Psychological Wellbeing and Engagement of Architects in South Africa: The Role of Job Conditions and Job Security

By

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Abstract

The construction industry has generally been suffering from mental stress issues as a result of a variety of stressors imposed on the employees, resulting in unhealthy behavioural habits, physical symptoms of burnout, chronic stress, and depression. Schedule constraints, challenging job conditions, and a lack of job permanence due to temporary contracts are well-known characteristics of the construction sector, and these could potentially lead to workplace stress and poor psychological health. Employees and organisations both suffer the adverse effects of stress experienced by members of the workforce. In recent years, the public has become increasingly aware of the importance of mental health and the general wellbeing of workers. Due to its connection to psychological well-being and employee engagement, psychological distress research has gained popularity in recent research studies.

The purpose of this study was to examine the factors that influence the psychological well-being and work engagement of South African architects. In particular, job security and job conditions were investigated to ascertain their relationship to both psychological well-being and the work engagement of employees. The research method comprised a critical review of the extant literature on psychological distress and workplace stressors, and the collection and analysis of data from a previous online survey questionnaire to architect members of the South African Council for the Architectural Profession (SACAP).

Using the 365 survey responses that were suitable for analysis, multiple regression analysis was employed to assess the relationship between the workplace stressors of job security and job conditions, and the potential outcomes of psychological well-being and work engagement. The results indicate that psychological well-being and work engagement are influenced by both workplace stressors analysed.

Interventions aimed at improving psychological well-being and the work engagement of architects in South Africa should focus on the promotion of healthy, clean, and safe working environments. In addition, organisations should encourage the improvement of employees' skills through periodic training to prevent the fear of skills redundancy and job insecurity.

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Plagiarism Declaration

Declaration

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Glossary of Terms

ASSET	A Shortened Stress Evaluation Tool
cidb	Construction Industry Development Board
ERI	Effort-Reward Imbalance
JD-C	Job Demand-Control
JDCS	Job Demand-Control-Support
JD-R	Job Demand-Resources
OSI	Occupational Stress Indicator
SACAP	South African Council for the Architectural Profession

Chapter One: Background to the Study

1.1 Introduction

Stress in the workplace is inevitable due to the strains of the modern work environment. Almost every occupation involves some degree of stress, and this work-related stress affects individuals in different ways. What affects one person in a particular way may not affect another in the same manner (Blonna, 2012). In addition, although stress is described as the adverse reaction that people have to excessive pressure or demands placed on them (HSE, 2007), stress is not always undesirable. According to some researchers, manageable amounts of stress can support individuals in their performance of certain daily activities and help them build resilience (Liu, 2015, Jones et al., 2001). However, globally, there is an increasing awareness of stress and its impacts on the psychological well-being of employees as a concerning issue in the workplace (Chambers-Holder, 2019, Cattell et al., 2017, Thirapatsakun et al., 2014, Bowen et al., 2013a). The prevalence of issues relating to individual mental health and overall well-being in the consciousness of society is growing.

Chronically-stressed workers frequently suffer from physical and psychological symptoms, including depression, mental disorders, eating disorders, musculoskeletal diseases (MSDs), physiological injuries, high blood pressure, and cardiovascular disease (HSE, 2007). Psychological stress in the workplace has also been connected to excessive drinking and smoking (Wong et al., 2019, Kim and Lee, 2015, Lipschitz et al., 2015). Furthermore, prolonged psychological distress may lead to psychosomatic diseases and suicide (Boccio and Macari, 2013, Heller et al., 2007). It is estimated that one in every six adults of working age in England and Wales has some form of mental health problem on any given week, such as depression, anxiety, or stress related disorders, and that this trend is generally duplicated throughout the industrialized world (Cattell et al., 2017).

The effects of stress on workers' psychological well-being, work engagement, and levels of commitment are becoming more widely recognised as a worrying workplace issue on a global scale. Good self-referential attitudes, positive emotions, and a sense of purpose are all components of psychological well-being. (Cheung et al., 2019a). Psychological well-being in adults is characterized by a state of good affect, the absence of negative affect, and the presence of job and life satisfaction concurrently (Panaccio and Vandenberghe, 2009). Thus, positive psychological well-being is often viewed as being

similar to a positive mental state (Weiss et al., 2016). A positive mental state is known to affect an individual's ability to cope with stressful events, and also affects their ability to enjoy daily life (Bowen et al., 2014b, Leung et al., 2008a).

Work engagement is a concept which describes the degree to which employees are involved in, passionate about, and dedicated to their work and workplace (Schaufeli, 2012, Bakker and Leiter, 2010). Employees that are engaged with their work express these qualities physically, cognitively, emotionally, and mentally as they perform their job roles (Kahn, 1990). Engaged employees regularly say good things about the organisation they work for, they have a feeling of emotional attachment and pride to the organisation, and they have a strong yearning to be a part of the organisation (Thirapatsakun et al., 2014, Bakker and Leiter, 2010). They believe in and support the goals and values of the organisation, and they go the extra mile for the organisation by putting in extra effort and showing initiative in their work roles.

Employee commitment refers to the psychological bond that exists between workers and their organisations that reduces the likelihood of them voluntarily leaving (Leung and Chen, 2011, Allen and Meyer, 1990). Commitment is characterised by an emotional connection to an organisation, and it is demonstrated by acceptance of the organisation's ideals and a desire to stay with the organisation. Studies have shown that employee commitment is frequently linked to good job performance and job satisfaction (Leung et al., 2008c, Bennett, 2002). In addition, a high level of employee commitment can result in lower absenteeism and lower staff turnover for an organisation (McGuire and McLaren, 2009). The longer an employee stays with an organisation, the more consistency they provide, which is very advantageous to the organisation. When employees within an organisation know one another better, they collaborate more effectively, as a greater degree of trust and comfort is present (Aghimien and Awodele, 2019). Long-term workers gain a better understanding of the organisation's procedures, suppliers, and clients. They also become more productive and efficient in a setting that emphasises teamwork.

The current outlook of workplace stress has led to the realisation of the need to understand workplace stressors, as well as their impact on psychological and physical health (Johnson, 2018). In addition, it has also been realised that there is a need for more effective methods of preventing excessive stress and anxiety as opposed to treating these health cases when they become severe among employees (Feldman, 2019). In many countries around the

world, there has been a call for change in the professional domain concerning psychological well-being in the workplace, and this call is coming from researchers, policymakers, and practitioners in a variety of industries (Arrman and Björk, 2017, Carod-Artal and Vázquez-Cabrera, 2013, Baines, 2011, Biggs, 2009). Work-related stress, poor employee engagement, and low levels of employee commitment are known to cause undesirable impacts on productivity and job satisfaction among employees in different professions (Artazcoz et al., 2013, Yong et al., 2013, Lath, 2010, Haq et al., 2008, McVicar, 2003, Ahmad and Khanna, 1992). Numerous studies also show that when excessive, work-related stress is a major contributor to absenteeism, low employee morale, high accident rates, and high turnover rates (Ajayi et al., 2019, Bailey et al., 2015, Wahab, 2010, Cooper and Dewe, 2008, Donald et al., 2005, Chau et al., 2004). Tougher job conditions, job insecurity, and longer working hours, which are a common feature of the 21st century workplace, are significantly contributing to places of work becoming ever more stressful environments (Wong et al., 2019, Leung et al., 2016a, Kim and Lee, 2015, Bartolini and Sarracino, 2013).

The construction industry is a project-orientated industry and places a lot of emphasis on delivering products on time, within budget, and to the specified quality standards (PMI, 2021, Nicholas and Steyn, 2016, Asquin et al., 2010). Job conditions and incentives are viewed as matters of serious concern to professionals in this industry due to hazardous working conditions, sophisticated technical issues, excessive pressure, and significant responsibilities being commonplace (Leung et al., 2016a, Bartolini and Sarracino, 2013, Carr et al., 2010, Mohr and Wolfram, 2010, Loosemore and Waters, 2004). In addition, risks and uncertainties are inherent in the nature of construction projects of different types, particularly large projects with long durations (Asquin et al., 2010, Mohr and Wolfram, 2010). Furthermore, working habits of construction professionals continue to evolve in response to the growth of information and communication technology, which in turn accelerates the perceived speed of both work and life (Holden and Sunindijo, 2018, Derks et al., 2015).

Uncertainties, tight deadlines, harsh physical working conditions, frequent travel, long working hours, and poor remuneration are just a few of the known work-related stressors, and these are commonplace in the construction industry (Holden and Sunindijo, 2018, Johnson et al., 2018, Arrman and Björk, 2017, Langdon and Sawang, 2017, Leung et al., 2015c, Bowen et al., 2014a). According to Haydam and Smallwood (2016), the

mismanagement of such workplace stressors is the primary cause of the serious occupational health issues that the construction industry as a whole is currently experiencing. As a result, in recent times, there has been considerable research confirming a strong presence of occupational stress and poor psychological well-being within the construction industry (Liang et al., 2021, Cheung et al., 2020a, Ajayi et al., 2019, Cattell et al., 2018, Holden and Sunindijo, 2018, Bowen et al., 2014b, Bowen et al., 2013c, Chan, 2011, Love et al., 2010). The severity of this problem is further highlighted by Cattell et al. (2017), who report that construction workers committed suicide at a higher prevalence than any other occupation in the UK between 2010 and 2015.

Limited studies have specifically examined the effects of job insecurity and poor job conditions workplace stressors on the psychological well-being and work engagement of architects. Furthermore, these studies have predominantly been conducted in Europe and North America, with very few being conducted in Africa (Richter and Naswall, 2018, Vander Elst et al., 2016, Cheng and Chan, 2008, Hellgren and Sverke, 2003, Sverke and Hellgren, 2002, Höge et al., 2015). This study aims to address this gap in knowledge.

1.2 Background

In recent years, macro-economic factors such as inflation, elevated interest rates, regulation, and unemployment have created major challenges for many businesses across South Africa (cidb, 2019, Cant and Johannes, 2013). The worsening economic landscape in South Africa has resulted in the creation of tough business conditions for many industries (Botha et al., 2021). The South African construction industry is not an exception, and the Construction Industry Development Board (cidb) has reported that difficult economic times have befallen the construction industry in recent years (cidb, 2018). The cidb further puts forward the view that these harsh business conditions are likely to continue into the short to medium-term future, due to insufficient demand for building and construction work. This tough and highly competitive business environment has created tighter deadlines for contractors and consultants, lower job incentives, a sense of job insecurity, and clients who are demanding ever more from contractors and consultants.

As is the case with other industries, the modern-day construction industry is fixated on production efficiency (Bartolini and Sarracino, 2013). Both managers and employees are forced to adopt a profit-driven mindset. Continuous modification of building processes,

evolving information and communication technology, pace and complexity of work, and increasing demand for higher productivity have become common features of the construction industry and have led to a highly aggressive business culture (Holden and Sunindijo, 2018, Ibem et al., 2011). Consequently, professionals in the construction sector operate in an increasingly competitive environment where projects are designed, constructed, and delivered within tight budgets and stringent deadlines.

This profit-driven culture has had an adverse effect on job conditions, job demands, and job security for many professionals working in this industry. According to Ajayi et al. (2019), the fast-paced, demanding nature of the construction sector is well recognised, and this naturally comes with intense pressure to succeed despite deteriorating industry conditions. Furthermore, the tough economic conditions have made clients fussier and more demanding of the services they are paying for when they engage contractors and consultants. Consequently, the worsening industry conditions being experienced by many construction professionals are having an adverse impact on their psychological well-being, work engagement, and levels of commitment (Cheung et al., 2020b, Aghimien and Awodele, 2019, Edwards et al., 2015, Bowen et al., 2011). This demonstrates that in order for organisations to stay competitive, maximize worker productivity, and achieve desired levels of employee commitment, it is necessary to adequately ascertain the factors that influence construction workers wellbeing as well as their desire to stay or leave a particular organisation.

Construction projects by nature rely heavily on the physical and mental performance of the workforce. Various factors can combine to make construction work mentally and emotionally demanding and stressful (Haydam and Smallwood, 2016, Bowen et al., 2014c, Zawawi et al., 2014, Leung et al., 2010b). Thus, there is a growing body of literature on occupational stress, work engagement, and levels of commitment among professionals and workers in the construction industry (Bowen et al., 2021, Cheung et al., 2020a, Ajayi et al., 2019, Oswald et al., 2019, Cattell et al., 2018, Cattell et al., 2017, Langdon and Sawang, 2017, Haydam and Smallwood, 2016, Leung et al., 2016b, Enshassi et al., 2015, Leung et al., 2015b, Bowen et al., 2014b, Bowen et al., 2013a, Mostert et al., 2011, Love et al., 2010).

Saikala and Selvarani (2015) investigated the key stress factors among construction professionals including architects, engineers, builders, and other related specialists

involved in the building construction industry of India. According to their findings, the main causes of stress were a high workload, work pressure, a lack of job resources, a lack of coordination between people at different levels, poor management, a lack of feedback/poor communication, and changes in scope of work. Cheung et al. (2022) investigated how the well-being of construction professionals around the globe mediates the effect of work–life balance on their commitment to the organisation they work for. This study made use of the A Shortened Stress Evaluation Tool (ASSET) model, which is a psychometrically validated scale, to show how work-life balance influences organisational commitment through the mediation effect psychological well-being i.e., positive emotions and sense of purpose. The findings from this study suggest that rather than focusing on improving the work-life balance of construction professionals, construction organisations could benefit more from boosting the sense of purpose and positive emotions of construction professionals to produce higher organisational commitment. Sang et al. (2007) investigated the gender differences in occupational health and well-being of architects within the UK construction industry. The questionnaire they developed measured four aspects of health and well-being: affective well-being; physical symptoms of stress; work–life conflict and turnover intentions. According to their findings, female architects report lower levels of well-being and poorer health than their male counterparts. Oyedele (2013) investigated factors that influence architects' demotivation and lack of interest in their work within organisational workplaces in the UK. The results of this study revealed seven prominent demotivating factors, including "organizational injustice," "project-induced stress," "dysfunctional design team," "poor interpersonal relationships," "perceived career decline," "negative leadership behaviour," and "poor organizational culture." Cheung et al. (2019b) evaluated the level of workplace wellbeing of project professionals across the globe in relation to a sound benchmark of workplace wellbeing that had been developed prior to this study. In addition, they investigated the factors that support or detract from project professionals' workplace wellbeing. The population (norm group) against which the respondents of this study were benchmarked includes approximately 70,000 responses to ASSET surveys from a range of organisations and industries in the public and private sectors, obtained during the period of 2013 to 2017. The results of this study found that project professionals were experiencing lower levels of work engagement as compared to the norm group. In addition, concerns among project professionals about adverse job conditions was significantly higher than the norm group. Leung et al. (2015b) investigated the levels of

workplace stress experienced by construction professionals in Hong Kong and South Africa, as well as the relationship between job stressors (job control, job demand, and job support) and job stress. The results show that many construction professionals in the two jurisdictions have reported suffering from stress, anxiety, an/or depression as a direct result of working in the construction industry. Bowen et al. (2014b) investigated the strain effects of stress and the coping mechanisms of South African architects, civil engineers, quantity surveyors, and project managers. Using an online survey, the perceived level of workplace stress experienced by construction professionals was ascertained, and the psychological, physiological, and domestic/social effects of stress were determined. The positive and negative coping mechanisms of the construction professionals in response to the effects of stress were also reported. Results from this study indicated that architects experience higher levels of stress than other groups of construction professionals in South Africa. In addition, women reported higher levels of stress than men.

This body of contemporary literature has gone a long way in advancing our understanding of the causes of work-related stress, and how construction professionals are coping with it. However, despite a significant number of studies exploring work-related stress, psychological well-being, and the employee engagement of construction professionals having been conducted, the topic has not been extensively explored in the case of South African architects.

This research shall focus explicitly on architects. Architects are usually key persons involved in the successful completion of construction projects. The role of architects includes not only designing, planning, organizing, and ensuring the quality standards of the project deliverables, but often also includes monitoring the progress of work, contract negotiation, handling intrinsic uncertainties, and engaging clients and stakeholders. Architects have been reported to be one of the most highly stressed groups of construction professionals in South Africa (Bowen et al., 2014b). Thus, the growing evidence of the effects of occupational stress and psychological well-being in the construction industry makes it worthwhile to study the current levels of these phenomena among architects in South Africa (Bowen et al., 2021, Haydam and Smallwood, 2016, Leung et al., 2015b, Bowen et al., 2013a, Mostert et al., 2011, Love et al., 2010).

In relation to the mental health concerns that are currently afflicting professionals in the construction industry, this research shall specifically explore the effects that job conditions

and job security have on the psychological well-being and work engagement of South African architects. The contribution of this research lies in its examination of how workplace stressors affect the psychological well-being and work engagement of architects in a developing country that is characterized by economic hardship and social problems.

1.3 Problem Statement

The increasing awareness of workplace stress and the psychological well-being of construction professionals is a growing concern within the construction industry in South Africa as well as many other countries around the world. Architects belong to the construction professionals' group, who possibly experience a different degree or type of workplace stress as compared to other professionals in the sector.

To date, there have been several studies of the workplace stress experienced by construction professionals in general. These include studies of construction professionals in South Africa and in other countries around the world. However, there are no published studies that specifically evaluate the psychological well-being and work engagement of South African architects using a psychometrically validated scale.

Consequently, there is a need to investigate the nature and extent of workplace stress experienced by South African architects, and the impact that specific workplace stressors have on the positive psychological well-being and work engagement of architects. This study aims to address this knowledge gap.

1.4 Research Question

The research questions to be addressed are stated as follows:

a) *What is the nature of the relationship between job security related workplace stressors and the psychological well-being of South African architects?*
b) *What is the nature of the relationship between job security related workplace stressors and the work engagement of South African architects?*
c) *What is the nature of the relationship between job conditions related workplace stressors and the psychological well-being of South African architects?*
d) *What is the nature of the relationship between job conditions related workplace stressors and the work engagement of South African architects?*

1.5 Aim of the Study

The overarching aim of this study is to investigate the perceived levels of psychological well-being and work engagement experienced by architects in South Africa and to determine how various workplace stressors affect these constructs.

1.6 Research Hypotheses

The research will test the following hypotheses:

H_1: Job insecurity and change is negatively associated with the psychological well-being of South African architects.

H_2: Job insecurity and change is negatively associated with the work engagement and commitment of South African architects.

H_3: Poor job conditions are negatively associated with the psychological well-being of South African architects.

H_4: Poor job conditions are negatively associated with the work engagement and commitment of South African architects.

1.7 Research Objectives

The research objectives to be achieved are to:

a) Establish how job insecurity and change affect the psychological well-being of employees.
b) Establish how job insecurity and change affect the levels of work engagement of employees.
c) Determine how adverse job conditions affect the psychological well-being of employees.
d) Determine how adverse job conditions affect employee levels of work engagement.

1.8 Research Methodology

The study will achieve the afore-mentioned objectives by adopting the following research methodology:

a) Conduct a critical review of the relevant English literature.
b) Extract secondary data from a stress audit conducted on South African architects using selected scales from the "A Shortened Stress Evaluation Tool" (ASSET) model.

a) Inspect the dataset for abnormalities and missing values.
b) Conduct regression analysis to test the postulated hypotheses.
c) Discuss the research findings in the context of the extant literature.
d) Draw conclusions from the findings and make recommendations.

1.9 Research Scope Delimitation and Statement of Limitations

The following limitations apply to the scope of the study:

a) The research was carried out on architects in South Africa only. Hence, some of the findings may not be applicable to architects in other countries, as the constructs being measured may differ from region to region. In addition, the findings may not be broadly applicable to all professions.
b) The research was carried out using data collected from a cross-sectional survey conducted on construction professionals during 2018/2019. Thus, it only gives a snapshot of the level of positive psychological well-being and work engagement of architects at that given point in time. It does not monitor any changes in levels of psychological well-being and work engagement of architects over a period of time.

1.10 Structure of Research

Chapter titles for the research are listed as follows:

Chapter One: Introduction & Background

This chapter introduces the research topic by providing the motivation behind the study, as well as a framework of the research approach and structure of the dissertation. This chapter situates the research in context and provides comprehensive information on the study background, environment, and setting. Additionally, the research questions and objectives are stated in this chapter.

Chapter Two: Literature Review

An extensive review of extant literature is conducted in this chapter in order to provide an argument from existing literature justifying the undertaking of the study. In addition, a review of relevant literature identifies the key themes relevant to the study, such as: (1) work-related stress, (2) positive psychological well-being, and (3) work engagement.

Chapter Three: Research Methodology

This chapter provides a detailed description of how the study is approached and conducted. The research design and data collection methods that are used during the research are stated in this chapter.

Chapter Four: Data Analysis and Interpretation

This chapter presents the quantitative analysis of the data collected. In addition, the significant statistical findings are also presented. Lastly, this chapter presents a detailed evaluation of findings from the study. Contextual knowledge, critical thinking, and the application of logic are used to draw insights from the findings based on the literature reviewed.

Chapter Six: Conclusion and Recommendations

This chapter states the answers to the research questions posed in Chapter One and provides a synopsis of the findings with an emphasis on critical reflection. In addition, this chapter discusses the limitations of the study, recommendations, and potential areas for future research.

References

This section lists all references cited in the dissertation.

Chapter Two: Literature Review

2.1 Introduction

This literature review critically examines the extant literature with regard to the nature of the relationship between workplace stressors and the psychological well-being of employees as well as their work engagement. This chapter discusses workplace stress in general, followed by a discussion of influential theoretical models of stress. Thereafter a discussion of psychometric analysis scales used to measure stress is presented. In addition, scales specific to the ASSET model i.e., 'psychological well-being (i.e., sense of purpose and positive emotions)', 'engagement', 'job security and change', and 'job conditions' are discussed. Finally, the chapter is summarised.

2.2 Workplace Stress

The concept of stress has a long tradition in organisational and social literature, and it has become a common phenomenon in a lot of modern societies (Ganster and Rosen, 2013, Somerfield and McRae, 2000). In recent decades, it has been observed that the workplace can be a substantial source of stress, and work stress is a major determinant of both physical and mental health (Chirico, 2016, Lucas et al., 2012). Stress in modern-day workplaces is becoming increasingly common, and it can have significant negative effects on employee productivity, absenteeism, and business profitability (Arrman and Björk, 2017, Cattell et al., 2017, Yong et al., 2013). Stress is frequently associated with psychophysiological and behavioural symptoms such as anxiety, sadness, irritability, fatigue, and aggression (HSE, 2007). Moreover, severe or prolonged psychological stress can result in psychosomatic disorders, hypertension, chronic depression, and even suicide (Boccio and Macari, 2013, Heller et al., 2007).

Workplace stress has been cited by the World Health Organization as one of the worst problems in the twenty-first century (Houtman et al., 2007). According to one estimate, stress impacts one in five workers in the UK, leading to 6.5 million sick days claimed annually (Johnson and Cooper, 2003). Moreover, organisations may incur additional indirect expenses as a result of work-related stress, including low morale, job discontent, human error, work accidents, and hostility among co-workers in the workplace (Bonds, 2017, Leung et al., 2016b, Demir et al., 2014). Thus, stress has negative effects on both employees and organisations. However, the notion of stress is often not fully understood

or recognised by many individuals, and in some cases, it is even misconstrued (CIOB, 2006).

Numerous studies have acknowledged the subjective nature of stress, and it is generally agreed that different individuals will perceive stress differently (Donald et al., 2005, Jones and Bright, 2001, Rees, 1995). Different people will have different reactions to the same stressful scenario due to the individual variances they bring with them in terms of their personalities and their unique life experiences (Cooper and Baglioni, 1988). Furthermore, stress may not always be a bad thing, and an individual may feel more motivated and focused in the face of challenges, demands, and situations requiring risk taking (Leung et al., 2008a, McGowan et al., 2006, Jones and Bright, 2001, Lazarus and Folkman, 1984, Selye, 1983). This suggests that pressure or a challenging event in the workplace could be interpreted as a positive or negative experience based on cognitive and emotional factors. Moreover, there is evidence to support the notion that individuals can develop adequate coping mechanisms in response to moderate levels of stress (Bowen et al., 2014b, Cummings and Pargament, 2012, Harris, 2012, Pines, 2009) (Wright et al., 2015).

Stress can therefore be viewed as either: (a) an aspect of an individual's surrounding environment that exerts an influence on them, (b) the individual's responses (physiological, psychological, and behavioural) to the demands, threats, and challenges imposed by their environment, or (c) the interaction of the two aspects (Chirico, 2016, Ganster and Rosen, 2013). The third conceptualization recognises stress as a process in which environmental events trigger a chain of cognitive and physiological responses that ultimately affect well-being. The work stress literature commonly describes the environmental events that trigger these processes as **stressors**, while individual responses are known as **strains** (Bowen et al., 2021, Ganster and Rosen, 2013, Griffin and Clarke, 2011). Thus, workplace stress can be described as the process by which a demanding working environment or prolonged exposure to work-related stressors, leads to job strain which is accompanied by mental and physical symptoms.

The most influential theoretical models of stress in relation to the work domain will be reviewed under the following sub-headings.

2.3 Models of Workplace Stress

The broad range of viewpoints on stress and its characteristics has played an important part in the development of many different models for understanding it. There is an absence

of consensus in the description of stress and its causes, and our understanding of various constructs about stress is still undergoing rapid development and has vague boundaries (Ajayi et al., 2019, Arrman and Björk, 2017, Cooper and Dewe, 2004). There is also a wide range of applications of the concept of stress in different fields, e.g., medical, behavioural, and social science. Each area has its own description of stress, as well as its own generally accepted theories that are used as a guideline for investigating and understanding it (Cooper and Dewe, 2004, Jones and Bright, 2001). Over time, as the concept of stress has been studied, a few prominent models have been developed to aid our interpretation of this concept.

2.3.1 Stress Response Model

Selye (1983) was one of the first scholars to develop a model to describe the impact that various stressors have on individuals. In order to investigate workplace stress, Selye (1975) devised a one-factor model that explored how detrimental workplace stress can be when it exceeds tolerable levels. Selye (1978) viewed a stressor as being a chemical substance, biological substance, external stimulant, environmental condition, or event that has the potential to cause distress, anxiety, or fear. Selye's definition of stress focused on stress as a physiological response pattern and describes the characteristics of the individual's response to the stressors (Siegrist, 1996, French et al., 1982, French et al., 1974, Selye, 1956). Thus, according to this model, stress can be understood to be the body's natural reaction to a challenging, threatening, difficult, or demanding situation whether anticipated or not. According to Selye, stress is distinct from other physical responses in the sense that its effects are unaffected by the nature of the stimulus that provokes it, be it good or negative (Selye, 1973, Selye, 1956). He referred to the bad form of stress as *'distress'*, and he called the happy form *'eustress'* (Selye, 1956).

2.3.2 Job Demand-Control Model

The Job Strain model, also known as the Job Demand-Control (JD-C) Model, put forward by Karasek (1979), is one of the most prominent models in research pertaining to the connection between an employees workplace and their health (Ganster and Rosen, 2013). The JD-C model argues that the combination of low levels of work-related job control such as a lack of autonomy combined with high workloads, can be particularly harmful to workers because such a combination often leads lead to job strain (Karasek, 1979). In turn, excessive levels of job strain can

lead to employees experiencing poorer mental and physical health. The model infers that not only are the two variables of job control and job demands associated to poorer physical and mental health, but it also suggests that high levels of choice latitude on the job will buffer or lessen the unfavourable impacts of high levels of job demands (Karasek et al., 1982).

Job control constitutes one's ability to direct their own work responsibilities, and is sometimes referred to as "decision latitude" (Van Der Doef and Maes, 1999). Working time control is a major aspect of job control, and is characterised by an individual's degree of independence with regard to matters such as starting and knocking-off times, breaks, days off, vacation days, and the total number of work hours (de Lange et al., 2009). Thus, according to the JD-C model the discretion and decision-making power that comes with job control, enables workers to reduce the physiological and psychological impacts of stress and make work more satisfying and enjoyable.

Research findings supporting the notion of the buffering potential of job control and decision latitude over job demands are mixed, with several studies offering strong support for the hypothesis (de Lange et al., 2003, Van Der Doef and Maes, 1999). Nonetheless, studies have generally shown clear support for the concept that decision latitude and job control are negatively related to job strain (Alterman et al., 2015, Brough and Biggs, 2015, Leung et al., 2015a).

The JD-C model implies that work stress is mostly produced by the structural or organisational components of the work environment, as opposed to the personal traits or demographics of the individual doing the task (Karasek, 1979). Thus, this model concentrates on the external environment surrounding the individual and describes stress as the cause of an unpleasant experience rather than the experience itself. An individual's particular evaluation of an event or stressor is not allowed for in this model, as this model states that stress is a result of the combined impacts of the demands of the work environment (stressors) and environmental stress moderators, namely the range of decision-making freedom (control) available to the worker facing those demands (Dollard, 2001). Furthermore, not all aspects of work-related stress are attributed to excessive job demands (van der Doef et al., 2000, Van Der Doef and Maes, 1999). Thus, it is argued that the JD-C model is insufficient at

providing a holistic understanding of stress, mainly because it views the human subject as a passive recipient of stress, and due to the fact that the model does not encompass a wide range of stressors (Van Der Doef and Maes, 1999).

Nearly a decade after Karasek first presented the JD-C model, Johnson et al. (1989), in the context of research on heart disease modified the JD-C model to add social support as another variable. The broader model that came about as a result was named the Job-Demand–Control–Support (JDCS) Model.

2.3.3 Job Demand-Control-Support Model

The Job Demand–Control–Support (JDCS) Model (Johnson et al., 1989), posits that in addition to decision latitude and control over one's work, job-related strain can also be buffered by workers establishing and maintaining a job support mechanism consisting of healthy relationships with co-workers and supervisors. In essence, assistance and encouragement from co-workers and supervisors form a support mechanism associated with the workplace (Fila, 2016). These researchers referred to the situation in which there are high levels of job demands, low levels of job control, and low levels of co-worker support as '*iso-strain'* (Johnson et al., 1989). Thus, the importance of gaining support and assistance from colleagues and supervisors is emphasised, as they serve as a coping mechanism to lessen the likelihood of high job demands causing excessive job strain (Karasek and Theorell, 1990, Johnson et al., 1989).

There is a growing body of research grounded in the idea that social relationships at work affect employee health, and several studies support the notion that high work demands, low job control, and low support from supervisors or co-workers exposes an employee to a greater risk of experiencing psychological or physical symptoms of stress (Zheng and Wu, 2018, Bell, 2017, Fila, 2016, Shankar et al., 2011, Wood et al., 2011, Almendra, 2010, Aira et al., 2010, Vigoda-Gadot and Talmud, 2010, Abu Al Rub, 2003, Dollard, 2001). Employees often cite a lack of support from supervisors and co-workers when they experience high levels of work-related stress and illnesses that may result from such stress (Jones et al., 1998). Additionally, it has been shown through several studies that having good social ties at work can have beneficial effects on an employee's immunological, cardiovascular, and neuroendocrine systems (Heaphy and Dutton, 2008). Consequently, employees are

encouraged to obtain assistance from both supervisors and colleagues when job demands are high, as they can provide support which acts as a coping mechanisms to help buffer the effects of high workloads (Van Der Doef and Maes, 1999). Furthermore, employees are encouraged to eliminate barriers which hamper effective communication and build constructive relationships with supervisors and co-workers within the organisation (Couper, 2015, Nawi et al., 2011). For greater employee well-being, it is essential to cultivate a supportive organisational culture that emphasizes positive relationships among staff members.

In a similar manner to the JD-C model, the JDCS model only takes into consideration the impact of external factors such as workload and poor work relationships that could result in an employee experiencing excessive levels of job stress (Johnson et al., 1989, Karasek, 1979). However, the individual's perception and evaluation of the stressor is not taken into consideration (Chirico, 2016). In addition, though the JDCS model is useful for employees with heavy workloads, which is fundamental to the concept of job demands (Karasek and Theorell, 1990), some studies have shown that it is not as reliable when studying employees who do not have a heavy workload but nevertheless experience high levels of work-related stress (Van Der Doef and Maes, 1999). Furthermore, though the JDCS model has proven to be a useful tool with male employees who operate in high-stress workplaces, a few studies have shown that it is less useful when investigating female employees with high stress jobs (Van Der Doef and Maes, 1999). This may suggest that the way women perceive high-stress jobs differs to that of men. This may be attributed to other factors that are intrinsic to the individual, that the JDCS model does not consider (Chirico, 2016). Thus, in a similar manner to the JD-C model, the JDCS model does not provide a holistic understanding of work stress, and intervening variables such as personality and coping strategies that influence the relationship between stressors and strains are not considered.

2.3.4 Job Demands-Resources Model

The Job Demands-Resources (JD-R) model, proposed by Bakker and Demerouti (2007), is a framework that describes how job resources and job demands may be related to personal, social, and organisational results at places of work. This model outlines the organisational, psychological, and physical components of work required to carry out job responsibilities and tasks (Demerouti et al., 2001). The JD-

R model argues that stress is the result of an imbalance between the demands placed on an individual and the resources that the individual has available to deal with those demands (Bakker and Demerouti, 2008, Bakker et al., 2003). The identification of the workplace resources thought to counteract the detrimental effects of job demands is a key element of this concept (Bakker et al., 2005). Accordingly, risk factors linked to job stress can be broadly divided into two major categories, which are: (a) job demands, and (b) job resources. These working conditions have varying relationships with the motivation and personal well-being of employees (Hakanen et al., 2008, Demerouti et al., 2001). Hence, the JD-R model comprises two main processes that contribute to the development of job strain and burnout. The first is excessive job demands that produce weariness and fatigue, and the second is a lack of resources which results in an inability to meet job expectations (Demerouti et al., 2001).

The JD-R model is generally accepted to be a derivative of the Job Demand-Control (JD-C) model (Karasek, 1979). The proponents of the JD-R model contend that the JD-C model is constrained to a predetermined and limited collection of predictor variables that may not be applicable to a wide variety of jobs (Bakker and Demerouti, 2007). Consequently, the JD-R combines a broader range of working situations into evaluations of organisations and employees. In addition, the JD-R model incorporates both negative and positive indications and outcomes of employee well-being, as opposed to focusing exclusively on negative outcome variables (Hakanen et al., 2008, Bakker et al., 2007).

The Job Demands-Resources (JD-R) model put forward by Bakker and Demerouti (2007) emphasises the significance of evaluating the resources at an employee's disposal in addition to the job-related demands, as resources are used to help achieve work goals or various objectives at an organisational level. Job demands are those elements of a job that need consistent physical and/or psychological effort or abilities. Thus, they are connected to a variety of costs that can be both physiologically and psychologically taxing on the employee. On the other hand, job resources are the elements of a job that are physically, psychologically, socially, or organisationally useful in accomplishing work objectives and mitigating against high work demands. In addition, they also stimulate the employee's personal growth, learning, and development (Bakker and Demerouti, 2008). Some examples

of this might include clear career prospects within the organisation, coaching from supervisors, role-clarity, and job autonomy.

As continued stress at work can have a negative impact on an individual's health, employees' mental and physical resources are depleted as a result of occupations that are poorly planned or that have persistently high demands (Bakker and Demerouti, 2008). As a consequence of this, an employee may experience a decrease in their energy levels as well as difficulties with their health. Conversely, motivated individuals are those who have access to a wealth of personal, professional, and organisational resources (Bakker et al., 2005). The utilization of job resources allows them to realise their full potential as motivators, which in turn results in high levels of engagement at work, increased productivity, and reduced levels of cynicism. Job resources can either play an intrinsic or an extrinsic influence in a person's level of motivation.

The JD-R model is supported by a substantial number of researchers, and numerous studies have shown that job resources have the potential to alleviate the demands connected with work-related contact during both working and non-working times, as well as the additional stress linked to work-family interference and health-related difficulties (Ceschi et al., 2017, Hu et al., 2017, Mbidoaka, 2017, Dettmers et al., 2016, Airila et al., 2014). These studies support the concept that job resources buffer the effect of excessive work-related demands, and even make employees more understanding when working under high workloads.

The job resources construct of the JD-R model parallels the job control construct of the JD-C model. Bakker and Demerouti (2007) argued that the employee's perception of the workload is related to the job resources at the employee's disposal. This corresponds with the JD-C Model, which describes job control as the employee's potential influence over his responsibilities and activities during the workday (Karasek, 1979). In other words, job control, which is synonymous with job autonomy, refers to the degree to which an individual selects when, where, and how to do their work (Tausig and Fenwick, 2011). Some studies view control over one's work schedule as a useful resource (Golden, 2001, Demerouti et al., 2001). Thus, a parallel can be drawn between the idea of job control and job resources, that in effect makes job control an important job resource that buffers against job

demands that could result in workplace stress (Ganster and Rosen, 2013). Working in tandem, job autonomy and schedule control are considered to be amongst the most valuable work resources because of their involvement in mitigating work-life conflict and overwhelming job pressure (Schieman, 2013, Glavin and Schieman, 2012).

An individual's particular evaluation of an event or stressor is not allowed for in the JD-C, JDCS, and JD-R models. Consequently, models that introduced a personal component in the analysis of employee well-being were also developed. An example of such a model, is the Effort-Reward Imbalance (ERI) model.

2.3.5 Effort-Reward Imbalance model

The Effort-Reward Imbalance (ERI) model put forward by Siegrist (1996), places an emphasis on the connection that exists between an employee's level of effort and the benefits that are directly associated with their work. This model posits that an individual exerts at work as part of a social contract based on the principle of reciprocity between the effort they put in and the reward they expect as a result. There are two aspects of "effort": the first is the intrinsic aspect which arises from one's own personal motivations, and the other is the external aspect which arises from external pressure such as excessive workloads (Chirico, 2016). In exchange for their effort at work, the employee expects to receive rewards such as monetary compensation, social approval, respect from co-workers and supervisors, job security, and career opportunities (Siegrist et al., 2004). According to the ERI model, a job that is characterised by high levels of effort but low rewards can lead to job strain, which can manifest itself in the form of psychological symptoms as well as physical health problems (Siegrist and Li, 2017).

The model presupposes that labour contracts that are likely to cause employees considerable distress fail to fully specify and offer a symmetric exchange in which there is equivalence between the desired efforts that the employee must put in and the benefits that are to be provided by the employer (Siegrist, 2009). This may be a result of the common reality that the repeated experience of reward deficiency in a fundamental social role (the work role) makes it more difficult for an individual to view themself as successful in life (Siegrist et al., 2004, De Jonge et al., 2000). Employment not only gives an individual's life structure and meaning, but also

provides them with a source of income, social interaction, and self-respect (Bowling, 1995). Thus, employment and the rewards which an individual reaps from it can affect both physical and mental health (Waddell et al., 2007).

With regard to the workplace, reward deficiency scenarios commonly occur when employees have limited employment options to choose from, such as: when there are few job alternatives available in the labour market, when the employee has a low level of competence, or when they have a physical or mental disability (Siegrist et al., 2014, Siegrist, 2009). Nonetheless, employees may agree to imbalanced effort-reward jobs for strategic reasons, such as to increase their prospects of being promoted at a later point or to improve their chances of finding a job with another organisation (Siegrist et al., 2004). Such a situation would likely come with a measure of job strain related to the effort-reward imbalance of the employee's current job.

An additional postulation embedded within the ERI model, is that a high level of "overcommitment" by the employee may increase the risk of sustained strain reactions, thereby causing poor physical and mental health (van Vegchel et al., 2005, De Jonge et al., 2000). Overcommitted individuals are described as those who have a motivational pattern defined by excessive work-related dedication and a high demand for approval within their work environment (Siegrist et al., 2004). Employees exhibiting a set of attitudes and behaviours characterized by overcommitment are at a greater risk of experiencing stress due to an exacerbation of the non-symmetric exchange between effort and reward (Chirico, 2016). Thus, the aspect of overcommitment within the ERI model highlights the importance of intrinsic factors such as a personal motivations, individual experiences, and personal preferences when it comes to jobs and careers.

There is a significant amount of empirical support showing that the ERI hypothesis of high effort and low reward results in an increased risk of poor health (Siegrist and Li, 2017, Hinz et al., 2014, Leung et al., 2010a, Niedhammer et al., 2006, van Vegchel et al., 2005, De Jonge et al., 2000). Furthermore, a major advantage of the ERI model is its consideration of both extrinsic and intrinsic factors affecting the employee, whereas models such as the JD-C and JDCS are only concerned with extrinsic factors that could potentially lead to job strain (Chirico, 2016).

2.4 Stressor Scales

A reliable psychometric analysis scale is necessary for accurate interpretation and application of scores that measure stressors in research and labour practice (Chirico, 2016, Ganster and Perrewé, 2011). It is essential that studies of job stress provide empirical proof that scale scores are reliable and accurate reflections of the psychological constructs they intend to measure (Tetrick, 2017, Tetrick and Peiró, 2016). In order to improve our understanding of occupational health and psychological well-being, and to create, evaluate, and put into practice interventions targeted at boosting the well-being of people and organisations, occupational health psychology characteristics must be accurately measured.

This section provides an overview of two common stress indicator scales that have been psychometrically validated. These scales broadly identify common workplace stressors and connect them to outcomes in the health and psychological well-being of employees (Symon and Cassell, 2010, Faragher et al., 2004, Cooper et al., 1988). These scales have been extensively used in the investigation of psychological well-being of construction professionals among other professions (Robertson and Cooper, 2010, Faragher et al., 2004, Johnson and Cooper, 2003), and this makes them worthwhile discussing in relation to the research questions of this study which explore relationships between workplace stressors and psychological well-being as well as work engagement.

The first stress indicator scale discussed is the *Occupational Stress Indicator* (OSI) which is based on the transactional model and has been used extensively as a research tool in the detection and management of occupational stress (Lyne et al., 2000, Evers et al., 2000). The second stress indicator scale is *A Shortened Stress Evaluation Tool* (ASSET) which is a wide-ranging psychometrically sound stress measurement tool that has been used by many researchers to gauge levels of workplace stress among employees from a variety of industries (Faragher et al., 2004). Both the OSI and ASSET encompass a wide range of stressor variables that make them suitable for gauging levels of workplace stress and psychological well-being experienced by employees using an extensive array of items. Furthermore, these scales can be used not only to identify existing workplace stressors but also to investigate factors that might moderate and/or mediate their effects (Faragher et al., 2004, Robertson et al., 1990).

2.4.1 Occupational Stress Indicator

The Occupational Stress Indicator (OSI) is a collection of scales that were developed by Cooper et al. (1988), and is one of the most popular tools for measuring workplace stress (Lyne et al., 2000, Evers et al., 2000). These scales are based on a structural model of occupational stress that was established by Robertson et al. (1990). The OSI stress measurement tool comprises seven questionnaires and 25 subscales (Lyne et al., 2000). The first questionnaire examines sources of job pressure, following which, three questionnaires examine moderating variables, including: (1) Locus of Control, (2) Coping Strategies, and (3) Type A Behaviour patterns. Lastly, the remaining three questionnaires examine the stress dependant variables of Mental Health, Physical Health, and Job Satisfaction.

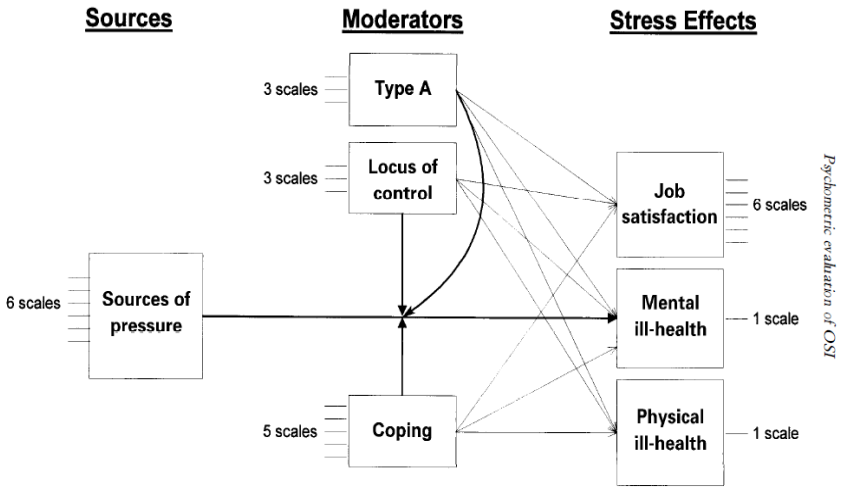

Figure 1: Schematic representation of the OSI model (Robertson et al., 1990)

The transactional model of stress and coping mechanisms put forward by Lazarus and Folkman (1984) forms the backbone of the OSI model. Transactional models explain stress as a dynamic process between a stimulus and the individual's response to the stimuli (Lazarus, 1995, Folkman et al., 1986, Kobasa, 1982). It follows that the perception of personal differences, such as coping mechanisms and support from co-workers, and the perception of stress outcomes, such as well-being and work satisfaction can be measured. As the OSI is primarily based on transactional models, it may be used to understand aspects of *hardiness*, which refers to a pattern of personality characteristics that distinguishes people who remain healthy under considerable stress compared to those who develop serious health problems (Lyne et al., 2000, Williams and Cooper, 1997, Kobasa, 1982). The recognition that the individual's appraisal of the stressor or stressful event plays a key role in the stress

process makes the OSI an appropriate tool to measure workplace stress. The theoretical underpinnings of the OSI are recognised as sound by several researchers, and thus it has been widely used to measure the essential aspects of the stress process in a wide variety of organisations and industries (Goh et al., 2010, Evers et al., 2000, Lyne et al., 2000, Siu et al., 1997).

The OSI is a self-report instrument, which makes it a good method for obtaining information directly from the source. However, one of the problems with the OSI method's dependence on a self-reporting data collection instrument, is its susceptibility to experimenter bias and participants exaggerating/minimizing their responses for personal gain (Demetriou et al., 2015, Watson et al., 1987). Some studies have also found the OSI instrument to be complicated and confounding as it uses self-report measures to relate causes of stress to outcome measures (Lyne et al., 2000, Schafer and Fals-Stewart, 1992). In addition to the afore-mentioned criticisms of the OSI model, in a few instances it has been demonstrated to be unsatisfactory in its ability to predict or measure appropriate coping methods that lessen the effects of stress (Lyne et al., 2000).

The reliability and validity of the OSI scales have been investigated in a number of different studies, and it has generally been found to have a consistent level of reliability and validity across the sources of pressure, job satisfaction, coping, physical ill-health, and mental ill-health scales (Lyne et al., 2000, Lu et al., 1995). However, in a moderate number of studies, the Locus-of-control scale fails to reach acceptable levels of reliability, and the Type A scale similarly shows moderate to low reliability (Williams and Cooper, 1997, Davis, 1996, Lu et al., 1995, Kirkcaldy et al., 1994, de Moraes et al., 1993). Similarly, there is some debate regarding the extent to which the Type A and locus-of-control scales accurately reflect the underlying constructs they attempt to measure (Cunha et al., 1992, Cooper and Williams, 1991).

The OSI endeavoured to provide a comprehensive risk assessment of stress, but it was determined by some researchers that the questionnaires were too lengthy and did not account for all the stressors commonly encountered in a variety of organisations (Faragher et al., 2004). This prompted questions over how representative the studies conducted using this instrument were of the professions

and working populations surveyed. Moreover, in addition to the OSI questionnaire being time-consuming to complete, it was also found to be more suitable for white-collar and managerial personnel (Faragher et al., 2004, Johnson and Cooper, 2003). Thus, using the OSI scales for working populations outside these categories, could give rise to inconsistent results.

2.4.2 A Shortened Stress Evaluation Tool (ASSET)

The concerns raised regarding the OSI indicated the need for a stress risk assessment tool that could be completed quickly and easily (Faragher et al., 2004). Consequently, ASSET was created based on a prior model by Cooper and Marshall (1976). The ASSET questionnaire analyses relationships between the potential causes (stressors) and effects of stress in the workplace (Faragher et al., 2004). ASSET was created to quantify stress, and it is thought to be more succinct and suitable than the OSI to a wide range of occupations (Faragher et al., 2004, Johnson and Cooper, 2003). As ASSET questionnaires are simple and quick to complete, and organisations often incur minimal expense if the questionnaires are completed during working hours.

ASSET is a wide-ranging psychometrically sound stress measurement tool that has been used by many researchers to gauge levels of workplace stress among employees from a variety of industries (Robertson and Cooper, 2010, Faragher et al., 2004, Johnson and Cooper, 2003). The ASSET model was psychometrically validated with 9,196 employees from 10 public and private organisations, including: public hospitals, transportation corporations, and manufacturing companies Faragher et al. (2004). The instrument was further validated in police departments, prisons, municipal governments, higher education, insurance firms, and steel businesses (Coetzer and Rothmann, 2006, Donald et al., 2005). As it has been utilised in numerous empirical studies by many researchers, its validity and reliability have gained substantial support (Cheung et al., 2022, Cattell and Bowen, 2019, Cheung et al., 2019b, Cheung et al., 2019a, Johnson et al., 2018, Cattell et al., 2017, Robertson et al., 2012, Johnson and Cooper, 2003). Well-established instruments exhibit high measurement validity for well-designed and tested measures (Johnson and Turner, 2003).

ASSET includes six workplace stressor scales known as the "Six Essentials" designed to capture the sources of work-related stress experienced by an employee (Johnson et al., 2018, Faragher et al., 2004). The "Six Essentials" are listed as follows:

a) **Resources and Communication** (e.g., lack of adequate equipment/resources to do the job).

b) **Job control** (e.g., lack of involvement in decision- making).

c) **Balanced workload**. This scale has two sub-scales:

    i. **Work–Life Balance** (e.g., work interfering with home and personal life)
    ii. **Workload** (e.g., unrealistic deadlines, unmanageable workloads)

d) **Job security and Change** (e.g., career development, job insecurity).

e) **Work relationships** (e.g., support from others, poor relationships with colleagues).

f) **Job conditions** (e.g., poor pay and benefits, dealing with difficult clients).

In addition to the workplace stressor scales, ASSET also includes scales that measure the impacts of work-related stress on an employee's physical health, psychological well-being, and work engagement (Donald et al., 2005, Faragher et al., 2004, Ryff, 1989b). Other studies and tools aimed at measuring workplace stress and its related concepts, such as the OSI discussed in the preceding sub-heading, make use of similar scales and behavioural symptoms (Lyne et al., 2000, Cooper and Marshall, 1976). This allows researchers to determine whether a low level of psychological well-being is likely to be experienced by employees experiencing significant levels of work-related stress. In addition, work stressors and their impact on an employee's lack of engagement with their work can also be measured.

ASSET is relevant and valuable to organisations because it can detect negative working situations (stressors) that have the potential to be damaging to both the health of employees and the outcomes connected to their employment, such as productivity, absenteeism, and engagement with work (Johnson et al., 2018, Faragher et al., 2004). It is contended that the most helpful information from ASSET

is on stressors associated with working conditions, because working conditions are something that an organisation has a good measure of influence over (Johnson et al., 2018). The ASSET factor scores indicate with a good degree of accuracy, the areas a company or industry should prioritise when developing stress prevention programs (Johnson and Cooper, 2003).

This study was centered on the 'Job Security & Change' and 'Job Conditions' stressor scales as defined in ASSET, mainly because the extant literature predominantly focuses on stressors related to job demands (workloads), job control, job resources, and work relationships (social support). This is evidenced by the large number of researchers that have made use of models such as the JD-C, JDCS, and the JD-R models when conducting research related to occupational stress (Ganster and Rosen, 2013). The ASSET model has scales exclusively focused on the constructs of 'Job Security & Change' and 'Job Conditions', which made which made it an ideal tool to investigate these constructs (Faragher et al., 2004).

2.5 Psychological Well-being

Well-being is a broad category of phenomena that can be summarised as the experience of good health, happiness, satisfaction, and prosperity (Ryff and Keyes, 1995). More generally, well-being is simply feeling good. A person is considered well when he or she has a balanced life emotionally, physically, intellectually, and socially (Yeung et al., 2015, Abdel-Khalek and Lester, 2012). This entails a balance between the various aspects of one's life. Although there are currently many definitions of well-being, two prominent concepts of this construct are *subjective well-being* and *psychological well-being* (Dodge et al., 2012).

Subjective well-being comprises the emotional responses, domain satisfactions, and overall evaluations of life satisfaction of individuals (Diener et al., 1999). Subjective well-being is based on a hedonic framework, where an individual's main goal is to have good life experiences. It is usually gauged by how happy someone is with their life in combination with how well their positive and negative feelings are balanced (Weiss et al., 2016). On the other hand, psychological well-being refers to intra-individual levels of positive functioning that include one's positive sense of self, self-mastery, and personal growth (Dodge et al., 2012). Psychological well-being comprises positive self-referent attitudes, positive emotions, and a sense of purpose (Cheung et al., 2019a). Panaccio and

Vandenberghe (2009) hypothesise psychological well-being as being typified by the presence of positive affect, the absence of negative affect, as well as the joint presence of job and life satisfaction. As a result of the similarities between subjective well-being and psychological well-being, the two constructs have come to be viewed as two separate but related dimensions (Disabato et al., 2015). Moreover, a review of literature suggests that well-being can be viewed as a general area of scientific interest as opposed to a single construct, and numerous tools and techniques that have been developed to measure the phenomenon of well-being normally divide it up into smaller more measurable constructs (Faragher et al., 2004).

ASSET has two subscales measuring psychological well-being - "Positive Emotions" and "Sense of Purpose" (Faragher et al., 2004). These two scales represent constructs that are measured by items that make it possible to understand well-being using several measures.

The "Six-factor Model of Psychological Well-being" is another tool used to measure psychological well-being, and it consists of six factors which are believed to contribute to an individual's overall psychological well-being (Ryff and Singer, 1996, Ryff and Keyes, 1995). These factors include: (1) Self-acceptance, (2) Personal growth, (3) Purpose in life, (4) Environmental mastery, (5) Autonomy, and (6) Positive relations with others (Ryff and Keyes, 1995). According to this theory, positive psychological well-being generally emerges from a combination of these factors (Abbott et al., 2006, Ryff, 1989a). Similar to the ASSET model, this model divides the concept of psychological well-being into several constructs, which are each measured by several items (Ryff and Keyes, 1995, Ryff, 1989a). *Personal Growth* is reflective of a person who is constantly striving to improve, is welcoming of new experiences, and recognises continued improvement in conduct and behaviour over time. *Positive Relations with Others* describes a person who engages in meaningful relationships with others that include reciprocal empathy, intimacy, and affection. Thus, they essentially became a person who possesses quality relationships with others. *Purpose in Life* is indicative of an individual's strong goal orientation, and belief that life holds meaning and purpose. *Self-Acceptance* is reflective of a person's positive attitude about oneself and their past life. Such an individual is content and comfortable with most aspects of their personality. *Environmental Mastery* describes the capacity to effectively manage one's life and surrounding world. Lastly, *Autonomy* consists of a sense of self-determination and personal liberties.

Positive psychological well-being is often viewed as being similar to a positive mental state (Weiss et al., 2016). A positive mental state is known to affect an individual's ability to cope with stressful events (Bowen et al., 2014b, Leung et al., 2008a). In addition, a person's mental state affects their ability to enjoy daily life. Thus, the way an individual feels, thinks, acts, and relates to others, are indicative of the level of psychological well-being they are experiencing. Studies have shown that a person's psychological wellbeing is normally high when they can refer to themselves as "happy", "content", and "satisfied" (Monnot and Beehr, 2014, Faragher et al., 2004). This brings to the fore the subjective nature of psychological well-being, as it entails the need to feel purpose and meaning in addition to positive emotions. Hence it can be posited, that for work professionals to experience psychological well-being they would have to enjoy the work they do, and it would have to bring a measure of meaning and purpose to their life (Cheung et al., 2019a).

2.6 Work Engagement

Work engagement is a concept that has received increased attention from practitioners, academics, and organisations from numerous industries in recent times (Thirapatsakun et al., 2014). In the business, consultancy, and academic domains, there exists a variety of perspectives on work engagement. However, a review of the literature pertaining to this concept suggests that engaged employees are generally those who are involved in, enthusiastic about, and committed to their work and workplace (Schaufeli, 2012, Bakker and Leiter, 2010). In the context of work engagement, employees express these qualities physically, cognitively, emotionally, and mentally as they perform their job roles (Kahn, 1990).

"Work engagement", also commonly referred to as "employee engagement", is not a fixed state, and an employee's level of engagement may fluctuate with time (Bakker and Schaufeli, 2008). There are generally three prominent qualities displayed by employees that are engaged with their work, and these can be described as the "say", "stay", and "strive" behaviours (Thirapatsakun et al., 2014, Bakker and Leiter, 2010). Firstly, engaged employees regularly "say" good things about the company or organisation they work for to co-workers, customers, and people who would want to work there. They have a feeling of emotional attachment, pride, and a sense of belonging to the organisation. Secondly, they possess a strong yearning to "stay" and be a part of the organisation, even though opportunities to work elsewhere abound. They believe in and support the goals and values of the organisation. Lastly, they "strive" and go the extra mile for the organisation by

putting in extra effort and showing initiative as they endeavour to achieve business success.

The third quality of going the extra mile for the organisation, parallels the construct of "overcommitment" posited by Siegrist (1996) in the Effort-Reward Imbalance Model, which is also characterized by excessive work-related dedication. Both are characterised an employee's behavioural willingness to go above and beyond for the organisation with the purpose of accomplishing more for themselves and the organisation.

Schaufeli et al. (2002) posit that an engaged employee views their work as positive, meaningful, and fulfilling. This view suggests that "satisfaction" plays a key role in work engagement, as satisfaction entails an employee being enthusiastic and happy with their job or organisation (Harter et al., 2002). Such a state of mind increases the likelihood that an employee will speak positively about their job roles and employer, which harmonises with the "say" behaviour of an engaged employee as reported by Bakker and Leiter (2010). Also, according to Sak (2006), an employee's commitment to their work and workplace is another defining feature of "work engagement". Sak (2006), further adds that high levels of commitment may even be characterized as "organisational citizenship", as employees exhibit a strong emotional attachment to the organisation, cognitive-belief in and support for the goals and values of the organisation, and persistence even in the face of difficulties (Thirapatsakun et al., 2014). This viewpoint is in tandem with the "stay" behaviour as reported by Bakker and Leiter (2010). Furthermore, engaged employees are dedicated to and enthusiastic about their work. This entails high levels of energy, vigour, and mental resilience while working, as well as the willingness to exert above average effort in ones work (Schaufeli, 2011, Schaufeli et al., 2009b). They exhibit proactivity, initiative, and pride in relation to their job roles, and may even experience difficulty detaching themselves from their work (Schaufeli et al., 2009a). These viewpoints agree with the "Strive" behaviour of an engaged employee as reported by Bakker and Leiter (Bakker et al., 2011, Bakker and Leiter, 2010).

Organisations can reap benefits from fostering a work environment that lends itself to employees being engaged with their work (Donald et al., 2005). There are many potential benefits that can accrue to an organisation as a result of employee engagement. Engagement may have positive effects on an organisation's profit and productivity, customer satisfaction, turnover, and job safety, among other things (Thirapatsakun et al.,

2014, Harter et al., 2002). Thus, organisations can expect to increase their profitability as engaged employees are more productive and diligent about keeping their customers and co-workers satisfied. Likewise, organisations can decrease turnover rates as engaged employees are more committed to the organisation to which they belong. Further to this, several scholars posit that levels of work engagement of employees in an organisation can be encouraged by variables such as adequate job resources, organisational support, performance feedback, job control, task variety, and opportunities for learning and developing (Bakker and Demerouti, 2008, Maslach and Leiter, 2008). Therefore, organisations need to capitalise on the talents, commitment, and motivation of their employees if they are to achieve best performance (Bakker and Leiter, 2010, Bakker, 2009).

2.7 Job Security

According to several studies, job uncertainty and layoffs are becoming more common in the modern workforce (Giunchi et al., 2016, Wang et al., 2015, Boswell et al., 2014, De Cuyper et al., 2014, Yu, 2014). Corporate downsizing, mergers and acquisitions, plant closures, and workforce reorganisations are popular causes of layoffs and organisational change, and these occurrences have become increasingly common in recent decades as a result of economic crises, international commercial rivalries, government deregulation of industry, and the accelerating pace of organisational technology change (Probst et al., 2013). Job insecurity is described as the degree of uncertainty a person experiences regarding the continuation of their employment (Wang et al., 2015, De Witte, 2005, Hellgren and Sverke, 2003).

The fact that an employee feels uncertain about their job, does not always mean that they will lose it. Instead, job insecurity is the perception that the nature and future of one's job is uncertain, and that uncertainty causes the employee stress and anxiety in anticipation of the unpleasant event (Giunchi et al., 2016, Hellgren and Sverke, 2003). The employees view themself as not being able to adequately cope with the effects of an unpleasant event such as job loss, organisational change, or redundancy of their skills. Thus, in the context of the transactional stress theory, job uncertainty can be thought of as a work stressor (Lazarus and Folkman, 1984). This is because the personal component of the employee's analysis of the perceived stressful event is taken into consideration in the analysis of their well-being in transactional stress theory, and job insecurity is expected to be positively

associated with undesirable outcomes such as job exhaustion and burnout (Schaufeli and Taris, 2005, Maslach et al., 2001).

Psychological contract theory can also be applied to comprehend the negative effects of job insecurity and change (Vander Elst et al., 2016, Schreurs et al., 2010). The psychological contract pertains to the agreements that apply between employees and employers (Jardat and de Rozario, 2012). According to Schreurs et al. (2010), the psychological contract traditionally concerns the trade between security on behalf of the employer, and loyalty on behalf of the employee. When the psychological contract is broken, employees feel insecure about their jobs and this causes them anxiety and worry (Vander Elst et al., 2014, Chang et al., 2013, De Cuyper et al., 2008). As a result, the overall well-being of the employee, their commitment to the organisation, and their work engagement are negatively affected (Vander Elst et al., 2016, Jardat and de Rozario, 2012, Wanous et al., 1992). The theoretical understanding of the negative effects of job insecurity on the employee based on the psychological contract theory harmonises with the Effort-Reward Imbalance (ERI) model presented by Siegrist (1996), which places an emphasis on the connection that exists between an employee's level of effort and the benefits that are directly associated with their work. If an employee perceives that they will not have a job in the near future, and therefore no salary or social security, they are less likely to exert themself and be engaged with their work as part of a social contract based on the principle of reciprocity between the effort they put in and the reward they expect from being employed (Siegrist et al., 2004).

In general, both permanent and temporary employees are conscious of the issue of job security, and a modest number of studies have been conducted to determine the effect of job insecurity on employee well-being (Giunchi et al., 2016, Cheng and Chan, 2008). For example, studies have identified job security as one of the most crucial elements for job happiness by employees (Wang et al., 2015, Debus et al., 2014). In addition, job insecurity was found to be negatively related to job satisfaction, organisational commitment, psychological health, physical health, work performance, and job involvement (Giunchi et al., 2016, László et al., 2010, Ito and Brotheridge, 2007, Richter and Naswall, 2018). Moreover, job insecurity has been reported as positively related to turnover intention (Kinnunen et al., 2014, Cheng and Chan, 2008).

Employers are encouraged to utilise appropriate strategies to help employees deal with job uncertainty if they want to keep them motivated and productive, especially during challenging economic times (Sverke et al., 2008, Probst, 2005). For instance, managers could limit temporary contract arrangements in preference of permanent contract agreements in order to decrease employee perceptions of job insecurity in the near future (Cheng and Chan, 2008). Additionally, managers aiming to negate the negative effects of job insecurity would do well to minimise any unfavourable messages regarding potential future employment that workers might misinterpret. Rather, if it makes sense in the prevailing circumstances, managers should endeavour to provide a positive outlook regarding employment, and they should take into account employee opinions and suggestions prior to implementing major changes withing the organisational (Debus et al., 2014, Sverke et al., 2008).

Limited studies have examined the effects of job insecurity on psychological well-being and work engagement (Wang et al., 2015, László et al., 2010). In addition, these studies have predominantly been conducted in Europe and North America, with very few being conducted in Africa (Richter and Naswall, 2018, Vander Elst et al., 2016, Höge et al., 2015, Cheng and Chan, 2008, Hellgren and Sverke, 2003, Sverke and Hellgren, 2002). This study aims to address this gap in knowledge.

It is therefore hypothesised that:

H_1: Job insecurity and change is negatively associated with the psychological well-being of South African architects.

H_2: Job insecurity and change is negatively associated with the work engagement and commitment of South African architects.

2.8 Job Conditions

Job conditions, also referred to as working conditions, encompasses a wide range of aspects of an employee's work environment. This includes factors such as job demands, physical working conditions, remuneration and benefits, interactions with clients and customers, and job satisfaction (Rusli et al., 2008, Faragher et al., 2004). Unfavourable working conditions often lead to withdrawal behaviours from employees such as physical removal from the workplace, employee punctuality, absenteeism, and turnover, which are costly to employers (Koslowsky, 2000).

Job conditions related to several of the items found in the ASSET model's 'Job conditions' scale are discussed below.

2.8.1 Financial incentives

Financial incentives such as remuneration, bonus plans, and stock options, are widely viewed as an effective method of motivating and enhancing the performance of employees (Garbers and Konradt, 2014). Consequently, the practice of rewarding employees with financial incentives for their performance on the job is common in organisational settings (Garbers and Konradt, 2014, Young et al., 2012).

An individual's lifestyle depends on the financial benefits they receive from their job, which affects their sense of self-worth (Siegrist et al., 2014). The repeated experience of reward deficiency in a fundamental social role (the work role) makes it more difficult for an individual to view themself as successful in life (Siegrist et al., 2004, De Jonge et al., 2000). Furthermore, an employee's perception of the pay and benefits they receive may be viewed as a sign of how valuable they are to the company. Therefore, in accordance with the Effort-Reward Imbalance Model (Siegrist, 1996), we can expect stressful working conditions to develop for an employee when their efforts are not adequately rewarded in terms of self-esteem, financial incentives, or career opportunities.

2.8.2 Physical working conditions

The architecture and physical attributes of the workplace form an integral part of the work experience for employees, and it is the second largest operating expense for most companies (Pierce and Brown, 2019). The physical environment of an organisation's workplace, as well as its design and layout, are known to have an impact on the behaviour and commitment of employees while they are on the job (Ayoko and Ashkanasy, 2020, Leka and Houdmont, 2010). Physical qualities of the workplace which have the potential to influence employee well-being include noise levels, poor visibility, lack of privacy, dirty surroundings, and overcrowding (Ashkanasy et al., 2014). Though most workplaces are designed for the particular purpose of allowing efficient completion of assigned tasks in an environment that is conducive to the health, safety, well-being, and productivity of employees, certain undesirable aspects of the physical working environment may be overlooked or go unnoticed by employers (McGuire and McLaren, 2009). As a

result, workers' level of comfort and satisfaction with the physical work environment become critical concerns (Ayoko and Ashkanasy, 2020).

Some studies have found that a strong positive relationship exists between a conducive physical working environment and employee commitment as well as employee well-being (McGuire and McLaren, 2009). Researchers have also discovered that that favourable working conditions encourage greater interaction, collaboration and innovation among employees (Nenonen, 2004, Ilozor and Treloar, 2002). This suggests that organisations can derive direct and indirect benefits from investing resources in ensuring that the work environment is pleasant and amenable to employees.

It is also noted that, it is extremely difficult to reliably and validly evaluate the impact of the physical environment of a workplace without also taking into account the impact of things such as the individual preferences among employees, the demographic characteristics of the workforce, and the nature of the work tasks that need to be completed (Leka and Houdmont, 2010). The employee's environmental appraisal of the workplace is influenced by both individual differences and socio-cultural factors, and it is ultimately the employees who use the workspace that determine the quality of any given work environment. What is most important is the environment as it is perceived by people who work in it (Leka and Houdmont, 2010).

2.8.3 Difficult customers and clients

Dealing with difficult clients is a stressor that has been shown to have an impact on the psychological well-being of employees (Cattell et al., 2017, Zapf, 2002). Employees that regularly have to deal with difficult clients have to expend a considerable amount of "emotional labour" (Zapf et al., 2001). Emotional labour (also referred to as "emotional work") is a concept which was popularised by Hochschild (1979), and refers to an employee's expression of organisationally desired emotions during interpersonal transactions at work (Zapf, 2002, Zapf et al., 2001). Emotional labour entails the effort, planning, and discipline required to display organisationally desirable emotions during interpersonal interactions with co-workers, superiors, and clients (Morris and Feldman, 1996).

In many jobs, expressing appropriate emotions at the appropriate time is a requirement, and for employees this might entail suppressing one's actual emotions

and displaying fake emotions which the organisation considers appropriate (Zapf, 2002). Such behaviour is normally exhibited when an employee has to deal with clients, as they may have to project one emotion while feeling another when maintaining suitable communication with the client (Holman et al., 2008, Wong and Law, 2002). For example, this happens when signalling trust and confidence in one's skills when they are questioned, when resolving conflicts, or when arguing for good design over cheap construction costs. An employee has to be able to regulate their emotions, as successful regulation of one's emotions is believed to help influence clients decisions and improve goal achievement (Holman et al., 2008). Thus, the concept of emotional labour can be said to be especially relevant with regard to difficult and demanding clients, as several researchers note that such clients can have a debilitating and demoralizing effect on employees and organisational teams (Normann and Walseth, 2016, Opperman, 2006, Hockey, 1996). If left unchecked, high levels of emotional labour expended by employees can have a detrimental effect on their long-term psychological well-being, as working with clients can be challenging mentally and emotionally (Normann and Walseth, 2016, Wong and Law, 2002). Hence, it is possible to postulate that dealing with difficult customers and clients will have a negative impact on the psychological well-being and engagement of construction professionals.

2.8.4 Workplace violence

Individuals are potentially exposed to both physical and verbal violence in the workplace as they will come into contact with other people. Physical violence and threats of violence in the workplace are significant issues in some occupations where employees interact often with customers, patients, clients, and co-workers (Hogh et al., 2003). Verbal aggression, actual physical violence, and perceived violence and have been shown to have a significant negative impact on the psychological well-being of employees (van den Bossche et al., 2013, Spector et al., 2007). LeBlanc and Kelloway (2002) found that exposure to workplace violence and verbal hostility was connected with poor physical and emotional health. Spector et al. (2007) observed that employees that are the subject of violent and verbal hostility or those that anticipate danger on the job are more likely to experience physical and psychological strains. This could further lead to withdrawal from the workplace and absenteeism, which would negatively affect an employees work engagement and

commitment to the organisation (Thirapatsakun et al., 2014). Violence, verbal aggression, injury, and feeling threatened were connected substantially with somatic symptoms, anxiety, and depression (Spector et al., 2007).

A conducive working environment includes one where the patterns of conduct and interaction amongst individuals within organisations encourages safety and leads to behaviour that minimizes the likelihood of violence, aggression, accidents, and rudeness (Spector et al., 2007). Thus, organisations are encouraged to create a violence free environment by focusing employee attention on how their actions may impact the actions of others and urge employees to behave in ways that limit violence (Kessler et al., 2008). This also includes focusing employee attention on spotting antecedents to violence and making them more likely to foresee escalating events and take preventative measures. This way minor rudeness or misunderstandings between individuals will not escalate into more serious interpersonal encounters (Spector and Bruk-Lee, 2008).

In relation to the above discussed job conditions, it is therefore hypothesised that:

H_3: Poor job conditions are negatively associated with the psychological well-being of South African architects.

H_4: Poor job conditions are negatively associated with the work engagement and commitment of South African architects.

2.9 Summary

This chapter reviewed and analysed the extant literature pertaining to the relationship between workplace stressors and the psychological well-being of employees as well as their work engagement. This chapter discussed workplace stress in general, which was followed by a discussion of popular theoretical models of stress, such as: the Stress Response Model, Job Demand-Control (JD-C) model, Job-Demands-Control-Support (JDCS) model, Job Demand-Resources (JD-R) model, and Effort-Reward Imbalance model (ERI). Psychometric analysis scales such as the OSI and ASSET were also discussed.

The literature review revealed that a relationship exists between workplace stressors and the psychological well-being as well as work engagement of employees. This led to the development of the hypotheses, which aim to analyse these relationships through the use of the ASSET model.

Chapter Three: Research Methodology

3.1 Introduction

This chapter describes the development of the survey-based research design utilised in the investigation of the relationships between various workplace stressors and the psychological well-being and work engagement experienced by South African architects. This research makes use of quantitative research methods, in order to investigate the hypotheses posited *a priori*. This chapter provides an explanation of the chosen survey-based strategy to be used in this study, and subsequently the chosen research methodology is described. Following this, the methods utilised to collect the population and sample data are detailed. Lastly, the statistical methods used to analyse the data in Chapter 4 are described.

3.2 Methodological Approach of the Study

The research questions of the study are as follows:

a) *What is the nature of the relationship between job security related workplace stressors and the psychological well-being of South African architects?*
b) *What is the nature of the relationship between job security related workplace stressors and the work engagement of South African architects?*
c) *What is the nature of the relationship between job conditions related workplace stressors and the psychological well-being of South African architects?*
d) *What is the nature of the relationship between job conditions related workplace stressors and the work engagement of South African architects?*

In order to answer the above stated research questions, this study adopted a positivist research methodology utilising quantitative methods to investigate whether (and how strongly) the variables being studied are related. Numerous studies of construction professionals involving work-related stress and psychological well-being in the workplace have made use of a quantitative research approach including a questionnaire survey with good reliability and validity (Ajayi et al., 2019, Bowen et al., 2018, Cattell et al., 2018, Enshassi et al., 2015, Bowen et al., 2014b, Bowen et al., 2013a, Leung et al., 2011, Demerouti et al., 2010, Leung et al., 2008b, Abbe, 2005). Questionnaire surveys are frequently utilised in research on work-related health and well-being, and they are especially helpful for assessing people's attitudes and perspectives (Symon and Cassell, 2010). Quantitative methods also allow the findings to be generalised to the whole

population in the country/region where the study was conducted, provided the findings are statistically significant and the sample size is sufficient (Tabachnick and Fidell, 2013). The potential scope and significance of the findings are greatly enhanced by generalisability and wider acceptability, and this adds considerable value to the potential reach and impact that the research can have.

The time horizon of the study was cross-sectional, and the data used in the analysis was collected using a questionnaire survey during 2018/2019. This data was collected by other researchers using the ASSET research instrument (Faragher et al., 2004). The methodology was exploratory, as a validated and reliable instrument (ASSET) was used to measure levels of psychological distress experienced by architects in an attempt to explain how the psychological well-being and level of work engagement of the respondents was related to specific stressors in their work and workplace. No research instrument can guarantee perfect reliability and validity , however the ASSET scales were selected because they have demonstrated high levels of reliability and validity verification of the constructs being studied in previous research (Cheung et al., 2022, Cheung et al., 2020a, Cattell et al., 2017). Well-established instruments exhibit high measurement validity for well-designed and tested constructs (Johnson and Turner, 2003). ASSET makes use of several core psychometrically validated scales, which include: *6 Essentials; Psychological Well-being; Your Health; and Engagement & Related Scales*. Additional questions aimed at gathering demographic information and details of employment were also part of the original survey and were included in the analysis of data for this study.

3.2.1 An Overview of Methods Used in Previous Surveys

To determine the soundness of the methodology employed in the current study, it was necessary to evaluate the strengths and weaknesses of the research methods used in other similar studies.

Haydam and Smallwood (2016) investigated the work-related stressors imposed on site agents and foremen in the civil engineering sector of the Nelson Mandela Bay Metropole construction industry of South Africa. This study aimed to clarify the physical and organisational stressors imposed on a sample of site agents and foremen, and also intended to identify the behavioural activities and physical sensations (forms of strain) that were existent in the workforce. They conducted an exploratory empirical study of 15 medium to large civil engineering contractors

obtained from local business directories and municipal databases. The research method for this study included a self-administered questionnaire delivered by hand and by e-mail. The questionnaire consisted of three sections, which covered (1) the extent to which physical stressors were experienced, (2) extent to which organisational stressors were experienced, and (3) the extent to which behavioural and physical sensations were experienced. The questionnaire was developed through a literature review of existing stressor, strain, and stress measurement techniques obtained from contemporary theoretical models used within the construction industry. Of the 90 questionnaires that were sent out, 21 questionnaires were returned resulting in a response rate of 23.3%. The data was analysed using the Statistical Package for the Social Sciences (SPSS) software, in order to obtain descriptive statistics in the form of mean scores and standard deviations. This method is useful for the purpose of analysing the data descriptively, but using mean scores and standard deviations does not allow the researcher to identify relationships that show how physical and organisational workplace stressors are related to behavioural and physical sensations of strain (Pallant, 2016).

Leung and Chen (2011) explored the influence of commitment on stress for cost estimators in Hong Kong. The research method for this study included the circulation of a questionnaire survey to professionally qualified (members of professional institutions) quantity surveyors and estimators from different types of construction companies in Hong Kong. The construction companies were randomly selected and included consultants and contractors. 45 questionnaires were returned from the total of 120 questionnaires that were sent out. The study measured three types of commitment, namely affective, continuance, and normative, using Likert-type questions which were adapted from the studies of Allen and Meyer (1990). In addition the study measured objective stress and emotional stress using questions adapted from the Rustout–Burnout Scale (RO-BO) (Gmelch, 1982), and Maslach Burnout Inventory (Maslach and Jackson, 1981) respectively. Leung and Chen (2011) used Cronbach's alpha (α) to analyse the reliability and internal consistency of the constructs (commitment and stress). Following which Spearman correlations between the three components of organisational commitment and the two dimensions of stress were used to analyse the associations. An advantage of this method is that it is simple and easy to analyse the data collected. However, a major

limitation to this study is the small sample size, which reduces the generalisability of the findings (Tabachnick and Fidell, 2013). Furthermore, the use of correlation analysis on its own doesn't allow for the establishment of cause-and-effect relationships to determine how commitment influences stress as correlation analysis only describes the strength and direction of the linear relationship between two variables (Pallant, 2016).

Robertson et al. (2012) investigated whether employee productivity levels would be better predicted by a combination of positive job and work attitudes (engagement) and psychological well-being, as opposed to positive job and work attitudes alone. The research method for this study included the circulation of a cross-sectional survey to 12 separate UK organisations in both the public and private sector from a range of industries including the police forces, utility companies, manufacturing, higher education, a local council, and the financial services. The survey collected demographic information, and also included items measuring psychological well-being, engagement, and productivity, which were based on ASSET scales developed by Faragher et al. (2004). The main sample consisted of 9,930 respondents of which 58 per cent were male, which gave a relatively balanced ratio of men to women (Robertson et al., 2012). A correlation analysis was performed between all the study variables of productivity, positive job and work attitudes (engagement), and psychological well-being. Furthermore, a multiple linear regression analysis was conducted to assess the unique contribution of psychological well-being and engagement (independent variables) to productivity (dependant variable). A limitation of this study was the use of cross-sectional and self-report data for the analysis. Cross-sectional data does not permit the establishment of causal relationships, and this study could only demonstrate the covariance between the studied variables (Robertson et al., 2012). In addition, due to the study's reliance on self-report data alone, the covariance may potentially be inflated by common method variance, as evidence from various studies reveals a strong association between self-report performance metrics and objective measures (Hurst et al., 1996). Another possible limitation of this research method was the use of a single item to measure productivity and a modest number of items to measure positive job and work attitudes.

Leung et al. (2016a) investigated the impact of job stressors and stress on the safety behaviour and accidents of construction workers in Hong Kong. They hypothesized that job stressors impact accidents among construction workers directly and indirectly through stress and safety behaviour. The research method for this study included the circulation of a questionnaire survey in both Chinese (the mother tongue of Hong Kong construction workers) and English through personal contact, company delivery, and governmental vocation training institutions, to construction workers who had experienced an accident. The survey collected demographic information, and also included items measuring job stressors (Goldenhar et al., 2003, Leung et al., 2005), stress (Gmelch, 1982), and safety behaviour (Mearns et al., 2001). 166 questionnaires were returned from the total of 500 questionnaires that were sent out (Leung et al., 2016a). Pearson's correlation analysis was performed to explore the relationships between job stressors, stress, safety behaviour, and accidents. Following which multiple linear regression analysis by the stepwise method was used to further investigate the interrelationships among stressors, stress, safety behaviour, and accidents. The main advantage of multiple linear regression analysis by the stepwise method is its ability to manage a large number of potential predictor variables (i.e., stressors, stress, and safety behaviour), and then fine-tune the model to select the best ones among the available alternatives that influences the dependent variable (i.e., accidents). Conversely, the disadvantage of models or findings identified by stepwise approaches are that they are more likely to exploit random data characteristics, and they frequently fail when used on new datasets (Harrell, 2015, Tibshirani, 1996).

Bowen et al. (2018) studied the relationship between work contact, work–family conflict and their subsequent influence on psychological distress and sleep problems experienced by South African construction professionals. The research method for this study included the circulation of an online questionnaire survey to construction industry professionals and requested demographic and professional background information from the respondents, in addition to questions pertaining to perceived psychological, physiological, and sociological effects of workplace stress. Schieman and Young (2013) were the primary source of the survey questions, which were modified for use online as considered necessary for the professional nature of the sample. Based on their review of literature, they posited psychological distress and

sleep problems as the predictive outcomes of a combination of demographic variables, work contact, and work-family conflict. Confirmatory factor analysis was conducted using structural equation modelling (SEM) to verify the factor structure of all measured variables. The reliability of the scales was assessed using Cronbach's alpha. In addition, Bowen et al. (2018) specified and tested path models using SEM. A total of 630 of the 942 responses that were received for this study were suitable for analysis. Considering that just 19% of respondents were female, the ratio of men to women was unbalanced. A major limitation of this study method was the self-selecting and self-reporting nature of the survey, which could potentially have led to respondent bias. A major advantage of the research method employed in this study was the use of path models involving SEM which permit the examination of a series of dependence relationships simultaneously (Hair et al., 2014).

As it is difficult to discern the direction of causal relationships in cross-sectional surveys, quantitative research based on questionnaires is often considered limited. This is because it is possible for causal links to go in the other direction (Sedgwick, 2014). Several researchers have suggested that questionnaire-based studies should permit longitudinal studies as a follow-up (Lingard and Francis, 2006, Robertson et al., 2012). Bowen et al. (2013b) observed that research focusing on workplace stress and its effects typically describe the survey scales but do not explain the extent to which participants experience and react to stressors.

Thia study analysed a relevant subset of data which had been obtained in an ASSET online questionnaire survey, and it is likely that similar strengths and limitations will occur. The cross-sectional nature of the data, in addition to the potential sample bias, are notable limitations to the data of the current study. The primary data collection used from the ASSET online survey had been gathered by emailing the membership of the South African Council for the Architectural Profession (SACAP).

3.2.2 Ethics

Participants had been required to provide their full consent in order to initiate the questionnaire survey. This had been presented as the first question in the questionnaire. In order to comply with the ethics requirements at the university, ethics clearance was obtained from the Faculty of Engineering and the Built

Environment at the University of Cape Town. The ethics clearance for this study may be found in Annexure B.

3.3 Methods of Data Collection

3.3.1 Population and Sampling

The respondents targeted for this study include architects registered with the South African Council for the Architectural Profession (SACAP). Given that it is mandatory for practising architects to register with this body, the entire population was surveyed. Questionnaire responses from participants in the cross-sectional study were selected based on the inclusion and exclusion criteria set for the study in relation to the constructs being measured and the research questions the study aimed to answer (Bryman and Bell, 2015). In the literature on work-related health and well-being, questionnaires are frequently employed and are especially helpful for assessing people's attitudes and perceptions (Symon and Cassell, 2010). Respondents working in the private, government, and non-profit sectors of South Africa from all nine (9) provinces were included in the analysis. Responses also include both male and female architects with any level of work experience in the construction industry, including early-career, mid-career, and late-career professionals.

The SACAP membership categories of architects that were included in the analysis were: (1) Professional Architect (Pr.Arch), (2) Professional Architectural Technologist (PAT), (3) Professional Architectural Draftsperson (PAD), and (4) Professional Senior Architectural Technologist (PSAT). Thus, the total population of architects within these SACAP categories at the time of the survey in the year 2017 was 8426 (N = 8426) (SACAP, 2018). The dataset collected contained a total of 365 responses. This represents 4.33% of the population of architects registered within the specified SACAP categories, and this level of response is not unusual for web-based surveys of this nature (Fricker, 2008). The Tabachnick and Fidell (2013) formula for calculating a suitable sample size requirements based on the number of independent variables that one wishes to use is : $N > 50 + 8m$ (where m = number of independent variables). This formula was used for this study, and the suitability of the sample size used is shown under section 4.3.

3.3.2 The Survey Instrument

The data made use of in this study was collected by other researchers using ASSET. It is noted that the author of this study may be contacted if any information pertaining to the research instrument is required, which will be provided, subject to copyright restrictions The survey took place in 2017/2018 and comprised the following sections:

a) Section A: Demographic Information

Demographic information collected from respondents included gender, date of birth, marital status, mother tongue, language used at work, organisation's sector, years of work experience in the construction industry, years of work experience in current organisation, employment basis, number of people in the organisation, working hours per week, and travel time to and from work per day.

b) Section B: ASSET

i. *6 Essentials*

The original survey conducted, included all six of the *'6 Essentials'* scales. However, for this study, only two of the stressor scales from the *'6 Essentials'* were used in line with the research questions being investigated. These are the *'Job Security and Change'* and *'Job Conditions'* scales. As was stated in the literature review, limited studies have specifically examined the effects of job insecurity and job conditions workplace stressors on the psychological well-being and work engagement of architects. Thus, these two scales were selected from the 6 Essentials for further investigation. All items in these scales are preceded by the phrase: "I am troubled that…" Examples include:

- **Job security and change scale** – "*My job is insecure*" and "*My job skills may become redundant in the near future*".
- **Job conditions scale** – "*My physical working conditions are unpleasant (e.g., noisy, dirty, poorly designed)*" and "*My pay and benefits are not as good as other people doing the same or similar work*".

The *'Job Security and Change'* and *'Job Conditions'* survey items used a 6-point response option (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree). The responses were coded, such that scores

for each item ranged from 1 – 6, with 1 representing strongly disagree, 2 representing disagree, 3 representing slightly disagree, 4 representing slightly agree, 5 representing agree, and 6 representing strongly agree. Higher scores represent higher levels of the construct of interest.

ii. ***Psychological Well-being***

Both subscales measuring the construct of '*Psychological Well-being*' were used. These are the *'Positive Emotions'* and '*Sense of Purpose'* scales. The '*Positive Emotions'* scale measures the extent to which employees report experiencing emotions such as happiness, excitement, contentment, and enthusiasm at work. The *'Sense of Purpose*' scale measures the extent to which the employee's view their work as meaningful and fulfilling, and the extent to which they view their job goals as being clear, specific, and challenging. Survey items in the *'Sense of Purpose'* scale required the respondent to select a response ranging from disagreement to agreement regarding how the statement described them. Examples include:

- **Sense of Purpose scale** – "*My current job goals are specific*" and "*I am committed to achieving the goals of my job*".

The *'Sense of Purpose*' survey items used a 6-point response option (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree). The responses for the items in this scale were coded in a similar manner to the *'Job Security and Change'* and *'Job Conditions'* scale items, such that scores for each item ranged from 1 – 6, with 1 representing strongly disagree and 6 representing strongly agree. Higher scores represent higher levels of the construct of interest.

Survey items in the *'Positive Emotions'* scale are preceded by the phrase: "Indicate the extent to which you have felt like this during the last three months at work…" Examples include:

- **Positive Emotions scale** – "*Inspired*", "*Enthusiastic*", "*Contented*", and *"Happy"*.

The *'Positive Emotions'* scale used a 5-point response option (very slightly or not at all, a little, moderately, quite a bit, very much) response option. The responses were coded, such that scores for each item ranged from 1 –

5, with 1 representing very slightly or not at all, 2 representing a little, 3 representing moderately, 4 representing quite a bit, and 5 representing very much. Higher scores represent higher levels of the construct of interest.

iii. ***Engagement and related scales***

All three of the *'Engagement & Related Scales'* subscales were used to measure the construct of work engagement. These are the *'Engagement'*, *'Perceived Commitment of Organisation to Employee'*, and the *'Commitment of Employee to Organisation'* subscales. These subscales measure the extent to which the employee feels engaged with and valued by the organisation, and the extent to which the employee perceives the organisation as being committed to them and vice-versa. All survey items in these scales required the respondent to select a response ranging from disagreement to agreement regarding how the statement described them. Examples include:

- **Engagement** – *"Working in this organisation is motivating"* and *"If necessary, I am prepared to put myself out for this organisation e.g., working long hours and/or unsociable hours"*.
- **Perceived Commitment of Organisation to Employee** – *"I feel valued and trusted by the organisation"* and *"Overall I am happy with my organisation".*
- **Commitment of Employee to Organisation** – *"I am committed to this organisation"* and *"I feel that is worthwhile to work hard for this organisation".*

The survey items belonging to all three scales of the *'Engagement & Related Scales'* used a 6-point response option (strongly disagree, disagree, slightly disagree, slightly agree, agree, strongly agree). The responses for the items in this scale were coded in a similar manner to the *'Job Security and Change'* and *'Job Conditions'* scale items, such that scores for each item ranged from 1 – 6, with 1 representing strongly disagree and 6 representing strongly agree. Higher scores representing higher levels of the construct of interest.

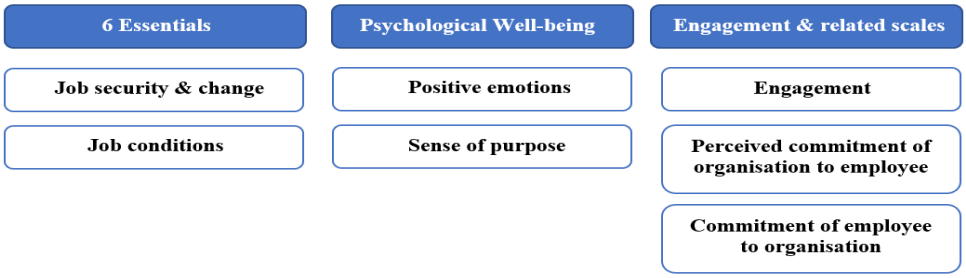

Figure 2: ASSET scales used in current study.

The scale scores were computed by adding up the scores of all items contained in the scale. These scales formed the composite variables used in the data analysis i.e., Job Security and Change, Job Conditions, Psychological Well-being, and Engagement & Related Scales. **Table *1*** below displays the scale score ranges of the composite variables used in this study based on the constituent items of each scale.

Table 1: Scale Score Ranges for Composite Variables

	Scale Score Range of Construct	**№ of Items**	**Sample Items**
1	Job Security and Change (Scale score range = 5-30)	5	• I am troubled that my job is insecure • I am troubled thar my job skills may become redundant in the near future
2	Job Conditions (Scale score range = 8-48)	8	• I am troubled that my physical working conditions are unpleasant (e.g., noisy, dirty, poorly designed) • I am troubled that my pay and benefits are not as good as other people doing the same or similar work
3	Psychological Well-being (Score range = 11 - 59)		
3.1	Positive Emotions (Scale score range = 7-35)	7	• Inspired • Enthusiastic • Contented • Happy.
3.2	Sense of Purpose (Scale score range = 4-24)	4	• My current job goals are specific • I am committed to achieving the goals of my job
4	Engagement & Related Scales (Score range = 9 – 54)		
4.1	Engagement (Scale score range = 5-30)	5	• Working in this organisation is motivating • If necessary, I am prepared to put myself out for this organisation e.g., working long hours and/or unsociable hours
4.2	Perceived Commitment of Organisation to Employee (Scale score range = 2-12)	2	• I feel valued and trusted by the organisation • Overall, I am happy with my organisation
4.3	Commitment of Employee to Organisation (Scale score range = 2-12)	2	• I am committed to this organisation • I feel that is worthwhile to work hard for this organisation

3.4 Methods of Analysis

Several tests were used in the analysis and interpretation of the quantitative data collected.

3.4.1 Software Used

The data obtained from the ASSET questionnaire responses was analysed using IBM SPSS Statistics V28.01 for Windows software. Firstly, the dataset was sorted and cleaned within the context of the current study, and missing value analysis was performed using Little's MCAR test. Secondly, descriptive statistics, and multivariate analysis was used to examine the relationships between two of the *'6 Essentials'* scales and the *'Psychological Well-being'* as well as *'Engagement & Related Scales'* scales. Additionally, the mean values and standard deviations were calculated for each scale item separately.

3.4.2 Statistical Tests

The following tests were performed on the data set:

a) Correlation Analysis

Correlation analysis was used to measure the strength and direction of the linear relationship between the variables (Pallant, 2016, p. 168). Bivariate correlation analysis (Pearson's correlation coefficient (*r*)) was used to measure the strength of the relationship between the *'Job Security and Change"* and *"Job Conditions"* stressor scales and the *'Psychological Well-being'* and *'Engagement & Related Scales'* scales.

b) Internal Consistency of the ASSET Scales

The reliability (internal consistency) of the scales was assessed using Cronbach's alpha (α). Higher alpha values suggest greater internal consistency, and Cronbach's alpha greater than .70 is considered a good level of reliability (DeVellis and Thorpe, 2021, Hair et al., 2014). Low alpha values (<.30) show that the item may be measuring something other than what the scale as a whole is measuring. Furthermore, acceptable correlation values should ideally not be lower than .50 (Pallant, 2016).

c) Regression Analysis

This study utilised multiple linear regression analysis to test the strength of the interrelationship between the stressor variables of *'Job Security and Change'* and *'Job Conditions'* (independent variables), and (1) *'Psychological Well-being'*

(dependent variable) and (2) *'Engagement and Related Scales'* (dependent variable). Prior to the multiple regression analyses being performed, the underlying assumptions of regression analysis were checked, namely: absence of outliers, normality, linearity, homoscedasticity, and independence of the residual.

d) Confirmatory Factor Analysis

Structural equation modelling (SEM) was used to test the measurement models used in this research by confirmatory factor analysis (CFA) in IBM SPSS Amos. The model-fit measures were used to assess the model's overall goodness of fit.

3.5 Summary

This chapter provides an overview of the methodological orientation of the study, the survey method utilised, and the data analysis methods used. It also discussed the research methods used in other studies of a similar nature with the purpose of justifying the method adopted in the current study. The data analysis techniques employed include an assessment of scale internal consistency, correlation analysis, and multiple regression analysis. Chapter 4 discusses the research findings.

Chapter Four: Data Analysis

4.1 Introduction

This chapter presents the analysis of the survey response data drawn from the sample of 365 architects registered with the SACAP. An analysis of the relationship between the each of the dependent variables, 'Psychological Well-being' and 'Engagement & Related Scales', and the independent variables, i.e., the ASSET stressor scales 'Job Security & Change' and 'Job Conditions' was performed using Pearson's correlation and multiple linear regression. Lastly, a discussion relating the results to the extant literature is presented.

4.2 Data Cleaning and Missing Values

The data set was screened and examined for anomalies. The dataset of 365 cases was subject to within-scale and across-scale missing value analysis. The analysis indicated that the extent of missing values was low for all individual variables (less than .3%).

Traditional approaches to missing data in statistical analyses are initiated with the assumption that the absent data is missing completely at random (MCAR) (Little et al., 2014). Little's MCAR test was performed on the dataset, and indicated that the assumption that all item missing values were missing completely at random was tenable as follows: Job Security & Change (χ^2 = 6.25, *df* = 12, *p* = .90, range 0 – .3%); Job Conditions (χ^2 = 35.16, *df* =35 , *p* = .46, range 0 – .3%); Positive Emotions (χ^2 = 8.50, *df* = 12, *p* = .75, range 0 - .3%); Sense of Purpose (χ^2 = 4.07, *df* = 6, *p* = .67, range 0 - .3%); Engagement (χ^2 = 3.73, *df* = 8, *p* = .88, range 0 – .3%); Perceived Commitment of Employee to Organisation (χ^2 = .47, *df* = 2, *p* = .79, range .3%); and Commitment of Employee to Organisation had no missing values.

Little's MCAR test was also performed on all items across all measures simultaneously (χ^2 = 387.57, *df* = 446, *p* = .98, range 0 – .3%), again indicative that item missing values were missing completely at random and were imputed using the expectation-maximization (EM) algorithm.

4.3 Sample Size Sufficiency

The sample size of this study was three hundred and sixty five (*n* = 365), which was 4.33% of the total population of architects registered with SACAP. Tabachnick and Fidell (2013) provide a formula for calculating sample size requirements, based on the number of

independent variables that one wishes to use: N > 50 + 8m (where m = number of independent variables). With regard to this formula, the recommended sample size was 58 for each hypothesis tested (i.e. 58 x 4 = 232 for this study). The sample size of 365 in the current study was therefore taken as sufficient.

4.4 Demographic Profile of Respondents

The demographic breakdown of the sample was 54.0% (n=197) men with the rest being women, and marital status was: 63.0% (n=230) married, 10.7% (n=39) living with a partner, 4.4% (n=16) divorced, 1.4% (n=5) separated, 1.1% (n=4) widowed, and 19.5% (n=71) had never married.

The respondents' number of years of industry experience comprised: 15.1% from 0 to 5 years (n=55), 19.2% from 6 to 10 years (n=70), 14.8% from 11 to 15 years (n=54), 11.0% from 16 to 20 years (n=40), 11.0% from 21 to 25 years (n=40), 10.1% from 26 to 30 years (n=37), and 17.8% with 31 or more (n= 65).

Respondents' roles within their organisations were: 50.1% (n=183) director/partner/owner or manager, 39.2% (n=143) registered professional employee, 6.0% (n=22) registered professional technician, and 4.7% (n=17) "other".

4.5 Data Analysis

4.5.1 Descriptive statistics

The descriptive statistics (mean and standard deviation) for each item of the various ASSET scales are presented in Appendix A. Given the nature of the research questions being addressed, these descriptive statistics per se are not central to the analysis and are presented in Appendix A for information only.

The questions within each of the stressor scales ('Job Security and Change' and 'Job Conditions') are preceded by the statement "I am troubled that…" which indicates the direction of the responses (polarity) and the meaning of the scores. The mean thus indicates the strength of the disagreement or agreement with the statement (disagreement for means of 1 to 3, and agreement for means of 4 to 6). The standard deviation indicates the spread about the mean which indicates the extent to which the respondents "slightly agree" / "agree" and "slightly disagree / disagree" with the questions.

When interpreting these descriptive statistics, it is important to note the direction of scale questions. For example, in Table 11 of Appendix A, for the first item (job insecurity), the mean is 3.45 and the SD is 1.65. This SD indicates that 68% of the responses were 3.45 plus or minus 1.65 – so they range from 1.80 to 5.10. Therefore, some are in the "slightly agree" / "agree" end of the range, but mostly they show varying levels of disagreement with the statement – "I am troubled that my job is insecure". Most respondents said that they disagree with the statement that they are troubled because they feel their jobs are not secure, meaning that they were mostly not troubled.

All items within the various ASSET scales may be similarly interpreted *mutatis mutandis*.

4.5.2 Correlation analysis

A 1-tailed correlation analysis using Pearson's correlation coefficient was applied to both of the independent variables and each dependant variable (refer to Table 2). As depicted in these tables, all relationships are significant at the $p < .01$ level. The association between 'Job Security and Change' and 'Job Conditions' was found to be positive, whilst all other associations were found to be negative. The magnitude of the relationships varied between medium (.30 to .49) and large (≥ .50) (see Table 2).

Notably, the strongest relationships were found between Job Conditions and each of Engagement and Related Scales (r = -.660) and Psychological Well-being (r = -.633). Equally notable is that approximately 50% of the associations may be categorised as large (Cohen, 1988). Conversely, the smallest magnitude was found to be between Job Security and Change and Psychological Well-being (r = -.462).

Table 2: Pearson's Correlation Coefficients between the stressor scales and the constructs of 'Psychological Well-being' and 'Engagement and Related Scales'

	JSC	JC	PW	ER
Poor Job Security and Change (JSC)	1			
Poor Job Conditions (JC)	.590**	1		
Psychological Well-being (PW)	-.462**	-.633**	1	
Engagement and Commitment (ER)	-.475**	-.660**	-	1
Mean	14.868	24.123	38.995	40.332
SD	5.449	7.744	9.332	10.664
*p < .05, ** p < .01, ***p<.001				

Briggs and Cheek (1986) recommend the optimal minimum range for the inter-item correlation as .2 to .4. The strength of associations between all the scales ranges between moderate to strong. Correlations greater than .70 can sometimes lead to redundancy, and it can be questioned whether the items are measuring the same thing (Pallant, 2016). The inter-item correlation between all the variables was within the recommended threshold, and there was no possible presence of multicollinearity. The presence of multicollinearity was tested more fully below.

4.5.3 Confirmatory factor analysis

Confirmatory Factor Analysis (CFA) was computed using AMOS to test the measurement models. Two measurement models based on the four latent factors described above were specified and tested. The first measurement model involved three latent factors, namely JSC, JC, and PW. The second measurement model involved only one factor, namely, ERS. This was necessitated because combining all four latent factors into one unitary measurement highlighted the possibility of the observed (independent) variables being linearly dependent, perhaps because the sample size was rather small in relation to the number of independent variables (Byrne, 2016). Nevertheless, this approach does not invalidate the confirmatory factor analysis.

First measurement model (JSC, JC, and PW)

The output indices of the first measurement model, a 24-item, 3-factor model, indicated a weak fit to the data (χ^2/df ratio = 4.085, $p < .001$); TLI = .794; CFI = .814; RMSEA = .092 CI 90% (.086 - .098); SRMR = .0736; and Hoelter (95%) = 103. Factor loadings in this model were all statistically significant ($p < .001$) but not all items exceeded .5 – specifically, JSC3, JC2, JC3, JC4, JC6, and SP2 (six out of 24 items).

The modification indices indicated the need for several correlated error terms in the JSC and PW constructs, specifically, between e1-e2, e14-e15, e15-e16, e14-e16, e15-e17, e18-e20, e19-e22, and e23-e24. This was most likely due to the similarity in the wording of the relevant questions. All suggested error covariances were amongst items within the same construct so, although not desirable, there was no threat to the overall integrity of the measurement model.

With these paths specified, the resultant model presented a good fit to the data (χ^2/df ratio=2.564, $p < .001$; TLI=.895; CFI=.909; RMSEA=.066 CI 90% (.059 - .072); SRMR = .0590; and Hoelter (95%) = 164. Factor loadings in this final model were again all statistically significant ($p < .001$), with most item loadings exceeded .5, again except for JSC3, JC2, JC3, JC4, JC6, and SP2. No modifications were necessary, and the dimensionality of this first measurement model was deemed tenable.

The Chi-Square Difference Test revealed that this final model was a significant improvement on the initial model [($\Delta\chi^2(8) = 399.294$, $p < .001$), indicating that the inclusion of the error term covariances substantively enhanced the model. Consequently, these pathways were retained in this final measurement model.

This final first measurement model is depicted in **Figure 3**. The item loadings are shown in Table **Table 3**.

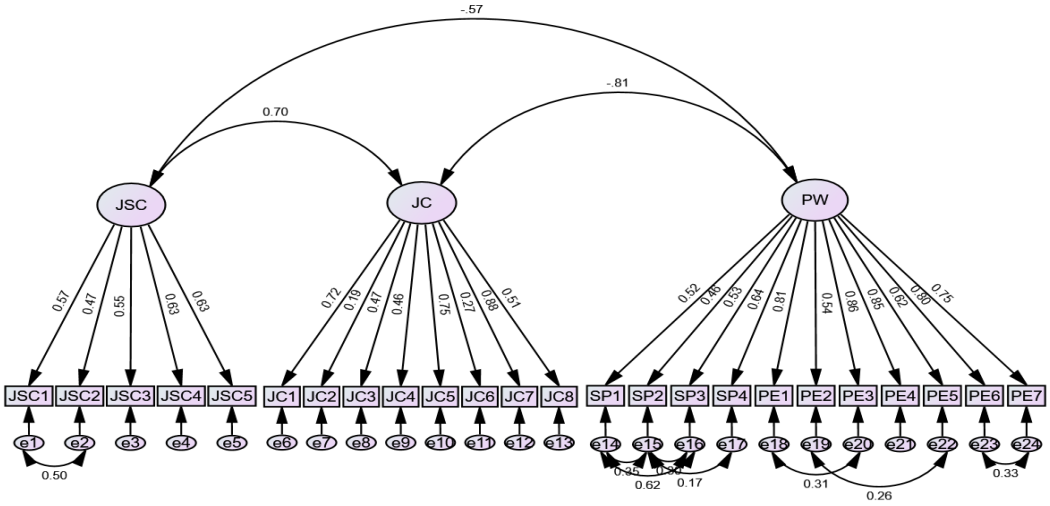

Figure 3: First measurement model

Table 3: Observed Variable loadings onto Model 1 Factors

Model Factor	Observed Variable Label	Observed Variable Description	Variable loadings
Job Security & Change (JSC)	JSC1	Job insecurity	.57
	JSC2	Lack of job permanence	.47
	JSC3	Organisation changes for changes sake	.55
	JSC4	Future job change	.63
	JSC5	Fear of skill redundancy	.63
Job Conditions (JC)	JC1	Job is unlikely to change in the next 5-10 years	.72
	JC2	Risk of physical violence	.19
	JC3	Work performance closely monitored	.47
	JC4	Comparatively poor pay and benefits	.46
	JC5	Dull and repetitive work	.75
	JC6	Dealing with difficult customers & clients	.27
	JC7	Lack of enjoyment of job	.88
	JC8	Poor physical working conditions	.51
Psychological Well-being (PW)	SP1	Specific job goals	.52
	SP2	Committed to achieving job goals	.46
	SP3	Clear job goals and objectives	.53
	SP4	Challenging job goals	.64
	PE1	Inspired	.81
	PE2	Alert	.54
	PE3	Excited	.86
	PE4	Enthusiastic	.85
	PE5	Determined	.62
	PE6	Happy	.80
	PE7	Contented	.75

Second measurement model (ERS)

The output indices of the second measurement model, a 7-item, 1-factor model, indicated a very weak fit to the data (χ^2/df ratio = 11.115, p <.001); TLI = .901; CFI = .934; RMSEA = .167 CI 90% (.144 - .191); SRMR = .0415; and Hoelter (95%) = 56. Factor loadings in this model were all statistically significant (p < .001), with all but one item (E3) exceeding .5.

The modification indices indicated the need for several correlated error terms in the ERS construct, specifically, between e25-e26, e26-e29, and e30-e31. Again, this was most likely due to the similarity in the wording of the relevant questions. All suggested error covariances were amongst items within the same construct so, although not desirable, there was no threat to the overall integrity of this measurement model.

With these paths specified, the resultant model presented a good fit to the data (χ^2 /*df* ratio=2.804, p <.01; TLI=.982; CFI=.991; RMSEA=.070 CI 90% (.042 - .100); SRMR = .0215; and Hoelter (95%) = 233. Factor loadings in this final model were again all statistically significant (p <0.001), with all item loadings exceeded .5, again except for E3. No further modifications were necessary, and the dimensionality of this second measurement model was deemed tenable.

The Chi-Square Difference Test revealed that this final second measurement model was a significant improvement on the initial model [($\Delta\chi^2(3)$ = 124.770, p < .001), indicating that the inclusion of the error term covariances substantively enhanced the model. Consequently, these pathways were retained in this final measurement model.

This final second measurement model is depicted in **Figure 4**.The items loadings are shown in **Table 4**.

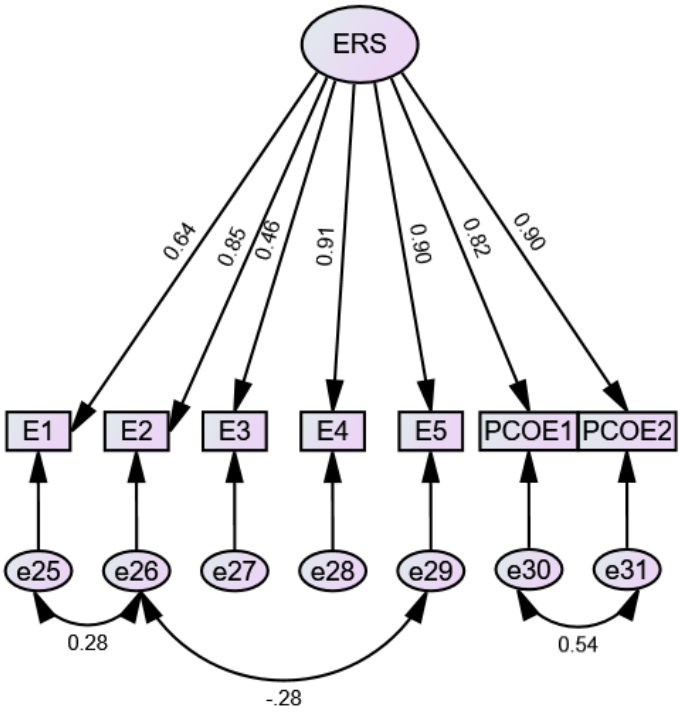

Figure 4: Second measurement model

Table 4: Observed Variable loadings onto Model 2 Factor

Model Factor	**Observed Variable Label**	**Variable Description**	**Variable loading onto factor**
Engagement & Related Scales (ERS)	E1	Put myself out for the organisation	.64
	E2	Committed to organisation	.85
	E3	Achieving the goals of the job	.46
	E4	Work hard for this organisation	.91
	E5	Organisation is motivating	.90
	PCOE1	Feel valued and trusted by organisation	.82
	PCOE2	Happy with organisation	.90

4.5.4 Internal consistency of scales

The internal consistency of the stressor scales and the scales measuring the constructs of 'Psychological Well-being' and 'Engagement and Related Scales' was assessed using Cronbach's alpha coefficient (see **Table *5***). The analysis indicated good internal consistency:

Positive Emotions (7-items) (α = .91, Sense of Purpose (4-items) (α = .81), Engagement (5-items) (α = .87), Perceived Commitment of Organisation to Employee (2-items) (α = .93), Commitment of Employee to Organisation (2-items) (α = .88) all possess strong internal consistency (α > 0.80). Furthermore, Job Security and Change (5-items) (α = .74), and Job Conditions (8-items) (α = .77) all possess satisfactory internal consistency (α > .70).

The *'Positive Emotions'*, *'Sense of Purpose'*, *'Perceived Commitment of Organisation to Employee'*, and the *'Commitment of Employee to Organisation'* scales have corrected item-total correlation values that all exceeded .50 (indicative of very good discrimination). The *'Job Security and Change'*, and *'Engagement'* scales both have at least one item with corrected item-total correlations between .5 and .3. The *'Job Conditions'* scale indicated at least five items with corrected item-total correlation between .5 and .3. Notably, two items within the *'Job Conditions'* scale, namely, 'Risk of physical violence' and 'Dealing with difficult customers/clients' reflected corrected item-total correlations below the .3 threshold, indicating the possibility that items may be measuring something different from the scale as a whole.

The *'Job Security and Change'*, *'Job Conditions'*, *'Positive Emotions'*, and *'Engagement'* scales indicated an improvement in internal consistency occasioned by the removal of either one or two items from that scale, whilst the *'Sense of Purpose'* scale did not indicate any improvement in internal consistency with any item removed. The *'Perceived Commitment of Organisation to Employee'*, and the *'Commitment of Employee to Organisation'* scales only have two items each, thus no improvement in consistency of the scale could be calculated if any item was removed from these scales.

When analysing the results of the scale reliability analysis, it was important to take into account the length of the various scales, as Cronbach alpha values are quite sensitive to the number of items in the scale (Pallant, 2016). As this study made use of data that was collected using scales that had already been psychometrically validated (Faragher et al., 2004), it was not advisable to add or remove items from these scales. Nevertheless, overall, the scales used in this study indicated good internally consistency (i.e., reliability).

Table 5: Reliability of Scale Items

	Scale	No. of Items	Sample Item	Cronbach's Alpha (α)
1	Job Security and Change	5	I am troubled that my job is not permanent. I am troubled that my job skills may become redundant in the near future.	.74
2	Job Conditions	8	I am troubled that I do not enjoy my job. I am troubled that my work is dull and repetitive.	.77
3	Positive Emotions	7	Inspired Enthusiastic Contented Happy	.91
4	Sense of Purpose	4	My current job goals are specific. I am committed to achieving the goals of my job.	.81
5	Engagement	5	Working in this organisation is motivating. If necessary, I am prepared to put myself out for this organisation e.g., working long hours and/or unsociable hours.	.87
6	Perceived Commitment of Organisation to Employee	2	I feel valued and trusted by the organisation Overall, I am happy with my organisation	.93
7	Commitment of Employee to Organisation	2	I am committed to this organisation I feel that is worthwhile to work hard for this organisation	.88

4.5.5 Convergent and discriminant validity

A 1-tailed correlation analysis using Pearson's correlation coefficient was applied to all scale items used for this study. In general, convergent validity is deemed sufficient if >75% of hypotheses are true or if the correlation with a measure of the same construct is > 0.50 (Terwee et al., 2007). These cut-off points' precise values

may be arbitrary, but they serve as a guide when determining whether convergent validity is sufficient (Stangor, 2006). Overall, all the correlations between items measuring the same construct showed good convergent validity, and the correlations between items measuring the constructs of *Job Conditions* and *Job Security and Change* were divergent from the constructs of psychological well-being and work engagement. This was consistent with the reviewed literature.

Correlations between items within the *Job Security and Change* scale were all positive and significant at the $p < .01$ level. These correlations ranged between .20 and .47 which indicated good convergent validity of the scale. Correlations between items within the *Job Conditions* scale were all positive. Correlations ranged between .15 and .66, with the exception of correlations between JC2 and JC4, JC2 and JC5, and JC3 and JC6, which had correlations of .04, .08, and .05 respectively. Apart from these three exceptions, this scale indicated good convergent validity. Correlations between items within the *Psychological Well-being* scale were all positive and significant at the $p < .01$ level. These correlations ranged between .27 and .75, which indicated good convergent validity of the scale. Correlations between items within the *Engagement & Related Scales* scale were all positive and significant at the $p < .01$ level. These correlations ranged between .31 and .87, with the exception of correlations between E2 and CEO2, and E4 and CEO1, which had unusually high correlations of 1.00, and .99. This indicated that these items may possibly be measuring the same thing. Apart from these two exceptions, this scale indicated good convergent validity.

Correlations between items in the stressor scales of *Job Security and Change* and *Job Conditions*, and items in the *Psychological Well-being* scale were all negative. This indicates good discriminant validity between these workplace stressors and the construct of psychological well-being, and it was possible to discriminate between these constructs. Correlations between items in the stressor scales of *Job Security and Change* and *Job Conditions*, and items in the *Engagement & Related Scales* were all negative. This indicates good discriminant validity between these workplace stressors and the construct of work engagement and commitment by employees, and it was possible to discriminate between these constructs. This was expected, as numerous studies have shown that higher levels of workplace stress result in poor psychological well-being and a lack of work engagement.

Table 6: Scale item labels and descriptions

Scale		Item Label	Item Description
Job Security & Change		JSC1	Job insecurity
		JSC2	Lack of job permanence
		JSC3	Organisation changes for changes sake
		JSC4	Future job change
		JSC5	Fear of skill redundancy
Job Conditions (JC)		JC1	Job is unlikely to change in the next 5-10 years
		JC2	Risk of physical violence
		JC3	Work performance closely monitored
		JC4	Comparatively poor pay and benefits
		JC5	Dull and repetitive work
		JC6	Dealing with difficult customers & clients
		JC7	Lack of enjoyment of job
		JC8	Poor physical working conditions
Psychological Well-being	Sense of Purpose	SP1	Specific job goals
		SP2	Committed to achieving job goals
		SP3	Clear job goals and objectives
		SP4	Challenging job goals
	Positive Emotions	PE1	Inspired
		PE2	Alert
		PE3	Excited
		PE4	Enthusiastic
		PE5	Determined
		PE6	Happy
		PE7	Contented
Engagement & Related Scales	Engagement	E1	Put myself out for the organisation
		E2	Committed to organisation
		E3	Achieving the goals of the job
		E4	Work hard for this organisation
		E5	Organisation is motivating
	CEO	CEO1	Work hard for this organisation (Commitment)
		CEO2	Committed to organisation (Commitment)
	PCOE	PCOE1	Feel valued and trusted by organisation
		PCOE2	Happy with organisation

CEO = Commitment of Employee to Organisation
PCOE = Perceived Commitment of Organisation to Employee

Table 7: Scale Item Correlations

Scale Item Correlation Matrix																																
	JSC 1	JSC2	JSC3	JSC4	JSC5	JC1	JC2	JC3	JC4	JC5	JC6	JC7	JC8	SP1	SP2	SP3	SP4	PE1	PE2	PE3	PE4	PE5	PE6	PE7	E1	E2	E3	E4	E5	CEO1	CEO2	PCOE 1	PCOE 2
JSC1	1.00	0.63	0.21	0.38	0.34	0.30	0.11	0.20	0.45	0.35	0.21	0.37	0.25	-0.34	-0.21	-0.32	-0.28	-0.32	-0.14	-0.36	-0.35	-0.17	-0.35	-0.39	-0.14	-0.30	-0.21	-0.34	-0.40	-0.34	-0.30	-0.33	-0.36
JSC2	0.63	1.00	0.20	0.39	0.29	0.20	0.08	0.18	0.33	0.25	0.15	0.22	0.15	-0.22	-0.14	-0.17	-0.18	-0.17	-0.12	-0.15	-0.15	-0.12	-0.18	-0.21	-0.06	-0.20	-0.14	-0.18	-0.21	-0.18	-0.20	-0.19	-0.18
JSC3	0.21	0.20	1.00	0.31	0.34	0.36	0.21	0.40	0.22	0.36	0.25	0.42	0.35	-0.23	-0.17	-0.20	-0.18	-0.27	-0.19	-0.28	-0.25	-0.25	-0.38	-0.33	-0.30	-0.43	-0.17	-0.47	-0.48	-0.46	-0.43	-0.48	-0.50
JSC4	0.38	0.39	0.31	1.00	0.47	0.27	0.14	0.31	0.23	0.21	0.27	0.30	0.20	-0.17	-0.13	-0.21	-0.19	-0.23	-0.18	-0.24	-0.22	-0.25	-0.26	-0.28	-0.18	-0.27	-0.13	-0.25	-0.29	-0.25	-0.27	-0.28	-0.27
JSC5	0.34	0.29	0.34	0.47	1.00	0.28	0.06	0.15	0.30	0.27	0.23	0.34	0.14	-0.26	-0.22	-0.18	-0.21	-0.25	-0.23	-0.26	-0.27	-0.26	-0.28	-0.24	-0.09	-0.25	-0.22	-0.30	-0.35	-0.30	-0.25	-0.29	-0.31
JC1	0.30	0.20	0.36	0.27	0.28	1.00	0.15	0.34	0.40	0.58	0.21	0.63	0.34	-0.30	-0.28	-0.33	-0.40	-0.44	-0.28	-0.47	-0.42	-0.31	-0.42	-0.40	-0.37	-0.48	-0.28	-0.49	-0.49	-0.48	-0.48	-0.42	-0.44
JC2	0.11	0.08	0.21	0.14	0.06	0.15	1.00	0.19	0.04	0.08	0.19	0.16	0.25	-0.03	-0.11	-0.04	-0.03	-0.10	-0.03	-0.10	-0.03	-0.08	-0.23	-0.07	-0.15	-0.11	-0.11	-0.16	-0.15	-0.16	-0.11	-0.15	-0.16
JC3	0.20	0.18	0.40	0.31	0.15	0.34	0.19	1.00	0.24	0.37	0.05	0.38	0.33	-0.24	-0.17	-0.24	-0.23	-0.26	-0.27	-0.26	-0.25	-0.29	-0.30	-0.29	-0.41	-0.49	-0.17	-0.45	-0.41	-0.45	-0.49	-0.47	-0.45
JC4	0.45	0.33	0.22	0.23	0.30	0.40	0.04	0.24	1.00	0.37	0.21	0.33	0.20	-0.20	-0.09	-0.20	-0.21	-0.24	-0.16	-0.31	-0.31	-0.13	-0.29	-0.35	-0.18	-0.24	-0.09	-0.23	-0.26	-0.23	-0.24	-0.28	-0.26
JC5	0.35	0.25	0.36	0.21	0.27	0.58	0.08	0.37	0.37	1.00	0.20	0.66	0.37	-0.29	-0.29	-0.27	-0.49	-0.50	-0.33	-0.48	-0.50	-0.38	-0.44	-0.41	-0.35	-0.46	-0.29	-0.49	-0.53	-0.49	-0.46	-0.41	-0.44
JC6	0.21	0.15	0.25	0.27	0.23	0.21	0.19	0.05	0.21	0.20	1.00	0.22	0.12	-0.07	-0.09	-0.13	-0.13	-0.12	-0.02	-0.13	-0.14	-0.06	-0.19	-0.08	-0.05	-0.07	-0.09	-0.12	-0.11	-0.12	-0.07	-0.08	-0.11
JC7	0.37	0.22	0.42	0.30	0.34	0.63	0.16	0.38	0.33	0.66	0.22	1.00	0.45	-0.45	-0.38	-0.41	-0.54	-0.62	-0.38	-0.64	-0.60	-0.46	-0.64	-0.58	-0.45	-0.58	-0.38	-0.61	-0.70	-0.61	-0.58	-0.53	-0.62
JC8	0.25	0.15	0.35	0.20	0.14	0.34	0.25	0.33	0.20	0.37	0.12	0.45	1.00	-0.26	-0.19	-0.23	-0.18	-0.30	-0.16	-0.31	-0.33	-0.25	-0.41	-0.31	-0.30	-0.36	-0.19	-0.45	-0.45	-0.45	-0.36	-0.42	-0.46
SP1	-0.34	-0.22	-0.23	-0.17	-0.26	-0.30	-0.03	-0.24	-0.20	-0.29	-0.07	-0.45	-0.26	1.00	0.52	0.72	0.44	0.40	0.24	0.44	0.39	0.30	0.41	0.45	0.25	0.40	0.52	0.45	0.51	0.45	0.40	0.38	0.49
SP2	-0.21	-0.14	-0.17	-0.13	-0.22	-0.28	-0.11	-0.17	-0.09	-0.29	-0.09	-0.38	-0.19	0.52	1.00	0.50	0.46	0.33	0.33	0.32	0.38	0.44	0.37	0.32	0.31	0.45	1.00	0.42	0.39	0.42	0.45	0.31	0.40
SP3	-0.32	-0.17	-0.20	-0.21	-0.18	-0.33	-0.04	-0.24	-0.20	-0.27	-0.13	-0.41	-0.23	0.72	0.50	1.00	0.49	0.41	0.27	0.45	0.40	0.34	0.40	0.44	0.25	0.36	0.50	0.42	0.46	0.42	0.36	0.35	0.43
SP4	-0.28	-0.18	-0.18	-0.19	-0.21	-0.40	-0.03	-0.23	-0.21	-0.49	-0.13	-0.54	-0.18	0.44	0.46	0.49	1.00	0.51	0.36	0.52	0.53	0.46	0.46	0.46	0.34	0.50	0.46	0.46	0.53	0.46	0.50	0.41	0.49
PE1	-0.32	-0.17	-0.27	-0.23	-0.25	-0.44	-0.10	-0.26	-0.24	-0.50	-0.12	-0.62	-0.30	0.40	0.33	0.41	0.51	1.00	0.48	0.79	0.71	0.47	0.63	0.59	0.36	0.43	0.33	0.50	0.58	0.50	0.43	0.46	0.51
PE2	-0.14	-0.12	-0.19	-0.18	-0.23	-0.28	-0.03	-0.27	-0.16	-0.33	-0.02	-0.38	-0.16	0.24	0.33	0.27	0.36	0.48	1.00	0.46	0.48	0.51	0.38	0.39	0.26	0.34	0.33	0.37	0.36	0.37	0.34	0.29	0.32
PE3	-0.36	-0.15	-0.28	-0.24	-0.26	-0.47	-0.10	-0.26	-0.31	-0.48	-0.13	-0.64	-0.31	0.44	0.32	0.45	0.52	0.79	0.46	1.00	0.75	0.47	0.71	0.68	0.31	0.40	0.32	0.48	0.58	0.47	0.40	0.43	0.50
PE4	-0.35	-0.15	-0.25	-0.22	-0.27	-0.42	-0.03	-0.25	-0.31	-0.50	-0.14	-0.60	-0.33	0.39	0.38	0.40	0.53	0.71	0.48	0.75	1.00	0.58	0.69	0.62	0.30	0.46	0.38	0.51	0.58	0.51	0.46	0.46	0.53
PE5	-0.17	-0.12	-0.25	-0.25	-0.26	-0.31	-0.08	-0.29	-0.13	-0.38	-0.06	-0.46	-0.25	0.30	0.44	0.34	0.46	0.47	0.51	0.47	0.58	1.00	0.50	0.43	0.40	0.47	0.44	0.49	0.48	0.49	0.47	0.43	0.47
PE6	-0.35	-0.18	-0.38	-0.26	-0.28	-0.42	-0.23	-0.30	-0.29	-0.44	-0.19	-0.64	-0.41	0.41	0.37	0.40	0.46	0.63	0.38	0.71	0.69	0.50	1.00	0.73	0.31	0.46	0.37	0.56	0.63	0.56	0.46	0.53	0.60
PE7	-0.39	-0.21	-0.33	-0.28	-0.24	-0.40	-0.07	-0.29	-0.35	-0.41	-0.08	-0.58	-0.31	0.45	0.32	0.44	0.46	0.59	0.39	0.68	0.62	0.43	0.73	1.00	0.31	0.45	0.32	0.53	0.63	0.53	0.45	0.49	0.55
E1	-0.14	-0.06	-0.30	-0.18	-0.09	-0.37	-0.15	-0.41	-0.18	-0.35	-0.05	-0.45	-0.30	0.25	0.31	0.25	0.34	0.36	0.26	0.31	0.30	0.40	0.31	0.31	1.00	0.67	0.31	0.62	0.54	0.62	0.67	0.52	0.57
E2	-0.30	-0.20	-0.43	-0.27	-0.25	-0.48	-0.11	-0.49	-0.24	-0.46	-0.07	-0.58	-0.36	0.40	0.45	0.36	0.50	0.43	0.34	0.40	0.46	0.47	0.46	0.45	0.67	1.00	0.45	0.79	0.70	0.79	1.00	0.68	0.76
E3	-0.21	-0.14	-0.17	-0.13	-0.22	-0.28	-0.11	-0.17	-0.09	-0.29	-0.09	-0.38	-0.19	0.52	1.00	0.50	0.46	0.33	0.33	0.32	0.38	0.44	0.37	0.32	0.31	0.45	1.00	0.42	0.39	0.42	0.45	0.31	0.40
E4	-0.34	-0.18	-0.47	-0.25	-0.30	-0.49	-0.16	-0.45	-0.23	-0.49	-0.12	-0.61	-0.45	0.45	0.42	0.42	0.46	0.50	0.37	0.48	0.51	0.49	0.56	0.53	0.62	0.79	0.42	1.00	0.82	1.00	0.79	0.76	0.82
E5	-0.40	-0.21	-0.48	-0.29	-0.35	-0.49	-0.15	-0.41	-0.26	-0.53	-0.11	-0.70	-0.45	0.51	0.39	0.46	0.53	0.58	0.36	0.58	0.58	0.48	0.63	0.63	0.54	0.70	0.39	0.82	1.00	0.82	0.70	0.74	0.83
CEO1	-0.34	-0.18	-0.46	-0.25	-0.30	-0.48	-0.16	-0.45	-0.23	-0.49	-0.12	-0.61	-0.45	0.45	0.42	0.42	0.46	0.50	0.37	0.47	0.51	0.49	0.56	0.53	0.62	0.79	0.42	1.00	0.82	1.00	0.79	0.76	0.82
CEO2	-0.30	-0.20	-0.43	-0.27	-0.25	-0.48	-0.11	-0.49	-0.24	-0.46	-0.07	-0.58	-0.36	0.40	0.45	0.36	0.50	0.43	0.34	0.40	0.46	0.47	0.46	0.45	0.67	1.00	0.45	0.79	0.70	0.79	1.00	0.68	0.76
PCOE1	-0.33	-0.19	-0.48	-0.28	-0.29	-0.42	-0.15	-0.47	-0.28	-0.41	-0.08	-0.53	-0.42	0.38	0.31	0.35	0.41	0.46	0.29	0.43	0.46	0.43	0.53	0.49	0.52	0.68	0.31	0.76	0.74	0.76	0.68	1.00	0.87
PCOE2	-0.36	-0.18	-0.50	-0.27	-0.31	-0.44	-0.16	-0.45	-0.26	-0.44	-0.11	-0.62	-0.46	0.49	0.40	0.43	0.49	0.51	0.32	0.50	0.53	0.47	0.60	0.55	0.57	0.76	0.40	0.82	0.83	0.82	0.76	0.87	1.00

4.5.6 Testing the underlying assumptions of regression analysis

Multicollinearity Test

Multicollinearity exists when the independent variables used in a regression analysis are highly correlated (r > .90) (Pallant, 2016). As was noted in the correlation analysis described above, there was no strong association between the independent variables of Job Security and Change and Job Conditions (r = .590). Nevertheless, further examination with respect to possible multicollinearity was conducted. Tolerance and the Variance Inflation Factor (VIF) were used to assess possible multicollinearity between the independent variables. Tolerance indicates the extent of variability of the independent variables that is unexplained (Hair et al., 2014). A small tolerance level (<.10) indicates a high likelihood of multicollinearity, and thus a high level of tolerance is often desired. Furthermore, a Variance Inflation Factor (VIF) value greater than 10 indicates multicollinearity (Pallant, 2011). The results of the multicollinearity tests are shown in **Table 8**.

Table 8: Multicollinearity Test

Dependant Variable	Independent Variable	Collinearity Statistics	
		Tolerance	VIF
Psychological Well-being			
	Job Security and Change	.652	1.535
	Job Conditions	.652	1.535
Engagement and Related Scales			
	Job Security and Change	.652	1.535
	Job Conditions	.652	1.535

The tolerance for all variables was acceptable (>.10). Additionally, the VIF for all the variables was <10, which is indicative of the absence of multicollinearity.

Normality, Linearity, Homoscedasticity, Independence of Residuals

The underlying assumptions of linear regression analysis include an absence of outliers, normality of the dataset, linearity of the relationship between independent and dependent variables, homoscedasticity, and independence of residuals (Pallant, 2011). No outliers in the data were detected, as there were no standardised residual values >3.3 or < –3.3 (Tabachnick and Fidell, 2013). The Normal P-P Plots of the regression of standardised residuals for both analyses conducted for the current

study showed the observed points in a reasonably straight line from bottom left to top right. This indicates that there are no significant deviations from normality in the data set. The normal P-P Plot are shown in Figure 5 and Figure 6.

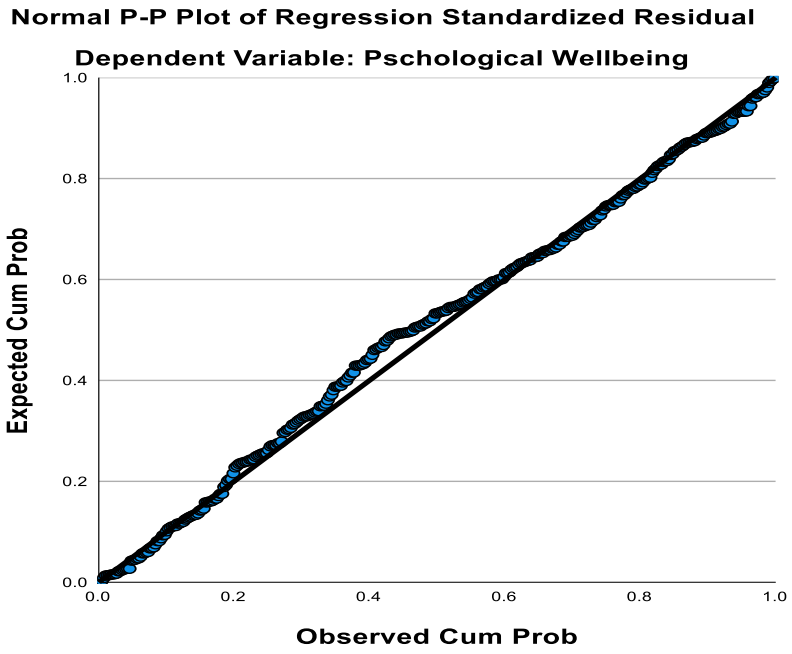

Figure 5: Normal P-P Plot with Psychological Well-being as dependent variable

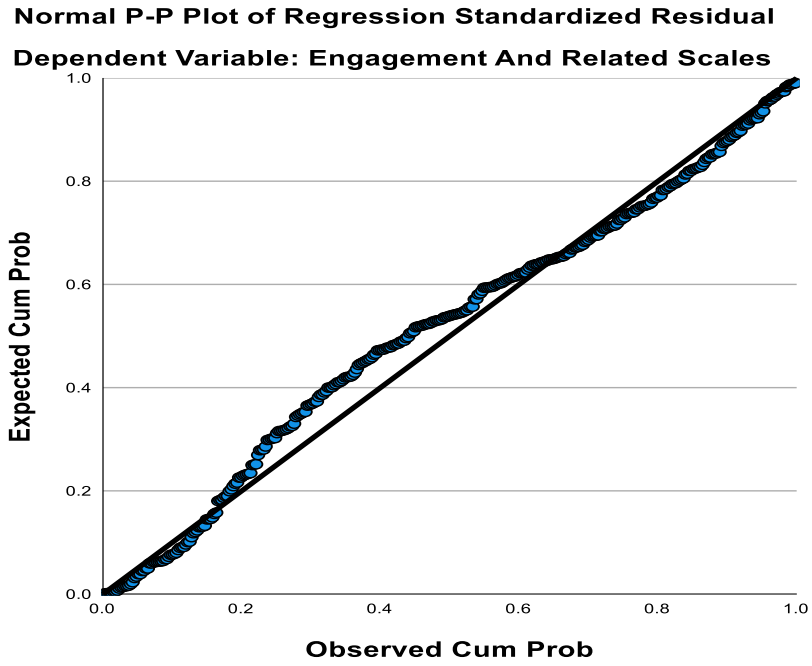

Figure 6: Normal P-Plot with Engagement and Related Scales as dependent variable

The Scatterplot of standardised residuals for the regression with Psychological Well-being as the dependent variable (Figure 7) is clearly rectangularly distributed. A straight line could be drawn through the main cluster of observed points, which indicates that the relationship between the independent variables and dependent variables was linear, and thus, Pearson's inter-item correlation could be used to analyse the relationship. The shape of the cluster is distributed evenly from one end to the other, which means that heteroscedasticity was not a concern.

The Scatterplot of standardised residuals for the regression with Engagement and Related Scales as the dependent variable (Figure 8) is roughly rectangularly distributed and there is no clear pattern to the residuals. A straight line could also be drawn through the main cluster of observed points, which indicates that the relationship between the independent variables and dependent variables was linear, and thus Pearson's inter-item correlation could be used. The shape of the cluster is distributed evenly from one end to the other, which means that heteroscedasticity was not a concern.

The respective scatterplots are shown in Figure 7 and Figure 8.

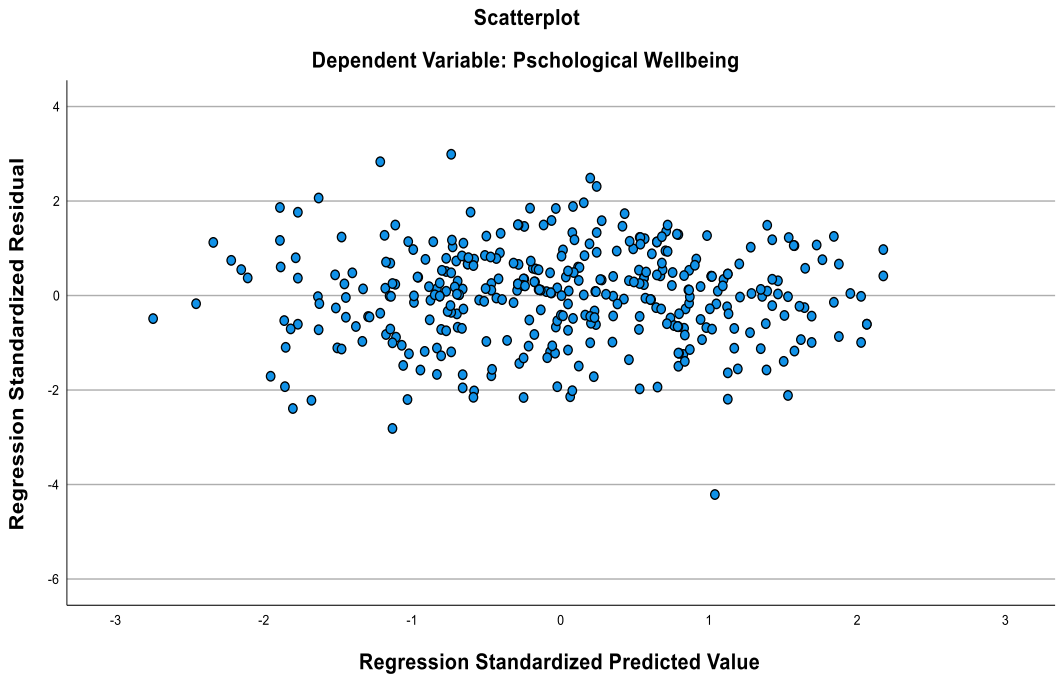

Figure 7: Scatterplot of standardised residuals: Psychological Well-being as dependent variable

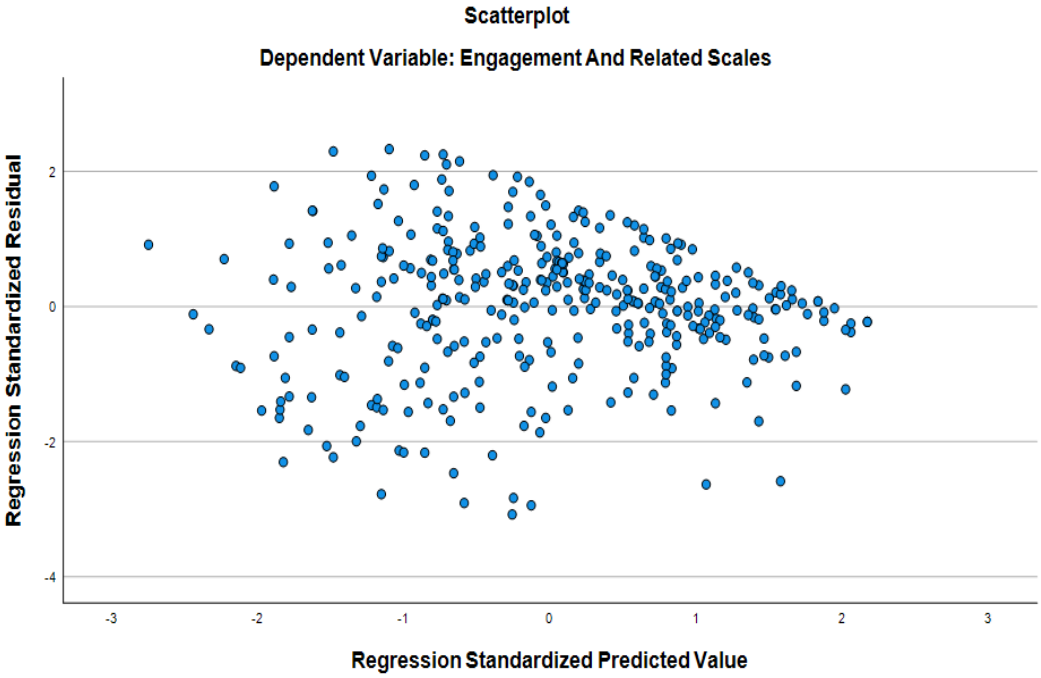

Figure 8: Scatterplot of standardised residuals: Engagement and Related Scales as dependent variable

4.5.7 Regression Analysis on the Scales

Table 9: Multiple Linear Regression Analysis with 'Psychological Well-being' and 'Engagement & Related Scales' as Dependent Variables

Dimension	Dependant Variable	Independent Variable	B	S.E.	β	t	p-value	R	R^2	*F*	*95% Confidence Level*	
											Lower Bound	*Upper Bound*
	Psychological Well-being		58.513	1.298		45.085	.000***	.642	.412	127.004***	55.960	61.065
1		Job Security and Change	-.232	.085	-.135	-2.713	.007**				-.400	-.064
2		Job Conditions	-.666	.060	-.553	-11.075	.000***				-.784	-.548
	Engagement and Commitment		63.503	1.439		44.131	0.000***	.668	.447	146.226***	60.673	66.333
1		Job Security and Change	-.257	.095	-.131	-2.710	.007**				-.443	-.070
2		Job Conditions	-.802	.067	-.583	-12.029	0.000***				-.933	-.671
*p<.05; **p<.01; ***p<.001												

Regression analysis was used to explain how much of a variance in the dependent variable could be explained by the independent variables. The first regression analysis had *Psychological Well-being* as the dependent variable, *Job Security and Change* as the first independent variable with β = -.135, and Job Conditions as the second independent variable with β = -.553. The relationship between *Job Security and Change* and *Psychological Well-being* was significant at the $p < .01$ level, whilst the relationship between *Job Conditions* and *Psychological Well-being* was significant at the $p < .001$ level. Thus, both a lack of job security and poor job conditions contribute to the outcome poor psychological well-being, with poor job conditions having a stronger contribution.

The second regression analysis had *Engagement & Related Scales* as the dependent variable, and *Job Security and Change* as the first independent variable with β = -.131, and *Job Conditions* as the second independent variable with β = -.583. The relationship between *Job Security and Change* and *Psychological Well-being* was significant at the $p < .01$ level, whilst the relationship between *Job Conditions* and *Psychological Well-being* was significant at the $p < .001$ level. Thus, both a lack of job security and poor job conditions contribute to the outcome of poor work engagement and a lack of commitment by employees, with adverse job conditions having a stronger contribution.

4.6 Discussion of the Findings

This section discusses the results presented above in the context of the extant literature. It is structured to, firstly, discuss the correlation analysis of the stressor variables of 'Job Security and Change' and 'Job Conditions', and, secondly, to discuss the regression model analysis. Within this discussion, the relevant literature is linked to the discussion, as well as to whether the hypotheses offered *a priori* are accepted or rejected.

The correlation analysis found that 'Job Security and Change' had a strong positive association with 'Job Conditions'. This indicates that participants who experienced poorer job conditions also felt less secure about the nature and future of their jobs, and those experiencing good job conditions were more likely to feel more secure about their jobs. This is consistent with the literature on job insecurity and the important job condition of financial incentives (László et al., 2010, Sverke et al., 2002). The lifestyle that an individual can provide for themselves and their family to feel secure depends on their remuneration. Thus, the job condition of poor pay and benefits is likely to work in tandem

with job insecurity, as high levels of both adversely affect an employee's view of their future, and consequently their psychological well-being and sense of self-worth (Siegrist et al., 2014, Siegrist et al., 2005). Cheng et al. (2005) found that employees with less education and lower paying jobs are more likely to be affected by job insecurity due to their lower social and inferior financial resources. Poor pay and a lack of financial incentives at work can cause employees to feel that they are not being sufficiently rewarded for their efforts. Consequently, the experience of a reward deficiency in a fundamental social role, such as the work role, makes it more difficult for an individual to view their career and overall life as successful and meaningful. This is true even when an employee perceives or anticipates the unpleasant experience of reward deficiency through job loss, organisational change, or redundancy of their skills (Lazarus and Folkman, 1984).

'Job Security and Change' was found to be negatively associated with 'Psychological Well-being'. This indicates that architects who experience higher levels of job insecurity and job change are more likely to experience lower levels of psychological well-being and also find their work less fulfilling. This is consistent with the transactional stress theory (Lazarus and Folkman, 1984), which treats stress as a dynamic process operating between a person and his or her environment. As job insecurity is a subjective work-related stressor, it is expected to adversely affect the positive emotions that an employee experiences as well as their sense of fulfilment from work (Wang et al., 2015, Debus et al., 2014). Thus, an employee's perception or anticipation of a future unpleasant event such as job loss, organisational change, or redundancy of skills is likely to cause them stress and anxiety (Richter et al., 2013, Hellgren and Sverke, 2003).

The regression model indicated a negative relationship between job insecurity and psychological well-being. This is consistent with studies which found that continuous exposure to psychological work stressors like job insecurity is linked to low levels of psychological well-being (Vander Elst et al., 2016, Boswell et al., 2014, László et al., 2010, Cheng et al., 2005, Hellgren and Sverke, 2003). Consequently, Hypothesis 1 (H1) which states that job insecurity and change is negatively associated with the positive psychological well-being of South African architects, is supported.

'Job Security and Change' was found to be negatively associated with 'Engagement and Related Scales'. This indicates that architects who experience higher levels of job insecurity and job change are more likely to experience lower levels of work engagement

and be less committed to their organisations. This is consistent with the literature on job insecurity (Richter et al., 2013, Sverke and Hellgren, 2002). Two meta-analyses found job insecurity to be negatively related to job performance (Gilboa et al., 2013, Cheng and Chan, 2008). Highly engaged employees not only strongly identify with their work but are also motivated to devote personal resources such as knowledge and skills to improve their role performance (Bakker and Demerouti, 2008). Thus, one would not expect architects experiencing high levels of job insecurity to display the "strive" behaviour as described by Thirapatsakun et al. (2014), in which employees go the extra mile for the organisation by putting in extra effort and showing initiative. The findings of this study also align with the understanding of the outcomes of high levels of job insecurity as explained by the psychological contract theory, as the trade-off between financial security on behalf of the employer and commitment on behalf of the employee is compromised (Schreurs et al., 2010). A high level of job insecurity breaks the psychological contract, and consequently leads to employees who are not prepared to exhibit the "stay" behaviour of committed and engaged employees, who remain with the organisation even when opportunities to work elsewhere present themselves (Thirapatsakun et al., 2014, Chang et al., 2013, De Cuyper et al., 2008).

The regression model also indicated a negative relationship between job insecurity and the engagement and commitment of employees. This is consistent with studies that found that job insecurity is negatively associated with job performance, job involvement, organisational commitment, and trust in the organisation (Gilboa et al., 2013, Cheng and Chan, 2008, De Witte, 2005, Sverke et al., 2002). Consequently, Hypothesis 2 (H2) which states that job insecurity and change is negatively associated with the work engagement and commitment of South African architects, is supported.

'Job Conditions' was found to be negatively associated with 'Psychological Well-being'. This indicates that employees who experience more unfavourable working conditions than do their counterparts are more likely to experience lower levels of psychological well-being and find their work less fulfilling. This is consistent with the findings of several other studies, which found links between unfavourable working conditions and stress (Nieuwenhuijsen et al., 2015, Szeto and Dobson, 2013, Stansfeld et al., 2012, Wieclaw et al., 2008). Saikala and Selvarani (2015) demonstrated that physical work environment stressors such as spatial inadequacy, poor lighting, dirty/dusty surroundings, and a lack of safety and security, create an uncomfortable work environment that is a major source of

stress among construction professionals in India. To reduce the negative impact of unfavourable working conditions in the workplace, architects' security and physical working environment must be enhanced through the implementation of viable strategies. The findings of the current study also agree with the concept of "emotional labour" (Hochschild, 1979), which argues that employees who frequently have to deal with difficult clients (adverse job condition) expend large amounts of emotional labour resulting in high levels of job stress (Wong and Law, 2002, Morris and Feldman, 1996). Building design is not an easy process, since architects must strike a balance between accommodating the client's wishes and adhering to the fundamental tenets of architecture, engineering, and project management. Saikala and Selvarani (2015) found that variations to the scope of work is one of the most prevalent stressors experienced by construction professionals in India. Thus, architects who frequently have to deal with difficult and demanding clients who struggle to make timely decisions, request frequent changes to designs, or have unrealistic expectations, would likely expend large amounts of emotional labour as a result (Zapf, 2002, Zapf et al., 2001), leading to low levels of psychological well-being.

The regression model further indicated a negative relationship between job conditions and psychological well-being. This finding is consistent with studies which found that continuous exposure to poor job conditions, such as a lack of financial incentives and a poor physical working environment, is linked to low levels of psychological well-being and low levels of job satisfaction (Nieuwenhuijsen et al., 2015, Young et al., 2012, Siegrist et al., 2005). In addition, this finding is also consistent with studies that found that employees who enjoy their work and are intellectually stimulated by it are more likely to describe it as fulfilling and satisfying (Bovier and Pernegar, 2003). Consequently, Hypothesis 3 (H3) which states that poor job conditions are negatively associated with the positive psychological well-being of South African architects, is supported.

'Job Conditions' was found to be negatively associated with 'Engagement and Related Scales'. This indicates that job conditions such as poor pay and undesirable working conditions are likely to adversely affect an employee's view of their future, and consequently, their work engagement and commitment to their organisation will also likely be adversely affected. An employee's perception of the pay and benefits they receive may be viewed as a sign of how valuable they are to the company (Seigrist et al., 2004). This agrees with research linking job conditions such as poor pay and a lack of

financial incentives to poor employee performance, a lack of enthusiasm towards work, and low levels of employee commitment (Garbers and Konradt, 2014, Siegrist et al., 2005). The Effort-Reward Imbalance Model (Siegrist, 1996) argues that working environments are more stressful when an employee's efforts are not adequately rewarded financially. In addition, the findings of this study agree with other studies in which it was found that a poor physical workplace environment, in terms of design, layout (personal space/privacy) and cleanliness, has an adverse impact on the behaviour and commitment of employees (Ayoko and Ashkanasy, 2020, Leka and Houdmont, 2010). Overcrowded, noisy, and unclean working environments encourage employee withdrawal from the workplace and a lack of social interaction between colleagues. Consequently, such environments would likely decrease work engagement, job performance, and the building of beneficial work relationships that could counteract job stress. Thus, architects working in environments with unfavourable conditions are not likely to have a feeling of emotional attachment, pride, or a sense of belonging to their employer organisation (Thirapatsakun et al., 2014).

The regression model also revealed that a negative relationship exists between job conditions and the engagement and commitment of employees. This is consistent with studies which found that continuous exposure to adverse job conditions such poor financial incentives, poor physical working conditions, dull and repetitive work, and the risk of physical violence, is linked to low levels of both engagement and commitment of employees (Attarchi et al., 2014, Ashkanasy et al., 2014, Garbers and Konradt, 2014, Young et al., 2012, McGuire and McLaren, 2009, Spector et al., 2007, LeBlanc and Kelloway, 2002). Consequently, Hypothesis 4 (H4) which states that poor job conditions are negatively associated with the engagement and commitment of South African architects, is supported.

It is restated that, with respect to South African architects, the current study aimed to discover the relationship between:

a) *job security related workplace stressors and both psychological well-being and work engagement, and*
b) *job conditions related workplace stressors and both psychological well-being and work engagement.*

Table 10: Summary of Hypothesis Testing

Hypothesis		Results
H_1	Job insecurity and change is negatively associated with the positive psychological well-being of South African architects.	Supported
H_2	Job insecurity and change is negatively associated with the work engagement and commitment of South African architects.	Supported
H_3	Poor job conditions are negatively associated with the positive psychological well-being of South African architects.	Supported
H_4	Poor job conditions are negatively associated with the work engagement and commitment of South African architects.	Supported

4.7 Summary

This chapter presented the analysis of the data that had been obtained from respondents to an online survey questionnaire distributed amongst architectural professionals in South Africa. Pearson correlation analysis found that a positive and significant relationship exists between the 'Job Security and Change' and 'Job Conditions' stressors. The regression model indicated the existence of (i) a negative relationship between 'Job Security and Change' and 'Job Conditions', and psychological well-being; and (ii) a negative relationship between 'Job Security and Change' and 'Job Conditions', and employee engagement and commitment. These findings are consistent with extant literature.

The final chapter draws conclusions and makes recommendations for future research.

Chapter 5: Conclusions and Recommendations

5.1 Introduction

The purpose of this study was to determine whether the workplace stressors 'Job Security and Change' and 'Job conditions', as defined, cause South African architects to experience poor psychological well-being and a lack of engagement with their work. Given the demanding and stressful nature of the construction industry, it is important to establish the extent to which these stressors cause psychological distress in architects.

The problem addressed by this study is that little is known about the nature of workplace stress experienced by South African architects, and the impact of the specified workplace stressors on their psychological well-being and work engagement.

In this chapter, the findings of the study are reviewed, which allows the research problems to be validated by discussing the findings of the study, the research questions answered, and the research objectives achieved. Furthermore, this chapter documents the achievement of the research aims and whether the hypotheses postulated a priori were upheld or not. Thereafter, conclusions are drawn based on the findings emanating from this study, limitations of the study are discussed, and recommendations for future studies on psychological distress are presented.

5.2 Findings of Research Questions

In this study, the following research questions were posed:

a) *What is the nature of the relationship between job security related workplace stressors and the psychological well-being of South African architects?*
b) *What is the nature of the relationship between job security related workplace stressors and the work engagement of South African architects?*
c) *What is the nature of the relationship between job conditions related workplace stressors and the psychological well-being of South African architects?*
d) *What is the nature of the relationship between job conditions related workplace stressors and the work engagement of South African architects?*

The relationship between the 'Job Security and Change' and 'Job conditions' workplace stressors on Psychological well-being was examined. The relationship between the 'Job Security and Change' and 'Job conditions' workplace stressors on Employee engagement and commitment was also examined. 'Job Security and Change' and 'Job conditions' were

negatively associated with Psychological well-being. In addition, 'Job Security and Change' and 'Job conditions' were negatively associated with the work Engagement and commitment of employees.

5.3 Research Hypotheses

The research hypotheses were as follows:

H_1: Job insecurity and change is negatively associated with the psychological well-being of South African architects.

This hypothesis is supported.

H_2: Job insecurity and change is negatively associated with the work engagement and commitment of South African architects.

This hypothesis is supported.

H_3: Poor job conditions are negatively associated with the psychological well-being of South African architects.

This hypothesis is supported.

H_4: Poor job conditions are negatively associated with the work engagement and commitment of South African architects.

This hypothesis is supported.

5.4 Achievement of Research Objectives

The research objectives to be achieved were to:

a) Establish how job insecurity and change affect the psychological well-being of employees.
b) Establish how job insecurity and change affect the levels of work engagement of employees.
c) Determine how adverse job conditions affect the psychological well-being of employees.
d) Determine how adverse job conditions affect employee levels of work engagement.

The abovementioned objectives were all achieved by means of the analysis of the data obtained from respondents to the online survey questionnaire administered to architects registered with SACAP. Significant relationships were identified between these stressors

and each of 'Psychological wellbeing' and 'Engagement & Related Scales' through the regression analysis of the data. Objectives (a), (b), (c) and (d) were thus achieved.

5.5 Limitations of the Study

The study was conducted using data collected from a cross-sectional survey conducted on construction professionals during 2018/2019. Thus, it only gives a snapshot of the level of positive psychological well-being and work engagement of architects at a given point in time. It does not monitor any changes in levels of psychological well-being and work engagement of architects over a prolonged period.

The methodology chosen which relied on quantitative methods of analysis has the drawback of not taking into account qualitative information that may have provided insight into how the respondents' particular situations may have influenced their responses. This is a common shortcoming of all methodologies which exclusively use quantitative methods.

In addition, the depth of the standardised questions was limited as respondents were only permitted to score their experience instead of providing a full explanation. Thus, it was not determined how or why people in the sample feel and behave differently in response to various stressors.

Despite these limitations, and subject to the caveats raised above, it is argued that findings of this study provide valuable pointers to how workplace stressors related to '*Job security and change*' and '*Job conditions*' cause South African architects to experience poor psychological well-being and a lack of engagement with their work.

5.6 Conclusions

The contribution of this research lies in its examination of how workplace stressors affect the psychological well-being and work engagement of architects in a developing country that is characterized by economic hardship and social problems. It demonstrates that it is appropriate to examine various workplace stressors to understand their effects on psychological health using various methods of analysis.

The findings of the current study showed that job security and job conditions influence both the employee's psychological well-being and their engagement with their work. This suggests that ameliorating the negative effects of job insecurity and future job change by limiting temporary contractual arrangements and minimising any unfavourable messages

regarding potential future unemployment will improve the psychological well-being of employees. Furthermore, improving job conditions such as financial incentives, physical working conditions, and ensuring a violence-free environment in the workplace, will also improve the psychological well-being of employees and keep them more engaged with their work.

The contribution of this work lies in its examination of the influence that selected workplace stressors have on the psychological well-being and work engagement of architects in a developing country that is characterized by economic hardship and social problems. This study concerns architects in South Africa, and therefore similar trends likely exist in other developing countries. The following recommendations are based on the findings that have been presented in Chapter 4 and the conclusions described above.

5.7 Recommendations

The current study identified potential areas for further investigation into psychological well-being using qualitative methods. i.e., how individuals perceive and respond to various workplace stressors. In terms of application, the professional association responsible for the architectural profession in South Africa (SACAP) could explore various ways of sensitising and educating their members on psychological well-being in the workplace, in addition to raising awareness through publishing research reports in newsletters and encouraging involvement in research surveys for future publications.

On a microeconomic level, individual firms may also assist in improving the psychological well-being of employees by creating a healthy, clean, and safe work environment. In addition, reducing dull and repetitive work tasks, providing workshops and training to improve employees' skills to prevent the fear of skills redundancy could potentially improve the engagement and commitment of employees. The improvement of an employee's skills could also increase the likelihood of receiving a pay rise or promotion, thereby reducing the risk of employees experiencing an effort reward imbalance.

Further research through a longitudinal study making repeated observations of various workplace stressors and their impact on psychological well-being is recommended. This would provide insight into the changes in the participants levels of well-being and work engagement over time as the level of workplace stress being experienced. This would be beneficial, as the extant literature demonstrates that well-being and work engagement are not static constructs and they do change with time as the levels of stress being experienced

by individuals' changes. This hypothesis remains speculative regarding architects and must be investigated further as the data from the current study did not allow for its exploration.

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Appendix A: Descriptive Statistics

For the 'Job Security and Change', 'Job Conditions', 'Sense of Purpose', 'Engagement', 'Perceived Commitment of Organisation to Employee', and 'Commitment of Employee to Organisation' scales, the mean indicates how strong the sample populations agreement or disagreement is with the scale item. Where a mean score between 1 and 3 indicates disagreement and a score between 4 and 6 represents agreement. For the 'Positive Emotions' scale, the mean indicates the extent to which the sample population are experiencing a particular emotion. Where a mean score between 1 and 3 indicates a very slight to moderate experience of the emotion, and a mean score between 3 and 5 indicates a moderate to very frequent experience of the emotion.

The standard deviation indicates the spread of the responses about the mean (average) score.

This section discusses the mean and standard deviations of each question within the ASSET scales used for this study, using the standard report generated by psychological well-being specialists, Robertson Cooper Ltd.

1. Job Security and Change

This scale assesses the degree to which work changes and job insecurity are a source of anxiety.

Table 11: Job Security and Change Scale Items

	Item	Mean	Standard Deviation
1	I am troubled that my job is insecure	3.45	1.65
2	I am troubled that my job is not permanent	2.68	1.57
3	I am troubled that my job is likely to change in the future	3.13	1.57
4	I am troubled that my job skills may become redundant in the near future	3.03	1.50
5	I am troubled that my organisation is constantly changing for change's sake	2.56	1.52

The mean (x) for items 2 and 5 are less than 3 (x<3) which indicates that the respondents disagreed with these questions i.e., they felt that their job is permanent, and that their

organisation is not constantly changing. The mean for item 1, 3, and 4 is greater than 3 (x>3) which indicates that, on average, respondents felt that they are insecure about their jobs, they are troubled that their job is likely to change in the future, and they are troubled that their skills may become redundant in the near future.

2. Job Conditions

This scale assesses employee dissatisfaction with incentives, their working environment, and job enjoyment.

Table 12: Job Conditions Scale Items

	Item	Mean	Standard Deviation
1	I am troubled that I may be doing the same job for the next 5 to 10 years	3.42	1.75
2	I am troubled that my physical working conditions are unpleasant (e.g., noisy, dirty, poorly designed)	2.45	1.48
3	I am troubled that my job involves the risk of actual physical violence	2.02	1.30
4	I am troubled that my performance at work is closely monitored	2.48	1.48
5	I am troubled that my work is dull and repetitive	2.87	1.52
6	I am troubled that I have to deal with difficult customers/clients	3.73	1.48
7	I am troubled that I do not enjoy my job	3.15	1.74
8	I am troubled that my pay and benefits are not as good as other people doing the same or similar work	4.00	1.68

The mean (x) for items 1, 3, 4, and 6 are less than 3 (x<3) which indicates that the respondents disagreed with these questions i.e., they felt that their physical working conditions are pleasant, they are not at risk of physical violence, their performance at work

is not closely monitored, and their work is not dull and repetitive. The mean for items 2, 5, 7, and 8 are greater than 3 (x>3) which indicates that, on average, they felt that their job is not evolving and is repetitive, their pay and benefits are not as good as other people doing similar work, they do not enjoy their work, and that they often have to deal with difficult customers/clients.

3. Psychological Well-being

Positive Emotions

This scale assesses the extent to which people are experiencing positive emotions at work.

Table 13: Positive Emotions Scale Items

	Item	Mean	Standard Deviation
1	Inspired	2.82	1.21
2	Alert	3.37	1.05
3	Excited	2.72	1.20
4	Enthusiastic	2.90	1.50
5	Determined	3.58	1.11
6	Happy	2.88	1.56
7	Contented	2.76	1.13

The mean (x) for items 1, 3, 4, 6, and 7 are less than 3 (x<3) which indicates that the respondents seldom or moderately experience these emotions at work i.e., they often feel uninspired, unexcited, unenthusiastic, unhappy, and discontented. The mean for items 2 and 5 is greater than 3 (x>3) which means that, on average, respondents often feel alert and determined.

Sense of Purpose

This scale assesses the extent to which peoples view of their work goals gives them a feeling of purpose.

Table 14: Sense of Purpose Scale Items

	Item	Mean	Standard Deviation
1	My current job goals are specific	4.29	1.27
2	My job goals and objectives are clear	4.42	1.23
3	I am committed to achieving the goals of my job	5.05	0.98
4	The level of challenge of the goals in my job motivates me	4.21	1.33

The mean (x) for items 1, 2, 3, and 4 are greater than 3 (x>3) which indicates that, on average, they felt that their current job goals are specific, their job goals and objectives are clear, they are committed to achieving the goals of their job, and that their job goals are challenging enough to be motivating.

4. Engagement and Related Scales

Engagement

This scale assesses the extent to which people feel engaged with the organisation.

Table 15: Engagement Scale Items

	Item	Mean	Standard Deviation
1	If necessary, I am prepared to put myself out for this organisation e.g. working long hours and/or unsociable hours	4.45	1.43
2	I feel that it is worthwhile to work hard for this organisation	4.39	1.50
3	I am committed to this organisation	4.76	1.31
4	I am committed to achieving the goals of my job	5.05	0.98
5	Working in this organisation is motivating	3.96	1.52

The mean (x) for items 1, 2, 3, and 4 are greater than 3 (x>3) which indicates that, on average, they felt that working for their organisation is motivating, it is worthwhile to work hard for their organisation, they are prepared to go the extra mile for the organisation, they are committed to their organisation, and they are committed to achieving the goals of their job.

Perceived Commitment of Organisation to Employee

This scale assesses the extent to which employees view the organisation as being committed to them.

Table 16: Perceived Commitment of Organisation to Employee Scale Items

	Item	**Mean**	**Standard Deviation**
1	I feel valued and trusted by the organisation	4.30	1.49
2	Overall, I am happy with my organisation	4.26	1.49

The mean (x) for items 1 and 2 are greater than 3 (x>3) which indicates that, on average, they felt valued and trusted by the organisation, and they were generally happy with their organisation.

Commitment of Employee to Organisation

This scale assesses the extent to which employees feel committed to the organisation.

Table 17: Commitment of Employee to Organisation Scale Items

	Item	**Mean**	**Standard Deviation**
1	I feel that it is worthwhile to work hard for this organisation	4.39	1.50
2	I am committed to this organisation	4.76	1.31

The mean (x) for items 1 and 2 are greater than 3 (x>3) which indicates that, on average, employees are committed to their organisation, and they felt it was worthwhile to work for their organisation.

Appendix B: Ethics Clearance