An investigation into psychological stress detection and management in organisations operating in project and construction management

Patching, Alan; Best, Rick

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Alan Patching[a]* Rick Best[a]

[a]Bond University, Gold Coast 4229, Australia

Abstract

While psychologists remain divided whether 'workplace stress' is caused by workplace experiences or other factors, it's commonly accepted that, regardless of cause, people experiencing stress can demonstrate decreased workplace performance. From a human performance and productivity perspective, from whence stress arises is somewhat irrelevant–the relevant fact is that it's far more important to have systems and procedures in place to contribute to avoidance of undue work environment-caused stress. It is also important to identify when an employee is exhibiting signs of stress than it is to focus only on remedial measures for when stress effects have already taken their toll on a person. Many organisations engage external service providers to deal with management of stress effects on people. It has not been clear how many organisations engaged in construction or project management address workplace environment as a potential causal factor in stress as part of organisational risk management. This paper focuses more on what leading construction and project management organisations are doing (and according to benchmark practice, should be doing) to address the matter of stress impacts on employees from a three phase perspective–environmental stressors, management training to identify early signs of stress, and managing employee stress when it is clearly affecting performance. The paper also proposes an approach by which organisations in construction and project management can become more effective in this three phase approach to stress management in the workplace, based on a pilot study which is the basis of more in-depth research currently under way at Bond University.

Keywords: Stress; stress management; stress in project management; stress in construction

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 * Corresponding author. Tel.: +61 438 394040; fax: +61 5595 1477
  E-mail address: apatchin@bond,edu,au / ribest@bond.edu.au

1. Introduction

According to Relationship Awareness Theory an overdone or misapplied strength becomes a weakness (Porter, 1973). There is a parallel in stress development in the workplace. Professional careers sometimes affect people so strongly that it is not so much that certain people have a job, but rather that their job has them, and 'burnout' can be the eventual consequence. Stress and burnout cannot usually be attributed to work related pressures only, but rather to a complex interaction of individual characteristics and issues in the work environment (Lingard, 2003). In project management of construction projects, uncertainty and high risk can lead to excessive levels of work-related stress and work experience, project size and complexity and level of education are some factors that can affect project managers' ability to cope (Haynes and Love, 2004). With ineffective coping abilities, a person is likely to perceive they no longer have the resources to manage expectations and demands placed on them, and the state commonly known as psychological stress is likely to be experienced. Undetected and untreated it can contribute to all manner of disease (Nakao, 2010). The worlds of project management and construction offer exciting opportunities for enthusiastic professionals. Career advancement is also an attraction of these professions. However, while the challenges are exciting to many, the nature of the work with its contractual (and other) deadlines, matrix structures, high level of conflict and disputation, and increasing numbers of stakeholders wanting more active participation, can quickly take its toll on some practitioners.

The business world has been sensitive to the effects of stress for some time with Employee Assistance Programmes (EAPs) having been initiated in several countries decades ago (Arthur, 2000). While many construction companies still use tried and proven contracting methods, there have nonetheless been significant changes in project delivery approaches over the past two to four decades. Project management in its current form is relatively new. In the late 1980's, by far the majority of project management applications were on heavy industry projects while today, many project management associations boast a high percentage of members from IT, telecom, health, finance and banking and many other industries. Change is constant and pressure on project management and construction personnel is unlikely to reduce. In this scenario, increasing exposure to stress would be a reasonable expectation and so it makes sense for those in project management and construction likely to be affected to learn more about stress, and to understand the most effective ways of avoiding and/or dealing with its effects. This paper seeks to provide insight regarding the extent to which that occurs in project management and construction related organisations.

2. Defining stress.

From a psychology-technical perspective, stress is "psychosocial factors affecting general medical conditions" (DSM-IV-TR, 2000). Perhaps a more useful definition for our needs here comes from The National Institute of Occupational Safety and Health in the US which defines stress as: "The harmful physical and emotional responses that occur when the requirements of a job do not match the capabilities, resources or needs of the worker" (NIOSH, 1999).

Stress is largely governed by a primitive region of the brain near the brain stem known as the limbic hypothalamic system (LHS). The main components of this system are the hippocampus, which deals with emotional memory, the hypothalamus, which controls certain metabolic processes of the autonomous nervous system by secreting neuro-hormones, and the amygdala, an almond shape brain part which primarily controls our responses to intense emotions, such as aggression and fear. The LHS regulates vitally important body functions including heart rate, respiration, temperature, body weight, body fluids, metabolism, endocrine system, sleep and alertness, and muscle movements. It also regulates the pain and pleasure centres of the brain, which is very important in relation to an individual's perception of stress. (Flynn and Patching, 2006).

In simple terms, the LHS takes in information from our senses and filters it before we are consciously aware of it. It identifies how we feel about each situation (not what we logically think about it) and categorises those

feelings extremely simply – into a sense of being safe or a sense of feeling threatened. However, the LHS does not limit the fear associated with threat situations to only life-threatening situations; it determines whether or not fear exists not by logic or by what actually occurs, but by the emotion associated with what happens. Furthermore, if the LHS notices that one survives a perceived threatening situation, such as public speaking, by being extremely nervous, it will record this means of survival and automatically replay that survival programme when the individual needs to give a public presentation in future. This function of the LHS is called state dependent memory or the survival response, and it works extremely rapidly and out of conscious awareness. Once a stress inducing event or series of events gives rise to a perception of threat and the formation of this survival response, the sufferer effectively becomes hypersensitive to similar 'threatening' circumstances in future, and typically experiences the primary stress reaction known as the 'fight or flight response' whenever exposed. This response involves the release of adrenalin and noradrenalin from the adrenal gland (Flynn and Patching, 2006). It is the overuse of this gland that can eventually lead to production of cortisol – the stress hormone. Stress conditions in the workplace can lead to stress-related disease including cardio-vascular disease. (Keegel et al, 2008)

3. Understanding stress for employees

Clearly, stress affects individuals, and most certainly factors other than work are involved in its formation and manifestation (Lingard and Francis, 2003). So why would project management and construction related business owners and managers want to become involved? The literature shows that while factors outside of the workplace contribute significantly to an individual's stress, the most frequent stressors are work-related problems (Nakao, 2010). The increasing number of cumulative trauma (mental illness developed by continual exposure to occupational stress) compensation claims against US employers is noteworthy, and there has also been a strong increase both in numbers of cases brought before the courts and in successful claims in the United Kingdom (Clarke and Cooper, 2004). There is a correlation between hours of work and ill-health (Sparks et al, 2001) and stress largely results from exposure to psycho-social hazards in the workplace, with the worst cases leading to impairments of physical and psychological health of clinical significance (Cox et al, 2006).

In Australia, one study estimated that workers suffering from stress attract double the compensation of those suffering physical injuries and that, while claims for physical injury are decreasing, claims for mental stress increased by 83 percent between 1996-97 and 2003-04. These statistics could point to a gap between the focus of attention on stress related problems in the workplace and that placed on other, perhaps more visible/tangible aspects of health and safety.

Keegel et al. (2009) note that construction was one industry wherein the elevated presence of job strain was not reflected in claims patterns. This is of particular interest when read in context of research findings presented later herein regarding a perceived cultural reticence within the construction industry in particular to report stress related illness. Keegel et al. posit that, across industries, workers compensation claims data "are an inadequate evidence base for developing comprehensive policy response to job stress". While this finding is perhaps of more relevance for legislators, its message for project management and construction-related business owners is strong – they should not evaluate the need for stress management programmes in the workplace on reported instances of stress-related illness alone. This raises the question of what constitutes an effective organisational stress management programme.

4. Effective stress management

It should be recognised that not all 'stress' is bad. Stress can protect us by keeping us alert to danger. Numerous factors come into play in the manifestation of psychological stress of the level that would be medically diagnosable. These factors include, *inter alia*, personality type, flexibility, understanding and use of avoidance and/or coping mechanisms, cognitive style and sleep and behaviour patterns. In other words, what might be perceived as a medium level of strain by one person might be processed as significant stress by another, or as not

in the least stressful by yet another. It gets down to whether the subconscious filters the pressures we are exposed to as 'safe' or 'threat'. This being the case, employers in the fields of project management and construction would be well advised to put into effect systems of stress management that have significant focus on individuals and are not simply designed to satisfy some legislative compliance requirement.

In 1976 Cooper and Marshall categorised sources of occupational stress and the categories identified were later supported by the research of Cox (1993) and Cartwright and Cooper (1997). Clarke and Cooper presented an adaption of that model in 2004. This identified key sources of pressure as those intrinsic to the job, those related to role in the organisation, those associated with relationships at work, those concerning career development, those relating to organisational structure and climate, and those related to the home-work interface. Clarke and Cooper also recognised the importance of the home-work interface as a pressure source. An individual's personality and ability to cope were seen as important in the pressure to stress conversion and the identified outcomes of stress that was not well managed included mental ill-health, physical ill-health, sickness related absence and work accidents.

In the same 2004 text in which the above was presented, Clarke and Cooper presented the Cooper-Cummings framework, which was adapted from Cartwright and Cooper (1997) and this provides insights into stages of an effective stress management strategy within the workplace. That framework is shown in Fig.1.
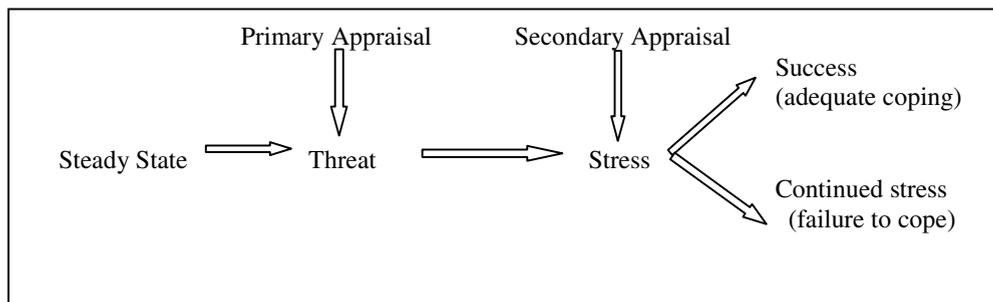

Fig.1 The Cooper-Cummings framework (Clarke and Cooper, 2004)

For the purposes of this paper, the model can be explained as follows:

- In the absence of perceived threat, an individual remains in a steady state. If the individual is positive about his/her work situation and feels they can cope adequately, they are likely to remain in this steady state
- When the individual perceives they cannot cope with a source of pressure they are likely to experience a stress response, and they are likely to respond with a similar stress response to similar events in the workplace. (It therefore makes sense for employers to appraise workplace threat levels as part of their stress management programme)
- If the individual experiencing stress takes coping action and it is successful, they can return to a steady state.
- If the individual does not adopt coping action, or if such action is not successful, they are likely to continue in a stressful state

The model suggests a stress management strategy for organisations along the following lines:

1. Take stock of the job-related factors likely to give rise to stress and apply risk management strategies. Continue to monitor the effect of the strategy on individuals, whenever threats by job-related factors are in play.
2. Maintain awareness for when the risk (stress event) manifests for any individual and encourage remedial stress management intervention. Preventative/early remedial strategies that mnight apply to this step and the

previous could include, for example, training in managerial behaviour adjustment and in stress avoidance and coping techniques.
3. Monitor results

5. Defining the ideal programme

The question arises as to what constitutes an ideal stress management programme for project management and construction organisations. The Cooper and Cummings model for addressing workplace stress is highly respected. The model suggests a focus adjustment away from remedial reaction after stress symptoms develop to one involving stress-threat risk assessment and encouraging the use of coping/avoidance techniques when pressure presents. Early remedial action at the first sign of stress symptoms presenting would obviously be another resourceful component of the ideal management strategy.

The research presented here was carried out in order to assess the current knowledge of and prevailing attitudes to this sort of approach to workplace stress management among firms engaged in project and construction management. The method and results described relate to a pilot study carried out recently in Australia that was primarily intended to assist the authors in the development of a more comprehensive methodology for deeper research in this area.

6. Research method

The method adopted for the pilot study included a semi-structured survey and interview of 12 project management and construction industry professionals from across a range of organisation sizes and focus areas. Eight considered themselves as focused more on traditional project management, emphasising detailed management of pre-construction work, and four regarded themselves as more associated with the delivery side of construction and were involved mainly in managing projects won through a tendering (or negotiated contract) process. All of the interviewees were from senior executive level and included two Chief Executives.

Half the interviewees were selected from among personal industry contacts; the remainder were selected using the following approach:

1. Listing several project management and construction firms who operate within one hours' drive from Bond University
2. Selecting from this list using a random number generator
3. Using industry contacts to effect introductions to senior personnel within the organisations so selected.
4. Conducting the interview

7. Form of Interview

A semi-structured survey was most appropriate for the study. Interviewees were asked to respond to 15 questions using a Likert scale approach, and to four questions seeking a 'yes' or 'no' response. Interviewees were encouraged to add their comments as and when they felt so inclined during the interview. Some useful insights were gained from this component of the approach adopted, and these are addressed in a separate section of the paper.

8. Key Findings from the Survey

Twelve people were interviewed. All except two were senior project managers, project directors, or development managers. Of the remaining two, one was the managing director of a state government department and one was a former managing director of a major construction and infrastructure company who had recently

completed his contract. Eight saw their role as more project management related and four saw their role as one concerned primarily with construction management.

The first survey questions sought to determine whether respondents considered stress as being caused primarily by non-work or work related issues or if both contributed. The questions allowed agreement or disagreement with two different propositions. The propositions were (1) Stress is more an issue caused by home or non-work factors than by work factors, and (2) Stress is an issue more significantly caused by work related factors.

Two respondents agreed stress was caused more by home-related factors than work related, citing relationships, financial and family health issues as the major contributors to non-work related stress. Four respondents neither agreed nor disagreed regarding stress being primarily caused by non-work related issues and six disagreed with the proposition. Significantly, three respondents strongly agreed and three agreed that stress is significantly caused by work-related issues. The next question set sought to determine respondents' perception of workplace as a stressful environment, and whether or not stressed individuals in the workplace were of concern, regardless of the cause of their stress.

All respondents either strongly agreed or agreed with the survey proposition that "The work we do in our business is stressful". Likewise, all either strongly agreed or agreed with the survey proposition that, "Regardless of whether stress is caused more by work related issues or non-work related issues, it can have a significant effect on performance in the workplace." Reduced productivity and increased potential for safety-related risk were cited as the two consequences most often experienced. In response to the proposition "Our business experiences significant absenteeism due to stress related issues/illnesses", seven respondents disagreed, four neither agreed nor disagreed, and one agreed. The respondent who agreed cited two incidences of heart attack suffered by 50 year old employees. Of note is the fact that those who neither agreed nor disagreed either explained they had no access to relevant information or made the point that major projects attracted people who would probably see stress as an illness or cause of illness that would be somewhat ridiculed by workmates and so, are unlikely to quote stress as a reason for absenteeism.

The next group of questions addressed the matters of avoidance and management of stress, and of Employee Assistance Programmes (EAPs). Information regarding whether or not leaders/managers and/or employees were trained to identify symptoms of stress in themselves and others was also sought. For the purpose of this survey, an EAP was (perhaps restrictively) defined as a programme by which people demonstrating symptoms of stress could have access to, or be referred to a qualified medical/counselling/psychology service provided by the employer on a confidential basis.

Table 1 presents the findings regarding whether or not respondents believed their organisations had effective stress avoidance, stress management or EAPs in place.

The survey next sought to determine to what extent people were trained to identify stress symptoms. In response to the proposition "Our business trains leaders and managers to be able to identify stress effects/symptoms in employees", one respondent strongly disagreed, nine disagreed, one neither agreed nor disagreed, and one strongly agreed. One respondent agreed, but five strongly disagreed and six disagreed, with a proposition that "Our business trains all personnel to be able to identify stress effects/symptoms in employees".

Table 1. Prevalence of stress avoidance/management strategies

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Our business has an effective stress avoidance programme	5	0	1	4	2
Our business has an effective stress management programme	3	2	2	4	1
Our business has an effective EAP for those who experience effects of stress	3	2	0	6	1

The final set of propositions sought information regarding what respondents considered would be an ideal approach to stress avoidance and management in their organisation. Being a simple question set which attracted little additional comment (apart from the direct answers) from respondents, responses are summarised in Table 2.

Table 2. Attitudes to stress management systems

Proposition	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
An EAP focusing on stress effects that employees report is sufficient for a business like ours	0	4	2	6	0
Stress should be a matter for individuals to deal with, and not employers	1	9	0	0	2
A stress management approach should include training of leaders/managers in the identification of stress in self and employees	0	1	0	10	1
A stress management approach should include training of all employees in identification of symptoms of stress in self and work mates	0	9	0	3	0
A stress management approach should include training leaders/managers in stress avoidance and management techniques	0	2	0	9	1

It is appropriate to compare the responses above, which indicate what respondents believe should be the case, with what actually exists in their organisations. The following summary of responses (Table 3) indicates strong disconnect between what respondents believe should be the case with regard to stress management in their organisations and what is actually the case.

Table 3. Stress management activities currently adopted

Proposition	YES	NO
Our business trains people in stress avoidance and/or management techniques	3	9
Our business trains leaders and managers only in stress symptoms identification	3	9
Our business trains non-leaders and non-managers in stress symptoms identification	0	12
Our business makes professional medical or counselling assistance available to anyone experiencing effects of stress	7	5

9. Information provided in discussion

Key insights provided in general discussion with respondents include the following (only points were made by at least one third of respondents are included):

- A major concern is that stressed individuals working in construction can compromise safety and/or quality standards, and neither is acceptable
- The nature of the industry is that, even if stress were the reason for absenteeism, it is unlikely that people would attribute absenteeism to stress for fear it might make them appear weak
- Often stress avoidance/management programmes are in place but do not filter down to site level or are not offered at site level
- Any site related symptoms identification training tends to be related to suicide prevention (e.g. the Mates in Construction programme (BERT 2008)) rather than stress avoidance or management related
- A commonly held opinion is that symptoms identification training should extend down to site managers but that training of people below that could have negative consequences on productivity (e.g. people would take time off for minor issues of a non-stress related nature under the guise of stress management)
- Limitations on working hours can often give rise to additional stress if there is no adjustment in deadlines or resources availability for the work requiring long hours of effort in the first place
- It is more common to have discussion/training around the issues of stress avoidance and management, but far less common to see solid programmes properly put in place
- There is a common perception that people in project management and construction are more likely to be those attracted to the 'tough' culture and less likely to be affected by stress. (The more aware saw the fault in this logic and realised stress levels could very well be the same or higher than in other industries but the tougher image culture prevented facing or reporting the reality of stress effects)
- Respondents from smaller organisations were more likely to express the opinion that stress was primarily a personal matter to be managed by the individuals affected
- The range of stress management programmes conducted by the organisations represented by the respondents varied from full (limited working hours, feedback system, gymnasium provided, wellness training provided, regular ergometer tests and health screenings, nutrition advice, and counselling availability) to the minimum of no formal avoidance or management protocol and no formal EAP, but a recognition that people suffering stress effects "would probably have counselling made available to them"
- There was a feeling expressed that, if subcontractors and consultants could be trained to better manage their businesses, stress would be reduced for them. There is too little training in leadership management and communication skills and in coping skills within the industry's education system
- More experienced senior leaders recognised the knock-on effect of work stress being displaced at home, causing deterioration of relationships which caused increased stress which was often, in turn, displaced back into the work environment
- It was regarded that working longer hours per day over a five-day week (with commensurate time off elsewhere) was a more effective means of recovering time than was working on six days. The taking of time

from family or even private job commitments often resulted in reduced productivity because of absenteeism through sick days as workers sought to catch up lost private time

One organisation offered all senior executives free health screening and found 74 per cent of their executives had high blood pressure yet only 15 per cent of these realised it and were on prescribed medication. The key quote from one respondent was as follows:

> "*We have only two assets in construction project management – machinery and people. We'd never think of not keeping our machinery well maintained. It's high time the industry at large took the same attitudes to our people.*"

This might well be a mantra for encouraging greater awareness and education regarding stress and its effects.

10. Conclusions

Generally, respondents exhibited an awareness of the potential of stress to cause problems in the workplace but a lack of consistency regarding how stress and its potential effects would be dealt with. Responses strongly indicate that an education programme is needed and that both the time and industry receptivity at executive level are ripe for the introduction of such a programme. The prevailing attitude that project management (as related to the construction industry) and construction management are 'tough' industries and attracted those who considered themselves tough people would need to be considered in structuring such a programme. The consensus of respondents that culture prevented a lot of reporting of stress effects because people felt they would be considered weak if they did report them is suggestive of a need for relatively urgent launching of such an education programme.

The clear difference of opinion as to whether stress was primarily attributable to non-work or work related issues raises the question of whether or not the culture characteristic described above was also present among respondents. The agreement of all respondents that, regardless of the cause of stress, it could have a significant effect in the workplace, and that their work was stressful, would reasonably lead one to expect a high level of stress avoidance and stress management systems, and of EAPs, within organisations represented, but this was not the case. Approximately half of the respondents, generally those from smaller organisations or from organisations undertaking smaller projects, stated their organisations had no stress avoidance or management programmes or EAPs. Furthermore, in all but one instance, neither staff nor managers/leaders had been trained in the identification of stress symptoms, and this despite more than 80 per cent of respondents stating that managers/leaders should be so trained.

While over 80 per cent of respondents disagreed with the proposition that stress should be a matter for individuals, and not organisations, to deal with, 50 per cent believed an EAP (dealing with stress after its effects have manifested) was a sufficient organisational response. Even more incongruously, all but one respondent agreed that managers/leaders should be trained in the identification of stress symptoms in themselves and others. This strong emphasis on dealing with stress after it has begun to manifest indicates a lack of understanding within PM and construction related organisations of what constitutes a comprehensive and well-structured organisational approach to dealing with stress. Again, an industry-wide education programme is strongly indicated.

On the basis of this pilot study the authors plan to undertake a wider survey that will involve a larger sample of organisations and the people within them including people in a greater diversity of roles.

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