The impacts of personal stress upon critical project decision making in construction

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ABSTRACT

The range of responsibilities for construction managers has become increasingly complex due to additional legal requirements and more widespread stakeholder involvements. These additional pressures potentially impact on the integrity of managers' decisions when advancing building projects safely and efficiently. The aim of the study is to develop a greater understanding of the direct and indirect effects of work stress upon the critical decision making practice of those charged with significant responsibility in construction projects. Fifty-five questionnaires and a further five interviews were completed by construction project development managers to test and ascertain the hypothesis: "What are the effects of accumulated personal stress build-up upon important project decision making and how can this be managed by construction managers?" The results of the survey indicated that stress is highly subjective and not readily assigned to specific decision making impacts for all managers. However, in terms of the mitigation of stress upon decisions, the results of this study revealed that decision confidence in relation to managerial support had the greatest overall influence upon decision clarity and outcome.

Keywords: Stress, communication, decision making, performance, construction manager.

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INTRODUCTION

Today, work place stress is high on the government's agenda, however, the Association of Arbitration and Conciliation Service (ACAS, 2006) reports that this phenomenon is not a symptom of our modern work ethic but that psychologists and psychiatrists have been studying the effects of stress since the early 1900's (Cannon, 1929; Selye, 1946). The concept of stress has been defined as being the external forces that influence the way in which a person responds and the natural tendency to resist such forces (Cannon, 1929). However more recent theories of stress emphasize the misfit between an individual and a particular environment and the varying abilities of an individual to cope with different levels of pressure (Cummings and Cooper, 1979). The International Stress Management Association (ISMA) UK (2009) defines stress as "an adverse response to what people perceive as too much pressure". If the experiences of the pressures are perceived as a challenge by the individual, this will promote motivation; conversely if the level of pressure exceeds an individual's capability to cope then the effect materialises as stress and is likely to have a negative impact on the individuals' health (ACAS, 2009).

The relationship of stress to judgment and decision making is an aspect of human behaviour that remains inadequately explored (Hammond, 2000 and Gillis 1993). Stress has complex influences upon decision making, such as narrowing the focus of attention, and can prevent people from using logic or reason to make decisions (Rondeel et al., 2008). Keinan (1987) suggests that severe stress situations often lead to conditions of psychological isolation for construction managers due to the temporal narrowing effects of concentration upon a difficult task. Decision isolation may be linked to the trait of decision making, speeding-up when under stress (Djebarni,1996) and reduce the likelihood of individuals to: follow decision guidance protocols, overlook guidance and consequently make irrational decisions.

CAUSES OF WORK PLACE STRESS

Management is generally defined as a high stress occupation attributed to the excessive workload (Hinsliff, 2005). In a survey by Campbell (2006), stress, anxiety and depression were experienced by 68.2% of construction managers as a direct result of: poor communication, inadequate staffing, too much work, ambitious deadlines, pressure and conflicting demands. ACAS (2006) describe similar issues as they cite the main causes of work stress as: a workload that individuals cannot cope with; lack of consultation by managers with employees regarding their work; communication and negative relationship issues. Such conditions for employees lead to anxiety, self doubt, sickness absence, poor behaviour, bullying and grievances. Specific to the construction industry, Prosser (2009) indicates that the largest cause of work related stress is the demands of the job and senior managers.

Buck (1972) and Djebarni (1996) Leung (2003) argue that untrustworthy and unfriendly senior managers also present significant stress symptoms for construction managers. These include three stressors: 1. Boss stress. 2. Job stress and 3. Environment job stress (Djebarni, 1996: 288). Environment job stress is significant for all individuals and covers many things, e.g. noise, cramped conditions, poor resource support, interpersonal differences such as race, gender related tensions, and social isolation. Such conditions exacerbate the impacts of the more typical boss stress and job stress strain upon people depending on the individual's susceptibility to stress.

In addition to occupational stress, significant stress contributors for construction managers may well include non-work related issues such as: personal finance, relationship problems, moving house, domestic arguments, divorce, marriage and being under threat from verbal, emotional and physical abuse (BUPA, 2007). However, survey date reveals that despite the high percentage of construction mangers experiencing stress, of the 62% of construction management respondents, only 42% would not take time off even if diagnosed with stress by a medical expert (Prosser, 2009).

THE EFFECT OF STRESS ON QUALITY DECISION MAKING

Construction managers experience pressure from work-load and time constraints as well as the pressures imposed on them by the organization to make decisions. It is the decisions of the managers that have the potential to impact on the performance of the organization. Consequently managers need to have an awareness of their stress comfort limits to be able to cope with these pressures (Djebarni, 1996).

Research emphasises the importance of identifying stress risk related to a decision outcome, especially the effect of stressful conditions on human judgment in emergency situations (Djebarni, 1996). Decision making under stress is at risk of becoming faulty as hasty decisions are often made as a defence mechanism to offload responsibility to others (Djebarni, 1996).

Personal emotions are a risk contingent especially if negative with effects upon others being of two main concerns: i) Expected emotional impact of decisions, here the manager is preoccupied with predicted backlash from subordinates this is a significant problem where newly appointed managers seek to win approval of their charges; ii) Expected immediate emotional impact of decisions. In this scenario the anxious manager may find making a decision impossible due to an expected deluge of disapproval from subordinates (Loewenstein and Lerner, 2003).

STRESS AND DECISION MAKING SUPPORT MECHANISMS

Heaney (2005) argues that coping with stressors is heavily influenced by the availability of appropriate resources at the time of need. Coping theories for stress have been discussed at large in the field of general psychology since the cognitive theory of stress and coping was conceived to suggest that people continually adjust and then re-adjust their perception of their environment in order to manage stressful situations (Haynes and Love 2003).

Coping methods are directly linked to the importance to which the individual achieves accomplishment (Yip and Rowlinson, 2006). Coping with stress is offset when managers are able to realise individual goals felt to be important. Vulnerability of individuals to professional burnout is largely dictated by the managers coping method type, this is again further complicated by the individuals' sensitivity to the effects of anticipated or predicted negative decision outcomes (Leiter and Maslach, 1999).

Leung et al. (2008) reports that improvement in decision making outcomes are attributed where organisational support to individuals is strong. House (1988) states that organisational support for individuals should be divided into two aspects: a. Formal and b. Informal supports:

a. Formal support relates to timely provision of information and guidance from managers to decision making individuals so that problems are tackled with best knowledge available to them.
b. Informal support will need to come from colleagues who reinforce the formal guidance in a complimentary manner.

The importance of managing the emotional component in decision making was initially promoted by Leiter and Maslach (1999). "Human factors, subjective stress, arousal and mood have an influence on decision making, and that the amount of risk concerned with the decision moderates this influence." Past research has not yet addressed the specific influences of subjective stress, arousal and mood on decision making processes in particular decision tasks or context (Rondeel et al., 2008).

This research aims to establish whether there is a significant link between work-related stress and decision making. Rondeel et al. (2008) states: "The main findings from previous research about the influence of stress (both subjective stress and arousal) on decision making are that stress leads to the narrowing of attention, a lack of concentration, over-reliance on heuristics and biased decisions."

Decision making behaviour is considerably affected by environment dynamics, because most natural dynamic situations contain much uncertainty (Kerstholt, 1994). Strong parallels can be seen between

Kerstholt's theories and the scenario for construction projects due to the individuality of client needs and the unique challenges each contract presents to construction managers.

Uncertain environments forces decision makers to achieve trade-offs between the cost of poor outcomes from hasty decisions and the risk of non-progress through avoiding making decisions (Kerstholt, 1994). It is the uncertainty and the potential risk of decision making in a transient and fragmented environment such as the construction industry that have the potential to exacerbate the impact of stress and pressure on decision making.

METHODOLOGY

This study aims to measure and assess the impact of personal stress upon decision quality for construction managers. Following a detailed evaluation of relevant research into stress and decision theory specific to construction management roles, four levels of management were surveyed; Supervisory, Assistant Site Manager, Site Manager and Executive Manager. Fifty-five construction project development managers were selected for the survey and in all cases participants had significant resource management responsibilities. Thirty survey questionnaires were completed through postal return and twenty-five samples handed to candidates in weekly contact with the researcher, however, no distinction has been applied to the measured data.

Further to the postal questionnaires, five informal interviews were conducted with construction managers holding significant responsibility within their companies. Personal interview questions informed the findings from the questionnaire and served as a validation process.

Consisting of forty questions, the questionnaire was divided into three parts:

a. Part A recorded details about the person in terms of age, experience, time in post and work environment features and general work routine with questions about how they operate and interrelate with others. Evidence gathered here was crucial to the value of later conclusions as this data stress conditions to be tested in a cumulative sense.
b. Part B asked the candidate to describe work characteristics, close working relationships and decision support, here variables in the roles between the survey respondents were examined to identify correlation of stress problems at this micro level but also against the individual values identified for part A.
c. Part C examined personal philosophy, how well the candidate mitigates work stress and daily commitments in general. Comparison of survey candidates by nature and personal circumstance were made possible, in the light of issues discovered at parts A and B.

Personal interview questions were reflective of the knowledge gaps identified from careful examination of postal questionnaires and earlier literature research and served to qualify earlier feedback from postal questionnaires as being either safe or spurious and non-reflective of a manager's decision making activity

Data Collection and Method of Processing

After the survey findings had been tabulated, to reinforce validity for small frequencies in samples, the two-way Yates corrected Chi-square calculation was used.

A single degree of freedom between positive and negative data variables was applied as only two survey questions were compared against each other to establish pure relationship in each of the three tests of probability or non-probability of significant hypotheses. The three groups of data to be tested for statistical relationship of probability are as follows:

Line Management Support and Decision Confidence in Managers

A principle stressor, boss stress referred to in literature (Leung, 2003) significantly impacts upon the well being of construction managers. The assumption is that decision integrity is improved where high line-

manager support exists. The null hypothesis therefore is that boss stress has no affect on a manager's decision making.

Relationship Environment and Personal Decision Comfort for Managers

Assessment of work environment factors against the level of discomfort experienced by managers during decision making is tested. The hypothesis is that a high comfort environment leads to high decision comfort for managers. The null hypothesis is that work environments have no affect on decision comfort levels and stress levels.

Decision Difficulty and Stress Reaction for Managers

A core component of the research aim is testing to establish to what extent difficult decisions affect stress reactions in managers. The hypothesis here is that the greater the decision responsibility, the greater the stress reaction. The null hypothesis is that there is no direct relationship between decision difficulty and stress experience for managers.

DATA ANALYSIS AND FINDINGS

T Survey feedback data was collated into groups to cover; Decision Difficulty and Decision Confidence, Environment Support and Decision Difficulty and Stress Reaction. These data groups were compared against each other and across both the age range for managers to test several null hypotheses that stress does not negatively affect decision judgment and decision outcome quality for construction managers.

Supervisory Management Analysis

Time in post and experience were similarly reflected across the age range bandings with the exception of the 45 to 54 age group where more than 11 years of experience was recorded. Evidenced from both survey questionnaire and follow up interviews; older and longer serving managers cited a reluctance to engage in stressful decision making as being the reason for not seeking promotion and that this was their best defence against uncomfortable work stress. At this age level, manager, peer and environmental support were cited as being good although problem origin was split evenly between line managers and subordinates.

Interview discussions revealed that decisions were more likely to be made as a result of reaction to situational needs and that lower stress levels were cited for older managers who had experience of what worked and what did not work in projects. A dichotomy existed however between the youngest and oldest supervisors, for the two age groups that ranged from 18 to 34. The significant stressor was on the spot decision making in the company of both managers and subordinates, whereas for the oldest supervisors the significant stressors were the lack of ICT skills, especially when in the company of younger line managers, this was explained during interviews as being the result of feeling obsolete and fearful of being replaced by younger staff.

Decision stress mitigation for older supervisors was afforded where high support existed from peers of similar age and where good office facilities existed. Younger supervisors quoted less stress in decision making where regular support and access to feedback was readily available. A lack of understanding of the macro-impacts of decision making was apparent for the younger managers with less stress personal stress. Older supervisors recorded higher levels of decision stress than younger supervisors.

Assistant Site Management Analysis

In the 18 to 24 age group, assistant managers reported high levels of decision support from line-management, however, a high incidence of relationship problems existed due to conflict with subordinate team members when compared to supervisor level managers, this was examined during interviews with managers, with the consensus being that in the main, older staff do not like taking advice from less experienced and younger managers and is often due grudges and the lack of influencing skills (Turner, 2003: 120–22).

Relationship with peers was recorded as being generally good although personal comfort with decisions was reported to be low. Overall, the decision environment in this age group was stated as being good, this was explained as being largely due to low decision responsibility and that environment was not critical to supporting decisions.

Problem solving at this management level requires less comparable reliance on holistic decision management skills; this limits the exposure to emotional origin stressors. In the trainee route into assistant management, decision skill development is less affected by emotional preconceptions of problem environments as is the case typically for former craft operatives who tend to experience a higher degree of role adjustment to management techniques and this is attributed to increased frustration and anxiety due not achieving their own goals as discussed in interviews (Turner, 2003: 120).

The 25–34 year age range had the widest range of entry routes with those from craft disciplines experiencing more line manager conflict than managers with educated or trainee backgrounds. Those that came from a craft background also cited less effective relations with sub-ordinate staff; later interview data revealed that such issues were typically the result of over familiarity with former peers and peer jealousy over promotion acquired by the assistant manager (Turner, 2003: 120–22).

Practical problem solving skills were given as a common strength for those from former craft backgrounds, this was confirmed at interview, as decision confidence levels in those managing familiar work. Issues with this are, however, that maverick style decision logic does not always afford the best overall solutions for project problems and it often leaves the manager at higher risk of criticism where methods fail due to not complying with decision policy. Paradoxically, this management position recorded the lowest score of personal comfort in decisions yet had the highest chance of promotion.

Site Management Analysis

All survey respondents were aged 35 to 44 with 5 being from a craft background with 2 to 5 years experience. Two respondents were from a trainee background with between 6 and 10 years experience. A relationship with peers was recorded as being generally good although personal comfort with decisions was reported to be low. Overall the decision environment in this age group was stated as being good although the decision nature required site managers to predict problems more frequently than solve them; this exposes the site manager to a longer period of decision flux and greater stress symptoms than their assistants due to the higher likelihood of taking problems home after work.

Initial survey data scrutiny indicates varied stress and decision impact trends with some not affected by stress and some very uncomfortable with such. Grouping of survey data will facilitate further examination of the data through statistical analysis to establish any relationship bias between role specific stresses in decision activity.

Three groups of collated survey data that are subjectively assumed to have positive association will be statistically tested for probability of positive relationship, these are: 1. Line Management Support in Decision Making and Decision Confidence in Managers; 2. Decision Difficulty and Stress Reaction for Managers, and 3. Relationship Environment and Personal Decision Comfort for Managers.

DISCUSSION AND CONCLUDING RESULTS

The process of investigating the effects of stress upon decision making for construction managers has revealed measures of both synthesis and divergence in the comparison of stress to collected survey material.

Significant Departures from Expected Research Results

- Primary research data indicates that a relatively younger age range of managers are operating at higher management levels than expected across the management levels surveyed; this may be significant to findings.

- The impact of stress reported by the respondents as a result of their exposure to high stress environments is less significant in terms of potential for personal and project harm than stress levels quoted in literature (BUPA 2007).

Stress Experience for Management Roles

The experience of work-stress for managers involved in this study revealed that:

- Stress symptoms experienced are more superficial, at a conscious level and are short lived compared to those identified as common symptoms in literature. This may be explained by the fact that in general, managers are young and may well be more physiologically resilient to daily work stressors.
- In contradiction with the literature reviewed, the managers sampled may not have had sufficient exposure to the hypothetical and more medically aligned threshold of damaging stress, although their current stress may precipitate in the future.
- The interviews indicated that longer serving managers tended to suffer more from psychological stress, whereas less experienced managers stated that they felt stressed emotionally as a result of trying to prove themselves to others.

Stress Environment Decision Support for Construction Managers

Cited in research as being highly relevant to stress manifestation, this study realises that:

- A high level of environment, colleague and boss components existed for the surveyed managers, therefore in this study the significant stressors as detailed in literature may well have been removed from the cumulative stress equation.
- Poor communication of critical information and isolation from resources and decision support by line managers was cited by participants as being a significant stressor in a fast changing environment.
- Decision confidence of the participants was identified as being affected directly by the availability of manager support.
- Decision comfort was recorded as being higher for older managers where they had; lower responsibility positions, better office facilities, and micro-management decisions that tended to involve smaller teams with less project risk outcome.
- Decision comfort for younger managers was not affected by the quality of office facilities but was sensitive to the level of verbal feedback and manager support.
- Participants who declared greater work routine isolation and poor relationship environments also declared poor decision confidence and greater stress levels overall.
- Macro-level decisions taken by executives exposed the highest levels of significant stress discomfort. This indicated that responsibility may well affect decision comfort as this is linked to a higher incidence of stress unease.

A distinction must be clearly made between decision confidence and decision comfort, as higher levels of manager support increased decision confidence however no relevance could be associated between high or low decision support and decision comfort for the managers involved.

Decision Impacts of Stress

In assessing the affects upon decision quality of precipitating stress factors, the managers in this study did not exhibit clear patterns of impacted stress, however:

- Younger executive managers are significantly less confident than the older managers although decision comfort remained high.
- Executive managers from craft backgrounds had lower decision confidence across the age ranges.

- At site manager level those with craft backgrounds had a significantly low score of decision comfort but relatively good levels of decision confidence
- Literature has stated that too much stress is likely to result in impaired judgment. In the primary research a relationship between low manager support and poor decision confidence lead to low decision comfort.

The stress levels experienced by the managers in this study are not fully correlated with literature conclusions in as far as apparent damage to decision integrity is concerned. However, it is reasonable to conclude that the relatively short periods in management of the surveyed managers involved is responsible for this under-reporting of decision stress.

The results of the survey in terms of the effect of stress upon decision outcome has proved less conclusive than had been expected however it is apparent that judgment confidence reduces as managerial responsibility increases.

Decision Support for Construction Managers

Decision support for construction managers are considered to be the main objective of the research is the ability of this study to expose judgment logic protection methodologies for construction managers.

- Managers that declared; good peer relations, good boss support and the regular use of decision protocols, were marginally more positive about their ability to manage stress and make safe decisions. This may be because they feel they are "doing things right" and perceive less risk of latent criticism should things go wrong.
- The potential for decision support assessment within this study has its limitations. The research suggests further stress and decision theory study will need to be undertaken to fully compile comprehensive stress and decision guidance for the surveyed managers.
- What is evident from this research however; is that managers should attempt to observe others and learn from their pitfalls and from this try to perceive within their own work environments the negative environment factors that precipitate decision stress.

RESEARCH LIMITATIONS

This research identifies critical restrictions of this study to be the limits of time and scope in terms of age range and the lack of long term exposure to decision practice observed from respondents. Furthermore it is perceived that the emerging higher credence given to greater levels of corporate responsibility, stricter project safety and more diligent risk management in recent years may have had the potential to reduce the decision risk contingent and with this a reduction of the significant stressors to the managers of construction projects.

FURTHER IDENTIFIED SUPPORTING RESEARCH

Given that decision confidence and decision comfort have been axial to research in this study with an interrelationship indicating divergence from published stress and decision theory; the following items are suggestions to further this research:

- The consideration of personality and general confidence and self-esteem of construction managers should be examined to assess the possibility of a pattern of relationship to decision comfort as this has not been related to decision confidence for managers in this study.
- Investigate the corporate maturity of companies and their ability to manage the skill sets of individuals working at similar management levels.

- Time weighted calibration studies of stress build-up to determine if there are mathematical approaches to assessing stress impacts upon decisions for low stress for many years and high stress for few years in post scenarios as experienced by managers.

A meaningful progression of this study would be to re-assess the managers involved in five years time. As hypothesised in research, stress may well have not become critical in terms of decision making effect for the managers at the time of study.

Therefore the charting and later examination of the longer term stress and decision experience for the managers may prove valuable to correlating this study with literature or indeed the definition of a change in decision theory for construction managers working in an environment of increasing contractual, relationship and cultural change.

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