

# Occupational stress and job demand, control and support factors among construction project consultants



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Received 31 May 2013; received in revised form 8 January 2014; accepted 21 January 2014

Available online 6 February 2014

## Abstract

Occupational stress affects the health and wellbeing of people who work, and the construction industry is recognized as a high-stress working environment. The relationship between job demands, job control, workplace support, and experiences of stress in the South African construction context is investigated, using hierarchical regression, factor analysis and structural equation modeling to explore the strength of thirteen factor relationships with perceived stress. Data were gathered from an on-line questionnaire survey response sample of 676 architects, civil engineers, quantity surveyors, and project and construction managers. Predictors displaying a significant relationship with occupational stress are the presence of work–life imbalance, the need to ‘prove’ oneself, hours worked per week, working to tight deadlines, and support from line managers in difficult situations at work. Existing theories of occupational stress are confirmed but not completely supported. The construction industry should give attention to how the need to work long hours is justified. Organizations should look to improving managerial and collegial support for construction professionals, but be careful in engaging in socializing and project team-building activities. Further research will need to focus more deeply on construction-specific job demand factors; explore why women professionals appear to experience more stress than men; and aim to develop reliable early-warning detection techniques for construction professionals.

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*Keywords:* Occupational stress; Stressors; Construction projects; Project management; Personnel management

## 1. Introduction

The construction industry is noted for work-related stress (Lingard and Francis, 2004; Love et al., 2010; Pocock et al., 2007). The project-driven nature of the industry, with its emphasis on delivery on time, within budget and to required standard, exacerbates conditions for stress already characterized by dynamic uncertainty (Asquin et al., 2010; Mohr and Wolfram, 2010) and often interpersonal and inter-role conflict (Leung et al., 2007; Loosemore and Galea, 2008). Moreover, working hours in construction tend to be long and arduous (Van Wanrooy and Wilson, 2006) for professionals as well as for artisans and laborers. Occupational stress threatens the health of working people (Health and Safety Executive (HSE), 2006) and its prevalence, impacts and

causal factors have been the subject of considerable research attention (e.g., Gallie, 2005; Houtman, 2005), with the conclusion that matters are getting worse, not better.

Previous studies of occupational stress in construction have focused on the experiences of a single professional group and have largely been undertaken in industrialized countries with advanced economies. Few studies have compared the experience of occupational stress in different professional groups. Neither has research evaluated the extent to which theoretical models of occupational stress developed and tested in industrialized countries apply to countries with less developed economies. The research presented here addresses these knowledge gaps by investigating occupational stress experienced by multi-disciplinary professionals working in the construction industry in South Africa. Survey data are subjected to mathematical modeling, using hierarchical regression, factor analysis and structural equation modeling techniques, to explore the strength of association between one or more of the job demand,

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control and support factors of interest, and a dependent variable measuring self-assessed levels of stress occurring for construction professionals.

The paper commences with a description of the background context for the research; followed by a brief review of occupational stress, with emphasis on the construction industry. The research methodology, design, and survey administration are described. The analysis of the survey response data, and the mathematical modeling techniques are presented and discussed. Conclusions are drawn and recommendations made for practice and further research.

## 2. The South African context

The *apartheid* legacy in South Africa provides a unique context to examine occupational stress among construction professionals. Under pre-1994 *apartheid* legislation, persons were racially classified as ‘White’, ‘Black’, ‘Colored’ (mixed race), or ‘Asian’. For the purposes of enforcing *apartheid*, persons were generally categorized as either ‘White’ or ‘Non-White’ (using this term as a broad, non-pejorative descriptor). In the construction industry ethnic discrimination prevented many workers other than those classified as ‘White’ from becoming skilled artisans (so-called ‘job reservation’). While ‘Non-white’ people were not prevented from working as construction professionals, their access to qualifying tertiary education was so limited that it was almost an ‘impossible dream’. Post-*apartheid* South Africa saw the introduction of ‘positive discrimination’ or ‘affirmative action’ (RSA, 1996) as a vehicle to assist previously disadvantaged individuals (PDIs: ‘Non-whites’ and women). Black Economic Empowerment (BEE) and affirmative procurement policies are examples of mechanisms used to facilitate change. Within the context of the construction industry, affirmative action in the public sector has, for example, taken the form of preferential procurement in the award of building contracts and the appointment of professional consultants.

South Africa, as a developing country with a unique history, thus presents a particularly interesting case because discrimination is a known risk factor for work-related stress (De Haas et al., 2009; Dollard et al., 2007; King, 2005). Importantly, women, along with ‘Black’ people, have been deemed to be ‘historically disadvantaged individuals’ (HDIs) for the purposes of affirmative action policies (see DPW, 2001; DTPW, 2002; RSA, 2000). While official statistics indicate that professional women account for 50% of economically-active professionals in the economy (Department of Labour, 2005), the percentages of professional women in construction are far lower.

In South Africa only persons registered with their respective statutory councils are permitted to undertake professional work. Within the context of post-*apartheid* South Africa and the aspirations of HDIs, it is not uncommon to hear the construction professions accused of elitism, exclusivity and a reluctance to redress the legacy of *apartheid*. The need to maintain professional standards is the most powerful counter-argument to these criticisms, but the professions (and the tertiary institutions that service them) are sensitive to exploring how the rate of entry by HDIs can be improved.

The research extends the findings of previous research by examining construction professionals’ experiences of stress in the context of commonly utilized theories of stress (notably the ‘Job Demands Control’ and ‘Job Demands Control–Support’ theories).

## 3. Factors associated with occupational stress

A relationship between work and stress is explained by Karasek (1979) in terms of the combination of demands and control inherent in a job. Job demands are quantifiable features of work, including time pressures and workload, while control is associated with the extent to which employees can exert individual influence over their tasks and conduct. According to the Job Demand–Control (JDC) model of occupational stress, work that is simultaneously high in demands and low in control produces the most stressful responses and is most damaging to health (Belkic et al., 2004; De Lange et al., 2004).

The JDC model of occupational stress has also proved reliable in predicting workers’ psychological wellbeing, job-related wellbeing and burnout (Hausser et al., 2010). More recently, adaptations of the JDC model of occupational stress have incorporated workplace support as a mitigating influence (Schaufeli and Bakker, 2004). Johnson et al. (1989) suggest that social support from colleagues or supervisors serves to reduce the damaging impact of stressful work situations on workers’ health. According to the Job Demand Control–Support (JDC–S) theory of occupational stress, jobs that are high in demands, low in control and low in workplace social support are experienced as the most stressful and produce the most damaging health impacts (Michie, 2002; Wilkinson and Marmot, 2003). The research sought to investigate the applicability of these theories in the context of the South African construction industry.

## 4. Stress in the construction industry

Sutherland and Davidson (1989) identified inadequacy of project information flow, onerous paperwork and excessive workload as the top three stressors among construction site managers. Leung et al. (2007) reported high levels of objective stress (i.e., stress associated with external demands such as deadlines, time constraints and workload) in construction estimators, associated mainly with a perceived lack of autonomy and/or low levels of reward. Onerous bureaucracy, a lack of opportunity to learn new skills and work–family conflict were ranked the three most difficult stressors to manage in a study of Hong Kong construction industry employees (Ng et al., 2005).

Occupational stress is associated with low levels of job performance in construction. Djebarni (1996) reports a curvilinear relationship between stress and leadership performance among construction site managers. In contrast, Leung et al. (2008a) provide no evidence for a curvilinear relationship between stress and performance, but report that the task performance of construction project managers is inversely and linearly linked to stress, and suggest that the stress levels of construction project managers in their sample may be higher than the threshold value at which the ‘inverted U-curve’ effect would apply.

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