours increase the precision of an estimate and maintain a high quality at work. However, no coping style that is adaptive across all stressful circumstances as they are so complicated. Coping behaviours for estimators are hence distinguished in terms of two focuses (problem and emotion) with numerous sub-dimensions under careful empirical work as shown below.

Problem-focused coping focuses on task situation and problem solving through a number of coping behaviours, e.g.,

Direct and Control Action refers to the process of taking direct actions of an estimator to remove the stressor suffered during estimate, to ameliorate its effect and to resolve the problem (Newton and Keenan 1985);

Instrumental Support Seeking represents the situation that an estimator seeks advice, assistance or information from different people in order to help in completing the estimate (Billings and Moos 1984; Carver *et al.* 1989);

Preparatory Action involves mental planning and organizing for coming up with action coping to handle problems (Carver *et al.* 1989); and *Problem Appraisal* means that an estimator tries to identify the cause, possible actions and related consequences of problems (Billings and Moos 1984).

Emotion-focused coping aims at managing distress emotions of individual through various coping behaviours explained hereafter (Craver *et al.* 1989; Latack and Havlovic 1992; Djebarni 1996).

Affective Regulation intends to control emotions by suppressing impulsive acts and then bolster morale by positive thinking (Newton and Keenan 1985).

Emotional Discharge is a behavioural expression of unpleasant emotions to reduce tension, e.g., exercising, smoking, drinking and eating (Billings and Moos 1984).

Seeking Emotional Support means that estimators like to talk with someone else for getting moral supporting, sympathy or understanding (Newton and Keenan 1985; Carver *et al.* 1989).

Denial /Escape represents that an estimator isolates himself from the stress encountered by ignoring or escaping (Newton and Keenan 1985; Carver *et al.* 1989).

The selection of coping behaviours is affected directly, indirectly or interactively by various factors such as the perceived stress, stressors, different experiences and social networks (Tillmann and Beard 2001). If estimators can control these factors with appropriate copings, there will be a positive impact on estimation performance. Response of estimators to stress is contingent on the nature of stressors. Each stressor may activate its own coping behaviour (Lazarus and Folkman 1984; Djebarni 1996). For example, people are more likely to use problem-focused coping in dealing with work-related problems and use emotion-focused coping behaviours with family or health issues.

COPING BEHAVIOURS AND PERFORMANCE

The consequences of high stressful circumstances may have both direct and indirect effect on the individuals and organizations, e.g., decline in performance and intention to quit project (Djebarni 1996). Job performance is a multidimensional concept which includes performance of both technical and non-technical aspects (Anderson 1976).

Technical performance refers to the effectiveness of an estimator's execution of an estimate, while non-technical performance refers to an estimator's ability to get along with others at work. Pearlin and Schooler (1978) emphasized that an effective coping behaviour could maximize positive consequences and, simultaneously, minimize the impact of stress and alleviate its negative consequences (Lazarus and Folkman 1984). Individuals suffered react with different types of coping behaviours for different stressors which, in turn, lead to varying levels of performance. Hence, Anderson (1976) reported that the frequent use of the problem-focused coping behaviours have positive influence on job performance whereas emotion-focused coping behaviours were associated with low performance under high stress.

RESEARCH METHOD

Questionnaire survey was conducted for this research to establish the significance relationship of the identified coping behaviours to stress. It involved the personal background information of estimator including age, gender, company type, position in the company, working experience, etc.

The stress level of estimators which was measured based on the difference between the expectation and actual abilities of estimator to handle the project as proposed by Gmelch (1982). For the coping behaviours relating to construction estimators such as problem-focused and emotion-focused copings were designed based on previous researches (e.g., Cooper *et al.* 2000). All statements in the Coping Behaviours part requested respondents to answer on a seven-point scale, from (1) to (7), representing the degree of agreement on the sentences. The questionnaires were distributed out to

the estimators in Hong Kong by post/fax/email. 200 sets of questionnaire were sent out to different types of construction companies including public sectors, consultants, contractors and developers all over the world.

Finally, 90 questionnaires were received, representing a response rate of 45%. Among the respondents, more than half of them contain over 10 years working experience. 43.3% of them have 10-20 years working experience and 16.7% of them have more than 20 years working experience. In the construction industry, an estimator with less working experience seldom works on an estimate independently. Therefore, only 7.8% and 11.1% of respondents have less than 3 years and 3-5 years working experience respectively in the study.

RELATIONSHIP BETWEEN STRESS AND COPINGS

To identify the principal components of the items, all items relating to coping behaviors were factor-analysed in SPSS for Window R11.0 with varimax rotation and the results is shown in (Table 1). Most of the variables were loaded on appropriate factors (C2-C4) with the exception of the original ‘problem appraisal’ and ‘direct and control action’ items being combined into the factor ‘direct and control action’ (C1). The original ‘emotional support seeking’ and ‘emotional discharge’ scales were transformed into two new factors, namely ‘positive emotional discharge’ (C5) and ‘negative emotional discharge’ (C6). All the coefficient alpha reliabilities were within the acceptable ranges. The seven coping behaviours (C1-C7) were further classified into two main focuses: problem and emotion.

Table 1 Factor analysis of coping behaviours

Category of Copings	Factors (Copings)	Item	Factor loading	Alpha
Problem-Focused	C1 Direct and control action	I try to solve the problem with different ways. .	.815	0.83
		I think about the event and learn from my mistake	.774	
		I consider several alternatives for handling the problem	.762	
		I draw on my past experiences that I was in a similar situation before.	.709	
		I try to find out more about the situation	.626	
	C2 Instrumental support seeking	I talk to colleagues who can help me out with the problem.	.799	0.75
		I draw on support from boss /supervisor, discuss the problem with him/her	.797	
		I sought help from persons with similar experiences	.698	
	C3 Preparatory action	I put extra attention on planning and scheduling rather than acting on impulse	.865	0.78
I try to come up with a strategy about what to do		.813		
I brainstorm all possible solutions before deciding what to do		.633		
Emotion-Focused	C4 Escape	I get busy with other things to keep my mind off the problem.	.868	0.76
		I move to other work activities that I know I can get satisfaction from.	.772	
		I try to keep away from this type of the situation	.678	
		I think about the challenges I can find in this situation.	.624	
	C5 + emotional discharge	I get upset and let my emotions out	.769	0.57
		I talk to someone about how I feel.	.667	
		I try to reduce tension by eating more	.648	
	C6 - emotional discharge	I try to reduce tension by smoking more	.885	0.73
I try to reduce tension by taking more tranquilizing drugs		.812		
C7 Religious emotional support	I try to find comfort in my religion.	.867	-	

To evaluate the behaviours for coping stress in the estimation process, relationships amongst the identified coping behaviours to stress were tested by correlation coefficient (see Table 2). Since there involves complicated coping behaviours applied by the estimators in the construction industry, the evaluation is further divided into five main groups according to the working experiences of estimators in the industry (< 3 yrs, 3-5 yrs, 5-10 yrs, 10-20 yrs and > 20 yrs).

Table 2 Correlation between Stress and coping behaviours

COPING BHEAVIOURS	STRESS				
	<3 yrs.	3-5 yrs.	5-10 yrs.	10-20 yrs.	>20 yrs.
<u>Problem-focused orientation</u>					
C1 Direct action	-.167.	-.355	-.408	.134	-.470
C2 Instrumental support seeking	.071	-.133	-.522*	.098	-.288
C3 Preparatory action -.	-.578	.037 -.	-.086	.019 -.	-.179
<u>Emotion-focused orientation</u>					
C4 Escape .	.534	.331.	.246 .	.015	.167
C5 +Emotional discharge	-.057	.257	-.365 .	.057	.160
C6 - Emotional discharge	-.460	-.196	-.004	-.113	-.037
C7 Religious emotional support	-.902**	-.180	.380	.148	-.291

Note: Total sample size = 90 estimators.

** Correlation is significant at 0.01 level (2-tailed) ; and

* Correlation is significant at 0.05 level (2-tailed).

The results indicate that ‘religious emotional support’ has a significant negative relationship to the perceived stress of respondents with experience below 3 years (-0.902 , $p < 0.01$), while the ‘instrumental support seeking’ is related to the perceived stress of respondents with working experience between 5-10 years (-0.522 , $p < 0.05$). However, there has no significant relationship between the coping behaviours and the perceived stress level of respondents who have working experience between 3-5 years, 10-20 years and over 20 years.

DISCUSSION

Estimators with working experiences of 5-10 years often equip a certain amount of working experiences in their careers. However, it may not sufficient to solve all the estimation problems, due to the complicated construction projects in Hong Kong. The study indicates that they normally apply problem-focused coping behaviour (instrumental support seeking) in the stress management.

Estimators with certain amount of working experiences often seek support from colleagues and supervisors in order to alleviate stress in the estimation process. However, they rarely apply emotion-focused coping behaviours under the stressful circumstances. Craver *et al.* (1989) and Latack and Havlovic (1992) also reported that the emotion-focused coping behaviours can help in reducing or managing emotional distress that is associated with the situation and maintains a moderate level of arousal. Therefore, this group of estimators should have a better understanding of the positive effects of the emotionfocused coping behaviours which are useful responses especially under the extremely high stressful situation.

Religion is an important variable to assist a person to manage the stress well in the job. The results show that estimators with the working experience less than 3 years positively rely on the religion to release their stresses in the estimation. They prefer to relax and stimulate their positive thinking to deal with the problems at work by religion rather than ‘escape’ or ‘negative emotional discharge’ coping behaviours which may cause the job dissatisfaction or seriously affect the health of estimators respectively. This study indicates that estimators with *working experience below 3 years and between 3-5 years* rarely adapt the problem-focused coping behaviours in the stressful situation. It represents that they normally cannot solve the problems at work positively. Indeed, it is difficult for them to deal with a problem directly and individually as they have limited alternative solutions and lack of confidence to consult others’ advice.

Therefore, it is necessary to provide sufficient on-job training and problemsolving skills (e.g., information collection and cost adjustment) to the estimators who have limited estimation experiences in the industry. In order to optimize the estimation performance, it is necessary to establish good team spirit in a company. In fact, a good working environment can encourage junior estimators to seek support or consult from others at work (Billings and Moos 1984).

It is interesting to note that there has no significant relationship between stress and problemfocused/ emotion-focused coping behaviours for estimators with *working experience more than 10 years*. In accordance with the literature review, the stress level of estimator was measured based on the difference between the expectation and the actual abilities of estimator to handle the estimate (Gmelch 1982). In fact, estimators with rich working experiences do not consider estimate is one of the main sources of stress as they can solve the problems stemming from their sufficient experiences. It seems that this group of estimators suffers stress due to the other factors which are not covered in the study, e.g., attending the construction meeting on behalf of the company or the government for strategic decision.

CONCLUSIONS

Through an extensive literature review and a questionnaire survey, two kinds of coping behaviours are identified as: problem-focused coping behaviours (direct and control action, instrumental support seeking and preparatory action); and emotion-focused coping behaviours (escape, positive/negative motional discharge and religious emotional support). The study reveals that estimators with different length of working experience apply different coping behaviours in the estimation.

The estimators with rich working experiences do not consider estimate is the major source of stress for them, while the junior estimators with limited estimate experiences seek emotional support from religion in the stress management. On the other hand, the estimators who equip a certain amount of working experiences in their careers prefer to apply problem-focused coping behaviours to manage their stress.

Sufficient on-job training and appropriate problem-solving skills are thus required to ensure the accuracy estimation performance, especially for the junior estimators in the industry. Nevertheless, this research is not without limitations. For instance, estimators may have their own theories of causality so their responses may be influenced by a tendency to give, consistent answers to the questions of stress and coping behaviours. Also, further research is recommended to investigate the variables that have effect on estimators during the estimating process such as the cultural difference, gender difference, etc. since working experience may only be one of the factors influencing the stress and the coping behaviours of estimators in the industry. In addition, this study did not focus on the effect of coping behaviours in the entire estimation process. Further investigation of the relationships between coping behaviour and performance is desirable for determining how coping behaviour could be correctly applied to improve the performance of the estimators.

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