Routledge
Taylor & Francis Group

Construction Management and Economics

ISSN: 0144-6193 (Print) 1466-433X (Online) Journal homepage: https://www.tandfonline.com/loi/rcme20

Psychological adjustment and coping among construction project managers

Natasha S. Haynes & Peter E. D. Love

To cite this article: Natasha S. Haynes & Peter E. D. Love (2004) Psychological adjustment and coping among construction project managers, Construction Management and Economics, 22:2, 129-140, DOI: 10.1080/0144619042000201330

To link to this article: https://doi.org/10.1080/0144619042000201330

Construction Management and Economics (February 2004) **22**, 129–140

Spon Press
Taylor & Francis Group

Psychological adjustment and coping among construction project managers

NATASHA S. HAYNES and PETER E. D. LOVE*

School of Management Information Systems, Edith Cowan University, Churchlands, Perth, WA 6018, Australia

Received 17 June 2002; accepted 20 February 2003

Construction project managers work under conditions of uncertainty and high risk, and this can contribute to an excessive level of work-related stress being experienced. To date, there has been limited research that has examined how project managers cope with work-related stress. This paper investigates whether coping and affect (both negative and positive) influence adjustment (anxiety, depression and stress) among project managers. A sample of 100 male project managers from Australian contracting organizations completed a questionnaire that measured coping strategies, affect state and potential stressors. Hierarchical regression analyses demonstrated that specific work-related characteristics such as work experience, project size, age and level of education influenced the psychological adjustment of the project managers sampled. Further, those who engaged in a more problem-focused style of coping, such as active coping were found to be better adjusted than those who engaged in more emotion-focused styles of coping such as cognitive avoidance coping, social coping, accepting responsibility and self-controlling coping. In addition, it was revealed that increased adjustment of project managers was associated with positive affect. It is concluded that the psychological adjustment of project managers is influenced by specific work-related characteristics, the types of coping strategies they use and their affect state.

Keywords: Adjustment, anxiety, depression, stress, coping, project managers

Introduction

Management has generally been identified as a high stress occupation (Karasek, 1979; Beehr *et al.*, 1990; Bacharach and Bamberger, 1992; Cohen, 1997; Noblet *et al.*, 2001). Recent research has indicated that work-related stress among managers is reaching epidemic proportions (Williamson and Vine, 1998; Cartwright and Boyes, 2000; Noblet *et al.*, 2001) and that when compared with other occupations they are subjected to high levels of stress (Cohen, 1997). The high rate of stress being experienced by managers is a serious concern, considering the important role they perform in an organization (Noblet *et al.*, 2001). The job of a manager has been defined as demanding, complex and varied. It includes the management of people, information and decision-making processes, and therefore is a critical human resource (Fryer, 1997). Yet, the increasing demands and constraints being imposed on managers by the internal and external environment have resulted in longer working hours being experienced, which can have adverse psychological and physiological consequences. The central role that managers play in the performance of an organization suggests work-related stress is not just a direct health threat to the manager, but is also a severe risk to organizational success (Albrecht, 1979).

In comparison to managers of other disciplines, the level of stress inducement encountered by construction project managers is significantly higher than that of managers in other industries (Khosh and Kerzner, 1984; Sutherland and Davidson, 1993; Sommerville and Langford, 1994).[1] According to Sommerville and Langford (1994), this is largely due to the nature and characteristics of the industry within which they operate. For instance, the male-dominated environment of construction promotes competitiveness and conflict (Dainty

*Author for correspondence. E-mail: p.love@ecu.edu.au

Construction Management and Economics
ISSN 0144-6193 print/ISSN 1466-433X online © 2004 Taylor & Francis Ltd
http://www.tandf.co.uk/journals
DOI: 10.1080/0144619042000201330

et al., 2000), one-off type production requires high levels of coordination and specialist input, and poor on-site working conditions can lead to quality and safety problems being experienced. Having to complete a project on time, to a desired quality, within budget as well as satisfy a wide range of stakeholder objectives, which are often conflicting, can subject a project manager to 'on-the-job' pressure that manifests itself as stress. The way in which site managers cope with their stress impacts on them as individuals and their project team (Sutherland and Davidson, 1993).

Yet, not everyone is affected by stress in the same way, with some individuals appearing to cope better with stress than others. Lazarus and Launier (1978) state that stress is any internal or environmental demand that exceeds the normal adaptive resources of an individual. How an individual copes with the stress determines how they will in turn be affected by the stress (Billings *et al.*, 2000). Coping is any conscious effort by an individual to manage or overcome a stressful event (Lazarus and Launier, 1978; Holahan and Moos, 1987). Coping strategies may be oriented towards confronting and overcoming the stressor, or may entail efforts to reduce tension by evading the problem. The type of coping strategies implemented may depend on how the individual appraises the stressful event, their negative and positive affect, personality differences and environmental factors, which may result in an enhanced or decreased psychological adjustment.

Adjustment is identified as psychological well-being, and for the purpose of this research presented in this paper includes *anxiety, depression and stress*. Recent developments in this area of research have recognized the importance of positive psychological states and has highlighted the necessity of assessing both positive and negative affect in relation to coping (Folkman, 1997; Nolen-Hoeksema *et al.*, 1997; Stein *et al.*, 1997; Folkman and Moskowitz, 2000). Adjustment and coping are areas that have received limited attention in the construction industry, even though workers, particularly project managers, experience high levels of stress. Considering the limited research in this area, one of the first steps to addressing any workplace health issue is to identify and measure its sources (Cox and Cox, 1993). The aim of this paper is, therefore, to identify coping strategies and affect state that predict adjustment in terms of depression, anxiety and stress for construction project managers.

Coping theory

Lazarus and Folkman's (1984) cognitive theory of stress and coping originates with the everyday appraisal and reappraisal of one's transactions with one's environment. The appraisal process involves the immediate cognitive and physical identification of the stress, and the immediate reaction (primary appraisal) and the evaluation of the individual's internal and external resources and their availability (secondary appraisal) (Lazarus and Launier, 1978). Appraisals are influenced by an individual's beliefs, values, goals and emotions, and the event is understood in terms of the personal significance it has for the individual (Stein *et al.*, 1997). This then determines whether the individual feels threatened, challenged or harmed (Figure 1). When a transaction is appraised as stressful, coping is required.

Lazarus and Folkman identified two types of coping: *emotion-focused coping* and *problem-focused coping* (Lazarus and Folkman, 1984). Emotion-focused coping attempts to regulate the emotional distress and return to normal social and physiological functioning, whilst problem-focused coping is goal directed, and includes strategies such as decision-making and planning to resolve conflicts or to manage the problem. Here either type of coping can lead to an event outcome that may be favourable, unfavourable or involve no resolution at all. Unfavourable outcomes or outcomes with no resolution do not alleviate the distress and require reappraisal and additional coping. In contrast, a favourable outcome results in positive emotion and the termination of any coping activity (Folkman, 1997).

Theories of coping have generally focused on the negative effects of stress and the regulation of distress. Positive affect, defined as positively toned emotions including mood, emotion or psychological state, have been largely omitted from most contemporary theories of stress and coping (Folkman, 1997; Lazarus, 2000). Recognizing the need for coping theory to be modified, Folkman (1997) proposed a revised model of the cognitive theory of stress and coping incorporating positive psychological states (Figure 1). The revised model includes three additional pathways.

The first pathway integrates meaning-based coping as a response to distress involving the activation of beliefs, values and goals that help search for and find positive meaning in the stress-event, which leads to renewed or sustained coping. Meaning-based coping relates to both problem and emotion-focused coping. The second pathway results from distress caused by the outcome of unfavourable or no resolution, rather than the stressor itself, and relates primarily to emotion-focused coping. This process involves searching for or creating some sort of positive psychological state, even for a brief period, to alleviate the enduring stress and negative psychological state. The third pathway is a sustained coping process that results from the outcome of positive emotion and loops back round to the appraisal phase. This process may help the individual to redefine the stressor and re-engage in coping efforts to manage an on-going stressor.

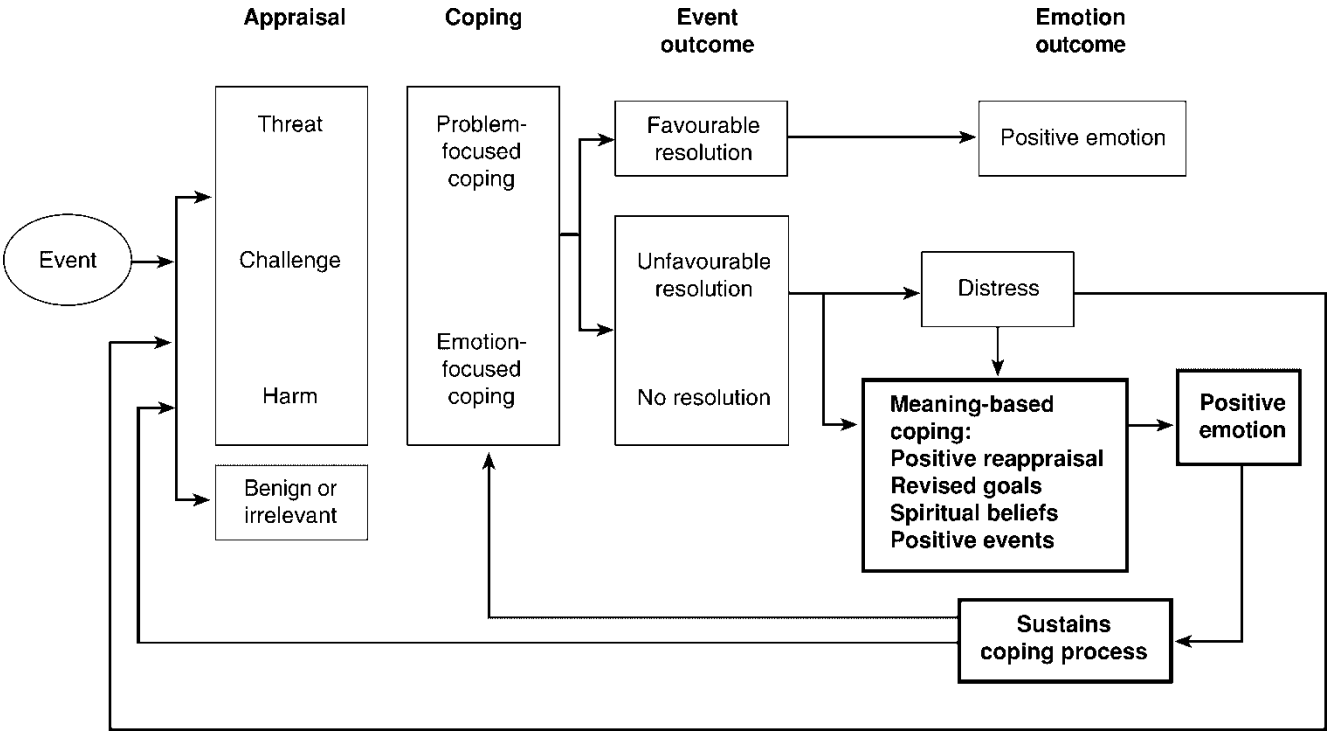

Figure 1 Revised Lazarus and Folkman model (Folkman, 1997)

Personality dispositions may influence the type of appraisal and coping processes used by an individual (Lazarus and Launier, 1978; Lazarus and Folkman, 1984). Some researchers contend that an individual's response to stress is substantially determined by their enduring dispositions, and that certain types of dispositions are associated with specific forms of coping (Holahan and Moos, 1987; Somerfield and McCrae, 2000).

Adjustment and coping in construction project managers

Project managers are acknowledged as key position holders in the construction industry, and recognition of their importance is a recurring theme in the construction and management-related literature (Harper, 1990; Constable, 1993; Farrell and Gale, 1996). It involves autonomous responsibility, the enjoining of several boundaries that may exist between different entities such as the client, the architect and the subcontractors, whilst simultaneously satisfying the company objectives and managing the project (Sommerville and Langford, 1995). Site management is ascertained as being vital on all construction projects, due to the impact that they assert on the overall quality and cost of the project (Farrell and Gale, 2000). It has been estimated that the quality of the individual site manager may affect the project cost by up to 10% (Herbert *et al.*, 1970).

The work of the site manager has been clearly documented as being tough and demanding, and exceedingly susceptible to a high work overload and long working hours (Djebarni, 1996a, 1996b; Farrell and Gale, 2000; Love *et al.*, 2001). In fact, it is not unusual for site managers to work six days a week for 10–12 hours a day throughout the duration of a project, especially if it is experiencing time and cost overruns (Love *et al.*, 2001). On completion of a project, site managers may be required to relocate to a new project. This creates a renewed potential for conflict, which can become part of a continuous cycle and therefore lead to additional stress (Langford *et al.*, 1997).

There is a plethora of documentation that suggests stress can have serious implications for both health and performance, often resulting in a decline in overall health and adjustment (Sommerville and Langford, 1994; Djebarni, 1996a, 1996b). In Table 1, the primary sources of stress experienced by site managers can be seen (Sutherland and Davidson, 1989). The research of Sutherland and Davidson (1989) indicated that job satisfaction levels were lower in comparison to other managerial groups. In addition, mental well-being (including anxiety, obesessionality and depression) was found to be lower when compared with other population groups.

Table 1 Perceived sources of stress among construction project managers

Sources of stress	(%)*
Inadequacy/inconsistency of communication flow	75
Paperwork – too much, too much unnecessary, high volume of reading material	69
Workload – constant time pressure	67
Lack of competent staff to do the job properly	67
Inadequate numbers of staff to do the job properly	64
Unable to delegate because of staffing problems	53
Conflict of boundary situations	50
Working long hours	44
Insufficient time spent in family/home environment	44
The company strategy – competitive/dynamic/go-getting image, changing staffing problems	44

*Percentage of total managers.

Sutherland and Davidson (1989) found that the following coping behaviours were most frequently engaged in: sports or hobbies (60%), alcohol consumption/socializing (25%), time management (25%) and coffee drinking/smoking (23%). These results demonstrate coping behaviours aimed at relieving effects of on-going work-related stress, but they do not identify cognitive coping strategies that relate to a specific work-related stressor; it is possible that behavioural coping may be related to cognitive coping strategies.

Educational background

Traditionally, site managers have progressed through the ranks, beginning with a trade such as carpentry and working their way up to leading-hand, foreman and then project manager. A typical site manager with a trade background has been identified as being practical, accessible to the workforce and a tendency to concentrate on the performance of work (Langford *et al.*, 1997). However, as an increased number of undergraduate and postgraduate construction management related courses have become available, a different type of manager has begun to emerge (Love *et al.*, 2001). This manager possesses skills such as creativity, critical analysis and the understanding of theoretical concepts. The literature outlines varying views towards the most beneficial route for site managers, with some advocating tertiary education and others practical on-site training (Try, 1986; Farrell and Gale, 2000; Love *et al.*, 2001). However, no research has determined whether a graduate or trade background influences adjustment to work-related stressors among site managers.

Size of the project

Larger projects require increased management and supervision over larger numbers of people, with the precision of co-ordinating and integrating all subcontractors being paramount in order to deliver in accordance with a client's requirements. As responsibility of the site manager increases on larger projects, the potential for stress may be elevated, which may influence how a stressful situation is appraised, and the type of coping strategy used (Sutherland and Davidson, 1993). Likewise, Djebarni (1996a, 1996b) found that the larger the project size the lower the site managers' effectiveness, thus when project size increased, site effectiveness decreased. Djebarni (1996a, 1996b) stated that when the project size was small it was easier for the site manager to organize the work, to co-ordinate and to communicate more effectively with the site labour force.

Research method

To identify coping strategies and affect state as predictors of adjustment in terms of depression, anxiety and stress for project managers, a questionnaire survey was randomly mailed to 250 construction contracting organizations throughout the State of Victoria in Australia. Each organization was asked to select project managers to complete the questionnaire survey. Responses were received from 100 male project managers, which equates to an overall response rate of 40%. The questionnaire included questions about demographic information, sources of stress and their intensity (plus psychometrically reliable and valid inventories for coping strategies, affect and adjustment). An item bank of ten potential sources of stress, identified by Sutherland and Davidson (1993) was rated by respondents on a Likert-type scale from 0 'no pressure' to 3 'high pressure'. Respondents were also invited to list and rate any additional stressors.

Measures

Coping

This was assessed with the Ways of Coping Questionnaire (WAYSS) (Folkman and Lazarus, 1988). Participants

were asked to have a stressful work-related situation in mind when they rated the 66 statements that comprised the inventory and indicate to what extent they used the statement in the situation. Answers were given on a four-point Likert scale from 0 'does not apply or not used' to 3 'used a great deal'. A few words in the instructions were altered to make them relevant to the site manager. For example, 'you must have a specific stressful situation in mind' was changed to 'you must have a specific work-related stressful situation in mind'. The time frame that the stressful situation must be experienced in was changed from 'the past week' to 'the past two weeks', making it less restrictive, as the level of activity changes depending on the stage of a project.

Affect

The Bradburn Affect Balance Scale was used to assess negative and positive affect (Bradburn, 1969). The scale consisted of 10-items asking a series of questions about feelings 'during the past few weeks', and was divided into two sub-scales, positive affect and negative affect. The format of the scale was altered from 'yes' or 'no' response to a 4-point Likert scale, with participants ratings ranging from 0 'not at all' to 3 'very often', which is consistent with several other coping studies (Folkman, 1997; Billings *et al.*, 2000). Items were summed producing either an overall positive affect score or a negative affect score. High scores on a sub-scale indicate high levels of positive or negative affect.

Adjustment

The Depression Anxiety Stress Scales (DASS) were used to assess adjustment of project managers (Lovibond and Lovibond, 1995). The DASS consists of three sub-scales: depression, anxiety and stress. Respondents were asked to indicate how much the statement applied to them over the past week on a four-point Likert scale. Response options for the items are listed as 0 'did not apply to me at all to 3 'applied to me very much, or most of the time'.

Results

Data reduction

Due to the large number of independent variables, and the low Cronbach's coefficient alpha (α) for the WAYSS sub-scales (Table 2), the coping variables were reduced from 8 to 5. The scales were combined using theoretical coherence as the basis for reduction (Billings *et al.*, 2000). Confrontive coping and seeking social support were identified as interpersonal approaches to coping and combined to form social coping, displaying an a level of 0.67. Distancing and escape avoidance combined into cognitive avoidance coping, yielding an a level of 0.68. Active coping was formed from positive reappraisal and planful problem solving, and an a level of 0.76 was achieved. While these levels are still considered low, they are superior to there original values.

The demographic variable 'highest level of education attained' was reduced into a dichotomous variable of postgraduate degree/undergraduate degree versus TAFE (Tertiary Further Education Institution)/trade qualification. Post-secondary certificate and completed year 12 were excluded from the analysis as neither variable related to previous research. As a result, this reduced the sample size to 99 for the purposes of the regression analysis described below.

Table 2 Descriptive statistics for WAYSS, Bradburn Affect Balance Scale and DASS

Scales	Mean($n = 100$)	SD	Range	α
Ways of coping				
Confrontive coping	6.01	2.77	0–18	0.50
Distancing	4.78	2.73	0–18	0.59
Self-controlling	9.71	3.53	0–21	0.63
Seeking social support	6.94	3.43	0–18	0.68
Accepting responsibility	3.22	2.10	0–12	0.49
Escape-avoidance	3.69	3.35	0–24	0.67
Planful problem solving	10.91	3.06	0–18	0.66
Positive reappraisal	5.38	3.28	0–21	0.71
Bradburn Affect Balance Scale				
Positive affect	8.62	2.83	0–15	0.74
Negative affect	5.34	3.46	0–15	0.75
Depression Anxiety Stress Scale				
Depression	6.66	7.55	0–42	0.93
Anxiety	4.30	5.38	0–42	0.89
Stress	12.88	8.84	0–42	0.93

Sample characteristics

The sample consisted of 100 male construction project managers. The age of respondents ranged from 23 to 62, with a mean age of 37.74 (SD = 10.02). In terms of marital status, 75% of respondents were either married or in a de-facto relationship, 21% had never been married and only 3% were divorced or separated. In addition, 20% were found to have attained a postgraduate degree, 55% had obtained undergraduate degrees or diplomas, 24% indicated TAFE or trade qualification and 1% of the sample held no tertiary qualifications. The mean number of months employed as a project manager was 114 (SD = 105.20), ranging from six months to 38 years. The value of the project at the award of the contract ranged from AUS$5600 to AUS$300 million with a mode value of AUS$30 million. Additionally, the mean number of weeks for duration of the contract at the award was 61.61 (SD = 33.7) ranging from 10 to 156 weeks.

Means and standard deviations for the sub-scales of WAYSS, Bradburn Affect Balance Scale, and DASS are presented in Table 2. In addition, the range and Cronbach's alpha (α) for the sub-scales are displayed in Table 2.

Mean scores for depression (6.66) and anxiety (4.30) for the site managers' sampled were found to be comparable to those provided by the DASS normative male sample for depression (6.55) and anxiety (4.60). However, the mean for stress (12.88) for site managers was higher than the normative male sample (9.93). this indicates that site managers sampled had a normal to mild severity rating for stress. Table 3 displays the sources of stress experienced by site managers sampled. The stressors rated as high pressure concerned work overload, having to work long hours and restrictions concerning time spent with the family and at home. Staffing problems were the next most commonly reported high-pressure stressors followed by communication problems and too much paperwork and, finally, pressures associated with competitive company strategy and conflicting boundaries.

Regression analysis

Hierarchical multiple regression was used to identify the predictors for depression, anxiety, and stress (Tables 4–6). In these tables, the unstandardized regression coefficients (*B*) and intercept constant, the standardized regression coefficients (b), the squared semi-partial correlations (sr^2) and R, R^2, R^2_{adj} and R^2_{change} at the entry of each of the hierarchical steps are displayed. Regression was used in accordance with past research into coping, examining the effect of recovery (Scheier *et al.*, 1989), personal and contextual determinants (Holahan and Moos, 1987) and affect (Billings *et al.*, 2000). Regarding the ordering of variables entering the regression equation, demographics and work-related characteristics were entered first holding them constant. Consistent with the previous research, coping and affect were then entered as a block.

Predictors of depression

For individual demographics and work-related characteristics, the equation $R^2 = 0.09$, $F\ (4, 94) = 2.32$, $p > 0.05$ was not significant after step one, which suggests no relationship existed between individual demographics and work-related characteristics and depression (Table 4). The addition of coping strategies at the second step contributed significantly to $R^2 = 0.35$, $F\ (9, 89) = 5.36$, $p < 0.05$, $R^2_{change} = 0.26$, $F\ (5, 89) = 7.2$, $p < 0.05$, indicating that the five coping variables explained 26% of the variance in (square root) depression. The significant predictors were avoidance coping and active coping, each adding 8% in unique predictive contribution. This suggests that high depression was associated with higher levels of avoidance coping and lower levels of active

Table 3 Perceived sources of stress experienced by construction project managers sampled

Source of stress	High pressure(%)	Moderate pressure(%)	Some pressure(%)	No pressure(%)
Workload – constant time pressure	56	32	11	1
Working long hours	40	44	13	2
Insufficient time spent in family/home environment	34	40	20	6
Inadequate numbers of staff to do the job properly	33	36	24	7
Lack of competent staff to do the job properly	30	45	21	4
Unable to delegate because of staffing problems	28	37	27	7
Inadequacy/inconsistency of communication flow	26	42	32	0
Paperwork – too much, too much unnecessary, high volume of reading material	26	32	39	3
The company strategy – competitive/dynamic/ go-getting image, changing staff problems	11	30	44	13
Conflict of boundary situations	10	24	52	13

Table 4 Regression analysis for variables predicting depression in project managers

Variables	B	β	sr^2	F value	R	R^2	
Step 1							
Demographics					0.30	0.90	
Age	0.04	0.26	0.02	0.16			
Education	0.36	0.10	0.01	0.35			
Months (as SM)	–0.15	–0.45*	0.06	0.02			
Project value	0.00	–0.11	0.01	0.27			
$R^2_{adjusted}$							0.05
R^2_{change}							0.09
Step 2							
Addition of coping					0.59	0.35	
Social coping	0.12	0.21	0.02	0.08			
Avoidance	0.22	0.35*	0.08	0.00			
Active coping	–0.20	–0.36*	0.08	0.00			
Self-control	0.02	0.04	0.00	0.75			
Accepting	0.12	0.18	0.02	0.08			
$R^2_{adjusted}$							0.29
R^2_{change}							0.26
Step 3							
Addition of affect					0.84	0.70	
Positive affect	–0.14	–0.27*	0.05	0.00			
Negative affect	0.24	0.56*	0.20	0.00			
$R^2_{adjusted}$							0.67
R^2_{change}							0.35

Table 5 Regression analysis for variables predicting anxiety

Variables	B	β	sr^2	F value	R	R^2	
Step 1							
Demographics					0.50	0.25	
Age	0.02	0.40*	0.05	0.02			
Education	0.48	0.16	0.02	0.10			
Months (as SM)	–0.17	–0.63*	0.11	0.00			
Project value	0.00	–0.30*	0.09	0.00			
$R^2_{adjusted}$							0.22
R^2_{change}							0.25
Step 2							
Addition of coping					0.73	0.53	
Social coping	0.13	0.25*	0.03	0.01			
Avoidance	0.14	0.27*	0.05	0.00			
Active coping	–0.14	–0.30*	0.05	0.00			
Self-control	0.05	0.15	0.01	0.14			
Accepting	0.11	0.19*	0.03	0.03			
$R^2_{adjusted}$							0.48
R^2_{change}							0.27
Step 3							
Addition of affect					0.81	0.66	
Positive affect	0.00	–0.01	0.00	0.93			
Negative affect	0.15	0.43*	0.12	0.00			
$R^2_{adjusted}$							0.62
R^2_{change}							0.13

coping. The third step, affect, contributed significantly to $R^2 = 0.70, F(11, 87) = 18.67, p < 0.05$, and $R^2_{change} = 0.35$, $F(2, 87) = 51.30$, $p < 0.05$. Affect added an additional 35% of variance with positive affect and negative affect being significant predictors, each adding 5%, and 20% respectively in unique predictive contribution. This

Table 6 Regression analysis for variables predicting stress

Variables	B	β	sr^2	F value	R	R^2	
Step 1							
Demographics					0.38	0.14	
Age	0.28	0.31	0.03	0.09			
Education	4.78	0.23*	0.04	0.03			
Months (as SM)	–0.82	–0.42*	0.05	0.02			
Project value	0.00	–0.21*	0.04	0.04			
$R^2_{adjusted}$							0.11
R^2_{change}							0.14
Step 2							
Addition of coping					0.61	0.37	
Social coping	0.95	0.27*	0.04	0.02			
Avoidance	0.34	0.09	0.00	0.38			
Active coping	–0.16	–0.35*	0.07	0.00			
Self-control	0.70	0.28*	0.04	0.02			
Accepting	0.71	0.17	0.02	0.09			
$R^2_{adjusted}$							0.30
R^2_{change}							0.22
Step 3							
Addition of affect					0.79	0.62	
Positive affect	–0.44	–0.14	0.01	0.07			
Negative affect	1.35	0.53*	0.18	0.00			
$R^2_{adjusted}$							0.57
R^2_{change}							0.25

indicates that when affect is considered in the regression, high depression is associated with lower positive affect, and higher negative affect.

Predictors of anxiety

For individual demographics and work-related characteristics, the equation, $R^2 = 0.25$, $F(4, 94) = 7.97$, $p < 0.05$, indicating that 25% of the variance in (square root) anxiety was explained by the four variables after step one. The significant predictors were age, project value and months employed as a site manager, each adding 5%, 9% and 11% respectively in unique predictive contribution. This implies that higher anxiety was associated with age, smaller project value and duration of employment as a site manager. The addition of coping strategies at the second step contributed significantly to $R^2 = 0.53$, $F(9, 89) = 11.03$, $p < 0.05$, $R^2_{change} = 0.27$, $F(5, 89) = 10.32$, $p < 0.05$.

Coping added an additional 27% of the variance with social coping, avoidance coping, active coping and accepting responsibility all being significant predictors. They each added 3%, 5%, 5% and 3% respectively in unique predictive contribution. This suggests that when coping is considered in the regression, high anxiety is associated with higher social coping, higher avoidance coping, lower active coping and higher accepting responsibility. The addition of affect at the third step contributed significantly to $R^2 = 0.66$, $F(11, 87) = 15.24$, $p < 0.05$, and $R^2_{hange} = 0.13$, $F(2, 87) = 16.68$, $p < 0.05$. Affect added an additional 13% of the variance. The significant predictor was negative affect, adding 12% in unique predictive contribution. Therefore, when affect is considered in the regression, high anxiety is associated with higher negative affect.

Predictors of stress

For individual demographics and work-related characteristics, the equation, $R^2 = 0.14$, $F(4, 94) = 3.96$, $p < 0.05$, indicates that 14% of the variance in stress was explained by the four variables after step one. The significant predictors were education, project value and months employed as site manager, each adding 4%, 4% and 5% respectively in unique predictive contribution. This suggests that higher stress would be associated with TAFE/trade qualification, lower project value and lesser months employed as a site manager. At the second step coping strategies were added, which contributed significantly to $R^2 = 0.37$, $F(9, 89) = 5.7$, $p < 0.05$, $R^2_{change} = 0.22$, $F(5, 89) = 6.24$, $p < 0.05$. An additional 22% of the variance was added by coping strategies.

Significant predictors were social coping, active coping and self-controlling, each adding 4%, 7% and 4% respectively in unique predictive contribution. This indicates that when coping strategies were considered in the regression, high stress is associated with high social coping, lower active coping and higher self-controlling

coping. The addition of affect at the third step contributed significantly to $R^2 = 0.62$, F (11, 87) = 12.74, $p < 0.05$, with $R^2_{change} = 0.25$, F (2, 87) = 28.45, $p < 0.05$. Affect added an additional 25% of the variance with negative affect being a significant predictor, adding 18% in unique predictive contribution. Thus, when affect is considered in the regression, high stress is associated higher negative affect.

Discussion

Intensity of work-related stressors

Workload was the greatest 'high pressure' stressor for site managers. The second stressor was working long hours, and the third was insufficient time spent in family/home environment. These top three stressors may have implications for the types of coping strategies employed by site managers and their adjustment. Working under a constant time pressure in itself may lead to decreased adjustment. Time pressures have been identified to lead to over-arousal, with the consequence that the cardiovascular system can be adversely affected (Sutherland and Davidson, 1993). Being in a state of over-arousal may also inhibit site managers from implementing appropriate coping strategies. Moreover, working long hours and having insufficient time with their immediate family may limit the amount of social support that they receive.

Individual demographics and work-related characteristics

Duration of employment (in months) as a site manager was a significant predictor of depression, anxiety and stress, with less experienced managers at greater risk of adjustment problems than their more experienced counterparts. No previous studies have identified associations between length of time employed as site manager and psychological adjustment. The literature on continual professional development (CPD), however, reveals that its adoption may lead to a reduction in stress, as managers are able to improve their effectiveness (Langford *et al.*, 1997). CPD can provide the site manager with additional skills to better organize and integrate work within specified project constraints, and the ability to deal with technical and environmental developments within the industry (Love *et al.*, 2001). Management development may also take place through hands-on experience of the job, where the learning process coincides within the activity of carrying out the job (Mumford, 1986). It is likely that the longer site managers are employed the more job-related skills they acquire, through either professional development or on the job experience, which enables them to be psychologically better adjusted than site managers who have spent less time in the job.

Project value was negatively associated with anxiety and stress, suggesting that higher levels of anxiety and stress were associated with projects of a lower value, or vice versa. An explanation for this finding is that smaller firms undertake lesser value projects. Here the site manager may have reduced security of tenure, fewer resources and lower numbers of staff to call on for social support (Langford *et al.*, 1997). Langford *et al.* (1997) assert that larger organizations are likely to offer more training and development activities to their employees than smaller firms.

Age was a significant predictor of anxiety, indicating a positive association between age and anxiety. This may be due to the increasing use of information and communication technology (ICT's), with younger employees being more knowledgeable and adaptable than their older counterparts (Love *et al.* 2001). The ability to keep up with advances in ICT's may be an ongoing concern or pressure for older project managers, which can contribute to higher anxiety levels than for their younger counterparts (Love *et al.*, 2000).

Education–identified as either university degree or TAFE/trade qualification–was a significant predictor of stress, but not depression or anxiety. The relationship indicated that site managers who had acquired a university education had lower stress. Yet, there appears to be little evidence in the literature that clearly supports one form of education over the other. Farrell and Gale (2000) asserted that advantages of a trade qualification such as craft appreciation and ability to share experiences with the trade people they supervise may be offset by difficulties dealing with administration, technical problems and complexities in legislation. Langford *et al.* (1997) revealed managers from a trade background were reluctant to accept advice from colleagues and were viewed as the management that relates particularly well to its workforce. These site managers are likely to find themselves in a position of conflict and increased stress, as they are torn between an alliance with the workforce and a need to fulfil organizational and project objectives.

Depression and anxiety were not influenced by education; however, this was not the case for stress. Stress involves a judgment about the environmental or internal demands that exceed available resources and require mobilization of additional resources (Lazarus and Launier, 1978). When the particular stressor is overcome or adequately managed the stress dissipates. Thus, it is possible that a university education can equip project managers with the necessary skills to adequately deal with work-related stressors. Lazarus and Launier (1978) identified depression and anxiety as stress emotions that cause pain and distress. These stress emotions may be

more enduring and continue after the stress has been overcome, and therefore be less influential in relation to type of educational background.

Coping strategies

Active coping involves active cognitive and behavioural attempts to manage stress. This includes a meaning-based coping process, in which the individual actively seeks and finds positive meaning in a stressful event, and attempts to engage in activities to alleviate the stress. This from of coping can be equated with problem-focused coping, which is a goal directed strategy including information gathering, decision making and planning, and conflict resolution, in order to manage or solve the problem obstructing the goals and creating distress. Active coping was found to be a significant predictor of adjustment, with this form of coping being associated with lower levels of depression, anxiety and stress. These findings support previous research, which has demonstrated that problem-focused coping is associated with reduced depression (Mitchell *et al.*, 1983).

Cognitive avoidance coping involves blocking or denying thoughts or feelings about the stressor. No association was displayed between avoidance coping and stress. Yet, a significant positive association was displayed between avoidance coping and depression and anxiety. These results correspond with previous research showing greater use of cognitive avoidance was associated with increases in negative mood (Billings *et al.*, 2000). Other research has also demonstrated that avoidance coping was associated with fewer personal and environmental resources (Holahan and Moos, 1987). Avoidance coping may be a type of 'defence mechanism' employed to protect oneself from the unpleasant emotions related to the stressor. The reappraisal process also includes a defensive-type reappraisal, denying or detaching psychologically from the stressor, and reframing the situation defensively as a non-threatening or even a desirable situation (Lazarus and Launier, 1978). Site managers working with limited resources may ignore or deny related stressors, as it is unlikely they will be able to improve the availability of resources given the financial constraints they often have to adhere to. Site managers using defensive reappraisal may therefore not experience stress, but the more enduring stress emotions of depression and anxiety, as the denied stressor may not been overcome.

Social coping is an interpersonal approach to coping involving social support and a confrontive approach. Increased use of social coping was associated with high stress and high anxiety. There may be instances when a site manager's social support may be restricted to project team members, especially in non-metropolitan areas. As a result, they may feel isolated as they are unable to receive adequate support from other management personnel (or head office), which can lead to higher levels of stress and anxiety being experienced. Another possible explanation for the positive relationship between stress and anxiety and social coping may be the confrontive element within social coping, involving challenging and confronting persons or situations viewed as the problem. Site managers engaging in a confrontive style interpersonal approach may blame others for the stressful situation, or take chances to rectify the problem without actually dealing with the stressor at hand, which can result in higher levels of stress and anxiety.

Accepting responsibility is a type of coping whereby one's role in the problem is acknowledged while simultaneously trying to put things right. No association was displayed between accepting responsibility and stress and depression. A significant association between accepting responsibility and high levels of anxiety was displayed. Site managers engaging in accepting responsibility may become overwhelmed trying to manage all the work-related stressors, without being able to diffuse responsibility amongst co-workers, which can result in higher levels of anxiety being experienced. The so-called 'macho' image that prevails within the industry may also play a role with site managers feeling ultimately responsible for 'their' project and unable to share problems with others.

Self-controlling coping is engaging in efforts to regulate and control one's emotions and behaviours towards a specific stressful situation. Increased use of self-control was associated with increased stress. The 'macho' environment within the industry may promote the attitude of not being able to display one's emotions. It is assumed that site managers engaging in self-controlling strategies inhibit feelings and actions towards a stressor, focussing their attention on controlling their emotions and concealing the situation and their stress rather than managing and overcoming the problem, which increases their stress levels.

Affect

Findings from this research have demonstrated that negative affect was associated with adjustment, indicating higher levels of depression, anxiety and stress. However, positive affect was not significantly related to anxiety or stress but was associated with lower levels of depression. Appraisals, including beliefs, goal outcomes, and emotional states, were shown to be associated with well being in bereaved caregivers, demonstrating that positive appraisals were negatively correlated with depressed mood (Stein *et al.*, 1997). Thus, site managers who displayed positive affect showed better psychological adjustment, whilst those who displayed negative affect were subject to decreased adjustment. This research has demonstrated that positive and negative affects are independent factors that are associated differently with the adjustment process.

Limitations of the research

The sample size used for the regression analysis was relatively small (99) and restricted in scope to the State of Victoria, Australia. The sample included all males, who are possibly less likely to admit to problems encountered with depression, anxiety and stress and tend to display a facade of coping successfully with work-related stressors. A further limitation is the cross-sectional design of the study, which does not capture the process of coping, or changes in affect, and adjustment over time. The type of scales used within the questionnaire, may be an additional limiting factor. The WAYSS displayed reasonably low alphas, so may not have been adequately reliable. Only a limited number of coping strategies are captured by the WAYSS, whereas the full repertoire of coping strategies is much larger (Dunkel-Schetter *et al.*, 1992). However, if the full repertoire had been used, the longer questionnaire might have attained and a lower response rate. Most of the coping strategies included in the WAYSS relate predominantly to emotion-focused coping and not problem-focused coping.

Conclusion

Construction project managers are active agents who respond to changes in the environment within which they work. This results in a transactional relationship between the individual and their environment, involving several processes. The most regulating process in the stress-related transaction is cognitive, involving several factors such as personal beliefs, individual differences, appraisals and affect, all of which give direction towards the adoption of specific coping strategies.

The hierarchical regression analyses demonstrated that specific work-related characteristics influenced the psychological adjustment of the site managers sampled. Site managers who engaged in a more problem-focused style of coping, such as active coping were better adjusted than those who engaged in more emotion-focused styles of coping such as cognitive avoidance coping, social coping, accepting responsibility and self-controlling coping. In addition, it was revealed that increased adjustment of project managers was associated with positive affect. It is therefore concluded that the psychological adjustment of site managers is influenced by the types of coping strategies they use, specific work-related characteristics and their affect state.

The increasing demands being imposed on construction organizations by clients to satisfy the requirement of time is reliant on site managers being able to be adaptive and responsive to the environment within which they work. If they are not able to manage and cope with the job strain that they are confronted with, then there is a danger of cost and time overruns being experienced. Consequently, if construction organizations are to ameliorate their performance, then they need to provide their site managers with an environment that encourages problem-focused coping through improved training and skills development. As there has been limited research undertaken in construction that has addressed psychological adjustment and coping of site managers, the findings reported in this paper provide the impetus for future research in this area, for instance, determining whether a site manager's personality and gender type influence their coping strategy and subsequently their psychological adjustment to work-related stress.

Acknowledgements

The authors would like to thank Mr Jim Georgiou, Deakin University and the three anonymous reviewers for their constructive comments, which helped improve this manuscript.

Note

1. In Australia, the term 'construction project manager' is considered to be synonymous with that of the site manager often used in the UK. Thus, there are instances when the terms are used interchangeably in this paper.

References

Albrecht, K. (1979) *Stress and the Manager: Making it Work for You*, Simon & Schuster, New York.

Bacharach, S. and Bamberger, P (1992) Causal models of role stressor antecedents and consequences: the importance of occupational differences. *Journal of Vocational Behaviour,* **41**, 13–34.

Beehr, T., King, L. and King, D. (1990) Work stressors and coworker support as predictors of individual strain and performance. *Journal of Organisational Behaviour*, **21**, 391–405.

Billings, D.W., Folkman, S., Acree, M. and Moskowitz, J.T. (2000) Coping and physical health during care-giving: the roles of positive and negative affect. *Journal of Personality and Social Psychology*, **79**, 131–42.

Bradburn, N.M. (1969) *The Structure of Psychological Well-being*, Aldine, Chicago, IL.

Cartwright, S. and Boyes, R. (2000) Taking the pulse of executive health in the UK. *The Academy of Management Executive*, **14**, 16–24.

Cohen, A. (1997) Facing pressure. *Sales and Marketing Management*, **149**, 30–8.

Constable, P. (1993) The Significance of Craft Training as a tool for Site Management. Unpublished MSc Dissertation, University of Bath, Bath, UK.

Cox, T. and Cox, S. (1993) Occupational health: control and monitoring of psychosocial and organisational hazards at work. *Journal of the Royal Society of Health*, **113**, 201–5.

Dainty, A.R., Bagilhole, B.M. and Neale, R.H. (2000) A grounded theory of women's career under-achievement in large UK construction companies. *Construction Management and Economics*, **18**, 239–50.

Djebarni, R. (1996) The impact of stress in site management effectiveness. *Construction Management and Economics*, **14**, 281–93.

Djebarni, R. (1996) The influence of project size on site managers' effectiveness, in Langford, D.A. and Retik, A. (eds) *The Organisation and Management of Construction: Shaping Theory and Practice*, Vol. 2, E & FN Spon, London.

Dunkel-Schetter, C., Feinstein, L.G., Taylor, S.E. and Falke, R.L. (1992) Patterns of coping with cancer. *Health Psychology*, **11**, 79–87.

Farrell, P. and Gale, A. (1996) Tasks performed by the site manager: A review of the literature, in Langford, D.A. and Retik, A. (eds) *The Organisation and Management of Construction: Shaping Theory and Practice*, Vol. 2, E & FN Spon, London.

Farrell, P. and Gale, A. (2000) The site manager: role, education and training in the UK. *Journal of Construction Research*, **1**, 43–52.

Folkman, S. (1997) Positive psychological states and coping with severe stress. *Social Science and Medicine*, **45**, 1207–21.

Folkman, S. and Lazarus, R. (1988) *The Ways of Coping Questionnaire*, Consulting Psychologists Press, Palo Alto, CA.

Folkman, S. and Moskowitz, J.T. (2000) Positive affect and the other side of coping. *American Psychologist*, **55**, 647–54.

Fryer, B. (1997) *The Practice of Construction Management*, 3rd edn, Blackwell Science Ltd, Oxford.

Harper, D. R. (1990) *Building: The Process and the Product*, Chartered Institute of Builders (CIOB), Ascot.

Herbert, A., Martvall, K. and Wirdenius, H. (1970) Site management and production disturbances. *Building Technology and Management*, **7**, 19–20.

Holahan, C.J. and Moos, R.H. (1987) Personal and contextual determinants of coping strategies. *Journal of Personality and Social Psychology*, **52**, 946–55.

Karasek, R. (1979) Job demands, job decision latitude, and mental strain: implications for job re-design. *Administrative Science Quarterly*, **24**, 379–405.

Khosh, M. and Kerzner, H. (1984) *Stress and Burnout in Project Management*. Annual Symposium on Project Management, Project Management Institute, 8–10 October, Philadelphia, USA. Cited in Kerzner, H. (1995) *Project Management*, 5th edn, Van Nostrand Reinhold, New York.

Langford, D., Hancock, M.R., Fellows, R. and Gale, A.W. (1997) *Human Resources Management in Construction*, Longman Group Limited, Edinburgh Gate.

Lazarus, R.S. (2000) Toward better research on stress and coping. *American Psychologist*, **55**, 665–73.

Lazarus, R.S. and Folkman, S. (1984) *Stress, Appraisal, and Coping*, Springer, New York.

Lazarus, R.S. and Launier, R. (1978) *Stress-Related Transactions between Person and Environment*, Plenum Press, London.

Love, P.E.D., Irani, Z., Li, H., Tse, R.Y.C and Cheng, E.W.L. (2000) An empirical analysis of IT/IS evaluation in construction. *International Journal of Construction Information Technology*, **8**(2), 21–38.

Love, P.E.D., Haynes, N.S. and Irani, Z. (2001) Construction managers' expectations and observations of graduates. *Journal of Managerial Psychology*, **16**, 579–93.

Lovibond, S.H. and Lovibond, P.F. (1995) *Manual for the Depression Anxiety Stress Scales*, Psychology Foundation Monograph, The Psychology Foundation of Australia, Sydney.

Mitchell, R.E., Cronkite, R.C. and Moos, R.H. (1983) Stress, coping, and depression among married couples. *Journal of Abnormal Psychology*, **92**, 433–48.

Mumford, A. (1986) *Handbook of Management Development*, Gower Publishers Inc, London.

Noblet, A., Rodwell, J. and McWilliams, J. (2001) The job-strain model is enough for managers: no augmentation needed. *Journal of Managerial Psychology*, **16**, 635–49.

Nolen-Hoeksema, S., McBride, A. and Larson, J. (1997) Rumination and psychological distress among bereaved partners. *Journal of Personality and Social Psychology*, **72**, 855–62.

Scheier, M.F., Magovern, Sr, G.J., Abbott, R.A., Matthews, K.A., Owens, J.F., Lefebvre, R.C. and Carver, C.S. (1989) Dispositional optimism and recovery from coronary artery bypass surgery: the beneficial effects on physical and psychological well-being. *Journal of Personality and Social Psychology*, **57**, 1024–40.

Somerfield, M.R. and McCrae, R.R. (2000) Stress and coping research: methodological challenges, theoretical advances, and clinical applications. *American Psychologist*, **55**, 620–5.

Sommerville, J. and Langford, V. (1994) Multivariate influences on the people side of projects: stress and conflict. *International Journal of Project Management*, **12**, 234–43.

Sommerville, J. and Langford, V. (1995) *Stress in the Construction Industry*, 51, Chartered Institute of Building (CIOB), Ascot.

Stein, N., Trabasso, T., Folkman, S. and Richards, A.T. (1997) Appraisal and goal processes as predictors of psychological well-being in bereaved caregivers. *Journal of Personality and Social Psychology*, **72**, 872–84.

Sutherland, V. and Davidson, M.J. (1989) Stress among construction site managers: a preliminary study. *Stress Medicine*, **5**, pp. 221–35.

Sutherland, V. and Davidson, M.J. (1993). Using a stress audit: the construction site manager experience in the UK. *Work and Stress*, **7**, 273–86.

Try, H. (1986). Management training, an agenda for action. *National Builder*, **67**, 324–5.

Williamson, J. and Vine, P. (1998). Run down, stressed out. *British Journal of Administration Management*, January/February, 14–6.