#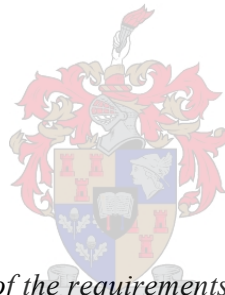 MENTAL TOUGHNESS, JOB DEMANDS AND JOB RESOURCES: TESTING THE EFFECTS ON ENGAGEMENT AND STRESS OF SOUTH AFRICAN EMERGENCY PERSONNEL

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Thesis submitted in partial fulfilment of the requirements for the degree of Master of Commerce (Industrial Psychology) in the Faculty of Economic and Management Sciences at Stellenbosch University

Supervisor: Mrs Michèle Boonzaier
Date: March 2017

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Date: March 2017

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ABSTRACT

Literature related to emergency personnel in South Africa highlights an overwhelming need to study the extent of stress they endure on a daily basis. According to a South African 2008/2009 police report, 323 police officers were declared medically unfit due to stress and depression in that period (Subramaney, 2010). In 2012, a research study conducted among a small sample of paramedics showed that 30% of the participants "had total burnout" (Stassen, Van Nugteren & Stein, 2012). Very recently, a 2016 study on Bloemfontein registrars and medical officers stated that burnout is a severe crisis, as it was shown that only 3.4% of the sample reported no burnout (Sirsawya, Steinberga & Raubenheimerb, 2016). These statistics represent just a small drop in a large pond of critical problems in this sample group.

The nature of the work of emergency personnel is embedded within South Africa's characteristic high crime rate (Kaminer, Grimsrud, Myer, Stein & Williams, 2008; Schwab, 2015; Subramaney, 2010). Just within the last five years, this country has witnessed and suffered through some devastating events. Emergency services personnel, as a result of their occupation, are at an increased risk for trauma exposure. An important consideration is whether or not prevalence rates for stress are higher in these groups (Subramaney, 2010). Specifically, are their working conditions to blame for the levels of stress they endure? Or could optimal working conditions generate engagement? Could recruiting, retaining or growing mental toughness as a personal resource equip emergency personnel with the necessary coping strategies to avoid the stress caused by their work? Also, by reducing stress, could the level of emergency personnel's engagement increase?

The current study thus asks whether and why variance in work engagement and stress exists between the different emergency workers operating within the same and different environments. Due to the uniqueness of the emergency services' work context, as well as the evident ill-health of the personnel, the well-accepted job demands–resources model (JD-R model) was used as a framework. Thus, the primary objective of this study was to test a proposed structural model (resulting from the theory) that illustrates how job demands, job resources and specific personal resources influence engagement and stress among emergency personnel within the South African health services context.

A non-experimental ex post facto correlational research design was used to collect the required data for the purposes of this research study. Upon gaining ethical clearance from all respective parties, and upon receipt of informed consent, quantitative data was gathered from police officers, firefighters, nurses, paramedics and trauma personnel in Gauteng and the Western Cape to represent the emergency services population. A sample size of 173 emergency service personnel was obtained using a non-probability sampling technique. This data was collected using both electronic and paper-format surveys.

The measurement instruments used for this research study include the 30-item Stress Overload Scale (Amirkhan, Urizar & Clark, 2015), the Utrecht Work Engagement Scale 17-item version (UWES-17) (Rothmann & Rothmann, 2010), the Job Demands–Resources Scale, consisting of 48 items (Rothman, Mostert & Strydom, 2006) and the Mental Toughness Scale (MT48), a shortened eight-item version (Gucciardi, Hanton, Gordon, Mallett & Temby, 2015). Throughout the research process, the participants' human rights were respected by adhering to basic research ethics.

To statistically analyse the data and test the hypothesised relationships, item analysis and PLS SEM analyses were used. Eighteen hypotheses were formulated in this research study; ten being main interaction effects and eight moderating interactions. Of the eighteen hypotheses, a total of six were found to be significant. However, it is vital to note that eight of the non-significant paths were moderating effects. Hypotheses 2, 3, 6 and 8 of the main effects were found to be statistically insignificant. This contradicts previous research efforts, and the reasons for the insignificant relationships may be the result of many factors and warrant further thought and inquiry. Hypotheses 1, 4, 5, 7, 9 and 10 were shown to be statistically significant and in accordance with existing literature on these interactions.

To conclude, various managerial implications, recommendations and limitations were discussed in relation to the current study. These will assist industrial psychologists, unit managers and human resources personnel to identify problem areas within the health-care industry, but also to highlight strengths that can be capitalised on as a result of the research findings. Remedial strategies include interventions at the task, individual, team and organisational levels. The results were further linked to JD-R theory and, in so doing, the extent was gauged to which the current study's findings support the theory. Various

limitations of the present research study were acknowledged, and recommendations for future research ventures were discussed.

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CHAPTER 1

INTRODUCTION

1.1. Background

Literature related to South African emergency personnel highlights a serious need to study the extent of stress they endure daily. A South African police report reported 323 police officers to be medically unfit due to stress and depression (Subramaney, 2010). Another research study conducted in 2012 among a small sample of paramedics showed that 30% of them "had total burnout" (Stassen, Nugteren & Stein, 2012). Very recently, a 2016 study on Bloemfontein registrars and medical officers showed that only 3.4% of the sample group reported to experience no burnout (Sirsawy, Steinberg & Raubenheimer, 2016). These statistics are just a small representation of some critical problems in this sample group.

Emergency service personnel are employees who are employed in the South African health services industry, more specifically emergency personnel working for the police (e.g. National, Metro), fire-fighting departments, the nursing industry, paramedics, emergency medical personnel (intermediate life support (ILS) and advanced life support (ALS)), doctors, specialists, etc. Thus, they form part of a unique workforce and endure the resultant work demands. Emergency service personnel are at the forefront of the South African health-care industry, thus their health and well-being should be made a priority too.

The nature of the work of emergency personnel is embedded in South Africa's characteristic high crime rate (Kaminer, Grimsrud, Myer, Stein & Williams, 2008; Schwab, 2015; Subramaney, 2010). Within the last five years, this country has witnessed and suffered through events such as the Marikana 'massacre' (Banchani & Van der Spuy, 2013), violent protests at various universities and voting stations across the country (Bendile, 2016; Nkomo & Felton, 2016), large-scale xenophobic attacks (Oyelana, 2016), frequent sexual abuse and rape cases (Stolk, 2015), on-going socio-economic inequality and poverty (Kaminer et al., 2008; Schwab, 2015), to name a few.

In South Africa, the job demands of emergency personnel are particularly taxing as a result of these high crime rates, the socioeconomic and political turmoil and the substantial political changes since the end of apartheid. In the post-apartheid period, government and

government-funded departments (including emergency services) have undergone immense organisational transformation (i.e. employment equity policies and organisational restructuring). These factors contribute to the poor health of emergency personnel (Subramaney, 2010).

South Africa's exceptionally high income inequality and youth unemployment problems persist; however, insufficient access to health care and the poor support system also contribute to a substandard sustainability aspect (Schwab, 2015). The high prevalence of crime in South Africa places extreme pressure on health-care providers. The emotional and behavioural problems experienced by emergency service personnel can adversely affect their personal and professional lives (Edwards, 2005; Van der Colff & Rothmann, 2014).

More specifically, ill-health among these service providers affects their well-being and quality of life, and the quality of service they offer to patients (Cieslak et al., 2014; Van der Colff & Rothmann, 2014; Van Wingerden, Derks & Bakker, 2015). A highly stressful, risky, demanding and emotionally labouring work context has the potential to lead to adverse individual, interpersonal and organisational outcomes, such as burnout, stress, fatigue, depression, intention to quit, turnover, drug/alcohol abuse, absenteeism, presenteeism, possible suicide, etc.

Generally, today's work environments are characterised by daily challenges, where employees and emergency service workers too are under extreme pressure to achieve their key performance indicators so as to sustain their employment, which is paramount in the current unstable economic climate. Fast-paced, demanding, constantly changing and challenging work environments are what people in any form of employment, in any country worldwide, are expected to endure and are thus universal (Cieslak et al., 2014). According to section 27 of the South African Constitution, access to good-quality health care is assured to all citizens. This sensibly includes that the care provided to the population be timely. Thus, response time is one of the key performance indicators for emergency service personnel – an aspect that is often difficult to meet, and the cause of stress and frustration due to the challenges brought about by the country's high crime rate and lack of resources (Stein, Wallis & Adetunji, 2015).

Dr Colinda Linde, Clinical Psychologist, conceptualised stress as being the relationship between strains, i.e. tasks, time, people issues etc. and coping skills, namely people support, excellent health, finances etc., (Tzoneva, 2012). Thus, it is essential for employees to safeguard a balance between their job demands and job and personal resources. People lacking the required resources to cope with everyday demands are likely to experience high stress levels. In organisations, burnout has been shown to result from extreme work demands over time. If this abundance of strain, stress, fatigue or burnout spills over into other areas of the individual's life, more severe disorders, such as depression, PTSD, anxiety disorders, etc. may develop (Tzoneva, 2012).

According to Tzoneva's (2012) article on the South African depression and anxiety group's website, the World Health Organization reported that between 50% and 80% of all doctor visits are based on a stress-related illness. These findings of work-related factors contributing to ill-health were corroborated in research among nurses (Adriaenssens, De Gucht & Maes, 2014; 2015) and police officers (Lorinc, 2016; Tucker, 2015).

According to the Global Competitiveness Report 2015/16, the health of South African employees is ranked 128th out of 140 economies as a result of the high rates of infectious diseases and poor health indicators (Schwab, 2015). The poor health of South Africans was further confirmed by the Department of Health's statement that the country's health care remains an area of concern (South Africa Yearbook 2013/14, 2015). Good quality health care is a prerequisite to ensure the general health and well-being of a society. However, access to such appropriate health care is dependent on the availability of competent emergency personnel (D'Emiljo, 2015; Van Wingerden et al., 2015). Thus, demanding that the health and well-being of emergency service workers be made a top priority.

South Africa's health-care industry consists of both a private and public sector. The purpose of the private sector is profit driven. In contrast, the public sector encompasses the most basic primary health care offered by the government to South African citizens free of charge or to pay small amounts towards medicine. It is common knowledge that the public sector is under-resourced and endures extreme pressure in providing services to the majority of the population (nearly 80%) who use these public health-care services. The private and public

sectors differ drastically and quality health care is discriminatory and inaccessible to a large portion of the population (Amado, Christofides, Pieters & Rusch, 2012).

With this is mind, the trade-off that the health-care industry has to withstand is being able to make a profit and/or delivering quality, equitable and accessible health care to the South African population, given that hospitals are poorly managed, underfunded, face a scarcity of resources and endure high crime rates, demonstrating yet another challenge for the health-care sector (Amado et al., 2012; Tshitangano, 2013).

1.2. Motivation for and significance of the research study

Professionals exposed to trauma as a result of their work may experience more forms of ill-health compared to other individuals in other occupations. Ill-health in the form of burnout, stress and post-traumatic stress disorder (PTSD) is a significant public health concern for the country (Edwards, 2005; Mitani, Fujita, Nakata & Shirakawa, 2006; Van der Colff & Rothmann, 2014; Van Wingerden et al., 2015). Thus, there exists a serious need to study several trauma- and stressor-related disorders (American Psychiatric Association, 2013; McGowan & Kagee, 2013; Seedat, 2013) among this population of employees.

The following statistics represent evidence of ill-health among emergency services personnel, highlighting an astounding need to research their well-being and the possible causes thereof. High percentages of PTSD (fluctuating between 5% and 74%) have been found in HIV-positive patients as compared to the general population. South Africa has approximately 0.7% of the world's population and 28% of the world's population of HIV and tuberculosis (TB) patients (Peltzer et al., 2013). The reason this is so important is because the total number of people living with HIV in South Africa increased from an estimated four million in the period 2002 to 2005, to 26 million by 2013 (Statistics South Africa, 2013). Additionally, employees in the health-care industry are at increased risk of getting HIV through needle-stick injuries, as well as "splash injuries" (into the eyes, mouth, etc.).

According to Lorinc's (2016) article, the Tema Conter Memorial Trust reported that 39 first responders committed suicide in 2015. The author also states that police officers are more likely to die by suicide than in the line of duty (Collopy, Kivlehan & Snyder, 2012; Lorinc, 2016). Internationally, surveys conducted in Britain, the United States, Australia and Brazil

indicates that the rate of PTSD among first responders varies between 5% and 22%. Of this group, paramedics reported the highest levels of PTSD (Lorinc, 2016).

In Melbourne, Australia, over 36% of paramedics suffer from some form of depression, as the emergency service workers are exposed to abuse, assault, fatality, motor vehicle accidents, etc. During 2007 and 2008, the Chicago Fire Department experienced seven suicides in an 18-month period (Collopy et al., 2012).

A study on an emergency rescue team showed that 72% of candidates experienced a traumatic event at least once during work, and 64% of them experienced it more than twice (Ogińska-Bulik & Kobylarczyk, 2015). Emergency personnel who lack sufficient personal resources to cope with emotional stress are at higher risk for emotional fatigue (Collopy et al., 2012).

The results of another study indicate that stressors influencing burnout in firefighters are PTSD- and general work-related stress (Mitani et al., 2006), as these employees are exposed to stressful, demanding and risky work conditions (Armstrong, Shakespeare-Finch & Shochet, 2014; Haisch & Meyers, 2004; Ogińska-Bulik & Kobylarczyk, 2015; Van der Colff & Rothmann, 2014). Such evidence of ill-health clearly indicates the need for research. Emergency service personnel are at the forefront of the South African health-care industry, thus their health and well-being should be made a priority too.

The largest group of regulated practitioners in emergency services, namely nurses, are internationally recognised as being fundamental to the provision of good-quality health care. Thus, it would be valuable to understand and apply methods to attract, retain and grow such employees in order to improve the quality of health care and health outcomes. Literature on nurse samples emphasises the reality of their high stress and burnout levels, exaggerating the need for intervention. To support the retention of nurses, as well as other emergency service personnel, it is necessary to alter their work environment and nurture a positive workplace culture. This is not occurring in many countries and thus justifies the concern (D'Emiljo, 2015; Huntington et al., 2011; Lorinc, 2016; Van der Colff & Rothmann, 2014).

Due to the shortage of nurses, and potentially also of other professionals employed in the health services industry, attempting to attract these individuals is likely to increase the employee pool. The engagement and retention of such employees is crucial to ensuring a sustainable workforce of health-care professionals, and thus creating or maintaining a viable health-care system (D'Emiljo, 2015). Interestingly, some research has demonstrated that social support is valuable to reduce stress. Human relationships at work are vital in lessening job strain and potentially fostering such a positive culture (Adriaenssens et al., 2015; Macauley, 2015; Mitani et al., 2006).

On a positive note, studies have shown that, despite negative working conditions, employees are able to experience work engagement. Instead of just damaging effects, positive changes after trauma have occurred in paramedics, police officers and firefighters. Such changes include affirmative alterations in self-perception, relationships with others and appreciation of life as a result of coping with life predicaments. Hence, it is proposed that trauma and harsh conditions may be a source of optimism, transformation and perception of personal growth (Macauley, 2015; Ogińska-Bulik & Kobylarczyk, 2015).

Work engagement reflects the recent trend in literature towards 'positive psychology' – where emphasis is placed on positive aspects of employees' perceived health. Particularly, there is acknowledgement of optimal functioning, human strengths and positive experiences at work. Investigating engagement among health-care workers is valuable, because health-care work has been shown to be characterised by high levels of engagement and commitment (Macauley, 2015; Mauno, Kinnunen & Ruokolainen, 2007; Santos, Chambel & Castanheira, 2016). It is also suggested that understanding how both organisational and individual factors impact on engagement will make significant contributions to research on work environments (Adriaenssens et al., 2015; Simpson, 2008).

Research has shown that the benefits of engagement include lessened intentions to quit, increased employee effort, reduced absenteeism, productivity, higher profitability, greater employee retention, reduced error rates, enhanced customer satisfaction and loyalty, and faster business growth (D'Emiljo, 2015). It has also been shown that organisations that engage their workers develop earnings at a rate that is 2.6 times faster than businesses that do not (Jeve, Oppenheimer & Konje, 2015).

Various other variables that may have contributed significantly to understanding engagement, but that have not been considered, include organisational restructuring, work-life balance, leadership styles, movement within the business and changes in personal circumstances (De Beer, Pienaar & Rothmann, 2013). Another study found that demographic factors may also be valuable to understanding engagement, as it was shown that employees with children felt more vigour and dedication at work than childless employees. This is especially interesting, as nursing has stereotypically been considered a female-dominant industry. Furthermore, job resources, such as supervisor support, physical and financial resources, were found to better predict work engagement than job demands (Mauno et al., 2007). The researcher acknowledges that many of these variables may provide a better understanding of and valuable contribution to the concept of engagement, but the study specifically aims to conceptualise the impact of the interactions between the work environment and emergency personnel's level of stress and engagement.

Besides the impact that the work context has on emergency personnel's levels of stress and engagement, research suggests that individuals equipped with the necessary personal resources may be better able to cope with such harsh working conditions. Examples of such personal resources that could buffer the impact of a demanding work environment include resilience, grit, hardiness, emotional intelligence and mental toughness (Bakker, Demerouti & Sanz-Vergel, 2014; Bakker, Hakanen, Demerouti & Xanthopoulou, 2007; Duckworth, Peterson, Matthews & Kelly, 2007; Mauno et al., 2007; Santos et al., 2016).

In the literature, mental toughness is regarded as the "defining attribute that enables one to thrive in challenging situations" and "a contextualized expression of dispositional traits that are activated or shaped by contextual or social factors" (Gucciardi et al., 2015, p.2 & 30). Research suggests that mental toughness plays a vital role in performance. Further supporting the above interpretation of mental toughness is that individual differences in mental toughness (as well as in personality) have been shown to be attributable to both genetic and environmental factors (Horsburgh, Schermer, Veselka & Vernon, 2008).

Understanding the job demands and job resources of emergency services personnel can be useful in understanding how their work conditions influence their well-being and attitudes,

specifically their level of engagement and stress. In addition, it will also help in understanding whether or not possessing sufficient personal resources, such as mental toughness, could assist this unique population group in adapting to and coping with such harsh working conditions while fostering high levels of engagement (Mauno et al., 2007).

The challenge for all emergency services employers and management is to attempt to manage the factors that are causing stress and identify and capitalise those factors that could foster engagement. Accordingly, it is the employers' and management's responsibility to equip employees with the necessary personal resources, tools and skills to handle/control the high job demands they endure daily in the emergency services environment. If these concerns are not addressed, they could result in a variety of negative consequences, including increased absenteeism and turnover rates; decreased quality of patient service; lower productivity; increased errors; as well as employee dissatisfaction (D'Emiljo, 2015). In order to develop and answer the research-initiating questions, an appropriate conceptual model for this research study to investigate the well-being of emergency services personnel is the job demands–resources (JD-R) model (Bakker & Demerouti, 2014). This model has been applied to various occupational settings in order to determine how both job and personal resources, as well as job demands, interact to affect work engagement and job burnout.

The JD-R model assumes that two different, but related, processes result from job demands and job resources, viz. a health-impairment and a motivational process. The first process is an exhausting process, in which high job demands predict stress and other forms of ill health. The second process is a motivational process in which job and personal resources are the most blatant forecasters of motivation, work enjoyment, enthusiasm and engagement. These effects are generally due to the fact that job resources satisfy basic psychosomatic needs, whereas job demands require effort and expend energetic resources (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen, Bakker & Schaufeli, 2006; Nahrgang, Morgeson & Hofmann, 2010).

Consequently, the JD-R model was used to better understand, explain and make predictions about the variance in employees' levels of work engagement and stress based on their work environment and personal resources to cope with such an environment, with the objective of

providing relevant and implementable interventions to address and improve stress and work engagement problems.

Therefore, by studying both emergency personnel's working conditions as well as individual characteristics, a more holistic perspective of their well-being and performance could be conceptualised. When there is an optimal balance between an employee's personal characteristics and his/her work context, general health, well-being and optimal performance may be ascertained. This not only ensures individual well-being, but may lead to other, positive organisational outcomes such as job or work satisfaction, improved performance, work-life balance, organisational commitment, lower intention to quit, less absenteeism and turnover, and possibly high levels of engagement (Adriaenssens et al., 2015; Armstrong et al., 2014).

In conclusion, there is no diagnostic tool that has been proven to be valid, reliable, fair, unbiased and registered with the Health Professions Council of South Africa for identifying and preventing more severe trauma-related stress disorders, such as PTSD, in the workplace, and also falling within the Scope of Practice of Industrial Psychologists. It is still important to note that one may come across such disorders as a business professional, especially working within the health services industry, and thus it is important to understand how they manifest and to refer an employee if further intervention is required (HPCSA, 2011).

The focus of this research was on the related, broader and well-studied construct of stress. It must be noted that the researcher is well aware that this is just 'touching on' a more severe problem within the health-care industry, but that considering the concept of stress is the first step for the industry to recognise the role that work environments play in causing adverse consequences on both an individual and organisational level. Also, this research hopes to raise awareness of stress and PTSD and to instil a proactive mindset and approach in organisations.

1.3.   Research-initiating questions

As a result of the nature of the occupation, emergency services are at an increased risk of trauma exposure. An important consideration is whether or not prevalence rates for stress are higher in these groups? (Subramaney, 2010)

Specifically, are the working conditions to blame for the levels of stress the personnel endure? Or could optimal working conditions generate engagement? Could recruiting, retaining and growing mental toughness as personal resources equip emergency personnel with the necessary coping strategies to avoid stress caused by their work? Also, could the level of engagement of emergency personnel increase by reducing stress?

The arguments made in the previous section, as well as these propositions, question whether an employee's job demands, job resources and personal resources will influence his/her level of work engagement and stress. In addition, it raises the question whether understanding these relationships and their various interactions could improve the well-being and productivity of South African emergency personnel?

The current study thus asks whether variance in work engagement and stress exists between different emergency workers operating within and between different environments, and why. The effects of salient resources and demands on stress and engagement will thus be examined.

1.4.   Objective of the study

The objective of this research study was to test a proposed structural model that illustrates how job demands, job resources and personal resources influence engagement and stress among emergency personnel in the South African health services context. More specifically, the research study aimed to:

- Determine the level of stress and work engagement among emergency personnel working in the health services industry;
- Identify the most salient antecedents of variance in stress and work engagement among emergency personnel in the health services;
- As a consequence, propose and test an explanatory stress and engagement structural model, incorporating mental toughness as a personal resource; and
- Recommend practical interventions for emergency personnel in the health services that could decrease stress and improve work engagement.

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1.5.   Outline of chapters

Chapter 1 has provided some disturbing statistics on and background to South Africa's health-care industry and the people employed therein. It has also rationalised the motivation for and significance of the research study. To conclude Chapter 1, specific questions were asked and specific research objectives were specified.

Chapter 2 involves a comprehensive literature review with the purpose of fulfilling the theoretical objective of the study (described in Chapter 1). Firstly, each construct deemed relevant in terms of existing academic research is defined and discussed. Thereafter, the various relationships between the latent variables are explored and hypothesised to assist in answering the research-initiating questions. Next, these relationships are depicted graphically in the form of a theoretical model.

Chapter 3 presents the research methodology that was used during the research process to answer the research-initiating questions. It entails an explanation of the research design, the research participants, the measuring instruments, missing values and statistical analyses. In addition, the substantive research hypotheses are outlined and the structural model developed (based on the literature review in Chapter 2) is presented.

Subsequently, the results of the statistical analyses performed are reported on and discussed in Chapter 4. This entails explaining the item analysis and structural equation modelling (SEM) related to specific hypotheses. Finally, the participant scores are explored and the hypotheses are interpreted.

In conclusion, various managerial implications, recommendations for future research and limitations of the current research as a result of the research study are highlighted and discussed.

CHAPTER 2

LITERATURE REVIEW

2.1.   Introduction and conceptual framework

Chapter 2 comprises an analysis of research literature that relates to explaining variance in both engagement and stress among emergency personnel. The objective of the literature review is thus to understand, from the various literature sources, the latent variables that are applicable to the investigation of the research-initiating questions, namely: "Do South African emergency personnel's job demands, job resources and personal resources explain significant variance in their work engagement and stress?" The most salient variables are discussed on the basis of a comprehensive exploration of the literature and extensive studying of the available research.

Firstly, due to the uniqueness of the work context of emergency services, as well as the evident ill-health in this field, the chapter starts by discussing earlier job stress models from occupational well-being literature, as well the more recent job demands–resources model (JD-R model). This is followed by a discussion of each construct, namely engagement, stress, job demands, job resources and lastly personal resources. Subsequently, a discussion and hypotheses are provided of the various relationships/paths between the variables. This will assist in answering the research-initiating questions. Furthermore, the hypothesised/proposed structural model, as developed by the researcher, will be illustrated. Finally, the chapter concludes with a brief summary of the literature review.

2.2.   Earlier models of job stress from occupational well-being literature

To fully comprehend how the work environment influences emergency personnel's stress and engagement levels, it is valuable to explore earlier theories of work motivation and job stress, as the evolution of the workplace assists in understanding its contribution in today's context. The following four instrumental models, viz. the two-factor theory of Herzberg, the job characteristics model of Hackman and Oldham, the demand–control model of Karasek and the effort–reward imbalance model of Siegrist, will be discussed briefly (Bakker & Demerouti, 2014).

Firstly, Herzberg's two-factor theory proposes two individual conditions that encourage employee motivation and happiness, viz. hygiene and motivator factors. If missing, hygiene factors, or dissatisfiers (company policies, management, remuneration, interpersonal relations and working conditions), are proposed to make employees unfulfilled at work. Motivator influences or satisfiers (success, recognition, nature of work, responsibility and development) are suggested to make employees feel good about their jobs. According to the two-factor theory, the lack of motivators will cause employees to perform their jobs out of obligation; however, with motivators they will expend more energy and exceed minimum requirements (Bakker & Demerouti, 2014; Hauff, Richter & Tressin, 2015).

Secondly, the job characteristics model explores individual reactions to jobs (amongst others happiness, illness, absenteeism, turnover, etc.) as a part of job characteristics regulated by individual qualities. Principal job features include: skill variety (extent of skills used), task significance (impact that work has on others), task identity (opportunity to finish a complete task), feedback (comments on effectiveness of job performance) and autonomy (degree to which the job provides ample independence and discretion in behaviour at work). Principal job features are expected to affect job happiness and intrinsic work motivation through three critical psychological conditions, namely perceived meaningfulness of work, felt responsibility for outcomes and knowledge of the outputs of work tasks (Bakker & Demerouti, 2014; Hauff et al., 2015).

Furthermore, the demand–control model (DCM) explains that stress will be most severe in jobs where the combination of high job demands and low job control exists ("high-strain jobs"). In contrast, the active learning hypothesis in the DCM proposes that jobs with high job demands and a lot of control will result in satisfaction, learning and personal development. Although such jobs are challenging, workers with sufficient decision autonomy are anticipated to use all their abilities to act through effective problem solving. These jobs are labelled as "active-learning jobs" (Bakker & Demerouti, 2014).

Finally, the effort–reward imbalance (ERI) model stresses the reward make-up of work, and not the control elements. The ERI model postulates that stress is the result of inequity between effort and reward (remuneration, self-regard and career opportunities – i.e.

promotion prospects and job security). The basic assumption is that, without the exchange between effort and reward (i.e. high effort/low reward conditions), distress will result (Bakker & Demerouti, 2014).

There are four concerns about the above versions of work distress and motivation. Primarily, each of the models focuses on only one aspect, either stress or motivation. Secondly, each of the models disregards the perspectives of other existing models. Thirdly, each of the early models is static. Finally, the make-up of jobs is changing fast and these models do not consider this unpredictability (Bakker & Demerouti, 2014).

In conclusion, the concerns of earlier stress models (listed above) can be dealt with by studying the more recent, well-accepted job demands–resources (JD-R) theory. This model is applied throughout a variety of work contexts and is an expansion of the JD-R model. It incorporates both job design and job stress theories. JD-R theory describes how both job demands and resources have distinctive effects on job stress and engagement. It is acknowledged that the earlier job stress models have made significant contributions to and form the foundation of the JD-R model. Thus, the JD-R model was used as the basis of the research in this paper. To proceed with the next section, a brief explanation of the JD-R model is provided, as this model is the underpinning of the literature review and is a major contributor to the development of a conceptual model.

2.3.   Job demands–resources (JD-R) theory and model

The JD-R model has one key assumption, and that is that, although every job or company may have its own particular work characteristics associated with its workers' well-being, it is still viable to sort these characteristics in two categories, namely job demands and job resources. It also assumes that two different, but related, processes result from job demands, as well as both job and personal resources, i.e. health diminishing and a motivational process (see Figure 2.1 below) (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

The first process is energetic and wears a person out. Here, high job demands generally lead to adverse outcomes that exhaust employees' mental and physical resources, potentially

resulting in burnout and stress and eventually in physical ill-health. Secondly, a motivational process occurs, in which job resources predict motivation, enthusiasm, work enjoyment and engagement. These effects result from job demands requiring effort and expending resources, whereas job resources fulfil psychological needs (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).
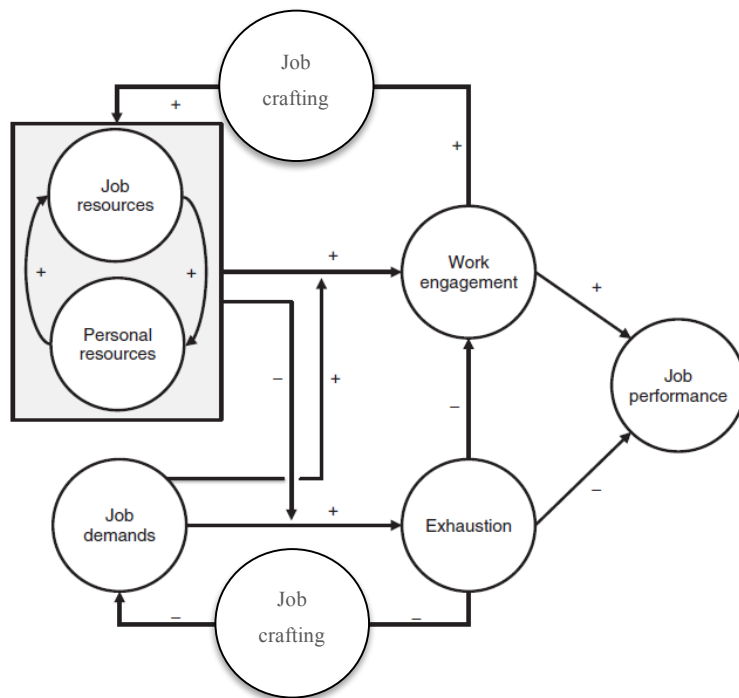
Figure 2.1: **The Job Demands–Resources Model (Bakker & Demerouti, 2014)**

Furthermore, JD-R theory suggests that reversed causal effects exist between various variables, such that stressed, burned-out workers may choose to shape more job demands for their role over time, whereas engaged workers may gather their own work resources to stay fulfilled and engaged. Consequently, the JD-R theory is a dynamic one (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006).

To summarise, this section briefly explained the job demands–resources model (JD-R model), as it forms the underpinning of the literature review and is a major contributor to the development of a conceptual model. The subsequent section will examine each relevant construct, viz. engagement, stress, job demands, job resources and personal resources.

2.4.   Defining the relevant latent variables

2.4.1 Engagement

Today's businesses necessitate a workforce that is psychologically connected to their work. The 21st century is dominated by information and service industries. It demands workers to be both eager and capable to immerse themselves fully in their work and job roles. Organisations want employees who are both vigorous and devoted. Hence, engagement has become a popular construct in both theory and practice (Breevaart, Bakker, Demerouti & Hetland, 2012; Macauley, 2015).

Going back to its origin, it is both interesting and valuable to explore the evolution of the construct of engagement so as to better understand how it is conceptualised today. Firstly, Kahn (1990, p. 700) was one of the first academic researchers to write about engagement and defined personal engagement as being "the simultaneous employment and expression of a person's "preferred self" in task behaviours that promote connections to work and to others, personal presence (physical, cognitive, and emotional) and active, full role performances". He also claimed that engaged workers identify with their work roles and express themselves physically, emotionally and cognitively through their roles (Jacobs, Renard & Snelgar, 2014). The concept, engagement, has developed over the years and can be deemed a rather new "buzz" concept in the field of Industrial/Organisational Psychology (Nell, 2015).

Initially, research into engagement was enthused by research into work-related stress and burnout. Consequently, engagement was accepted within stress research in the early 1900s. After research developments around the construct progressed, two perspectives unfolded. One of these was that engagement, jointly with its three elements (vigour, dedication and absorption), is the antithesis of burnout, while the other perspective argues that burnout and work engagement are distinct and should be studied separately and independently of one another. The latter and well-accepted perspective conceptualises engagement as being a distinct concept within the field of positive well-being (Jacobs et al., 2014; Nell, 2015).

Today, the literature acknowledges various types/forms of engagement, such as active, work and employee engagement. Researchers define active engagement as being elevated amounts of activity, resourcefulness and accountability; therefore, in this case, engagement holds both attitudinal and behavioural components (Roux, 2010).

Additionally, work engagement forms a major part of positive psychology, as it emphasises optimal functioning, well-being, enthusiasm and good health in organisations. As cited by several academics, work engagement is often referred to as the heightened affective and intellectual relationship that a worker has for their colleagues, job tasks and employer, which results in voluntary effort being expended in their work. Lin (2010) defines engagement as passion. The attitudinal and behavioural elements of engagement entail commitment, dedication, enthusiasm about work, loyalty, passion, concentrated effort, task involvement and satisfaction (Lin, 2010; Macauley, 2015; Macey & Schneider, 2008; Towers, 2003).

Work engagement is thus regarded by various academic sources as being rather complex in nature, as it is referred to as a specific construct (e.g. involvement, initiative, sportsmanship, altruism, etc.) with rare characteristics. Other academics regard it as a performance construct relating to individuals having to exceed an expected level of performance (Roux, 2010).

Lastly, employee engagement has also been regarded as an individual's participation in, eagerness for and fulfilment with their work (Roux, 2010). Saks (2006) says there is a difference between the concepts job and organisational engagement. He suggests that employee engagement is the all-encompassing concept and further proposes that the concept be separated into job/work engagement and engagement concerning an organisation (Nell, 2015).

In a recent study by Macauley (2015), it was stated that employee engagement has been defined as an emotional and functional commitment to the employee's organisation. It was noted that Leiter and Maslach (2003) state that engagement involves energy, involvement and efficacy. Further, this research study noted that earlier research by Kahn (1990) augments three elements of work environments related to employee engagement, namely meaningfulness, safety and availability.

According to the definition of work engagement described above, the three characteristics that comprise the concept are vigour, dedication and absorption. These three characteristics are well recognised in engagement literature as being the dimensions of engagement.

Firstly, vigour entails energy, intensity, willingness to exert effort in tasks/work, etc. Employees who have high levels of energy and great mental resilience are not easily fatigued and they persist despite significant difficulties (Breevaart et al., 2012; Lin, 2010; Santos et al., 2016). Dedication is being fully committed to the job/task and devoting oneself to work. It involves being enthusiastic, proud and intensely involved (Breevaart et al., 2012; Lin, 2010; Santos et al., 2016). Finally, absorption means being entirely enthralled in the job and experiencing the well-known idea of "time flying". This involves employees giving their work their full attention and is a psychological state of being pre-occupied by work. It implies being fully concentrated and happily engrossed in the task/job at hand (Breevaart et al., 2012; Lin, 2010; Santos et al., 2016).

The dimension of absorption has been compared to the construct of flow. According to Hamari et al. (2015, p. 172), flow refers to a "state of mind characterized by focused concentration and elevated enjoyment during intrinsically interesting activities." Literature on flow explains that using high levels of skills for challenging tasks results in deep concentration, absorption or immersion. Engagement resembling flow thus suggests a state of complete absorption in a challenge and having no cognitive energy left for distractions, as the entire attention is focused solely on relevant stimuli (Hamari et al., 2015).

A closely related, but highly distinct, concept to engagement is that of motivation. As explained by Macauley (2015), motivation is a person's ability to display eagerness or exert effort to complete a task. It entails effort, tenacity, direction and goals. But is there a difference between engagement and motivation? Motivation is the ability and eagerness to accomplish something. In contrast, engagement is the realisation in the "heart and soul" of the worker to be loyal to his/her job role and organisation. An individual therefore could be motivated, but not engaged, and hence there is a difference between the two concepts (Macauley, 2015).

Understanding the psychological basis of work engagement could aid researchers and practitioners in explaining and predicting why some employees psychologically identify with their jobs, and why others do not (Roux, 2010). Studying the individual's work engagement is valuable, as it could assist in the sustainability and growth of a business, whilst

disengagement could result in undesired consequences, such as distrust, weak commitment, high levels of burnout and low levels of performance (Lin, 2010).

According to the theory, job resources, job demands and personal resources are speculated to be antecedents of engagement, while improved job performance, organisational commitment and lower turnover are hypothesised to be some of the consequences of engagement. Engaged workers are empowered, enthused, stimulated and confident. These employees are both emotionally and cognitively engrossed in their work, fostering a sense of significance and value in their jobs, resulting in higher sensitivity to the organisation's mission and to organisational change (Jacobs et al., 2014; Macauley, 2015; Nell, 2015). Additionally, research suggests that engaged employees' values are inclined to conform to the business's values. These employees favour positive organisational behaviour, exceeding what is expected of them (Macauley 2015; Nell, 2015).

This point on employees taking initiative due to their high levels of engagement is further highlighted in research, where it has been shown that engaged employees attend to their own engagement by manipulating their work environments. Thus, they make full use of their job resources, as well as creating their own resources, in order to remain engaged. Engagement has been shown to mediate the interaction between job resources and organisational commitment. South African data has been shown to emphasise this point. Hence, it can be suggested that engagement leads to more productive and committed employees, given sufficient job resources (De Beer et al., 2013; Macauley, 2015).

Modern businesses desire high employee performance, and positive attitudes and behaviours, as research increasingly links engaged staff to a variety of positive employee and organisational gains, such as better psychological health, motivation, satisfaction and enthusiasm (Jacobs et al., 2014; Macauley, 2015; Nell, 2015). Additional positive outcomes as a result of engaged employees are briefly noted below.

Schaufeli (2011) (as cited by Nell, 2015) reviewed the results of numerous engagement studies attributed to health outcomes and reported that engaged employees show low levels of anxiety, work-related stress and depression. Furthermore, engaged workers' physical health

was perceived as being great. Finally, engagement was shown to be correlated with low levels of burnout, and with positive emotions and resilience.

Within the emergency services community, research has shown that, despite their demanding working conditions, this group can also experience work engagement, hence the particular interest for this research study. It is believed that, although engaged employees may experience exhaustion, they persevere through difficult times and may even feel satisfaction (Nell, 2015).

In a research study conducted among nurses it was demonstrated that emotive job demands reinforce the influence of personal resources on work engagement. This verifies that nurses who enjoy caring for others are passionate about their work and are mentally tough, and are likely to experience engagement (Bakker & Demerouti, 2014; Macauley, 2015).

In Macauley's (2015) research on another nursing community, it was found that engaged employees are more than double more productive than their unengaged colleagues. It was suggested that higher engagement can result in more efficient and better quality individual and team work, leading to higher growth, productivity and income for a business. Highly engaged organisational workforces have 26% higher revenue per employee, and are more likely to surpass the industry average for one year's revenue growth. Lastly, it was also noted that these businesses have a 49% safer work environment (Macauley, 2015).

Specifically relevant to this research study is the consideration that hospitals endure inconsistent pressures that concurrently demand high quality of patient care and resource rationing. These organisations are challenged with budget constraints and process efficiency, including staffing and wage cuts, ambitious bed availability targets, quick response times and hospital mergers. In addition to this, studies have shown that nurses are prone to burnout and dissatisfaction. Nurses', as well as other emergency service personnel's, commitment to both their clients and their organisation is necessary, as nurses are the largest group of hospital workers, and they play a significant role in the quality of patient care and safety, in addition to hospital cost management (Santos et al., 2016).

The construct of engagement is well researched, has many positive outcomes (as highlighted above), has various forms, and is crucial to define for measurement purposes.

In conclusion, the concept of work engagement is the product of many complex interactions. The 21st century calls for organisations and emergency services alike to employ workers who are both willing and able to invest themselves fully in their work. There are various types of engagement, such as active, personal, employee, job, work and organisational (discussed above). Generally in literature, and for the purpose of this research study, Schaufeli and Bakker's (2003) definition of work engagement will be used, as it is a well-accepted and well-understood definition. They define work engagement as "a positive, fulfilling, work-related state characterized by vigour, dedication, and absorption" (Breevaart et al., 2012, p. 1). Work engagement in this study was measured using the Utrecht Work Engagement Scale, which defines work engagement in the same way (Breevaart et al., 2012; Macauley, 2015).

2.4.2 Stress

As highlighted earlier in the introduction section, statistics explicitly indicate that South African emergency services are stressed or burnt out (Sirsawy et al., 2016; Stassen et al., 2012; Subramaney, 2010). As a result of the type of occupation they are in, certain populations are at an increased risk for experiencing trauma. These include emergency workers, trauma specialists, firefighters and police officers. Thus, importantly, one needs to consider whether their prevalence rates for stress are higher than in other occupational groups (Subramaney, 2010); and specifically, whether their working conditions are to blame for the levels of stress they endure.

Various conceptualisations in the form of stress models exist. Some of these conceptualisations are (1) the transactional model (TM), (2) the preventive stress model, (3) the challenge hindrance framework (CHF) and (4) the HR eustress model. These are briefly described in more detail below.

The principal conceptualisation of organisational stress is the transactional model (TM). This model depicts individuals encountering stressors as stimuli, after which the individual appraises what has been perceived. The TM hypothesises that stimuli may be perceived either as non-threats or as threats. Threats undergo secondary appraisal and, for the duration of this

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appraisal, the person assesses to what extent the threat can be controlled and what are the available resources to cope with such a threat. If the stimulus can be controlled and coped with, positive stress/eustress occurs, otherwise distress is experienced (Hargrove, Becker & Hargrove, 2015; Tallodi, 2015).

Next, the preventive stress model explains how stress occurs within organisations, as well as how stress can be prevented. This model theorises that individuals respond to stressors holistically, incorporating cognitive, affective and physiological reactions. After this response, a state of either distress or eustress ensues and, consequently, various outcomes are experienced (Hargrove et al., 2015).

The challenge hindrance framework (CHF) involves understanding how the idea of challenging workers at work is still valued. Originally it attempted to explore why some perceived stressors generated positive, rather than the expected negative, outcomes. Thus, it was determined that stressors are either challenge-related (resulting in positive consequences) or hindrance-related (leading to negative outcomes) (Hargrove et al., 2015; Min, Kim & Lee, 2015).

The HR eustress model regards organisational stress in terms of: (1) challenges (work pace, work load, job complexity and job responsibility), (2) response (individual appraisal of demands and coping resources, resulting in either distress or eustress), and (3) outcomes, in which distress outcomes include burnout, physical ill-health, counterproductive behaviours and increased turnover. Eustress outcomes include well-being, commitment, increased performance, citizenship behaviours, satisfaction and retention. Employees are exposed to work challenges and appraise the nature of the challenges in terms of demand and coping resources, after which either eustress or distress is felt (Hargrove et al., 2015). These four models describe some conceptualisations of organisational stress in the literature today.

Traditional theories of stress focus on the relationship between stress and ill-health. Some theories portray stress as biological in nature (i.e. environmental demands are consistent and exceed the body's adaptive capabilities, thus potentially leading to pathology). Other theories conceptualise it as psychological in nature (i.e. a person perceives his/her coping resources to be inadequate, thus stimulating emotional, physiological and behavioural changes that

compromise a person's well-being). Finally, other theories follow an economic principle, and claim that stress is a consequence of the outflow of resources, so that recurring demands cause a downward spiral that ultimately leads to poor health (Amirkhan, 2012; Amirkhan et al., 2015).

Trying to find a single, agreed-upon definition for stress is complicated, as it has been proposed that various forms of stress exist, such as physical stress (engineering), physiological stress (the body's response to stress) and psychological stress, defined as "an interaction of several variables involving a particular relationship between a person and the environment, which is appraised by the person as taxing or exceeding coping resources and endangering well-being" (De Bruin & Taylor, 2005, p. 748).

Regardless of their differences, the theories share a common feature, namely that stress is conceptualised as an overload of imposing demands and compromised resources, which link up to create somatic and psychological changes, making people susceptible to pathology. Furthermore, the theories support that demands and resources must combine in a precise manner for stress and illness to occur. Theoretically, other combinations should not yield stress, indicating that heightened personal resources (such as hardiness and resilience) can render people resistant to the impact of demands (Amirkhan, 2012; Amirkhan et al., 2015).

Recently, research has acknowledged that working people are aware of the negative form of stress, i.e. distress. Scarcely discussed is the positive form of stress, or eustress. For example, nurses who have specifically taxing jobs reported eustress, signified by hope and active engagement with their work. Among nurses dealing with the death of patients, those who found meaning in their work were passionate and highly engaged, and still experienced eustress and its benefits (Hargrove, Nelson & Cooper, 2013). Other studies have indicated that positive changes after trauma have occurred in paramedics, police officers and firefighters (Ogińska-Bulik & Kobylarczyk, 2015). Thus, it is critical to consider that stress may be conceptualised as both dysfunctional – distress, and as functional in the form of eustress.

Deciding on one concept of stress to be the most applicable for this research study therefore was challenging. It was decided that the conceptualisation of stress of the Stress Overload

Scale (SOS) be used in this research study. Accordingly, stress is theorised to be the product of two constructs – imposing demands and compromised resources – which, when combined in a precise manner, yield potential illness. This definition was deemed the most suitable for various reasons. These reasons include: (1) it is the most recently published general stress measure and is reasoned to embody improvements over former stress scales; (2) the SOS was constructed to reflect the shared aims of stress theories. Potential items for the SOS were chosen because they defined a state of overload (life demands overwhelming one's resources to meet those demands); (3) the SOS was wholly empirically derived; (4) the SOS was constructed entirely within community samples matched to census proportions, and is diverse in terms of age, gender, ethnicity and socioeconomic status (Amirkhan et al., 2015).

The conceptualisation of stress in the SOS recognises two factors, namely event load and personal vulnerability. Event load is understood as the feeling of being burdened by duties, demands and work stresses. In contrast, personal vulnerability is conceptualised as thoughts of inadequacy, weakness and ineffectiveness (Amirkhan et al., 2012). These factors consider both external and internal influences of stress.

The cost of stress can be conceptualised in both humane and economic terms. There is an abundance of evidence that work-based anxiety and stress causes both harmful physical and psychological disease (Hargrove et al., 2013). The American Institute of Stress reports that the estimated cost of stress to the United States economy exceeds $300 billion annually (as cited by Tallodi, 2015). Also, stress is perceived to be the most common type of job-related illness, as it was stated by Tallodi (2015) that 40% of stress-related illness cases were the cause of employees in Great Britain losing 10.4 million working days in the years 2011 and 2012. Consistently recognised in the literature, the costs of stress comprise of, amongst others, physical and psychological illness, absenteeism, burnout, suicides, etc. However, the less obvious, but still significant, less visible costs of stress include dysfunctional interpersonal relationships, errors of judgement in both an individual's personal and professional life, increased turnover, poor creativity, lowered performance and a weakened quality of health and well-being (Cieslak et al., 2014; Du Toit, 1997; Edwards, 2005; Tallodi, 2015).

No recent, explicit attempts at quantifying the costs of stress within the South African health services could be found during the research for this study. There is an abundance of research detailing that this specific sample of people endures high levels of stress, but the quantification of the costs as a result of this stress is not yet evident. This could indicate that, until now, no or relatively little attention has been paid to the cost of stress in this industry. It can be postulated, however, that such statistics, if available, would paint an ominous picture (Du Toit, 1997).

In the emergency services context, the importance of a person's perception of stress, coping effectiveness, relationships and incivility being susceptible to individual interpretation is especially interesting. It has been shown that distinctive stressors are experienced by members of the different emergency services. Specifically, it has been said that police officers experience judicial stressors as being severely challenging. Members of the ambulance services experience stressors related to patient care as the most taxing. Firefighters' stress is predominantly due to the nature of their job being physically exhausting and dangerous. Traffic officials found it stressful to enforce the law publicly and to deal with minibus taxi incidents (Clark, Nguyen & Barbosa-Leiker, 2014; Du Toit, 1997; Verdonk, Räntzsch, De Vries & Houkes, 2014).

Du Toit's (1997) research study also acknowledged that there were common stressors perceived by these different emergency service groups. Evidently, the low status of emergency personnel members (indicated by low salaries, long working hours and inadequate recognition and support from organisational structures and the public) has a negative effect on the quality of services rendered and on their personal lives. Members of these services are also subjected to management and leadership style problems, ineffective communication, team conflict, personal and family stressors (resulting in a lack of sufficient support), and insufficient coping skills (Du Toit, 1997).

The importance of studying stress is highlighted by the cost of stress to organisations and individuals alike, both in the form of human and economic components. It is valuable to acknowledge that there are various conceptualisations of stress in the workplace and that deciding on one concept of stress as being the most applicable for this research study was challenging. The Stress Overload Scale's (SOS) conceptualisation of stress was determined to

be the most suitable definition, as described earlier. Finally, an important consideration when studying stress is that a person's perception of stress, coping effectiveness and relationships are susceptible to individual interpretation and should be studied accordingly.

2.4.3 Job demands

The structure of occupational well-being consists of both emotional and cognitive components. The emotional element exists at both individual and organisational group levels. It incorporates positive (morale) and negative (distress) affect. The cognitive component involves evaluative judgments made being weighed on both positive and negative experiences, thus influencing an employee's job satisfaction (Cotton & Hart, 2003). The evidence provided in the introduction section of this study, namely that emergency personnel are distressed and dissatisfied at work, makes it seemingly relevant to study their uniquely challenging work demands and environments.

Earlier research into work environments looked at the concept of job design. Today it is still a well-researched concept and plays a significant role in work design literature. "Job design", according to Bakker & Demerouti (2014, p. 1), was initially explained as "the set of opportunities and constraints structured into assigned tasks and responsibilities that affect how an employee accomplishes and experiences work". Thus, job design academics attempted to determine which features of a person's job are perceived as satisfying and as those that motivate them to reach their goals. Currently, job design is defined more broadly as "encapsulating the processes and outcomes of how work is structured, organized, experienced, and enacted" (Bakker & Demerouti, 2014, p. 1). This definition of job design incorporates more dynamic roles, versus simply stressing static job types compiled by management.

In a recent study by Dahling and Lauricella, (2016) titled "Linking job design to subjective career success: A test of self-determination theory", it was suggested that modern approaches to job design acknowledge that jobs can be designed in ways that endorse a multitude of desirable outcomes for employees and organisations alike. Job design research based on self-determination theory provides employees with autonomous choices and positive organisational outcomes, such as job satisfaction, lowered burnout, organisational identification and unlikely turnover intentions (Dahling & Lauricella, 2016).

More recently, the well-accepted job demands–resources (JD-R) theory has been applied throughout a variety of work contexts and is an expansion of the JD-R model. As the JD-R theory underpins the Job Demands–Resources Scale and is built on the premise of two unique, but related, processes – a motivational and a health impairment process – it has become even more popular as the basis for conceptualising work contexts. It incorporates both job design and job stress theories. While job design theories have often overlooked the role of work stressors or strains, job stress models have disregarded the encouraging potential of job resources. JD-R theory describes how both job demands and resources have distinctive effects on job stress and engagement. Thus, the JD-R model was used to underpin the research for this thesis (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

As discussed earlier, the JD-R model assumes that job demands and job resources may cause two different, but related, processes, namely a health-impairment and a motivational process. The first process is energetic and wears a person out. Here, high job demands generally lead to adverse outcomes that exhaust employees' mental and physical resources, potentially resulting in burnout and stress, and eventually in physical ill-health. The second process is a motivational one and will be discussed in greater depth in the next section. Additionally, the model's flexibility and applicability to various occupations highlights its relevance and value in applying it to this sample group. According to the theory, all work contexts or job features can be demonstrated using job demands and job resources (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

The work environment of South African emergency personnel makes for an especially interesting topic regarding what causes job distress and what stimulates people in their jobs. Emotional labour seems to be inherent in the type of work they do. Emotional demands referring to the emotionally charged interactions at work, and emotion-rule dissonance, entailing the discrepancy between emotion rules and felt emotions, are considered to be significant antecedents of emotional labour. Emotional demands may not only have adverse consequences for an employee, but some research indicates that emotional demands have a positive impact on employees, particularly when job resources are readily available (Bakker & Demerouti, 2014; Xanthopoulou, Bakker & Fischbach, 2013).

According to the JD-R theory, job demands refer to those tangible, psychosomatic, social or organisational features of the job that necessitate continuous somatic and/or mental effort, and thus are linked to particular physiological and/or psychological efforts. Research on the health impairment process in JD-R theory has consistently indicated that job demands are strongly related to burnout and, ultimately, to ill-health outcomes (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Nahrgang et al., 2010).

A psychometric evaluation of the Job Demands–Resources Scale on a South African sample showed that job demands could further be broken down into two factors, namely overload and job insecurity. Overload includes items about the rate and quantity of work tasks, psychological load and emotional load. Secondly, job insecurity describes the individual's uncertainty regarding the future (Rothmann et al., 2006).

In emergency services, the occurrence of stress in South Africa could be attributed to the dominant role of witnessing a traumatic event in the public setting of high crime rates and subsequent trauma exposure. South African emergency service workers are expected to cope with and endure these traumatic experiences on a daily basis. This appears to be a significant contributor to their work load (Angelo & Chambel, 2015; Atwoli et al., 2013; Santos et al., 2016). As in all 21st-century jobs, and in the light of the unstable economic climate in South Africa, it seems logical that the majority of workers experience feelings of job insecurity. Evidently, the low status of emergency personnel (indicated by low salaries, long working hours and inadequate recognition and support) especially influences these vulnerable outlooks (Du Toit, 1997).

In contrast, it has further been suggested that job demands might determine the exciting challenges in emergency services work tasks instead of only the stressful aspects. However, job demands may become stressors in situations that require high effort to sustain an expected performance level, which seems likely for South African workers. Consequently, this could elicit negative responses, such as stress and burnout. In a research study, job demands that were identified as major causes of psychological strain included work overload and a poor physical work environment (Hakanen et al., 2006). Research shows that both job demands

and resources work together and have a significant influence on employee well-being (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; Santos et al., 2016).

Despite the many models of work motivation and job stress, JD-R theory incorporates aspects of all of them and is widely accepted in the literature. The psychometric evidence indicating its validity, as well as its generalisability across various occupational groups, further motivates its usability. Thus, this theory underpinning the job demands and resources scale (JDRS), as well as its definition of job demands, were used to define and measure job demands in the South African emergency services and their potential impact on their levels of stress and engagement.

2.4.4 Job resources

So why is it that some workers get bored and/or distressed by their jobs, whereas others are eager and passionate about their work? Adriaenssens et al.'s (2015) most recent research study on a sample of nurses showed that both individual and work-related factors contributed to emergency nurses' level of burnout or absence thereof. Work-related factors comprised exposure to traumatic events, various job characteristics (job demands were a burdening factor to burnout, whereas job resources, such as control and social support, were buffers), psychological demands (work and time pressure were associated with burnout) and organisational and contextual factors (personnel and material resources, procedures, policies, culture and reward) (Adriaenssens et al., 2015). Thus, there is value in understanding how both job and personal resources interact with job demands to potentially affect the stress and engagement of emergency workers.

As mentioned throughout, the JD-R model served as the basis of the literature review and was a major contributor to the development of the conceptual model. The JD-R model is useful in answering the aforementioned questions, as it assumes two different, but related, processes, viz. a health-diminishing and a motivational process (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

The first process was discussed in the previous section and was that high job demands generally lead to adverse outcomes that exhaust employees' mental and physical resources,

resulting in burnout, stress and eventually physical ill-health. The second process is a motivational one, in which job resources predict motivation, enthusiasm, work enjoyment and engagement. The motivational process speaks to job resources being the most important predictors of work pleasure, enthusiasm and engagement. These effects result from job resources fulfilling psychological needs (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

Job resources are those tangible, psychological, collective or organisational aspects of the job that: (a) are functional in achieving work objectives; (b) reduce job demands and the associated biological and psychological suffering; or (c) stimulate personal development and learning. The following five job resources have been acknowledged to be either major motivators that increase commitment or engagement, or that – when lacking – act as factors that could possibly increase stress: (1) job control, (2) access to information, (3) supervisory support, (4) innovative climate and (5) social climate (Angelo et al., 2015; Bakker et al., 2014; Hakanen et al., 2006; Nahrgang et al., 2010).

A psychometric evaluation of the Job Demands–Resources Scale on a South African sample showed that job resources could further be broken down into three relevant factors, namely growth opportunities, advancement and organisational support. Growth opportunities include items about having sufficient task variety, learning prospects and job independence. Secondly, organisational support describes the individual's relationships with his/her managers and co-workers, role clarity, movement of information, communication and involvement in decisions. Lastly, advancement involves items referring to remuneration, career prospects and training opportunities (Rothmann et al., 2006).

The literature states that job resources occur at various levels of an organisation, namely: (1) organisational (remuneration, growth opportunities, job security, etc.), (2) at work role level (role clarity, participation in decision making), (3) interpersonal (team climate, supervisory and collegial support) and (4) at task level (task significance, task performance feedback, task identity) (Asiwe, Hill & Jorgensen, 2015).

The JD-R model serves as the basis of the literature review. The key assumption in this model is that, although every job or company may have its own particular work

characteristics associated with the employee's well-being, it is still viable to sort these characteristics into two categories, namely job demands and job resources. It further assumes two different, but related, processes, viz. a health-diminishing and a motivational process. The preceding section dealt with job demands and the health-diminishing process. This section has discussed the job resources and the motivational process, in which job resources predict motivation, enthusiasm, work enjoyment and engagement. These effects result from job resources fulfilling psychological needs (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

2.4.5 Mental toughness as a personal resource

An important addition to the original JD-R model and theory is personal resources. These resources are positive self-assessments related to resilience. They describe an individual's perception of capacity to organise and influence his/her environment successfully. It has been indicated that such positive self-assessments predict, amongst others, motivation, work satisfaction, performance, life satisfaction, etc. (Bakker & Demerouti, 2014).

Adriaenssens et al.'s (2015) most recent research study shows that both individual and work-related factors contribute to emergency nurses levels of burnout, or absence thereof. Such individual factors include demographic factors (younger participants are likely to experience high levels of burnout), personality, coping strategies and job attitudes. Individual factors thus incorporate various personal resources.

The study of personal resources is relevant for emergency services, as research has shown that personal resources cushion the effect of emotional strain on engagement. It was also shown that emotional strain improves the influence of personal resources on work engagement. Evidence supporting these effects is vital for both theory and practice (Van Wingerden et al., 2015; Xanthopoulou et al., 2013).

There are several personal resources, amongst others grit, self-efficacy, personal effectiveness, optimism, hope, hardiness, resilience and self-esteem. In the literature, the four personal resources that have been proven to be impressionable and that can be developed through interventions are self-efficacy, optimism, hope and resilience. These four constructs

together, known as psychological capital, have been shown to be more impactful as a whole, than the individual parts comprising it (Van Wingerden et al., 2015).

Some of the aforementioned personal resources, namely hardiness, resilience and grit, have been linked to stress exposure and will be further termed and operationalised. Although all three psychological concepts explain psychological features that are vital in high-performance settings, they differ from the more recent construct of mental toughness. Mental toughness is a relatively new personal resource concept in the research, and is used in understanding stress and engagement. Mental toughness can vary and has enduring properties across different situations and time (Arthur, Fitzwater, Hardy, Beattie & Bell, 2015; Gucciardi et al., 2015). The literature proposes that experiential learning plays a significant role in the development of mental toughness (Crust & Clough, 2011; Gucciardi et al., 2015). These points highlight the potential value that mental toughness could offer the emergency services, as the work context and experience of the latter is highly dependent on enduring challenges, high performance rates and experiential learning.

Thus, mental toughness is a popular and highly valued concept, particularly within the business, medicine and military contexts, in which high performance underlies innovation, success and competitive advantage (Gucciardi et al., 2015). Hardiness, resilience and grit are distinct, but similar to the concept of mental toughness, and have contributed to its development, thus they will be briefly defined and differentiated accordingly.

Hardiness is conceptualised as a reasonably stable personality characteristic that implies courage, flexibility and the proficiency to maintain the best possible performance when under stress. It is theorised to comprise three main components: (1) control: the ability to feel and act as if one is in control of various life situations; (2) commitment: the tendency to involve rather than distance oneself from whatever one is doing; and (3) challenge: the ability to understand that change is normal (Arthur et al., 2015; Horsburgh et al., 2008). In contrast, mental toughness includes an additional component of confidence.

Resilience is being able to recuperate after experiencing an undesirable emotional ordeal, as well as being able to adapt and cope with stressful situations. Resilience requires hardiness and its elements, namely commitment, control and challenge (Arthur et al., 2015). On the

other hand, mental toughness incorporates an additional element, namely confidence, and mentally tough individuals believe that they are in control of their own future in its entirety.

Another, similar psychological construct is grit. One particular research study, by Duckworth et al. (2007), suggested that a personal quality shared by most prominent leaders is grit. The study defines grit as "perseverance and passion for long-term goals" (Duckworth et al. 2007, p. 1087). It entails working strenuously to achieving challenges, and maintaining effort and interest over time, regardless of difficulties and plateaus in progress. The gritty individual approaches achievement as a marathon, where their advantage is stamina. Gritty individuals are tortoise like, from the fable of the tortoise and the hare, differentiated by their tendency to sustain effort and interest over time, regardless of failure and hardship. In contrast, a less gritty person is more easily discouraged, likely to take regular rest breaks and is easily distracted (Arthur et al., 2015; Duckworth & Eskreis-Winkler, 2013; Duckworth et al., 2007).

Within the literature, the concept of grit belongs amongst the Big Five constructs, viz. conscientiousness, as it is found to overlap particularly with achievement motivation. However, its emphasis is on long-term endurance instead of short-term passion (Duckworth & Eskreis-Winkler, 2013). Within emergency services, grit seems to be an inherent job requirement.

In the literature, mental toughness is generally regarded as the defining attribute that enables one to thrive in challenging situations. Hence, mental toughness may be conceptualised as an attribute required for an individual to possess grit. Some researchers even propose that mental toughness, just as grit, is central to success in life (Gucciardi et al., 2015). Consequently, mental toughness as a personal resource may prevent the development of ill-health amongst emergency personnel.

For the purpose of this research study, mental toughness is used to represent personal resources. The evolution of mental toughness will be looked at briefly to understand its origins and how it is defined in today's literature. Mental toughness has been defined by many academics, but Clough, Earl and Sewell developed the well-accepted definition of mental toughness based on the accepted psychological concept, 'hardy personality', which was first introduced by Kobasa in 1979. Hardiness comprises three main components: (1) control: the ability to feel and act as if one is in control of various life situations; (2)

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commitment: the tendency to involve rather than distance oneself from a task; and (3) challenge: the ability to understand that change is normal (Horsburgh et al., 2008; Stamp, Crust, Swann, Perry, Clough & Marchant, 2015).

However, there were some components that did not apply to any of the three hardiness categories. Consequently, it was determined that a mental toughness model requires a fourth category, namely confidence. Therefore, the "4Cs model" was created, namely: control, commitment, challenge and confidence. The 4Cs characterise the construct mental toughness. The definition of mental toughness thus developed into (Horsburgh et al., 2008, p. 1):

> Mentally tough individuals tend to be sociable and outgoing; as they are able to remain calm and relaxed, they are competitive in many situations and have lower anxiety levels than others. With a high sense of self-belief and an unshakeable faith that they control their own destiny, these individuals can remain relatively unaffected by competition or adversity.

The development of the construct is set out in Table 1.1 below, which depicts the various definitions of mental toughness that have been proposed by researchers over the years (Gucciardi et al., 2015).

Table 1.1: ***Defining Mental Toughness (Gucciardi et al., 2015, p. 27)***

Source	Definition
Clough, Earle, & Sewell (2002, p. 38)	"Mentally tough individuals tend to be sociable and outgoing; as they are able to remain calm and relaxed, they are competitive in many situations and have lower anxiety levels than others. With a high sense of self-belief and an unshakeable faith that they control their own destiny, these individuals can remain relatively unaffected by competition or adversity."
Jones, Hanton, & Connaughton (2002, p. 209)	"Mental toughness is having the natural or developed edge that enables you to: (i) generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer; (ii) specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure."
Thelwell, Weston, & Greenlees (2005, pp. 328–329)	"Mental toughness is having the natural or developed edge that enables you to: (i) *always* [emphasis added], cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer; (ii) specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure."
Coulter, Mallett, & Gucciardi (2010, p. 715)	"Mental toughness is *the presence of some or the entire* collection of experientially developed and inherent values, attitudes, emotions, cognitions, *and behaviours* that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressures, challenges, and adversities to consistently achieve his or her goals."
Clough & Strycharczyk (2012, p. 1)	"The quality which determines in large part how people deal effectively with challenge, stressors and pressure . . . irrespective of prevailing circumstances."
Merriam-Webster Dictionary	Mental: "of or relating to the mind."
	Tough: "a strong or firm texture but flexible and not brittle."
Oxford English Dictionary	Mental: "relating to the mind."
	Tough: "(of a substance or object) strong enough to withstand adverse conditions or rough handling" and "able to endure hardship or pain."
Cambridge Dictionary	Mental: "relating to the mind, or involving the process of thinking."
	Tough: "strong, not easily broken or made weaker or defeated."

In an effort to summarise and combine these efforts, a working definition of mental toughness is proposed. This is to account for it being broadened over time as new findings about its nature transpired (Gucciardi et al., 2015). Hence, mental toughness is defined as a personal capacity to produce consistently high levels of subjective (e.g. personal goals or strivings) or objective performance, despite everyday challenges and stressors, as well as significant adversities. It is postulated that it is profoundly critical for striving (e.g. working toward self-defined objectives), surviving (e.g. dealing with challenges, demands or adversities), and thriving (e.g. sustaining high levels of performance, experiencing vitality and learning) (Gucciardi et al., 2015).

The research results of the studies conducted by Gucciardi et al. (2015) revealed that mental toughness may be best conceptualised as a one-dimensional, instead of a multidimensional, concept. Thus, this study will conceptualise mental toughness as a whole construct not containing further sub-dimensions. Mental toughness has been shown to play a vital role in performance, goal progress and thriving despite stress, which is especially relevant for the emergency personnel community. It has also been shown that mental toughness can vary and have enduring properties across different situations and times (Gucciardi et al., 2015).

It is valuable to understand what predicts mental toughness in order to know how it can be developed or enhanced. Among a group of adolescents, mental toughness was found to be predicted by four elements, namely: (1) interactions with significant others, (2) exposure to critical incidents, (3) provision of supportive social processes and (4) a personal propensity for curiosity (Mahoney, 2015). Research suggests that long-term thinking is required to develop mental toughness.

The literature suggests that there are three underlying systems needed to sustain mental toughness once it has been developed, namely (1) a limitless motivation to succeed, (2) relevant support systems and (3) effective use of basic and sophisticated psychological skills (Connaughton, Wadey, Hanton & Jones, 2008).

This section has discussed the important addition to the original JD-R model and theory, viz. personal resources. These are positive self-assessments related to resilience and describe an individual's perception of his/her capacity to organise and influence his/her environment

successfully. It has been indicated that such positive self-assessments predict, amongst others, motivation, work satisfaction, performance, life satisfaction, etc. (Bakker & Demerouti, 2014).

For the purpose of this research study, mental toughness will be used to represent such personal resources, as it has been suggested that it is more comprehensive than other resources, is valuable in understanding stress and engagement, and has been proven valuable in high-performance contexts such as the health-care industry, and thus it may be useful in trying to prevent the development of ill-health amongst emergency personnel.

2.4.6 Summary

This section served to discuss the relevant latent constructs, namely engagement, stress, job demands, job resources and, lastly, mental toughness as a personal resource. Subsequently, the various relationships/paths between the variables will be studied and hypothesised. This will assist in answering the research-initiating questions.

2.5.   Relationships between the latent variables

After conducting the literature review to define the relevant constructs, the following relationships between the respective latent variables appeared relevant. This led to the formation of the respective substantive hypotheses. It should be noted that both direct and moderating interaction effects were hypothesised and are each discussed in separate sections below.

2.5.1 The relationship between stress and engagement

Logically, stress is perceived as a type of negative form of ill-health, whereas engagement may be conceptualised as a positive form of ill-health. Are stress and engagement thus opposites, or should they be considered completely unique factors? How are these constructs related?

Research by De Beer et al. (2013) and Schaufeli and Bakker (2004) suggests that fatigued employees perceive their work environment negatively over time, and this potentially could result in unhealthy workers, poor productivity, turnover intentions and a lack of engagement.

Stress can be conceptualised as a severe form of ill-health, resulting in withdrawal behaviour and negative attitudes. In contrast, engagement involves employees psychologically identifying with their jobs and leads to positive organisational outcomes, such as increased performance and job commitment. Thus, the preceding thought pattern makes it seem plausible to assume that stress will negatively influence a person's level of engagement.

Burnout is another kind of negative organisational outcome (closely related to stress) with adverse health implications. In the study conducted by Schaufeli, and Bakker (2004), burnout and engagement were found to be negatively related, sharing between 10% and 25% of their variances. Another research study showed that all burnout and engagement scales were negatively related (Schaufeli et al., 2002).

Furthermore, an international sample of 782 rescue workers revealed that a supportive working environment promoted engagement, while at the same time diminishing the onset of burnout (Argentero & Setti, 2011). Hence, if an employee's environment is stressful, as a result of a poor culture and inadequate interpersonal relations, his/her levels of engagement may be adversely impacted by the stress endured.

Very little research has specifically examined the kind of relationship that exists between work engagement and stress. One study indicated that there was an association between occupational stress and work engagement ($P = 0,001$) (Padula et al., 2012). More recently, a 2015 research study conducted on front-line social workers and their supervisors in a child welfare setting showed that burnout was a major contributor to their levels of disengagement (Travis, Lizano & Mor Barak, 2015). Thus, this study proposes that stress has a significant detrimental effect on work engagement.

Hypothesis 1: Stress has a significant negative effect on work engagement.

2.5.2 The relationship between job demands and engagement

As discussed earlier, the JD-R model assumes that job demands and job resources may cause two different, but related, processes, namely a health-impairment and a motivational process. The first process is energetic and wears a person out. Here, high job demands generally lead to adverse outcomes that exhaust employees' mental and physical resources, potentially resulting in burnout, stress and eventually physical ill-health. Thus, initially it appears that job demands would negatively impede on a person's level of engagement.

In a study conducted on 651 firefighters, the causal relationship between job demands and work engagement was found to be reciprocal and was the best fit for the data (Angelo & Chambel, 2015). However, little research could be found to corroborate the reciprocal relationship, but this still corroborates other literature sources that suggest that these constructs are related.

Furthermore, within a sample of 481 nurses from 109 health-care centres, a research study showed the significance of the expanded JD-R model for the nursing population. These results indicate that having access to suitable job resources can help cushion the effect of demanding working conditions on work engagement (Gabel-Shemueli, Dolan & Suárez, 2014). Other recent studies among nurses verify that, when job resources are sufficient, job demands can heighten engagement (Macauley, 2015; Santos et al., 2016). Hence, if job demands are perceived as highly stressful and exceed the available resources, this may negatively impact workers' levels of engagement.

The challenge-hindrance framework of work stress was used in an attempt to explore why some perceived stressors generate positive rather than the expected negative outcomes. Thus, it was determined that stressors are either challenge related (resulting in positive consequences) or hindrance related (leading to negative outcomes) (Hargrove et al., 2015; Min et al., 2015). In line with this thought, a 2010 study showed that the relationships among demands and engagement were highly dependent on the nature of the demand. The results showed that demands that employees appraise as limitations were negatively related to engagement, and demands that employees perceive as challenges were positively associated with engagement (Crawford, LePine & Rich, 2010).

Therefore, in accordance with the notion that the relationships between job demands and engagement are dependent on the type of demands experienced, this research study looked at the two job demands sub-factors, viz. job insecurity and overload, as two separate constructs. Job insecurity describes the individual's uncertainty regarding the future. In contrast, overload includes items about the rate and quantity of work tasks, and the psychological and emotional burden (Rothmann et al., 2006).

Thus, research suggests that employees who are highly engaged perceive their work to be meaningful and stimulating, and consequently experience positive work outcomes, such as enthusiasm, contentment and work engagement. On the other hand, employees who have high levels of job insecurity cannot be fully engaged at work, as they are continuously worried about the status of their employment. Research has shown that job insecurity is negatively related to each dimension of work engagement, as well as engagement as a one-dimensional construct (Roll, Siu, Wai, Li & De Witte, 2015; Wang, Lu & Siu, 2014). Thus, this research study hypothesises that job insecurity will be negatively related to work engagement.

Moreover, because engaged workers are likely to experience positive work outcomes, such as contentment and work engagement, overburdened employees will likely not experience such positive outcomes. Emergency services' work environments are characterised by poor working conditions, comprising of economic instability, low salaries, long hours and work overload, and will likely result in an increase in ill-health, absenteeism, dissatisfaction, turnover and disengagement. As overload is conceptualised as high rates of and an overwhelming quantity of tasks, as well as psychological and emotional burdens, it is unlikely that "overloaded employees" will have high levels of work engagement, but rather may experience disengagement (Bar & Jarus, 2015; Rothmann et al., 2006; Shemueli, Dolan, Ceretti & Del Prado, 2015).

It must be noted that the results of some literature studies demonstrated no significant relationship between overload and job engagement (Yuan, Li & Tetrick, 2015). However, according to substantial amounts of other research (Bar & Jarus, 2015; Rothmann et al., 2006; Shemueli et al., 2015), and for the purpose of this study, it is hypothesised that overload will be negatively related to work engagement in the emergency services. Thus, in

summary, it is suggested that both sub-factors of job demands, namely job insecurity and overload, will have a significant negative effect on work engagement.

Hypothesis 2: Job insecurity has a significant negative effect on work engagement.

Hypothesis 3: Overload has a significant negative effect on work engagement.

2.5.3 The relationship between Job resources and Engagement

The theoretical framework most often used in the literature when investigating the relationship between job resources and work engagement is the well-accepted and validated job demands–resources (JD-R) model. According to the JD-R model, job resources (1) may reduce job demands, (2) are needed to achieve work objectives and (3) stimulate personal development and learning. Additionally, job resources are suggested to have motivational potential and to result in positive work-related outcomes, especially in relation to work engagement, and subsequently to improved performance and organisational commitment (Bakker & Demerouti, 2014). This has been proven throughout academic sources.

Research supports the JD-R model's claim that job demands and resources instigate two psychological processes that ultimately affect organisational consequences. The results of studies done by Angelo and Chambel (2015), Bakker and Demerouti, (2014), Hakanen, Schaufeli and Ahola (2008) and Schaufeli and Bakker (2004) supported both the motivational process and the health impairment process.

Even in other literature it is suggested that both organisational factors (leadership, work load, environment, etc.) and individual contributors (resilience, mental toughness, personality, etc.) significantly affect engagement at work (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; Inceoglu & Warr, 2012; Macauley, 2015; Nahrgang et al., 2010; Simpson, 2008). Also, general well-being research supports the central role of work characteristics for health and well-being of workers (Angelo & Chambel, 2015; Hakanen et al., 2008; Macauley, 2015).

Recently, and consistent with previous research, a positive relationship was found between job resources and work engagement (Seppälä, Hakanen, Mauno, Perhoniemi, Tolvanen & Schaufeli, 2015). For instance, support was found for the relationship between job resources

(knowledge, autonomy and a supportive environment) and motivating employees, as well as a positive relationship with engagement (Nahrgang et al., 2010). Another study showed that job resources enhanced engagement, particularly when job demands were elevated (Bakker & Demerouti, 2014; Bakker et al., 2007; Van Wingerden et al., 2015).

The literature suggests that proactive measures should be taken to promote relationships at work, specifically supervisor support. This should be in addition to preventing burnout and endorsing engagement (Adriaenssens et al., 2015; De Beer et al., 2013; Schaufeli & Bakker, 2004). Findings on the relationship between job resources and engagement were replicated among a sample of nurses (Santos et al., 2016). Therefore, it is proposed that job resources have a significant positive effect on the level of work engagement in emergency services.

Hypothesis 4: Job resources have a significant positive effect on work engagement.

2.5.4 The relationship between mental toughness and engagement

An important addition to the original JD-R model was personal resources. It has been indicated that such positive self-assessments predict, amongst others, enthusiasm, performance, job and life satisfaction, etc. (Bakker & Demerouti, 2014; Van Wingerden et al., 2015).

If employees are equipped with personal resources, such as hardiness, sense of coherence or mental toughness, they may be better able to cope with demanding situations. Engagement also is characterised by vigour, dedication and absorption, thus it seems likely that individuals who are mentally tough may find their work more engaging than those employees who lack this resource (Lin, 2010; Santos et al., 2016).

Individuals who fully utilise their job resources may still experience stressful, traumatic situations as being unbearable. However, having the adequate personal resources and the ability to utilise such personal resources may better equip these individuals to cope during dire times. It is suggested that employees with sufficient mental toughness will be able to reinforce their job resources to foster perceptions of work engagement (Bakker & Demerouti, 2014; Van Wingerden et al., 2015).

According to Airilaa, Hakanena, Schaufelib, Luukkonenc, Punakalliod & Lusa's (2014) 10-year longitudinal study, both job and personal resources possibly have long-term effects on engagement, consequently also influencing work ability. These results further illustrate the propositions of the JD-R model.

Therefore, in accordance with the JD-R model, the following studies evidence that personal resources impact an employee's work performance and engagement. Resilience (distinct, but closely related to mental toughness) in a group of international psychiatric nurses was shown to be positively correlated with work (Waddell, 2015), and hence potentially being engaged by their job. In another study, significant associations between physicians' personal strengths (e.g. resilience, optimism) and work engagement were assessed and supported (Mache et al., 2014).

In a recent study among 1 134 a heterogeneous group of adults, grit (distinct, but closely related to mental toughness) was found to have a significant positive relationship with work engagement ($r = .26$, $p < .001$) (Suzuki, Tamesue, Asahi & Ishikawa, 2015). Also, the results of a study on a sample of police recruits showed that perceived stress and coping are significant variables influencing work engagement (Kaiseler, Queirós, Passos & Sousa, 2014). Furthermore, samples of a group of random adults in a recent study conducted by Von Culina, Tsukayamab and Duckworth (2014) indicated a relationship between grit and engagement.

Results from a sample of police detectives (who had faced violent victimisation) and a sample of mental health professionals (who had suffered the same mental illness as their clients) revealed that they do experience work engagement, despite these stressors. It was shown that the relationship between a professional's direct experience of his/her client's difficulties and work engagement was moderated by higher levels of grit (Eskreis-Winkler, Shulman & Duckworth, 2014).

Due to the recent origin of the term mental toughness, it is suggested that the supported relationships between variables closely related to mental toughness (e.g. resilience, grit, etc.) and work engagement provide evidence that mental toughness also will have a positive

influence on work engagement. Thus, it is hypothesised that having mental toughness may foster high levels of engagement at work.

Hypothesis 5: Mental toughness has a significant positive effect on work engagement.

2.5.5 The relationship between job demands and stress

The well-proven and accepted health impairment process of the JD-R model stipulates that high job demands generally lead to adverse outcomes that exhaust employees' mental and physical resources, potentially resulting in burnout, stress and eventually physical ill-health (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

Other research also confirms this relationship. Job demands (e.g. quantitative workload, role ambiguity, job insecurity, etc.) are likely to result in different strain reactions, such as stress, burnout, impaired well-being, etc. Consequently, such feelings could cause withdrawal behaviour and negative attitudes to work, (e.g. reduced organisational commitment, job involvement and work motivation and increased turnover intentions) (Angelo & Chambel, 2015; Hakanen et al., 2008; Mauno et al., 2007; Nahrgang et al. 2010; Santos et al., 2016; Schaufeli & Bakker, 2004; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2009).

Interestingly, female professionals are likely to report higher levels of burnout due to the perceived depletion of emotional reserves or higher levels of compassion fatigue (Cieslak, et al., 2014). In a more recent study, this finding was contradicted in that it showed mixed results for gender and burnout in emergency nurses (Adriaenssens et al., 2015). Thus, the findings regarding whether the relationship between gender and stress is significant are contradictory.

According to Bakker et al. (2014), there are various antecedents of burnout, namely situational and personal variables. Their meta-analysis proved that job demands were more significant predictors of burnout than were a lack of job resources. They defined job demands as being those job elements requiring continuous physical, cognitive or emotional effort. Hence, job demands are correlated with physiological (increased heart rate, elevated blood pressure, etc.) and psychological detriments (e.g. fatigue). Persistent exposure to high job

demands may cause workers to become unendingly exhausted and to distance themselves psychologically from their work. Consequently, they may experience stress or burnout (Adriaenssens et al., 2015; Bakker et al., 2014; Wolkow, Ferguson, Aisbett & Main, 2015). In a study on a sample of Chinese correctional officers, the findings indicated that work-related stress caused high levels of burnout (Hu et al., 2015).

Being a member of an occupational group at the forefront of trauma (e.g. paramedics, police officers, firefighters, rescue workers, etc.) may be an important determinant of PTSD, stress and burnout as a result of the innate nature of the work (Adriaenssens et al., 2015; American Psychiatric Association, 2013; Angelo & Chambel, 2015; Cieslak et al., 2014; McGowan et al., 2013; Nahrgang et al., 2010; Schaufeli & Bakker, 2004).

An additional consideration is those workers exposed indirectly to trauma, which has been conceptualised as secondary or vicarious traumatisation, secondary posttraumatic stress disorder and compassion fatigue. A meta-analysis of a systematic review of the literature, analysing data from a total of 8 256 participants employed in permanent positions, indicated that associations between job burnout and traumatic stress were strong, thus a professional exposed to secondary trauma would report similar levels of job burnout and trauma-related stress (Angelo & Chambel, 2015; Cieslak et al., 2014; Schaufeli & Bakker, 2004).

Furthermore, in a study of a sample of ambulance personnel, the results suggested that being exposed to accidents and emergency work may be the cause of their physical ill-health, deterioration in their mental health and vulnerabilities in their emotional well-being. The study indicated that a third of ambulance personnel reported symptoms of burnout, general psychopathology and posttraumatic indicators. Burnout was correlated with longer tenure, less job satisfaction, less recuperation time between cases and more frequently experiencing trauma incidents (Alexander & Klein, 2001).

In a study conducted on 651 firefighters, the causal relationship between job demands and burnout was found to be reciprocal (Angelo & Chambel, 2015). These findings of work-related factors contributing to ill-health were corroborated in research among nurses (Adriaenssens et al., 2014; 2015) and police officers (Lorinc, 2016; Tucker, 2015).

As noted earlier, a psychometric evaluation of the Job Demands–Resources Scale on a South African sample showed that job demands could further be broken down into two factors, namely overload and job insecurity. Research clearly indicates a relationship between job demands and stress, but what may be more valuable is whether there is a significant interaction between job insecurity and/or overload, and stress. Overload includes items related to the rate and quantity of work tasks, and psychological and emotional burdens, whereas job insecurity describes the individual's uncertainty regarding the future (Rothmann et al., 2006).

In the current vulnerable economic state, job insecurity is a major issue for all employees, inclusive of emergency services. Job insecurity has even been coined a "psychosocial hazard" that is expected to worsen in the future. It is undeniable that job insecurity leads to poor health and well-being, as well as adverse consequences for organisations. Job-insecure workers are likely to experience high levels of anxiety, worry, resentment and dissatisfaction, resulting in lowered performance, along with turnover intentions, dissatisfaction, burnout and stress. Thus, in accordance with the research, it is postulated that, as job insecurity increases, so will an employee's stress levels (De Witte, 1999; Fan, Blumenthal, Watkins & Sherwood, 2015; Roll et al., 2015; Schaufeli, 2016; Wang et al., 2014).

Similarly, work overload is acknowledged as one of the most significant job demands causing work-related stress. Within nursing literature, work overload has surfaced as one of the most consistent stress factors, given nurses' inherent job requirements. It has been shown to lead to consequences such as burnout, turnover and stress (Altaf & Awan, 2011; Shemueli et al., 2015).

Furthermore, Cieslak et al.'s (2014) research highlighted that emergency service workers from different countries performing the same job may differ in their level of job burnout. For example, Japanese nurses reported lower levels of personal accomplishment and higher levels of emotional exhaustion and depersonalisation compared to nurses from the United States, Canada, the United Kingdom, Germany and New Zealand. This is a unique consideration given South Africa's high crime rates, which may result in their emergency service population experiencing higher levels of burnout in comparison to other countries with lower crime rates. Thus, this suggests that emergency service workers may be overly burdened and

could result in their experience of distress. Thus, it is hypothesised that the more demanding the job, the higher the emergency service worker's stress levels will be as a result of feeling overloaded. In summary, it is postulated that both sub-factors of job demands, i.e. job insecurity and overload, will have a significant positive relationship with stress, because as job insecurity and/or overload increases it is expected that stress levels will rise too.

Hypothesis 6: Job insecurity has a significant positive effect on stress.

Hypothesis 7: Overload has a significant positive effect on stress.

2.5.6 The relationship between job resources and stress

The basis of the job demands–resources (JD-R) model is the assumption that every occupation may have its own specific risk factors associated with job stress, i.e. job demands and job resources. Job resources are suggested to have motivational potential and to result in positive work-related outcomes. However, when there is a lack of job resources, this may result in employees experiencing work-related strain, illness and/or stress and, subsequently, in poor performance and turnover. The JD-R model further proposes that a lack of job resources form the ideal conditions for burnout, reduced work engagement and stress (Bakker & Demerouti, 2014; Bakker, Hakanen, Demerouti & Verbeke, 2004; Hakanen et al., 2006). Thus, it initially appears that adequate job resources may reduce the chances of distress occurring.

Trauma researchers have suggested that culture is a crucial resource factor to consider in emergency personnel's work environment, as sociocultural context may influence significant determinants (e.g. existing policies, social resources and organisational characteristics) in the development of adverse organisational consequences, which are likely to vary across countries (Cieslak et al., 2014). In another research study by Adriaenssens et al. (2015), they also suggest that various organisational and environmental factors (e.g. personnel and material resources, procedures, policies, culture and reward) are associated with higher levels of burnout and stress in emergency nurses.

A lack of job resources (e.g. lack of social organisational support and lack of job control) possibly obstruct goal accomplishment, resulting in frustration and failure. Consequently,

such feelings could cause withdrawal behaviour and negative attitudes to work (e.g. reduced organisational commitment, job involvement and work motivation, and increased turnover intentions and feelings of distress) (Bakker & Demerouti, 2014; Hakanen et al., 2008; Mauno et al., 2007; Nahrgang et al., 2010; Schaufeli & Bakker, 2004; Xanthopoulou et al., 2009).

Research among nurses has produced mixed results; however, most studies indicate that a lack of job resources is related to negative outcomes, such as long-term sickness absence, less job satisfaction, intention to leave the profession and burnout (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; Nahrgang et al., 2010; Santos et al., 2016).

At the heart of various models in the occupational health literature is that job strain is the result of a disruption of the balance between the demands made on employees and the resources they have at their disposal. There is empirical evidence illustrating that the combination of both high job demands and low job control is an important predictor of distress and physical illness. Hence, job resources are not only necessary to deal with job demands, but also are vital in their own right. Similarly, Hackman and Oldham's (1980) job characteristics theory explains that there is motivational potential of job resources at the task level, including autonomy, feedback and task significance. It is postulated that, if employees have insufficient resources, it is likely to make carrying out their daily tasks more challenging and tiresome, thus potentially increasing their levels of stress (Bakker & Demerouti, 2014; Hakanen et al., 2008). Hence, it is hypothesised that job resources may have a negative effect on an employee's stress levels, as having adequate resources is likely to reduce stress levels.

Hypothesis 8: Job resources have a significant negative effect on stress

2.5.7 The relationship between mental toughness and stress

Individuals who fully utilise their job resources may still experience stressful, traumatic situations as being unbearable. However, having the adequate personal resources and the ability to utilise such personal resources, as mental toughness, may better equip these individuals to cope during dire times. It is suggested that mentally tough employees will be able to reinforce their job resources to counter the effects of stress (Bakker & Demerouti, 2014; Van Wingerden et al., 2015).

The personal resource hardiness includes three personality traits, namely control, commitment and challenge. Persons with a stress-hardy personality are perceived to be able to cope with stressful situations in general, and are often defined as resilient. Hence, it is likely that mentally tough individuals are also better able to cope with distress (Györkös, Becker, Massoudi, De Bruin & Rossier, 2012).

The results of a study by Heinrichs, Wagner, Schoch, Soravia, Hellhammer & Ehlert (2005) on a sample of firefighters revealed that the combination of pre-existing high levels of hostility and low levels of self-efficacy were strong predictors of the development of PTSD symptoms. After a two-year follow up, the existence of both risk factors at the starting point accounted for 42% of the variance in posttraumatic stress symptoms. The study suggests that certain personal resources or lack thereof may inherently cause adverse consequences or prevent the onset thereof. It was shown that firefighters possessing these personality traits had a steady increase in scores on measures of PTSD symptoms, general psychological morbidity, depression and anxiety during the two-year period (Heinrichs et al., 2005). Thus, it is suggested that mentally tough individuals may be more able to avoid the onset of dysfunctional stress than those individuals lacking mental toughness.

Furthermore, in a sample of 141 surgical residents, grit was predictive of psychological well-being, suggesting that one could identify persons at risk for stress, burnout or lower overall well-being by quantifying grit (Salles, Cohen & Mueller, 2014). Thus, mental toughness may be a requirement in the harsh work environment for emergency personnel in South Africa to avoid such symptoms.

In a research study among 322 employed students, it was shown that both grit and work ethic were negatively correlated with stress; however, grit explained incremental variance in stress beyond work ethic (Meriac, Slifka & LaBat, 2015).

Mentally tough individuals tend to be highly competitive, committed, self-motivated, cope effectively, maintain concentration in pressurised situations and retain high levels of self-belief even after setbacks (Crust & Clough, 2011). The concept of stress is considered to occur when one experiences a situation to be taxing or exceeding your resources. According to Gucciardi, Jackson, Hodge, Anthony and Brooke (2014), stress is fundamental to

understanding mental toughness and has been correlated with mental toughness in athlete, student and employee samples.

As mental toughness is closely related to the concepts hardiness, resilience and grit (yet still distinct) from the above-mentioned findings, it is hypothesised that mental toughness will also be negatively related to stress, as it equips the individual with persistence in facing adversity during stressful and challenging situations. Thus, emergency service workers' stress levels are likely to decrease if they are mentally tough.

Hypothesis 9: Mental toughness has a significant negative effect on stress.

2.5.8 The relationship between job resources and mental toughness

If employees perceive job resources to be adequate, they may be able to cope better with their job demands, and thus it seems likely that this may lead to an increase in their capacity for personal resources such as mental toughness.

Xanthopoulou et al. (2009) studied the role of three personal resources (self-efficacy, self-worth and optimism) in predicting engagement and fatigue. The findings of Structural Equation Modelling (SEM) analyses indicated that personal resources did not compensate for the interaction between job demands and fatigue. Rather, personal resources were found to partly mediate the interaction between job resources and work engagement. This suggests that job resources nurture personal resources, thus also supporting the premise of JD-R theory (Bakker & Demerouti, 2014; Nell, 2015).

The longitudinal study by Xanthopoulou et al. (2009, p. 241 & 242) also suggested that "job and personal resources are mutually related with work engagement, and also with each other". Thus, job resources predicted personal resources and engagement, and it hence is hypothesised that job resources positively affect personal resources.

Hypothesis 10: Job resources have a significant positive effect on personal resources.

2.6.   Moderating effects between variables

2.6.1. The first moderating effect

The first interaction effect is one in which job demands, i.e. *job insecurity and overload*, buffer the impact of both job resources and mental toughness on engagement.

JD-R theory explains that work engagement results when there is a balance between the challenging demands and the resources that employees have at their disposal. Thus, if an employee has sufficient job and personal resources, the individual still may not experience engagement if the job demands are too immense and outweigh the job and personal resources. Hence, job demands intensify the effect of both job resources and mental toughness on work engagement.

Research has shown that *job resources* (leadership support, team support, financial and physical resources, etc.) become significant and have the greatest positive influence on engagement when demands are great (Bakker & Demerouti, 2014; Macauley, 2015; Nahrgang et al., 2010; Seppälä et al., 2015).

It seems likely then, that if employees have sufficient job resources that they may experience positive affect in the form of work engagement. However, it also seems plausible that the demands imposed on them should balance out these job resources and be challenging, not a major hindrance. According to the challenge-hindrance framework, if demands are deemed challenging, this will positively influence the interaction between available job resources and engagement (Hargrove et al., 2015; Min et al., 2015).

In Nell's (2015) dissertation on a nursing sample, the results indicated that job demands moderated the relationship between job resources and work engagement. Due to the fact that the relationships between job demands and engagement are dependent on the type of demands, this research study looked at the two job demands sub-factors, viz. job insecurity and overload, as two separate constructs. Job insecurity describes the individual's uncertainty regarding the future. In contrast, overload includes items about the rate and quantity of work tasks, psychological and emotional burden (Rothmann et al., 2006). Thus, it is further hypothesised for this research study that emergency personnel's job demands, in the form of

job insecurity and overload, will influence the direction and/or strength of the relationship between job resources and engagement.

As mentioned throughout the study, an important addition to the original JD-R model is *mental toughness* as a personal resource. In particular, Bakker and Demerouti's (2007) study showed that personal resources partly mediate the relationship between job resources and work engagement, thus proposing that job resources promote the development of personal resources. Another study found that job and personal resources related positively to work engagement (Xanthopoulou et al., 2009).

In addition, as mentioned earlier, research has shown that personal resources cushion the impact of emotional strain and dissonance on engagement, and that emotional strain and dissonance improve the influence of personal resources on work engagement (Xanthopoulou et al., 2013).

Bakker et al.'s (2014) research study stated that the relationship between the Big Five factors extraversion, emotional stability and conscientiousness were reliably correlated with higher work engagement. Furthermore, numerous other studies have uncovered a positive link between personal resources, namely optimism, self-efficacy and self-esteem, and work engagement. Further evidence was found for a positive relationship between (a) positive affect, core self-evaluations and sense of coherence and (b) engagement (Bakker & Demerouti, 2014; Bakker et al., 2014; Van Wingerden et al., 2015).

Optimism as a personal resource, as well as job resources, was shown to exert a positive effect on work engagement and its three dimensions of vigour, dedication and absorption. The moderation results indicated that optimism can reduce the negative effect of low job resources on work engagement. It has been demonstrated that a person's emotional coping method will positively influence job stress and may result in work engagement (Salminen, Mäkikangas & Feldt, 2014; Sathasivam, Malek & Abdullah, 2015).

Furthermore, research has shown that job resources become significant and have the greatest positive impact on work engagement when job demands are prominent (Bakker & Demerouti, 2014; Nahrgang et al., 2010; Van Wingerden et al., 2015). It is anticipated that

emergency personnel are generally mentally well-equipped to thrive in challenging and stressful situations. It may be plausible to consider that individuals equipped with mental toughness are able to be engaged in their work; however, it is dependent on the type of job demands with which they are faced. This is especially relevant in light of South Africa's high crime rate and the frequency and severity of emergencies that occur daily as a result thereof.

To contextualise for emergency service personnel, a study conducted on a sample of firefighters noted that their psychological occupational health had been dominated by the harmful effects of their work environment. Firefighters are believed to have a stressful job, as physical danger and psychological stressors are inherent in their daily work. Although very little empirical support exists regarding the positive well-being of these professionals, it has been shown that firefighters have displayed high levels of work engagement. However, the procedures or situations that rationalise this positive psychological state have not been studied sufficiently (Angelo & Chambel, 2015).

Nell (2015) found further evidence that job demands positively moderate the relationship between personal resources and work engagement. To take this finding one step further, and due to the fact that the relationship between job demands and engagement is dependent on the type of demands, this research study looks at job insecurity and overload (sub factors of job demands), as two separate constructs. Thus, it is proposed that emergency personnel's job demands, in the form of job insecurity and overload, moderate the relationship between mental toughness and their levels of engagement.

The following hypotheses can be formulated with regard to the buffering effect of job demands, namely *job insecurity* and *overload*, on the relationship between both job resources and mental toughness, and engagement:

Hypothesis 11: Job insecurity moderates the relationship between job resources and engagement.

Hypothesis 12: Overload moderates the relationship between job resources and engagement.

Hypothesis 13: Job insecurity moderates the relationship between mental toughness and engagement.

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Hypothesis 14:   Overload moderates the relationship between mental toughness and engagement.

2.6.2. *The second moderating effect*

The second interaction is one in which job demands, i.e. *job insecurity and overload*, amplify the impact of job resources on stress. According to JD-R theory, there are two processes that take place. The first process is an energetic one of wearing out, in which high job demands generally predict outcomes exhausting employees' mental and physical resources, potentially resulting in stress. If an employee experiences high job demands it is likely that their levels of stress may be high too, as proposed in hypothesis 7 in Section 2.5.5. These effects are generally due to the fact that job demands cost effort and consume energetic resources, whereas job resources satisfy basic psychological needs (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010).

At the heart of various models in the occupational health literature is that job strain is the result of a disruption of the balance between the demands employees are exposed to and the resources they have at their disposal. There is empirical evidence illustrating that the combination of high job demands and low job control is an important predictor of distress and physical illness. Hence, job resources are not only necessary to deal with job demands, but also are vital in their own right. Similarly, Hackman and Oldham's (1980) job characteristics theory explains that job resources have motivational potential at the task level, including autonomy, feedback and task significance. It is postulated that, if employees have insufficient resources, it is likely to make carrying out their daily tasks more challenging and tiresome, thus potentially increasing their levels of stress (Bakker & Demerouti, 2014; Hakanen et al., 2008).

It is further proposed that, if emergency workers are equipped with sufficient and valuable job resources, their levels of stress may improve, as they have additional support to cope with high job demands in the form of job insecurity and overload. As suggested in the research, job demands and resources predict organisational well-being, where job resources safeguard against the impact of job demands on strain. Hence, it is hypothesised that emergency personnel who experience high job insecurity and an overload of work are likely to

experience stress, but that this relationship is dependent on the availability and adequacy of their job resources.

The following hypotheses can be formulated with regard to the buffering effect that job insecurity and overload has on the relationship between job resources and stress:

Hypothesis 15:   Job insecurity moderates the relationship between job resources and stress.

Hypothesis 16:   Overload moderates the relationship between job resources and stress.

2.6.3. *The third moderating effect*

The third interaction is one in which *mental toughness* amplifies the effect of both job insecurity and overload on stress. The definition of mental toughness is based on the accepted psychological concept, 'hardy personality'. Hardiness comprises three main components, namely control, commitment and challenge (Horsburgh et al., 2008). At a later stage it was believed that some components did not apply to any of the three hardiness categories, and it consequently was determined that mental toughness requires a fourth category, viz. confidence. Therefore, the "4Cs model" was created: control, commitment, challenge and confidence (Horsburgh et al., 2008).

The definition researchers have developed for mental toughness is as follows (Horsburgh et al., 2008, p. 1):

> Mentally tough individuals tend to be sociable and outgoing; as they are able to remain calm and relaxed, they are competitive in many situations and have lower anxiety levels than others. With a high sense of self-belief and an unshakeable faith that they control their own destiny, these individuals can remain relatively unaffected by competition or adversity.

This definition indicates that, with a sense of self-belief, workers facing adversity may not have to experience distress, but rather that being mentally tough can buffer this effect.

According to Bakker et al. (2014) there are various antecedents of burnout, namely situational and individual variables. Individual influences denote individual differences or

personal characteristics that are comparatively stable over situations and time. Recent literature indicates the likelihood that stressful components of the work context are more significant predictors of burnout than is personality; however, it is crucial for researchers to acknowledge individual variation. Thus, if a person possesses suitable personal resources, he/she may perceive situations differently and more positively than those who do not. These individuals may be able to counter the effects of distress and instead perceive such obstacles as stimulating challenges.

As cited by Bakker et al., (2014) a meta-analytical study by Alarcon and colleagues illustrated that personality is reliably related to burnout. More specifically, the results indicated that four of the Big Five factors, namely extraversion, emotional stability, conscientiousness and agreeableness, are reliably negatively correlated with each of the three burnout dimensions. Furthermore, evidence revealed a relationship between both lower-order personality factors and personal resources and burnout. Specifically, it was shown that optimism, self-esteem, proactive personality, self-efficacy, locus of control, positive affectivity, negative affectivity and hardiness each had a significant relationship with burnout. This signifies that more flexible individual differences also contribute to the development of stress. Individuals with positive scores on these individual factors believe they have control over their work situation, thus they can cope better with job demands (Bakker et al., 2014).

In a research study among military ministers, it was hypothesised that compassion satisfaction (satisfaction from kindness, care, consideration, etc.) could cushion the impact of job demands on anxiety and depression. Compassion satisfaction was described as the fulfilment that professional emergency service providers (e.g. social workers, police, nurses, firefighters, etc.) experience from helping those who have suffered a traumatic experience. The results of regression analyses indicated that compassion satisfaction cushioned the impact of responsibility overload on job stress. A study among nurses assessed the boosting influence of personal resources. It was found that emotional job demands strengthened the influence of personal resources on work engagement, thus corroborating that these demands represent a challenging demand, rather than a hindrance, for these nurses (Bakker & Demerouti, 2014; Gucciardi et al., 2015; Van Wingerden et al., 2015).

Individuals who fully utilise their job resources may still experience stressful, traumatic situations as being unbearable in nature. However, having the adequate personal resources and the ability to utilise such personal resources may better equip these individuals to cope during dire times. It is suggested that employees' with sufficient personal resources will be able to support their job resources to prevent the onset of dysfunctional stress (Bakker & Demerouti, 2014; Van Wingerden et al., 2015).

An important consideration is the influence of perception in the relationship between job demands and stress. It is suggested that personality may influence ill-health via the impact of both the perceived and objective nature of one's work environment. Firstly, personality may incline workers to perceive their work situations in a favourable light, despite the objective nature of their work. Those who are emotionally stable, hardy, resilient and extraverted, amongst others, may adapt easily, and thus may self-select into enriched job contexts. In contrast, employees who are neurotic or lack resilience may experience stress from challenging jobs, and hence pursue more routine work. The last possibility is that particular personalities are better able than others to cope with their job demands (Bakker et al., 2014). For example, a person possessing grit may have various coping strategies to deal with stressors at work. When such persons face hardship, it is likely that they are able to adapt and manage situations in ways that are less likely to induce stress (Meriac et al., 2015). Thus, these individuals may be able to buffer the impact of their work context on distress.

According to a recent study conducted by Sathasivam et al. (2015), cognitive coping methods have a strong positive correlation with job stress, at 92.6% (p = 0.000). Gracia (2015) stipulated that, when considering coping resources, they should not be studied in isolation. It is suggested that different stressors may provoke different responses, resulting in the use of different coping strategies. Thus, this study suggests that mental toughness will be influenced by the type of job demand, job insecurity and/or overload.

Hence, the researcher hypothesises that emergency personnel endure high job demands, in the form of job insecurity and overload, on a daily basis and likely have high stress levels as a result. However, it is suggested that this relationship is influenced by the individual's use of mental toughness, or lack thereof. It is hypothesised that mental toughness moderates the relationship between both job insecurity and overload and stress.

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The following hypotheses can be formulated with regard to the buffering effect that mental toughness has on the relationship between both job insecurity and overload and stress:

Hypothesis 17:   Mental toughness moderates the relationship between job insecurity and stress.

Hypothesis 18:   Mental toughness moderates the relationship between overload and stress

2.6.4 Summary

The preceding two sections dealt with direct and moderating interaction effects among latent variables, on the basis of a comprehensive literature review. The following section depicts the resultant hypothesised theoretical model.

2.7.   Hypothesised theoretical model

This hypothesised model was formulated from the various literature sources used in the literature review above. The hypotheses were combined into a conceptual theoretical model, depicted in Figure 2.2 below. It should be noted that only a few variables were chosen for this study, as the focus was on the impact of emergency personnel's work environment and their mental toughness on their levels of engagement and stress.
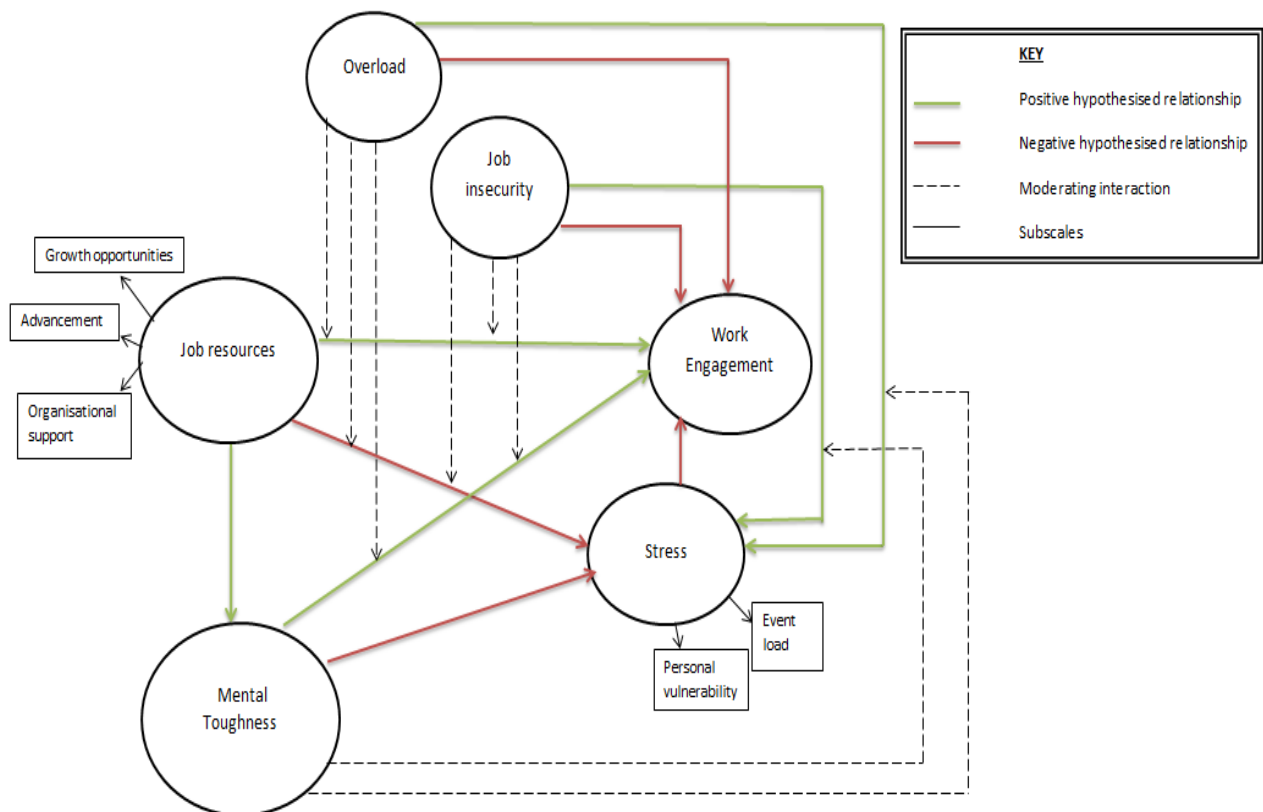
Figure 2.2: **Theoretical Model**

2.8. Summary

Due to the uniqueness of the emergency services' work context, as well as employees' evident ill-health, the chapter began by discussing earlier job stress models from occupational well-being literature, as well the more recent job demands–resources model (JD-R model). The literature review further presented the relevant variables that attempt to adequately explain the interactions between job demands (i.e. job insecurity and overload), job and personal resources of specifically emergency services personnel and the influence this has on their work engagement and stress. Various research studies and findings have provided considerable motivation to hypothesise how these variables may be correlated with each other. The relationships between the proposed variables were investigated via academic literature, and evidence was gathered to hypothesise on the significance of the interactions.

CHAPTER 3

RESEARCH DESIGN & METHODOLOGY

3.1. Introduction

Subsequent to the literature review, this section depicts the research methodology that was used during the research process to answer why there is variance in work engagement and stress between different emergency workers operating in different environments. The effects of salient resources and demands on stress and engagement were thus examined.

The purpose of this section is to adhere to the ideal of scientific method in an attempt to understand human behaviour while conducting research. The scientific method strives to search for knowledge and truth objectively and rationally. Rationality refers to the need to scrutinise research. Objectivity is the conscious effort to reduce and avoid error in research. An understanding alone is not enough; rather, the understanding of human behaviour must also be valid and rational, hence the need for an empirical approach to the research-initiating question (Theron, 2013). The prospect of gaining valid and permissible findings is thus a function of the methodology used (Nell, 2015).

Prior to dealing with the research methodology used, the study objectives are revisited. The main objective of the research study was to test a proposed structural model that illustrates how job resources and mental toughness, as well as job demands (job insecurity and overload), influence engagement and stress among emergency personnel in a South African health services context.

More specifically, the research study aimed to:
- Determine the level of stress and work engagement among emergency personnel working in the health services industry;
- Identify the most salient antecedents of variance in stress and work engagement among emergency personnel in the health services;
- As a consequence, propose and test an explanatory stress and engagement structural model, incorporating mental toughness as a personal resource; and
- Recommend practical interventions for emergency personnel in the health services that could decrease stress and improve work engagement.

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The remainder of Chapter 3 will discuss the research hypotheses, research design, research procedure and sample, measuring instruments, missing values, statistical analyses techniques and research ethics.

3.2 Substantive research hypotheses

The suggested research methodology attended to the above-mentioned objectives of the research study. The literature review highlighted variables, specifically targeting the sample of emergency services, that attempt to explain the interactions between job demands, job resources and personal resources; and the influence this has on engagement and stress. The research studies and findings provided considerable motivation to hypothesise these correlations. These hypothesised interactions were illustrated in the theoretical model presented earlier in Figure 2.2.

The path-specific substantive research hypotheses are as follows:

Hypothesis 1:   Stress (η_2) has a significant negative effect on work engagement (η_1).

Hypothesis 2:   Job insecurity (ζ_1) has a significant negative effect on work engagement (η_1)

Hypothesis 3:   Overload (ζ_2) has a significant negative effect on work engagement (η_1).

Hypothesis 4:   Job resources (η_3) have a significant positive effect on work engagement (η_1).

Hypothesis 5:   Mental toughness (η_4) has a significant positive effect on work engagement (η_1).

Hypothesis 6:   Job insecurity (ζ_1) has a significant positive effect on stress (η_2).

Hypothesis 7:   Overload (ζ_2) has a significant positive effect on stress (η_2).

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Hypothesis 8:   Job resources (η_3) have a significant negative effect on stress (η_2).

Hypothesis 9:   Mental toughness (η_4) has a significant negative effect on stress (η_2).

Hypothesis 10:   Job resources (η_3) have a significant positive effect on mental toughness (η_4).

Hypothesis 11:   Job insecurity (ζ_1) moderates the relationship between job resources (η_3) and work engagement (η_1).

Hypothesis 12:   Overload (ζ_2) moderates the relationship between job resources (η_3) and work engagement (η_1).

Hypothesis 13:   Job insecurity (ζ_1) moderates the relationship between mental toughness (η_4) and work engagement (η_1).

Hypothesis 14:   Overload (ζ_2) moderates the relationship between mental toughness (η_4) and work engagement (η_1).

Hypothesis 15:   Job insecurity (ζ_1) moderates the relationship between job resources (η_3) and stress (η_2).

Hypothesis 16:   Overload (ζ_2) moderates the relationship between job resources (η_3) and stress (η_2).

Hypothesis 17:   Mental toughness (η_4) moderates the relationship between job insecurity (ζ_1) and stress (η_2).

Hypothesis 18:   Mental toughness (η_4) moderates the relationship between overload (ζ_2) and stress (η_2).

3.3 The structural model

The literature review presented above concludes in a structural model, which is a graphic representation of the hypotheses generated in answering the research-initiating question through theorising. Once the latent variables are operationalised, the model allows for the devising and empirical testing of specific hypotheses. The proposed structural model (Figure 3.1) below proposes these interactions between several exogenous and endogenous latent variables.
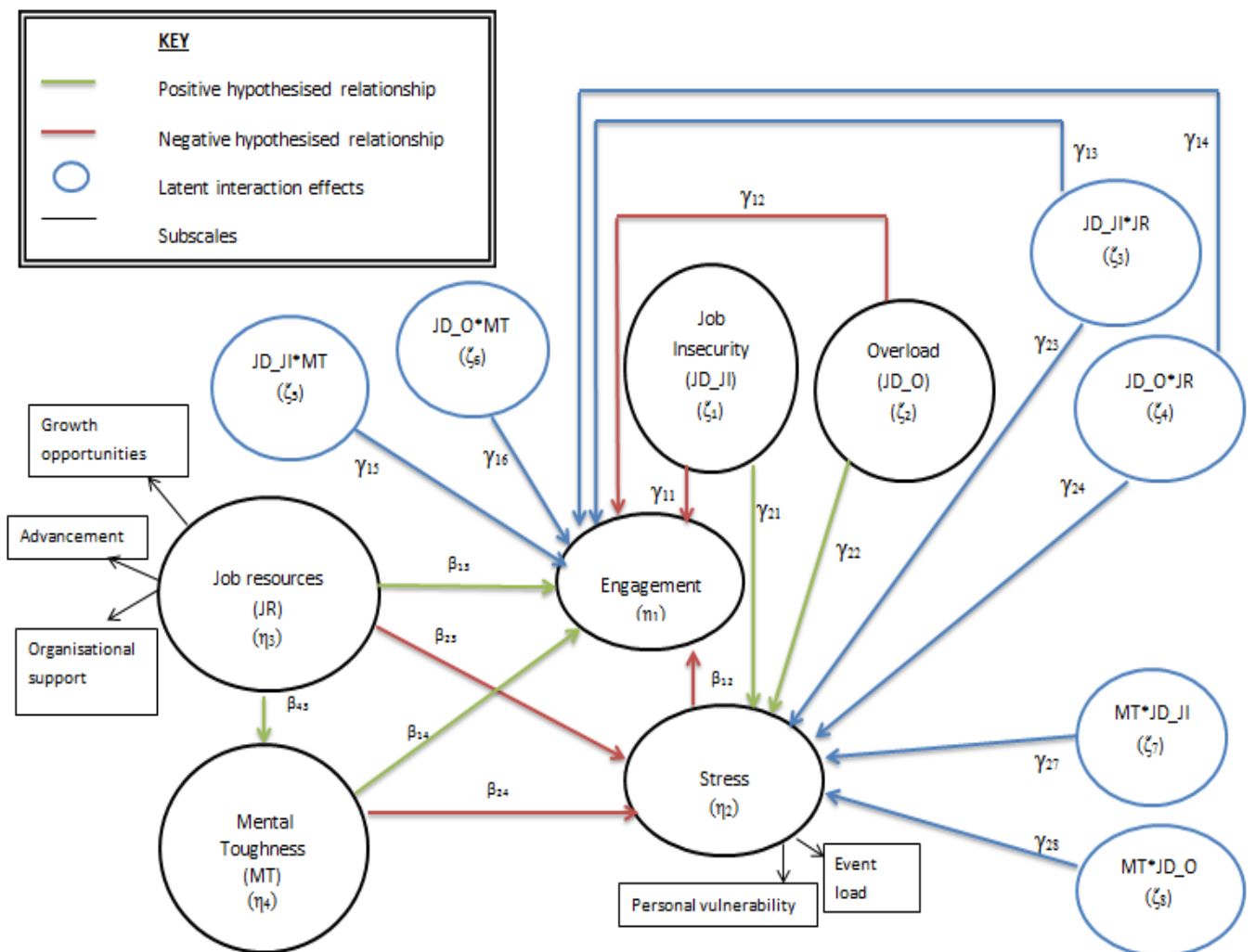

Figure 3.1: **Structural Model**

3.4 Statistical hypotheses

The statistical hypotheses given below depict the logic underlying the structural model, as well as the research design and the statistical analysis techniques linked to an ex post facto correlational design. The methodology that was utilised to test the proposed structural model had to attempt to yield permissible findings in order to serve the research objective as accurately as possible. The chosen statistical analysis technique for an ex post facto correlational design is partial least squares (PLS) structural equation modelling (SEM) (Nell, 2015; Theron, 2013). The notational system utilised in the expression of the statistical hypotheses is thus PLS-SEM.

When viewing both the theoretical model (Figure 2.2) and the structural model (Figure 3.1), variables circled in blue can be seen that represent the interaction effects of (1) job insecurity and job resources, (2) overload and job resources, (3) job insecurity and mental toughness, (4) overload and mental toughness, (5) mental toughness and job insecurity, and (6) mental toughness and overload, and their effect on engagement and stress respectively. The reason for this is that, to test a moderating effect in PLS-SEM, a separate variable needs to be created (Nell, 2015; Theron, 2013).

Next, statistical hypotheses representing exact and close fit will be discussed. In LISREL, the following null hypothesis of <u>exact model fit</u> can be expressed in terms of root mean square error of approximation (RMSEA):

H_{01}: RMSEA = 0

H_{a1}: RMSEA > 0

The value above must be small for the model to be valid or permissible. The RMSEA compares the observed covariance matrix with the reproduced covariance matrix. The likelihood of a structural model achieving exact fit is extremely unlikely, as it is an imitation of reality, hence it is seldom attained with actual data. However, more practically, researchers strive to achieve close fit of the structural model, which recognises the error of calculation. Where the significance value of the calculation error within the sample population is equal to

or less than a p-value of .05, it can be inferred that the structural model is a close replica of reality (Theron, 2013).

In LISREL, the following null hypothesis of <u>close model fit</u> was tested:

H_{02}: RMSEA ≤ 0.05

H_{a2}: RMSEA > 0.05

The closer the value is to 0 and less than 0.05, the closer the model fits, because fewer errors have been found. The following statistical hypotheses denote each individual causal effect depicted in the structural model in Figure 3.1:

H_{03}: $\beta_{12} = 0$ (stress will have no influence on work engagement)
H_{a3}: $\beta_{12} < 0$ (stress will have a negative influence on work engagement)

H_{04}: $\gamma_{11} = 0$ (job insecurity will have no influence on work engagement)
H_{a4}: $\gamma_{11} < 0$ (job insecurity will have a negative influence on work engagement)

H_{05}: $\gamma_{12} = 0$ (overload will have no influence on work engagement)
H_{a5}: $\gamma_{12} < 0$ (overload will have a negative influence on work engagement)

H_{06}: $\beta_{13} = 0$ (job resources will have no influence on work engagement)
H_{a6}: $\beta_{13} > 0$ (job resources will have a positive influence on work engagement)

H_{07}: $\beta_{14} = 0$ (mental toughness will have no influence on work engagement)
H_{a7}: $\beta_{14} > 0$ (mental toughness will have a positive influence on work engagement)

H_{08}: $\gamma_{21} = 0$ (job insecurity will have no influence on stress)
H_{a8}: $\gamma_{21} > 0$ (job insecurity will have a positive influence on stress)

H_{09}: $\gamma_{22} = 0$ (overload will have no influence on stress)
H_{a9}: $\gamma_{22} > 0$ (overload will have a positive influence on stress)

H$_{010}$: $\beta_{23} = 0$ (job resources will have no influence on stress)

H$_{a10}$: $\beta_{23} < 0$ (job resources will have a negative influence on stress)

H$_{011}$: $\beta_{24} = 0$ (mental toughness will have no influence on stress)

H$_{a11}$: $\beta_{24} < 0$ (mental toughness will have a negative influence on stress)

H$_{012}$: $\beta_{43} = 0$ (job resources will have no influence on mental toughness)

H$_{a12}$: $\beta_{43} > 0$ (job resources will have a positive influence on mental toughness)

H$_{013}$: $\gamma_{13} = 0$ (job insecurity will have no influence on the relationship between job resources and work engagement)

H$_{a13}$: $\gamma_{13} > 0$ (Job insecurity will have a moderating influence on the relationship between job resources and work engagement)

H$_{014}$: $\gamma_{14} = 0$ (overload will have no influence on the relationship between job resources and work engagement)

H$_{a14}$: $\gamma_{14} > 0$ (overload will have a moderating influence on the relationship between job resources and work engagement)

H$_{015}$: $\gamma_{15} = 0$ (job insecurity will have no influence on the relationship between mental toughness and work engagement)

H$_{a15}$: $\gamma_{15} > 0$ (job insecurity will have a moderating influence on the relationship between mental toughness and work engagement)

H$_{016}$: $\gamma_{16} = 0$ (overload will have no influence on the relationship between mental toughness and work engagement)

H$_{a16}$: $\gamma_{16} > 0$ (overload will have a moderating influence on the relationship between mental toughness and work engagement)

H$_{017}$: $\gamma_{23} = 0$ (job insecurity will have no influence on the relationship between job resources and stress)

H$_{a17}$: $\gamma_{23} > 0$ (job insecurity will have a moderating influence on the relationship between job resources and stress)

H$_{018}$: $\gamma_{24} = 0$ (overload will have no influence on the relationship between job resources and stress)

H$_{a18}$: $\gamma_{24} > 0$ (overload will have a moderating influence on the relationship between job resources and stress)

H$_{019}$: $\gamma_{27} = 0$ (mental toughness will have no influence on the relationship between job insecurity and stress)

H$_{a19}$: $\gamma_{27} > 0$ (mental toughness will have a moderating influence on the relationship between job insecurity and stress)

H$_{020}$: $\gamma_{28} = 0$ (mental toughness will have no influence on the relationship between overload and stress)

H$_{a20}$: $\gamma_{28} > 0$ (mental toughness will have a moderating influence on the relationship between overload and stress)

3.5 Research design

This section explains how the research was conducted and how the data gathering was performed. The chosen method for research design is dependent on the nature of the research-initiating questions, the research goals and practical evidence required in testing the hypotheses (Nell, 2015; Theron, 2013). Hence, the design is not a random choice, but rather intentional in its purpose.

The chosen research design that was used for this research study is the non-experimental ex post facto correlational design. The reason for this choice was that the non-experimental ex post facto correlational design is characterised by the measurement of the exogenous latent variables, rather than experimental manipulation of them. This is because (1) the investigator is unable to control or manipulate the selected variables, and (2) the demonstration of the phenomena has already transpired. To summarise, applicants were not randomly assigned and variables were not manipulated (Nell, 2015; Theron, 2013).

The purpose of this research design was to measure all the variables, namely job insecurity, overload, job resources, mental toughness, stress and work engagement. Furthermore, this design determined how much variance in work engagement and stress can be explained by the other variables and their hypothesised relationships. Utilising the ex post facto correlational design enables one to draw inferences from significant path coefficients. It should be noted that correlations between variables do not inevitably advocate causation; rather, they indicate that one variable has a relationship with another. Thus, it cannot be concluded that the one variable influences (causes) the other (Nell, 2015; Theron, 2013), but rather shows that a relationship does exist between them.

This research design is also able to (1) maximise variance due to the independent variable, (2) minimise error variance by both reducing random errors of measurement and using a homogeneous sample to reduce the error variance due to individual difference variables, and (3) control extraneous variance that has an imitative and hostile effect (Nell, 2015; Theron, 2013). Thus, the aforementioned points highlight the benefits of such a research design.

When selecting a research design, it is vital to acknowledge its limitations. According to Simon and Goes (2013) and Nell (2015), the limitations of an ex post facto correlational design include: Firstly, due to the fact that no random assignment is used for the treatment, that there could be inherent unknown sources of variance in the variables being studied (lack of control of threats to internal validity). Secondly, the sample not being random is considered a weakness. Lastly, there is often little information available on any participants who leave the study before its true conclusion.

An additional consideration is the fact that an ex post facto design will indicate whether variables are related, but may not ascertain that the "cause" is only the "cause" and is not possibly the "effect"; hence that another variable may be involved in the relationship. This is further explained by the following: The ex post facto design provides information about the nature of the relationship between two variables, but not why they are related. Additionally, due to the fact that the data is collected at a single point in time, it is not possible to determine change over time, hence its difficulty in revealing causality (Simon & Goes, 2013).

Moreover, it is common to assume that variables are linearly related to each other. However, when variables are not linearly related, correlational methods will reduce the strength of the

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relationship (the linear relationship will be closer to zero). Hence, nonlinear relationships will yield smaller linear correlations, which could mislead the researcher and the accuracy of the results. Furthermore, outliers will also reduce the strength of the relationship between variables (Simon & Goes, 2013). Lastly, a further drawback of this research design is thus poor interpretation.

Despite this design's shortcomings, the ex post facto research design is widely used and considered valuable in the field of psychology and other parts of the social sciences, as most of the phenomena occurring in these fields are inappropriate for controlled settings or manipulation (Nell, 2015). Thus, experimental design, in which manipulation takes place, may be less appropriate in such instances. Acknowledging the aforementioned limitations, this research design was used for this research study as it was the most suited regarding the research-initiating questions, research goals and practical evidence required in testing the hypotheses.

This study relied on correlational techniques to determine the direction and strength of the hypothesised relationships. These techniques determine the degree to which the variables are closely related. According to Tabachnick and Fidell (2007), the advantages of correlational designs include that 1) they investigate research questions that cannot be explored by means of experimental procedures, and 2) they allow for the determination of the strength between variables.

There are various ways to overcome the aforementioned shortcomings. Firstly, proof must be provided for the covariance of each variable in the relationship (evidence of a relationship between them). Secondly, there must be evidence that the researcher excluded a third variable that may have influenced the variations in either variable in question. Finally, it must be shown that the cause always preceded the effect. Although it is impossible to measure change over time in a cross-sectional study, its immediate nature and ease of the process of collecting the data make it a sensible choice for studying human behaviour (Lomax & Li, 2013).

To overcome the shortcoming of not knowing why variables are related, complex correlational methods, for example factor analysis, path analysis and structural equation

modelling, can be used to examine the fundamental relations among many variables, therefore these methods can be used to argue for causal inference (Lomax & Li, 2013).

Finally, to combat the inadequacy of assuming linear relationships between all variables, and the effect of outliers on the strength of the linear relationship, it is recommended that researchers study their data to see (a) if variables are linearly related (e.g. using scatterplots), and (b) if there are any influential observations (i.e. outliers) (Lomax & Li, 2013).

3.6 Research procedure and sampling size

The research procedure started by seeking and obtaining permission from emergency services organisations that employ a variety of emergency service personnel, such as paramedics, ambulance assistants, specialists, trauma surgeons, doctors, etc., as well as from police departments and fire-fighting services. It was a long and exhaustive process, as the industry is highly regulated by bodies such as the Health Professions Council of South Africa (HPCSA). Thus, documentation containing all the relevant evidence, information and ethical approval from the university was required and provided to the various institutions to meet their research departments' standard operating procedures and processes. The identities of the respective institutions will remain anonymous for confidentiality and ethical reasons. For the remainder of the data gathering process, the researcher was only allowed to liaise with specific contact persons so as to ensure confidentiality and reduce any possible coercion.

A small obstacle that had to be overcome during this part of the process was that both the university and the respective institutions required ethical clearance from the other party before proceeding to grant their own ethical clearance. Thus, after much deliberation, the university decided to provide the researcher with provisional ethical clearance while submitting documentation to the institutions, so they could proceed with their internal research procedures. Upon receiving the provisional clearance from Stellenbosch University, the various institutions sent the research request to their respective research departments and, after waiting for approval, each institution accepted the final proposal. Once the institutions had provided ethical clearance from their side, the researcher could continue to apply for ethical clearance from the university. This was a challenging and time-consuming process.

Once ethical clearance was granted by the university and the respective organisational committees, an e-mail with the link to the survey was forwarded to the respective contact persons for the organisations, after which the e-mail was forwarded to all their employees. No access to any personal information was granted to the researcher. The researcher was only aware of the contact person's identity. The e-mails containing the link to the survey were forwarded to the employees by the contact person. Thus the identity of each participant (except the contact person's) remained anonymous throughout the process. If a participant volunteered to participate in the study, written consent was sought and obtained. The participants were given the option to withdraw at any point. If they consented to participate in the study, they were then asked to complete a web-based questionnaire by following a link to the survey. The questionnaire consisted of a total of 103 items and should preferably have been completed in a single session. The factors covered in the questionnaire were job demands, job resources, mental toughness, engagement and stress. It was estimated that a participant would take approximately 30 minutes to complete the questionnaire.

The data was automatically captured on the Survey Checkbox system once submitted. The individual results were kept confidential and only used for the purpose of the assessment.

Due to the scarcity of responses and very low participation rates (approximately 60 complete responses) by the end of 2015, it was decided by the researcher and the respective contact persons within the various organisations to extend the research process by a further year and compile a paper and pencil version of the survey. This was done to increase the response rate and increase the sample size. The researcher then handed out the survey at various organisations and events, waited for participants to complete it, and were available if there were any questions. The surveys were then collected upon completion and the researcher had to manually enter the responses into an Excel document compiled by the statistician, Professor Kidd, at Stellenbosch University. Confidentiality and anonymity of participants was maintained, as no personal identifying information was asked of the participants.

Once all the data was received from both the surveys and captured in the Excel document, the results were analysed using structural equation modelling via the SPSS program for Windows Statistical Package and Lisrel (discussed more in depth in the next section), yielding diagnostic information. Once the findings had been captured and put into a report, the

feedback was sent to the contact personnel to use at their own discretion. The researcher has offered to help explain the findings of the study to the contact personnel, who can then share what they know with management and employees.

The target population for the research study was South African emergency services personnel, because this industry poses a challenge for human resources and people-related problems tend to be overlooked. The population of South African emergency services is too large for every member to be surveyed. Thus, a small, but carefully chosen, sample consisting of police officers, firefighters, nurses, paramedics and trauma personnel in Gauteng and the Western Cape was selected to try to represent the population. The sample imitates the characteristics of the South African emergency services population from which it is drawn.

If the majority of employees had consented to participate in the study, the sample should have been representative of the target population in the form of gender, various qualification levels, different job roles and a diverse mix of ethnicities and age groups. This was not possible, however, as although there were contact persons for each group, namely police officers, firefighters, paramedics, etc., only selected groups participated sufficiently. It was more challenging for the researcher to encourage select occupational groups to participate.

During the sampling phase of the research process it is necessary to do one's best to ensure that there is an overlap between the target population and the sample population. This means an attempt must be made to ensure that the sample is as representative as possible of the target population on which one wants to draw inferences, thereby reducing the gap between the two populations.

Among the sampling techniques available to the researcher were probability (viz. random, stratified, cluster and systematic sampling) and non-probability sampling (viz. quota, purposive, convenience/availability sampling). The difference between these two methods is that non-probability sampling does not entail random selection and probability sampling does (Trochim, 2008). Sampling technique also influences the outcomes of the results.

It is best to use a probability sampling technique, as each element in the sampling population has a known, positive chance of being selected into the sample. The sample size and

representativeness will also affect the statistical power of the analysis. In other words, these aspects can have an impact on the chance of rejecting the null hypotheses if the sample is too small or not representative enough (Theron, 2013). The sampling technique that was used to select the sampling unit was non-probability sampling, as the participants were selected to be part of the sample in non-random ways, hence the decision to extend the research project by a year, so as to have a large enough sample size and a sample that was representative of its population.

This technique was also decided on due to organisational time constraints (limited time for data collection and research endeavours on the part of the participating institutions), as well as practical limitations (the survey was in both electronic and paper copy form to reach as many participants as possible and to cater for those employees who did not have access to the internet at work). It should be noted that the link was sent only to employees' work e-mail addresses by the contact persons, as this is a rule of each institution's research ethics committee.

Finally, when determining an adequate sample size, three factors need to be considered when PLS-SEM is used as the analysis technique, namely (1) ratio of the size of the sample to the number of factors to be estimated; (2) the statistical power related to the test of the hypothesis of close fit (RMSEA < .05) against an alternative hypothesis of average fit (RMSEA > .05); and (3) hands-on concerns, e.g. cost, participation rates, geographical location and availability of appropriate participants. According to Kelloway (1988, p. 20), an academic researcher, proposed that 200 observations for a research study are satisfactory when PLS-SEM is used as the method of statistical analysis. For this study, a minimum of 350 participants was sought.

However, a total of approximately 1 000 emergency service employees should have been reached through the various contact persons. A fire-fighting department, three police stations, two emergency services organisations, a few self-employed specialists and five hospitals were approached for the research study and gave their consent to forward the e-mail to their employees (once they had seen the ethical clearance from their research departments). In total, 68 surveys were completed electronically, while 199 electronic surveys were sent out but not forwarded or completed. A total of 121 paper and pencil versions of the survey were

completed, but only 104 were wholly complete. This gave a total sample size of 173 – a response rate of 17.3%. Table 3.1 below provides a summary of the biographical information of the sample group.

Table 3.1

Biographical Information of the Sample Population

Gender (N=173)										
	Male	**Female**								
f	74	99								
%	43%	57%								
Age (N=173)										
	under 20	**20-29**	**30-39**	**40-49**	**50-59**	**60+**				
f	2	42	71	42	14	2				
%	1%	24%	41%	24%	8%	1%				
Ethnicity/Race (N=173)										
	African	**Coloured**	**Indian**	**White**	**Other**					
f	37	16	6	121	4					
%	21%	9%	3%	70%	2%					
Home language (N=173)										
	English	**Afrikaans**	**Ndebele**	**Sepedi**	**Xhosa**	**Venda**	**Tswana**	**Southern Sotho**	**Zulu**	**Siswati**	**Tsonga**
f	107	53	1	5	6	2	2	2	5	1	1
%	62%	31%	1%	3%	3%	1%	1%	1%	3%	1%	1%
Industry Category (N=173)										
	Nursing	**Fire fighter**	**Police officer**	**Paramedic**	**Doctor**	**Specialist**	**Other**			
f	65	6	20	84	1	2	6			
%	38%	3%	12%	49%	1%	1%	3%			
Number of years working in industry										
	min	**median**	**mean**	**standard deviation**	**maximum**					
	0	12	14.2188	9.5976	49					
f = frequency; % = percentage; N = number of partcipants who completed the relavant question										

3.7 Measurement instruments

In order to provide empirical support for the hypotheses being tested, each latent variable depicted in the structural model (Figure 3.1), had to be measured by an appropriate assessment tool. These instruments operationalised the constructs by making them measurable. To draw valid and reliable results from the data collected, the instruments utilised to measure the latent variables in question had to possess the necessary psychometric properties (Nell, 2015; Theron, 2013).

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The questionnaire sent to the research sample consisted of five sections. These sections comprised questions from existing questionnaires. Firstly, the participants were asked to provide their consent and, in the first section, biographical information was requested. The remaining sections measured the latent variables. To measure the constructs for the purpose of this study, four validated questionnaires were used. All of the variables were measured by an entire questionnaire.

The measurement instruments that were used for this research study included the 30-item Stress Overload Scale (Amirkhan, 2012; Amirkhan et al., 2015), the Utrecht Work Engagement Scale 17-item version (UWES-17) (Hakanen et al. 2006; Rothmann & Rothmann, 2010; Simpson, 2008), the Job Demands–Resources Scale, consisting of 48 items (Rothman et al., 2006), and the Mental Toughness scale (MT48), shortened eight-item version (Gucciardi et al., 2015). An in-depth discussion detailing the measuring instruments and the psychometric properties of each follows in the next sections.

3.7.1 Engagement measured by the Utrecht work engagement scale (UWES)

The Utrecht Work Engagement Scale (UWES) was used to measure work engagement. It is a self-report questionnaire and consists of 17 items that measure three sub-scales. As mentioned earlier, these subscales are vigour, dedication and absorption (Bakker & Schaufeli, 2008; Schaufeli & Bakker, 2004).

Originally, the UWES included 24 items – nine vigour items, eight dedication items and seven absorption items. After psychometric evaluation, seven items appeared to be fallacious and were removed, thus leaving 17 items: six vigour items, five dedication items and six absorption items. A 15-item UWES version also exists, subsequent to a further two items found to be psychometrically poor. The 17-item questionnaire was utilised in the current study (De Villiers, 2015; Mauno et al., 2007).

The 17-item scale consists of three subscales: *absorption* (contains six items, e.g. "I am immersed in my work", "When I am working, I forget everything else around me") (Schaufeli & Bakker, 2004, p. 6), *vigour* (six items, e.g. "At my job I feel strong and vigorous", "When I get up in the morning, I feel like going to work") (Schaufeli & Bakker, 2004, p. 5), and *dedication* (five items, e.g. "My job inspires me", "I am enthusiastic about

my job") (Schaufeli & Bakker, 2004, p. 5&6). The questions are asked and rated on a seven-point frequency-based scale, where possible responses vary from 0 to 6, with 0 representing 'Never', 1 representing 'Almost never (A few times a year or less)', 2 representing 'Rarely (Once a month or less)', 3 representing 'Sometimes (A few times a month)', 4 representing 'Often (Once a week)', 5 representing 'Very often (A few times a week)' and 6 representing 'Always (Every day)' (De Villiers, 2015; Mauno et al., 2007).

The scoring keys for the UWES questionnaire are as follows: Firstly, vigour is tested in questions 1, 4, 8, 12, 15 and 17. All vigour questions are scored positively. Scoring high on these questions should provide an individual with a high score in vigour. Secondly, dedication is assessed in questions 2, 5, 7, 10 and 13. All these questions are scored positively, and scoring high on these questions should give an individual a high score in dedication. Lastly, absorption is examined in questions 3, 6, 9, 11, 14 and 16. These are all scored positively and scoring high on these questions should give a person a high score in absorption (De Villiers, 2015).

Research in various countries (including South Africa) has indicated that the fit of the hypothesised three-factor structure to the data was superior to that of other factor models. Alpha coefficients for the UWES in South Africa were: vigour: 0.78, dedication: 0.89 and absorption: 0.78. In addition, the internal consistency of the three scales of the UWES is considered satisfactory, where in all cases values of Cronbach's alpha (α) are equal to or exceed the critical value of 0.70. Usually, values of Cronbach's alpha (α) for the scales ranging between 0.80 and 0.90 are sufficient (Bakker & Schaufeli, 2008; De Villiers, 2015; Schaufeli & Bakker, 2004). Furthermore, prior research conducted in other countries has revealed that the UWES has satisfactory psychometric properties (Hakanen et al., 2006; Rothmann & Rothmann, 2010; Simpson, 2008). Hence, the UWES was a reliable and valid survey to utilise for the purpose of the current research study.

It is recommended by academic researchers that work engagement be treated as an unidimensional construct, thus individual scores should be interpreted in a cumulative manner, giving a single global score (Langenhoven, 2015).

3.7.2 Stress measured by the Stress Overload Scale

To measure the construct of stress, the Stress Overload Scale (SOS) was used. The relationship between stress and health has not received strong empirical support. Amirkhan (2012) suggests that this may be due to problems in the stress measurement tools used in research studies to date. Available instruments have been criticised for being atheoretical, psychometrically unsound and impractical. Amirkhan presented the "Stress Overload Scale" as being the first wholly empirical development stress measurement tool in 2012 and suggests that it is believed to represent an improvement over existing scales – (1) conceptually, as it is derived from constructs shared by stress theories, (2) psychometrically, as it offers both reliability and superior validity, and (3) practically, because it is convenient and quick, and it is appropriate to diverse population groups (Amirkhan, 2012).

This scale transpired from the literature as a theory-consistent, psychometrically feasible and practical and diversity-encompassing measure of stress (Amirkhan, 2012; Amirkhan et al., 2015). The SOS contains 30 items, six of which are termed "filler items", for example "calm", to counterpoise the generally negative tone of stress questionnaires. Each item is rated on a point rating scale, ranging from 1 ('not at all') to 5 ('a lot') (Amirkhan et al., 2015).

The inoffensive title of "A Measure of Day-to-Day Feelings" disguises the SOS's true purpose in the hope of restricting social desirability and negativity biases. Its instructions assure anonymity and encourage honest responding (Amirkhan et al., 2015).

Originally, 150 items from the SOS was developed to reflect "overload", a common feature in stress theories. The results of five sequenced studies, conducted in heterogeneous samples, were then used to reduce the item pool. Exploratory (n = 431) and confirmatory (n = 433) analyses subsequently exposed two factors, namely Event Load and Personal Vulnerability, which corresponded to theoretical constructs. Consequently, only the best factor markers were subjected to further construct validity (n = 310) and reliability tests (n = 342). The 24 strongest items were selected for the SOS, which demonstrated criterion validity in predicting who (n = 285) would become sick following a common stressor (Amirkhan, 2012).

Currently, the scoring keys for the 30-item SOS are as follows: Twelve even-numbered items on the SOS encompass the Event Load (EL) subscale, which indicates perceived demands (e.g. "…felt swamped by your responsibilities"). Twelve odd-numbered items comprise the Personal Vulnerability (PV) subscale, which exposes perceived inability to deal with those demands (e.g. "…felt like you couldn't cope"). These subscales stemmed from an oblique factor solution and thus are distinct but correlated (Amirkhan, 2012). The six filler items are asked in questions 1, 6, 12, 16, 21 and 26.

The items may be summed to provide a continuous SOS total score, or they can be split at their means and crossed to provide categorical scores: High Risk (high EL, high PV), Low Risk (low EL, low PV), Challenged (high EL, low PV), or Fragile (low EL, high PV) (Amirkhan et al., 2015). In this paper, stress was treated as a unidimensional construct, hence all the items of the SOS – thus the total stress score – was used.

Examples of some items from the SOS include (Amirkhan, 2012, p. 68 & 69; Amirkhan et al., 2015): "In the past week have you felt: calm? Overextended? Like you were rushed? Overcommitted? Like things couldn't get worse?" etc.

The SOS has never been used on a South African sample or in the workplace, hence it was hoped that this study would prove or disprove its value in such a context. In all three studies of Amirkhan et al. (2015), the SOS scores proved to be valid indicators of stress.

3.7.3 Job demands and job resources measured by the Job Demands–Resources Scale (JDRS)

To measure the work context of emergency services, the Job Demands–Resources Scale (JDRS) was used. This theory forms the underpinning of this research study and formed the basis for the development of the conceptual model. The scale was originally utilised to measure the job demands and resources of educators. Currently it is often used to evaluate employee perceptions of pressure and support (Asiwe et al., 2015; Sæmundsdóttir, 2015).

The scale consists of 48 items measuring the two constructs, job demands and job resources. Each of these constructs has sub-factors, namely job insecurity, overload, growth opportunities, social support, organisational support and advancement. Job insecurity and

overload make up the job demands construct. Job resources are comprised of the factors growth opportunities, organisational support and advancement. For this research study, the job demands construct was separated into job insecurity and overload, and was measured and evaluated accordingly. Job resources were studied and measured as a whole construct. All questions were rated on a four-point Likert-scale ranging from 0 – 'Never' to 4 – 'Always'.

The scoring keys for the JDRS are as follows: Job insecurity is represented by items 40 to 42. Overload is measured by items 1 to 10, where item 3 is reversed scored. Growth opportunities are asked about in questions 11 to 18. Social support is found in items 19 to 21 and 37 to 39. Questions 22 to 36 measure organisational support. Lastly, advancement questions are asked in questions 43 to 48. All items are scored positively, except item 3.

Research studies have shown that the dimensions of the JDRS comprise seven reliable factors, namely organisational support ($\alpha = 0.88$), growth opportunities ($\alpha = 0.80$), overload ($\alpha = 0.75$), job insecurity ($\alpha = 0.90$), relationships with colleagues ($\alpha = 0.76$), control ($\alpha = 0.71$) and rewards ($\alpha = 0.78$) (Asiwe et al., 2015; Sæmundsdóttir, 2015).

Rothman et al. (2006) studied the JDRS's construct validity, equivalence and reliability to determine the degree to which the same construct is measured across the cultural groups under study. According to their results, the JDRS is valid, reliable and equivalent for diverse organisations (Asiwe et al., 2015; Sæmundsdóttir, 2015).

Examples of some items from the JDRS include: "Do you have too much work to do? Do you have enough variety in your work? Do you get on well with your colleagues? Can you discuss work problems with your direct supervisor? (Rothman et al., 2006, p.78).

3.7.4 Mental toughness measured by the shortened version of the mental toughness questionnaire (the MT48)

The concept of mental toughness has received noticeable attention in recent research. The MTQ48 was designed to provide a reliable and quick assessment of an individual's ability to endure pressure in a variety of workplace environments. The concept of mental toughness has its origins in both the corporate and sport fields. Psychologists first started looking at resilience in the workplace in the 1970s, when it was realised that there were measurable

differences among business executives' ability to cope with pressure – despite having comparable responsibilities, economic status and physical health, etc. (Clough, Strycharczyk, Rowlands & Czwerenko, 2007; Gucciardi et al., 2015).

Research in the sport, occupational and educational industries consistently shows that mental toughness is directly related to performance, behaviour (where mentally tough individuals adopt a more positive attitude towards challenges and stressors) and well-being (Clough et al., 2007; Gucciardi et al., 2015).

MTQ48 was created to meet a need in businesses. It attempted to answer four questions at the forefront of most senior manager's thoughts: (1) Why is it some people handle pressure well and others don't? (2) Can we measure where people have strengths and weaknesses in these matters? (3) Can we do something to improve "mental toughness" in people to improve their performance and our performance in an ever more demanding world? (4) How can we develop individuals with their specific needs? After eight years of careful and innovative research by Dr Clough and Keith Earle, the MQ48 was created to answer these questions effectively. Initially, the concept and the measure were applied predominantly in the occupational world (call centres, emergency services, etc.), but its applicability has been extended to the education and other service and health sectors (Clough et al., 2007).

The MTQ48 is a 48-item tool that measures the four components (subscales) of mental toughness, namely challenge, control, commitment and confidence. Firstly, challenge looks at the fact that individuals approach challenges differently, where some consider challenges and problems to be opportunities and others perceive them as threats. This subscale measures the degree to which a person is likely to perceive a challenge as an opportunity. Those individuals scoring highly on this scale may actively seek out such situations for self-development, whereas low scorers may avoid challenging situations for fear of failure or aversion to effort (Clough et al., 2007).

Secondly, control is the extent to which people feel they are in control of their life. Some individuals trust that they can exert considerable influence (being able to change things) over their working environment. However, others believe that the outcome of events is outside of their personal control and they are unable to exert any influence over themselves or others. Research has shown that this subscale can further be broken down into control (emotion) –

individuals scoring high on this scale are better able to control their emotions, are able to keep anxieties in check and are less likely to show their emotional state to other people – and control (life). Those scoring highly on the latter scale are more likely to believe they control their own lives. They feel that they can make a difference (Clough et al., 2007).

Furthermore, the commitment subscale measures the degree to which a person is likely to persist with a goal or task. Individuals differ in the extent to which they remain focused on their goals, as some may be easily distracted, bored or divert their attention to competing goals, and others may be more likely to persist with the current goal or task (Clough et al., 2007).

Finally, individuals high in confidence believe that they are able to complete their tasks successfully. Continuing research has identified two sub-scales of this component, namely confidence in abilities and interpersonal confidence. Respondents scoring high on confidence in abilities are more likely to have the self-belief that they are truly worthwhile people and are generally more optimistic about life. Individuals scoring high on the interpersonal subscale may be more assertive, promote themselves in groups and may be better able to handle difficult or awkward people (Clough et al., 2007).

Since mental toughness is a relatively new concept in academia, a lot of the research has been conducted among athletes and sporting groups. Thus, psychometric validity and reliability tests have predominantly been conducted among such samples. Based on data collected from 600 athletes, it was found that the reliability of this measure was .90. Although mental toughness is related to the construct of hardiness, studies have verified that they are dissimilar: the core difference being that mental toughness, as measured by the MT48, represents a broadening of hardiness with its consideration of confidence in addition to control, challenge and commitment. In Horsburgh et al.'s (2008) research samples, the reliabilities (coefficient alphas) of the scales ranged from .74 (challenge and control) to .92 (overall mental toughness).

Subsequent analyses indicate that the shorter eight-item, direct assessment of one-dimensional mental toughness fits the data very well, displays strong factor loadings, and produced an internally reliable score across three independent samples of performers.

Practically, the briefness of the direct approach is appealing, both academically, as well as in practice (Gucciardi et al., 2015).

Examples of some items from the MT48 shortened version include (Gucciardi et al., 2015, p.54 & 55): "I am able to use my emotions to perform the way I want to; I strive for continued success; I effectively execute my knowledge of what is required to achieve my goals."

The scoring keys for the shortened eight-item MT48 are scored positively, with no items being reversed scored. The items on the measure are rated on a five-point Likert-type scale anchored at 1 = 'Strongly disagree', to 5 = 'Strongly agree'. The eight items make the assessment a time-efficient and convenient measure to administer. It provides a total score for mental toughness. Thus, individuals scoring high on this measure are considered to be mentally tough.

3.8 Missing values

The incidence of missing values needs to be addressed before the data can be analysed statistically. The likelihood of coming across missing values with the survey data is rather high, as absenteeism and non-responses are common in survey data. To avoid the potential negative impact on the data that a missing value may create by affecting the permissibility of the inferences drawn from the data, it was determined if there were any missing values.

A missing value can occur if someone does not complete the questionnaire (non-response) or if an employee is absent when the questionnaire is sent out. If the number of returned questionnaires does not equal the number of sent questionnaires, the concept of missing values needs to be dealt with, as this has a detrimental effect on the results if it is not acknowledged before the analysis of the data commences (Nell, 2015; Theron, 2013).

In this research study, only 173 out of a total of 185 cases were wholly complete and could be used to test the structural model using partial least squares structural equation modelling techniques (discussed in depth in the subsequent sections). It is unknown why they were incomplete, but possible reasons include voluntary non-participation, forgetting to complete it and possible absenteeism and the paper and pencil version of the questionnaire created optimal

conditions for participants to leave out parts of the questionnaire. Consequently, the researcher used listwise deletion (deletion of the participant's entire record) to deal with this type of missing data.

Babbie & Mouton (2001) acknowledges that there are various strategies to prevent the problems that may arise from missing values, although these will depend on the number of missing values, the pattern of missing data and, finally, the nature of the data (e.g. whether the data is normalised or non-normalised). To remedy the issues associated with missing values, the methods recommended range from data deletion (listwise deletion or pairwise deletion) to data imputation (multiple imputations, imputation by matching, and full information maximum likelihood imputation) (Theron, 2013).

In this study, twelve participants (N = 12) did not complete major components of the questionnaire. Not one of the 12 participants' datasets was included in the study, as one needs complete data for all variables to do the multivariate analysis.

3.9 Statistical analysis

3.9.1 Data analysis

The structural model depicted in Figure 3.1 contains six latent variables (engagement, stress, job insecurity, overload, job resources and mental toughness). As seen in this model, causal relations have been hypothesised to exist between the variables. The endogenous latent variables cannot be manipulated experimentally, but rather can be observed and measured, hence the use of an ex post facto correlational design. Next, the choice of data analysis techniques was dependent on the type of research questions the current research study aimed to answer. Quantitative techniques were used in this study to analyse the data.

It should be noted that confirmatory factor analyses (CFA) could not be conducted on the data from this research study, as there was not enough data for this type of analysis. CFA allows the researcher to formulate and test hypotheses concerning the underlying factor structure of a construct, where the measurement model therefore is a reflection of the researcher's hypothesis regarding the underlying factor structure (Nell, 2015).

Furthermore, data needs to be analysed to establish whether the measuring instruments' items functioned acceptably, as well as whether the instruments' subscales/items corresponded with the constructs they were supposed to measure (item analysis was used for this). Thus, for the data obtained from the questionnaire to be measured and analysed, and to test the structural model, the techniques of item analysis and partial least squares (PLS) structural equation modelling (SEM) were used. The purpose of data analysis is to test the structural model. Each of the techniques employed is explained in the subsequent sections.

3.9.2 Item analysis

The various scales used to measure each latent variable in the structural model depicted in Figure 3.1 all comprised dimensions that were represented and measured by various items. All these items were compiled into one questionnaire. The questionnaire sent to the research sample consisted of five sections. In the first section, biographical information was requested from the applicants. The remaining sections measured the latent variables and consisted of a total of 103 items.

A variety of scales can be used to test the latent variables. By using item analysis, it is possible to increase understanding of the validity and reliability of tests. A close examination of individual tests is critical to understand why some tests show specific levels of reliability and validity, and others not (Langenhoven, 2015). An item analysis using SPSS Statistics 19 was performed on all measurement scales to decide if the respective items used in the measuring instruments, as listed above, provided a realistic representation of the specific latent variables.

The purpose of the measuring instruments is to measure an individual's position on each of the constructs. The items in the questionnaire act as stimuli to elicit responses regarding the behaviour of the core constructs. Hence, the item responses note the behaviour that caused the construct, consequently allowing the behaviour to be "observable" in the form of data. Thus, the purpose of an item analysis is to recognise which items are poor representations of the latent variable, and to determine the quality and internal consistency reliability for the items (Abrahams, 2013).

There are numerous ways in which items can be poor, namely they may be insensitive (for example items failing to differentiate between the different states of the latent variable, as when participants all receive the same score on a particular variable), or they may be inconsistent or portray a poor interpretation of the construct (the items that do not imitate a shared latent variable in combination with all the other items) (Abrahams, 2013; Langenhoven, 2015; Theron, 2013).

Item analysis is performed using SPSS. According to Nell (2015), research suggests that reliabilities (Cronbach's alpha) of .60 or higher are satisfactory. Other research suggests that a value of 0.7 or higher is sufficient (Langenhoven, 2015). Contingent on the outcomes of the item analysis and the nature of the poor items (if such items are present), the decision should be made whether to alter or remove the respective items from the instrument. If the overall reliability of an instrument or sub-scale displays significant improvement after the designated items have been deleted, they are then omitted from the ensuing analyses. If the overall reliability of an instrument or subscale shows significant improvement after the selected items has been deleted, it is excluded from subsequent analyses (Nell, 2015). The researcher, however, does not agree with deleting items from measures, as all items still correlated significantly and thus satisfactorily, with Cronbach's alphas of greater than .70.

3.9.3 Structural equation modelling (SEM)

Partial least squares methodology was used in the present research study. It is considered to be a soft modelling approach of SEM and makes use of partial least squares (PLS). In contrast, SEM is considered a hard modelling approach of SEM and uses maximum likelihood (Langenhoven, 2015).

The structural equation model with latent constructs, presented in Figure 3.1, has two components. Firstly, it contains a structural model – commonly referred to as the inner model in the PLS-SEM context – which shows relationships/paths between the latent variables. PLS-SEM does not allow for causal loops in the structural model, hence the paths between the latent constructs can only go in a single direction. Within the structural model, exogenous and endogenous constructs can be distinguished, where: (1) exogenous is used to describe latent variables that do not have any structural path relationships directed at them; and (2)

endogenous explains latent target constructs that are justified by other constructs via structural model relationships (Hair, Ringle & Sarstedt, 2011; Langenhoven, 2015).

The second component of the structural equation model includes the measurement models, also known as outer models in the PLS-SEM context. Measurement models include the unidirectional predictive relationships between each latent variable and its associated observed indicators (Hair et al., 2011; Langenhoven, 2015).

According to Hair, Sarstedt, Hopkins and Kuppelwieser (2014) and Langenhoven (2015), PLS SEM is recommended at the early stages of theoretical development so as to test and validate exploratory models. Research suggests that the most well-known reasons for using PLS-SEM are attributed to: (1) non-normal data (data collected for social science research often fails to follow a multivariate normal distribution and the PLS-SEM approach is distribution free, thus the data is not required to be normally distributed); (2) small sample sizes (sample size can affect several aspects of SEM, including parameter estimates, model fit and statistical power. PLS-SEM can be used with much smaller sample sizes); and (3) formatively measured constructs (the main difference between reflective and formative constructs is that formative measures represent occurrences where indicators *cause* the construct (arrows point from the indicators to the construct), whereas reflective indicators are *caused by* the construct (arrows point from the construct to indicators). PLS-SEM has received considerable support as being the recommended method for formatively measured constructs).

Prior to the conducting of a PLS model estimation, a few things need to be done. First, the reliability of the latent variables must be evaluated so as to estimate the measurement model fit. This will be done by analysing the composite reliabilities, average variance distracted (AVE) and R-squared values. If the coefficients of these analyses exceed .70 they are regarded as satisfactory. Upon completion of the systematic evaluation of the reliabilities of the latent variables, the PLS estimates reveal the measurement model's reliability and validity – this is according to certain criteria associated with the measurement model (Chin, 1998; Langenhoven, 2015).

Once the calculated latent variable scores present evidence for satisfactory reliability and validity, the structural model estimates need to be evaluated. The structural model shows

relationships/paths between the latent variables. To assess whether main effects and interaction effects are significant (the stability of estimates), a bootstrapping sampling procedure (approach for testing precision of PLS estimates) was performed. Following bootstrapping, the accuracy of the path estimates to the true effects was evaluated. It is important to consider that the estimates of the structural paths are likely to be more accurate than the reliability score for the estimated construct increases (Chin, 1998).

In the current research study, moderating effects were applicable and were also analysed using PLS path modelling. The PLS path modelling process starts with an iterative process – characterised by latent variable scores estimated for each latent variable. Following this, the latent variable scores were entered as dependent and independent variables into one or more regressions. For the second step, the recommendations for testing moderating effects in multiple regressions generally hold for PLS path modelling as well (Langenhoven, 2015).

As the researcher was interested in the moderating effect of latent variables on the direct relationships between latent variables, the researcher speaks of moderating effects in the context of PLS path modelling – signifying the moderating relationships within the structural model (Langenhoven, 2015).

3.10 Research ethics

This section on research ethics is especially important. In terms of the National Health Act, Act 61 of 2003 (2003), all research involving humans needs to be ethically cleared by an ethics committee registered with the National Health Research Ethics Council. The purpose of the ethical evaluation is to ensure that the participants' human rights are adhered to in order to protect their dignity, safety and well-being throughout the research study. Empirical behavioural research may potentially compromise the rights, dignity, safety and well-being of the candidates, and therefore requires justification regarding the objective of the research. The potential benefits to emergency personnel and society need to outweigh the costs that they may potentially experience.

The research study is relevant to the needs and interests of emergency services personnel, the healthcare industry, medical organisations, as well as the broader community. The methodology for the study followed the scientific approach to research. It was ensured that

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research candidates were well informed about the purpose of the research, how the research results would be determined and how feedback would be provided to the relevant parties who consented to participate. The subjects' rights to privacy and confidentiality were protected. The fair selection of candidates was ensured by asking all employees from the various participating organisations to participate, thereby avoiding unfair discrimination and biased behaviours by the researcher.

It is important to note that Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered under the Health Professions Act (Act no. 56 of 1974) (Republic of South Africa, 2006, p. 41) requires that psychological researchers get institutional permission from the business where the research will be conducted. Permission from emergency services organisations, which employ a variety of emergency service personnel such as paramedics, ambulance assistants, specialists, trauma surgeons, doctors etc., as well as police departments and fire-fighting services, was sought and obtained. It was a long and exhaustive process, as the industry is highly regulated by bodies such as the HPCSA. Thus, documentation with all relevant evidence, information and ethical approval from the university was required and provided to the various institutions to meet their research department's standard operating procedures and processes. Only once institutional permission was granted could the data gathering process begin.

This research study could be considered as a low-risk study, as there were no severe potential risks or discomforts. However, one major concern was the nature of emergency services personnel's work, as it is especially demanding and emotionally taxing. Thus, in the e-mail containing the link to the survey, the most widely used employee well-being and support service providers' details were provided to the participants. In addition, it was suggested that if any person felt it was necessary, that they contact their HR department for additional guidance and/or support.

Another ethical concern that was acknowledged and addressed by the researcher was maintaining the anonymity and confidentiality of the participants. No access to any personal information was granted to the researcher. The researcher was only aware of the identity of the contact persons of the various organisations (employing emergency services personnel). The e-mails containing the link to the survey were forwarded to the employees by the contact

person, thus the identities of each participant (except the contact person's) remained anonymous throughout the process. The participants' anonymity was guaranteed, as only the researcher, supervisor and the statistical analyst had access to the results, which were protected by a username and password. Also, any potential concerns from participants in terms of negative consequences after completion of the self-rated questionnaire were addressed by assuring the confidentiality of the results. If a participant volunteered to participate in the study, informed consent was sought and obtained via an informed consent form detailing this information. They had the rights to participate voluntarily or to withdraw at any point. There was no coercion to complete the survey. Agreeing or disagreeing to participate would not advantage or disadvantage any person.

Furthermore, the identities of the respective institutions employing emergency services personnel also remained anonymous for confidentiality and ethical reasons, and were requested as such from the start of the research process.

The confidentiality of the participants' information was maintained, although Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered under the Health Professions Act (Act no. 56 of 1974) (Republic of South Africa, 2006, p. 41) requires psychological researchers to disclose confidential information under the following circumstances:
(a) Only with the permission of the client concerned;
(b) When permitted by law to do so for a legitimate purpose, such as providing a client with the professional services required;
(c) To appropriate professionals and then for strictly professional purposes only;
(d) To protect a client or other persons from harm; or
(e) To obtain payment for a psychological service, in which instance disclosure is limited to the minimum necessary to achieve that purpose.

In addition, the informed consent meets the prerequisites of Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered under the Health Professions Act (Act no. 56 of 1974) (Republic of South Africa, 2006, p. 42). The informed consent document explained the purpose of the study, the procedures that would be followed, potential risks and discomforts, potential benefits to participants and society, confidentiality, participation and withdrawal, identification of investigators and the rights of the research participants.

The measuring instruments used in collecting the data from the emergency personnel are available in the public domain. None of the measuring instruments can be regarded as psychological tests as defined by the Health Professions Act (Republic of South Africa, 2006). An application for ethical clearance for the proposed research study was submitted to the Research Ethics Committee Human Research (Humanities) of Stellenbosch University and was approved.

The findings were reported only in aggregate form and feedback was sent to the contact personnel, which they may use at their own discretion. The researcher could help explain the findings of the study to the contact persons and, in the form of group feedback, to those interested.

It therefore can be concluded that the study posed no major ethical threats. The above procedures were introduced to ensure that the participants' human rights were adhered to, and to protect their dignity, safety and well-being throughout the research study. With these procedures in place, the researcher was confident that all ethical and legal requirements had been complied with.

3.11 Chapter summary

Chapter 3 has outlined the methodological choices made throughout the research process to answer why there is variance in work engagement and stress between different emergency workers operating within different environments. The effects of salient resources and demands on stress and engagement were thus examined.

Furthermore, an ex post facto correlational research design was utilised to collect the required data for the purposes of this research study. A non-probability sampling technique was used to select a suitable sample. Quantitative data was collected from various emergency service personnel in Gauteng and the Western Cape. This data was collected using an electronic survey, as well as paper format surveys.

The measurement instruments used for this study include the 30-item Stress Overload Scale (Amirkhan, 2012; Amirkhan et al., 2015), the Utrecht Work Engagement Scale 17-item

version (UWES-17) (Hakanen et al., 2006; Simpson, 2008; Rothmann & Rothmann, 2010), the Job Demands–Resources Scale, consisting of 48 items (Rothman et al., 2006), and the Mental Toughness scale (MT48), shortened eight-item version (Gucciardi et al., 2015).

To statistically analyse the data and test the hypothesised relationships, item analysis and PLS SEM analyses were used. To perform these analyses, LISREL 8.80 and SPSS software packages were utilised. The next chapter reports the research findings from the statistical analyses, along with their interpretation.

CHAPTER 4

RESULTS

4.1. Introduction

Chapter 4 presents and discusses the results obtained from the statistical analyses that were performed and discussed in Chapter 3. Firstly, an item analysis was performed to determine the psychometric soundness, in terms of the reliability of the measurement instruments that were used to represent the various latent variables (job and personal resources (mental toughness), job demands, engagement and stress). Once item analysis had been performed, partial least squares (PLS) structural equation modelling (SEM) was used to support the reliability of the different measurements and to confirm the fit of the measurement model. After establishing an acceptable measurement model fit, PLS (SEM) was utilised to analyse and investigate the relevant paths between the variables in order to confirm the structural model fit. Lastly, the final scores and hypotheses were interpreted.

4.2. Validating the measurement model

4.2.1 Item analysis

An item analysis, carried out in Statistica 13, provided a preliminary indication of the value of the various measurement scales. Validity and reliability criteria depend on the nature of the constructs being measured. Item analysis was performed for all items included in the questionnaire. Item correlations examine the consistency between items, where item correlations are the subtype of internal consistency reliability. Table 4.1 presents a summary of the item analysis results for each of the measurement scales. The item analysis summary includes the mean, standard deviation, Cronbach's alpha and average inter-item correlation of

all the items that measure the specific latent variables in question (i.e. subscales). Table 4.2 provides a summary of the mean, standard deviation, Cronbach's alpha and average inter-item correlation of all the *total scales*.

Table 4.1

Means, Standard Deviations and Internal Consistency Reliabilities of Subscales

Scale	Sample size	Number of items	Mean	Standard deviation	Cronbach's alpha	Average inter-item correlation
WE_vigor	173	9	25.44	5.38	0.80	0.40
WE_dedication	173	8	23.07	4.80	0.81	0.47
WE_absorption	173	7	24.79	5.60	0.77	0.36
SOS_event load	173	12	37.28	10.18	0.91	0.46
SOS_personal vulnerability	173	12	30.73	10.79	0.92	0.49
JDR_overload	173	10	30.34	4.42	0.77	0.26
JDR_job insecurity	173	3	6.95	2.82	0.88	0.73
JDR_organisational support	173	15	41.83	9.33	0.92	0.45
JDR_social support	173	6	18.64	3.64	0.83	0.46
JDR_growth opportunities	173	8	23.06	4.78	0.83	0.39
JDR_advancement	173	6	11.87	4.14	0.84	0.50
MT48	173	8	33.45	4.18	0.86	0.46

WE = Work engagement; SOS = Stress Overload Scale; JDR = Job Demands–Resources Scale; MT48 = Mental toughness questionnaire

A Cronbach's alpha value of between .65 and .80 is considered sufficient in human research studies (Vaske, Beaman & Sponarski, 2015). For the purposes of this research study, a value of .7 was deemed satisfactory (M. Kidd, personal communication, August 15, 2016; Nell, 2015). As seen in the table above, the Cronbach's alphas of internal consistency were acceptable (> 0.7). This was corroborated by acceptable average inter-item correlations. A higher score for inter-item correlation is regarded as an acceptable score, as it explains that these items are measuring the same construct to a certain degree (Vaske et al., 2015). It should be noted that, although the overload item from the job demands–resources model was the lowest when compared to the rest, it was still considered acceptable.

Table 4.2 below provides a summary of the mean, standard deviation, Cronbach's alpha and average inter-item correlation of all the *total scales*.

Table 4.2

Means, Standard Deviations and Internal Consistency Reliabilities of Total Scales

Scale	Sample size	Number of items	Mean	Standard deviation	Cronbach's alpha	Average inter-item correlation
WE	173	17	12.99	2.53	0.89	0.73
SOS	173	30	5.68	1.64	0.87	0.77
JR	173	35	7.64	1.56	0.75	0.52
MT48	173	8	33.45	4.18	0.86	0.46
JD	173	13	5.35	1.03	-0.055	-0.034

WE = Work engagement; SOS = Stress Overload Scale; JR = Job resource of the Job Demands–Resources Scale; MT48 = Mental toughness questionnaire; JD= Job demands of the Job Demands–Resources Scale

As seen in Table 4.2 above, the Cronbach's alphas of internal consistency were *acceptable* (> 0.7), except for job demands, which had a value -0.055, thus signifying unsatisfactory internal consistency. The other internal consistency scores were corroborated by *acceptable* average inter-item correlations, again except for job demands, which had an inter-item correlation of -0.034, indicative of no correlation. A higher score for inter-item correlation is regarded as an acceptable score (Vaske et al., 2015).

The lack of internal consistency within job demands was supported by the lack of inter-item correlation, with a value of -0.034. The Cronbach's alphas of the individual subscales were acceptable, as both scales were above .70 (overload = .77, job insecurity = .88). These results suggest that, although the Cronbach's alphas of the individual subscales were acceptable, the two subscales do not appear to aggregate to form the construct of job demands. Hence the job demands scale may not measure what it is intended to measure. Thus, due to the fact that the Cronbach's alphas of the individual subscales were acceptable, but the current job demands scale showed questioned reliability, it was decided to separate the construct of job demands into its two sub factors, i.e. job insecurity and overload, to improve the quality of the analyses and subsequently conduct further analyses as such. Each construct was studied and is discussed in more detail below.

4.2.1.1 Work engagement

The Utrecht Work Engagement Scale (UWES-17) obtained a Cronbach's alpha coefficient of .89, indicating high internal consistency reliability (Vaske et al., 2015). The UWES-17 scale comprises three subscales/dimensions, namely vigour, dedication and absorption. No items were deleted, as none of the individual items negatively affected the coefficient. The internal consistency was verified by an average inter-item correlation of .73. The individual inter-item correlations ranged between .36 and .47. These results demonstrate that the UWES-17 measures what it is intended to measure. The Cronbach's alphas of the subscales were also acceptable, as all three subscales were above .70 (vigour = .80, dedication = .81, absorption = .77).

4.2.1.2 Stress

The Stress Overload Scale (SOS) obtained a Cronbach's alpha coefficient of .87, indicating high internal consistency reliability (Vaske et al., 2015). The SOS scale comprises two subscales/dimensions, namely event load and personal vulnerability. No items were deleted, as none of the individual items affected the coefficient negatively. The internal consistency was verified by an average inter-item correlation of .77. The individual inter-item correlations were .46 and .49 respectively. These results demonstrate that the SOS measures what it is intended to measure. The Cronbach's alphas of the subscales were also acceptable, as both subscales were above .70 (event load = .91, personal vulnerability = .92).

4.2.1.3 Job demands

The job demands construct of the Job Demands–Resources Scale was measured by the subscales of job insecurity and overload. The job demands scale thus obtained a Cronbach's alpha coefficient of -0.055, indicating unacceptable internal consistency reliability. Ideally, the Cronbach's alpha coefficient should be greater than .7 (Vaske et al., 2015), thus a value of -0.055 is not considered acceptable.

The lack of internal consistency was supported by the lack of inter-item correlation, with a value of -0.034. The individual inter-item correlations were .26 and .73. The average inter-item correlation of the overload subscale (.26) is considered low, as a higher value for inter-item correlation is regarded as an acceptable score because it explains that these items are measuring the same construct to a certain degree (Vaske et al., 2015). The Cronbach's alphas

of the individual subscales were acceptable, as both scales were above .70 (overload = .77, job insecurity = .88).

These results suggest that, although the Cronbach's alphas of the individual subscales were acceptable, the two subscales do not appear to aggregate to form the construct of job demands. Hence the job demands scale may not measure what it is intended to measure. Thus, due to the fact that the Cronbach's alphas of the individual subscales were acceptable but the current job demands scale showed evidence of questioned reliability, it was decided to separate the construct of job demands into its two sub-factors, namely job insecurity and overload, and subsequently conduct further analyses.

4.2.1.4 Job resources

The job resources construct of the Job Demands–Resources Scale was measured by the subscales of organisational and social support, as well as growth opportunities and advancement. The Job Demands–Resources Scale thus obtained a Cronbach's alpha coefficient of .75, indicating satisfactory internal consistency reliability (Vaske et al., 2015). The job resources scale comprises four subscales/dimensions, namely organisational and social support, growth opportunities and advancement. No items were deleted, as none of the individual items adversely affected the coefficient. The internal consistency was verified by an average inter-item correlation of .52. The individual inter-item correlations ranged between .39 and .50. These results indicate that the job resources scale measures what it is intended to measure. The Cronbach's alphas of the subscales also were acceptable, as all four subscales were above .70 (organisational support = .92, social support = .83, growth opportunities = .83, advancement = .84).

4.2.1.5 Mental toughness

The Mental Toughness Scale (MT48) obtained a Cronbach's alpha coefficient of .86, indicating high internal consistency reliability (Vaske et al., 2015). The MT48 scale has no subscales, but rather is unidimensional in nature. No items were deleted, as none of the individual items negatively affected the coefficient. The internal consistency was verified by an average inter-item correlation of .46. These results demonstrate that the MT48 measures what it is intended to measure.

4.2.2 Decision regarding the reliability of latent variables scales

The objective of the preceding item analysis was to assess the functioning of each of the latent variables and to evaluate whether the indicator variables of the latent variables were psychometrically sound.

The Cronbach's alpha values for *all the items* showed acceptable internal consistency (> 0.7). This was corroborated by acceptable average inter-item correlations. A higher score for inter-item correlation is regarded as an acceptable score, as it explains that these items are measuring the same construct to a certain degree (Vaske et al., 2015). It should be noted that, although the overload item from the job demands–resources model was a bit lower than the rest, it was still considered acceptable.

When evaluating the *total scores*, the results of the item analysis indicated satisfactory evidence to corroborate the inclusion of the items in the measurement instruments of four of the five instruments. The Cronbach's alphas of internal consistency were acceptable (> 0.7), except for job demands, which had a value of -0.055, thus signifying unsatisfactory internal consistency. The other internal consistency scores were corroborated by acceptable average inter-item correlations, except again for job demands, which had an inter-item correlation of -0.034, indicative of no correlation.

The lack of internal consistency within job demands, supported by the lack of inter-item correlation, necessitates cause for concern. The Cronbach's alphas of the individual subscales were acceptable, as both scales were above .70 (overload = .77, job insecurity = .88). These results suggest that, although the Cronbach's alphas of the individual subscales were acceptable, the two subscales do not appear to aggregate to form the construct of job demands. Hence the job demands scale may not measure what it is intended to measure. Thus, due to the fact that the Cronbach's alphas of the individual subscales were acceptable, but the current job demands scale had questioned reliability, it was decided to separate the construct of job demands into its two sub-factors, viz. job insecurity and overload, and subsequently conduct further analyses as such.

4.3.   Partial least square (PLS) analysis

According to Hair et al. (2014), there are two parts to the process when using PLS methodology, namely evaluating the outer and the inner models. Firstly, the outer models, also referred to as measurement models, are used to evaluate the relationships between the indicator variables and their corresponding construct. The main objective of analysing the measurement model is to assess the measurement quality of the constructs that are used in the evaluation of the structural (inner) model. Secondly, the inner model, also known as the structural model, illustrates the various relationships between the latent constructs.

Once the reliability of each latent variable scale has been determined, thus showing that the measurement model fits, the next step is to analyse the path coefficients to establish the strength and significance of the various hypothesised relationships so as to confirm the fit of the structural model. These steps are explored in more detail in the subsequent sections.

4.3.1 Evaluation and interpretation of the measurement model

The aim of the reliability analysis is to scrutinise the measurement model fit and the reliability of the latent variable scales. To evaluate and interpret the reliabilities of each latent variable, composite reliability and average variance extracted (AVE) techniques were used.

First, composite reliability measures whether the reliability of the latent variable scales is satisfactory. Here, a value of 0.7 or greater is deemed acceptable (Hair et al., 2014; M. Kidd, personal communication, August 15, 2016). As seen in Table 4.3 below, the entire latent variable scores of reliability were greater than 0.7, therefore can be concluded to be satisfactory.

Secondly, the AVE value in Table 4.3 is an indication that the amount of variance of an indicator variable is explained by common factors. Although the AVE score is a more stringent measure of reliability, it can be compared to the other reliability scores. Here, a value of at least 0.5 is considered ideal, therefore indicating that the indicator variables do measure the construct in question (Hair et al., 2014; M. Kidd, personal communication, August 15, 2016). A value of 0.5 indicates that 50% of the variance of an indicator variable is explained by common factors and thus measures the construct in question. As seen in Table

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4.3 below, all of the AVE values were close to 0.5 (overload had the lowest value of 0.35, but is still satisfactory).

Table 4.3

Reliability Statistics of the PLS Model

Scale	Composite reliability	Average variance extracted
Engagement	0.93	0.82
Stress	0.94	0.89
Job insecurity	0.93	0.82
Overload	0.83	0.35
Job resources	0.86	0.68
Mental toughness	0.89	0.51

To establish construct validity, namely the extent to which a scale measures what it is intended to measure, additional analyses were done. Furthermore, the discriminant validity of each scale was assessed using the Heterotrait-Monotrait ratio method criteria (Kidd, 2016). Here, the researcher compared each latent variable to the other to determine whether each variable is unique and therefore a separate variable. Interestingly, all of the relationships were shown to have discriminant validity. Thus, it is evident that all the scales passed the discriminate validity test, and it can be concluded that these constructs are unique and do not correlate highly with the other constructs.

To conclude the evaluation of the reliability of the items included in the latent variable scales, a PLS bootstrapping analysis was done. The purpose of a bootstrapping analysis is to determine whether the item loadings are significant or not, hence an evaluation of the factor loadings was necessary. To evaluate the factor loadings, the researcher assessed whether zero fell within the 95% confidence interval. If zero did fall within the interval, the factor loadings would not be considered statistically significant; in contrast, if zero did not fall within this interval, the factor loadings were statistically significant (Chin 1998; Langenhoven, 2015; Kidd, 2016).

Table 4.4

Outer Loadings

Latent Variables	Path/ Relationship		Original sample	95% confidence interval (lower)	95% confidence interval (upper)	Significance
Engagement	Vigour	-> WE	0,929	0,906	0,949	Significant
	Dedication	-> WE	0,907	0,88	0,929	Significant
	Absorption	-> WE	0,877	0,833	0,913	Significant
Stress	Event load	-> Stress	0,945	0,921	0,963	Significant
	Personal vulnerability	-> Stress	0,945	0,915	0,963	Significant
Job insecurity	JD-R_i40	-> Job insecurity	0,92	0,78	0,97	Significant
	JD-R_i41	-> Job insecurity	0,92	0,74	0,96	Significant
	JD-R_i42	-> Job insecurity	0,87	0,61	0,96	Significant
Overload	JD-R_i1	-> Overload	0,66	0,55	0,75	Significant
	JD-R_i10	-> Overload	0,526	0,35	0,67	Significant
	JD-R_i2	-> Overload	0,75	0,62	0,84	Significant
	JD-R_i3(reversed)	-> Overload	0,21	-0,42	0,43	Insignificant
	JD-R_i4	-> Overload	0,63	0,41	0,76	Significant
	JD-R_i5	-> Overload	0,55	0,32	0,7	Significant
	JD-R_i6	-> Overload	0,6	0,39	0,75	Significant
	JD-R_i7	-> Overload	0,59	0,39	0,74	Significant
	JD-R_i8	-> Overload	0,53	0,34	0,68	Significant
	JD-R_i9	-> Overload	0,7	0,54	0,8	Significant
Job resources	Organisational support	-> JR	0,861	0,791	0,907	Significant
	Growth opportunities	-> JR	0,89	0,84	0,925	Significant
	Advancement	-> JR	0,706	0,565	0,803	Significant
Mental Tough	MT1	-> MT	0,747	0,644	0,818	Significant
	MT2	-> MT	0,769	0,661	0,833	Significant
	MT3	-> MT	0,627	0,468	0,752	Significant
	MT4	-> MT	0,715	0,608	0,8	Significant
	MT5	-> MT	0,754	0,655	0,833	Significant
	MT6	-> MT	0,659	0,541	0,759	Significant
	MT7	-> MT	0,735	0,629	0,811	Significant
	MT8	-> MT	0,717	0,632	0,793	Significant

WE = Work engagement; JR = Job resources ; MT = Mental toughness; JD-R= Job demands Resources Model; I = item

Table 4.4 above explains the strength of the relationships between the latent variables, as well as the relevant items measuring these variables in the survey. As can be seen in the table, it can be concluded that the paths between items and their relevant latent variables – work engagement, stress, job insecurity, overload, job resources and mental toughness – were all statistically significant, except for one of the overload items that was reversed score. This is evident, as zero fell within the 95% confidence interval, and subsequently confirms the reliability of every other item included in the latent variable scales. Item JD-R_i3 (reversed)

of the overload scale indicated that there may be a problem with the measurement of the scale. The researcher had to acknowledge these findings when inferences about job demands were drawn. The aforementioned findings are all outlined in Table 4.4 above.

In conclusion, the results suggest that all the latent variable scales, except the JD-R_i3 (reversed) of the overload scale, were considered to be statistically significant. These findings corroborate the reliability of the items included in these latent variable scales.

4.3.2 Evaluation and interpretation of the structural model

After establishing an acceptable measurement model fit (JD-R_i3 (reversed) was red-flagged), PLS (SEM) was utilised to analyse and investigate the quality of the relevant paths between the variables in order to confirm the structural model fit. The purpose of the PLS structural model analysis was to determine the degree to which the latent variables were related to each other. The structural model, commonly referred to as the inner model, showed relationships/paths between the latent variables. PLS-SEM does not allow for causal loops in the structural model, hence the paths between the latent constructs can only go in a single direction. Within the structural model, exogenous and endogenous constructs can be distinguished, where: (1) exogenous is used to describe latent variables that do not have any structural path relationships directed at them, and (2) endogenous explains latent target constructs that are justified by other constructs via structural model relationships (Hair et al., 2011). Thus, the effect of the exogenous variables on the endogenous variables and vice versa was established.

Figure 4.1 below depicts the relationships between the exogenous and endogenous latent variables, viz. job insecurity, overload, job resources, personal resources and their influences on work engagement and stress. The blue circles indicate the latent variables (job insecurity, overload, job resources, personal resources, work engagement and stress), whereas the green circles illustrate the moderating effects previously portrayed in the conceptual model in Figure 2.2.

Eight moderating interactions that were hypothesised to moderate relationships between specific variables are included in Figure 4.1 and are represented by the green circles. Firstly, the hypothesis that job insecurity moderates the relationship between job resources and work

engagement is captured as the first green circle (JR_JI moderator). Secondly, the hypothesis that overload moderates the interaction between job resources and work engagement is captured as the second green circle (JR_JO moderator). Next, the hypothesis that job insecurity moderates the relationship between mental toughness and work engagement is captured as the third green circle (PR_JI moderator, where PR stands for personal resources and represents mental toughness). Furthermore, the hypothesis that overload moderates the relationship between mental toughness and work engagement is captured as the fourth green circle (PR_JO moderator). Fifthly, the hypothesised relationship of job insecurity moderating the relationship between job resources and stress is depicted as the green circle, JR_JI moderator2. Furthermore, the hypothesised relationship of overload moderating the relationship between job resources and stress is illustrated as the green circle, JR_JO moderator2. The hypothesis that mental toughness moderates the relationship between job insecurity and stress is shown in the green circle PR_JI moderator2. Finally, the hypothesis that mental toughness moderates the relationship between overload and stress is captured in the last green circle (PR_JO moderator2).
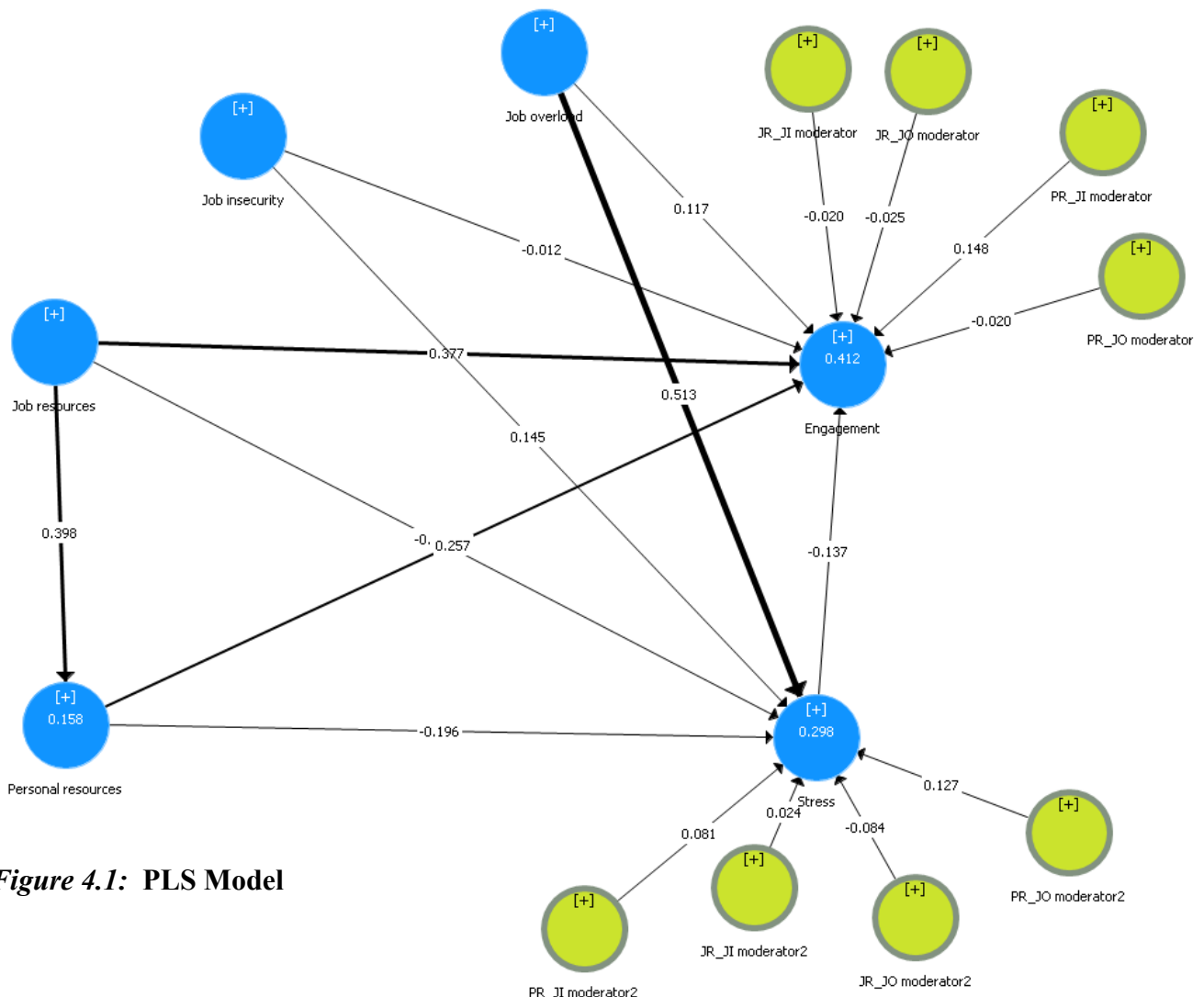
Figure 4.1: **PLS Model**

The PLS structural model analysis entails the evaluation of the following: testing for multicollinearity, R squares and, lastly, examining and interpreting both the main and moderating effects. A discussion of each of these steps follows in the subsequent sections.

4.3.2.1 Multicollinearity

Multicollinearity examines whether individual variables correlate with each other or not (Hair et al., 2011; M. Kidd, personal communication, August 15, 2016). Various predictor variables are present when conducting regression analysis and it must be presumed that these predictor variables are uncorrelated with one another. If it is the case that some of the predictors are excessively highly correlated with each other, it will cause volatile regressions established by estimated coefficients. To test for multicollinearity, the researcher used a variance inflation factor (VIF), which measures to what extent the variance in the estimated regression coefficients is increased/inflated in contrast to when the predictor variables are not linearly related. Hence, this evidence will explain how much multicollinearity – correlation between predictors – occurs in a regression analysis. Multicollinearity is problematic, as it necessitates the reconsideration of the measurement model setup. The reason this is problematic is because it can raise the variance of the regression coefficients, resulting in the regression coefficients becoming unstable and tricky to interpret (Hair et al., 2011).

Several suggestions for acceptable levels of VIF have been recommended. Some research proposes a maximum VIF value of four of five, which implies that 80% of an indicator's variance is accounted for by the remaining formative indicators related to the same construct. A value of 10 appears to be the well-accepted maximum level of VIF (Langenhoven, 2015). It is the researcher's discretion which criterion is utilised, as it must support the research objective. According to Kidd (personal communication, August 15, 2016), a maximum VIF value of 5 or greater than 5 was deemed problematic in the present research study. The results of the current research study's multicollinearity analysis showed no indication of multicollinearity problems, as all VIF values were below 5.

4.3.2.2 Evaluation and interpretation of the R square

The R square value reveals how much variance in the endogenous variables is explained by the exogenous variables in the study. Table 4.5 below shows the R square values for the endogenous variables.

Table 4.5

R square Values for the Endogenous Variables

Endogenous latent variable	R square value
Engagement	0.38
Stress	0.26
Mental toughness	0.15

As seen in Table 4.5 above, engagement had an R square value of 0.38, which means that 38% of variance in engagement is explained by the influence of exogenous variables. Furthermore, it can be seen that stress had an R square value of 0.26, indicating that 26% of variance in stress is explained by the influence of exogenous variables. Finally, mental toughness had an R square value of 0.15, which means that 15% of variance in mental toughness is explained by the influence of exogenous variables. These scores are all relatively low, suggesting that there likely are other feasible variables that may have had an impact on the endogenous variables (viz. stress, engagement and mental toughness) that were not measured in this study.

4.3.2.3 Evaluation and interpretation of the main effects

The objective of PLS path modelling is to assist with prediction (Hair et al., 2011). Once the reliability of each latent variable scale was ascertained, path coefficients were investigated in order to establish the strength and significance of the various hypothesised relationships. To determine the significance between the variables, the bootstrapping method was used. Here, the researcher assessed whether zero fell within the 95% confidence interval. If zero did fall within the interval, the factor loadings would not be considered statistically significant; in contrast, if zero did not fall within this interval, the factor loadings were considered statistically significant (M. Kidd, personal communication, August 15, 2016).

Table 4.6 stipulates whether the path coefficients of the main effects were significant or not. Moreover, it indicates the confidence intervals, both lower and upper. The confidence intervals were used for determining the strength and significance of the hypothesised paths – as suggested in the structural model in Figure 3.1. Thus, the path coefficients were examined by determining whether zero fell within the 95% confidence interval or not. Subsequently, the significance of the path coefficients was explored and the last column in the table provides information on whether the hypothesised paths were significant or not.

Table 4.6

Path Coefficients Between Variables

Path/relationship	Path coefficient	95% confidence interval (lower)	95% confidence interval (upper)	Description
H1: Stress -> WE	-0.137	-0.27	-0.019	Significant
H2: JD_JI -> WE	-0.012	-0.144	0.119	Insignificant
H3: JD_O -> WE	0.117	-0.028	0.302	Insignificant
H4: JR -> WE	0.377	0.246	0.505	Significant
H5: MT -> WE	0.257	0.097	0.422	Significant
H6: JD_JI -> Stress	0.145	-0.002	0.275	Insignificant
H7: JD_O -> Stress	0.513	0.418	0.652	Significant
H8: JR -> Stress	-0.13	-0.248	0.023	Insignificant
H9: MT -> Stress	-0.196	-0.346	-0.056	Significant
H10: JR -> MT	0.398	0.274	0.53	Significant

Hypothesis 1: Stress (η_2) has a significant negative effect on work engagement (η_1).

The hypothesised negative relationship between stress and work engagement was found to be *significant* (PLS path coefficient = -.137), as zero did not fall within the 95% confidence interval (as seen in Table 4.6 above). It should be noted that, when testing for significance, a $p < 0.05$ is used as guideline (Hair et al., 2011), but one can also use a 10% level ($p < 0.1$). Therefore, in this case, the result was not significant at 5% ($p > 0.05$), but was significant at 10% ($p < 0.1$) – still indicating a trend for a significant relationship.

Thus, these results highlight that the relationship between these two constructs was both significant and negative. Subsequently, the former finding – that the relationship between the

two constructs was significant – corroborates the small amount of existing literature on the relationship between stress and work engagement (Padula et al., 2012). Little research has been conducted on the nature of the relationship between stress and work engagement among emergency personnel, thus these results may be valuable for such future research endeavours in this sample group.

These findings suggest that stress among South African emergency services has a significant detrimental effect on them experiencing work engagement. Hence, in order for this group to feel engaged in their work, one of the considerations should be that they should not be stressed, which may prove difficult to ensure due to the risky and challenging nature of their job.

Hypothesis 2:   Job insecurity (ζ_1) has a significant negative effect on work engagement (η_1)

The proposed negative relationship between job insecurity and work engagement was found to be *statistically insignificant* (PLS path coefficient = -0.012), with zero falling within the 95% confidence interval. Hence, the results disproved that the relationship between job insecurity and work engagement was negative, and that the relationship between them was significant. Consequently, the findings contradict existing research on the relationship between job insecurity and work engagement. The existing literature suggests that employees who have high levels of job insecurity cannot be fully engaged at work, as they are continuously worried about the status of their employment. Previous research studies showed that job insecurity was negatively related to each dimension of work engagement, as well as engagement as a one-dimensional construct (Roll et al., 2015; Wang et al., Lu 2014). Thus, this contradictory finding needs to be explored further. Job insecurity appears not to be a relevant job demand influencing emergency service's work engagement. Other variables therefore should be explored, considered and evaluated.

Hypothesis 3:   Overload (ζ_2) has a significant negative effect on engagement (η_1).

The hypothesised negative relationship between overload and work engagement was found to be *statistically insignificant* (PLS path coefficient = 0.117), with zero falling within the 95%

confidence interval. Hence, the results disproved that the relationship between overload and work engagement was significant and negative. Consequently, the findings contradict existing research on the relationship between overload and work engagement. Research has suggested that, because emergency services' work environments are characterised by poor working conditions, such as work overload, the personnel likely will experience disengagement. As overload is conceptualised as high rates of and an overwhelming quantity of tasks, as well as psychological and emotional burdens, it is unlikely that "overloaded employees" would have high levels of work engagement, but rather might experience disengagement (Bar & Jarus, 2015; Rothmann et al., 2006; Shemueli et al., 2015). However, it should be noted that the results of some literature studies demonstrate no significant relationship between overload and job engagement (Yuan et al., 2015), which is consistent with the results of this research study. Thus, this differing finding needs to be explored further. Overload appears not to be a relevant job demand influencing the work engagement of emergency service personnel. Other variables therefore should be explored, considered and evaluated.

Hypothesis 4:   Job resources (η_3) have a significant positive effect on work engagement (η_1).

The proposed positive relationship between job resources and work engagement was shown to be *statistically significant*. As seen in Table 4.6 above, the PLS path coefficient was equal to 0.377, and zero was not located within in the 95% confidence interval. These results are in accordance with existing literature that analysed this relationship (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; Inceoglu & Warr, 2012; Macauley, 2015; Nahrgang et al., 2010; Seppälä et al., 2015; Simpson, 2008).

Consequently, the findings imply that, if South African emergency services personnel are equipped with sufficient job resources (i.e. organisational and social support, as well as advancement and growth opportunities), they will likely experience work engagement. This contributes to existing engagement and job demands–resources literature, but also makes significant contributions to research specifically on the emergency service industry.

Hypothesis 5:   Mental toughness (η_4) has a significant positive effect on work engagement (η_1).

The hypothesised positive relationship between mental toughness and work engagement was found to be *significant* (PLS path coefficient = 0.257), with zero not falling within the 95% confidence interval (as seen in Table 4.6 above). Thus, these results highlight that the relationship between these two constructs was significant and also confirmed that the nature of the relationship between mental toughness and work engagement was positive.

Subsequently, these findings corroborate existing research on the relationship between personal resources (i.e. mental toughness, resiliency and grit) and work engagement (Airilaa et al., 2014; Eskreis-Winkler et al., 2014; Kaiseler et al., 2014; Mache et al., 2014; Suzuki et al., 2015). It also contributes significantly to mental toughness literature specifically, as this kind of relationship has not yet been studied extensively. Little research has been conducted on the nature of the relationship between mental toughness and work engagement among emergency personnel, thus these results may be valuable for future research endeavours.

These findings suggest that if South African emergency services personnel are equipped with the personal resource of mental toughness it will increase their levels of engagement at work.

Hypothesis 6:   Job insecurity (ζ_1) has a significant positive effect on stress (η_2).

The hypothesised positive relationship between job insecurity and stress was found to be *statistically insignificant* (PLS path coefficient of 0.145), with zero falling within the 95% confidence interval. This result does not support the exiting literature on the relationship between job insecurity and stress, which states that, as job insecurity increases, so will an employee's stress levels (De Witte, 1999; Fan et al., 2015; Roll et al., 2015; Schaufeli, 2016; Wang et al., 2014). This is especially relevant to emergency services research, and it is important to note that job insecurity may not be a relevant job demand when trying to understand the antecedents of emergency service workers' levels of stress.

Hypothesis 7: Overload (ζ_2) has a significant positive effect on stress (η_2).

The hypothesised positive relationship between job insecurity and stress was found to be *statistically significant* (PLS path coefficient of 0.513), as zero did not fall within the 95% confidence interval. This result supports the existing literature on the relationship between overload and stress, which states that work overload has surfaced as one of the most consistent stress factors given emergency service workers' inherent job requirements. Overload has been shown to lead to consequences such as burnout, turnover and stress (Altaf & Awan, 2011; Cieslak et al., 2014; Shemueli et al., 2015). This is especially relevant to emergency service research, and it is important to note that job overload is a relevant job demand when trying to understand the antecedents of emergency service workers' levels of stress.

Hypothesis 8: Job resources (η_3) have a significant negative effect on stress (η_2).

As presented in Table 4.6 above, the hypothesised negative relationship between job resources and stress was shown *not to be statistically significant* (PLS path coefficient was equal to -0.13), with zero falling within the 95% confidence interval. The results disproved that the relationship between job resources and stress was significant. These findings contradict existing research on the relationship between job resources and stress (Bakker et al., 2004; Hakanen et al., 2006; 2008).

Consequently, the results suggest that the availability of job resources (i.e. organisational and social support, as well as advancement and growth opportunities) among South African emergency personnel may not necessarily influence their stress levels. This contributes to existing job demands–resources literature and stress studies. However, it also makes valuable contributions to research on the emergency services industry.

This insignificant finding might be due to the fact that the R square value for stress was relatively low, hence suggesting that there are other feasible variables, not job resources, that may have had an impact on the stress variable and that have not been considered and measured in this study.

Hypothesis 9:   Mental toughness (η_4) has a significant negative effect on stress (η_2).

The hypothesised negative relationship between mental toughness and stress was found to be *statistically significant,* with a PLS path coefficient of -0.196, and zero not located within the 95% confidence interval. Thus, this finding is consistent with other research endeavours on the relationship between personal resources and stress (Bakker & Demerouti, 2014; Györkös et al., 2012; Meriac et al., 2015; Van Wingerden et al., 2015). The results are of additional value to mental toughness literature, as little research is available for this specific relationship to stress. In addition, the emergency services will also benefit from understanding this dynamic. Thus it can be said that mentally tough emergency service workers are better able to cope in stressful situations, thus reducing their levels of stress.

Hypothesis 10:   Job resources (η_3) have a significant positive effect on mental toughness (η_4).

The hypothesised positive relationship between job resources and mental toughness was found to be *significant* (PLS path coefficient = 0.398), with zero not falling within the 95% confidence interval (as seen in Table 4.6 above). Thus, these results highlight that the relationship between these two constructs is both significant and positive, and corroborates existing literature on the relationship between job and personal resources (Bakker & Demerouti, 2014; Nell, 2015; Xanthopoulou et al., 2009).

These findings contribute to job demands–resources research and are of additional value to mental toughness literature. It can be said that emergency services having sufficient job resources positively contributes to their mental toughness.

4.3.2.4 Evaluating and interpreting the proposed moderating hypotheses
When evaluating the moderating effects, two methods were followed, namely the R square change test for interaction, and path coefficients. The R square change test for interaction made use of three variables (independent, moderator and dependent) each time to establish whether the R square would increase significantly when the interaction between the independent and the moderator variables (independent*moderator) was included. In Table 4.7 below, the R square change and p-values are given so as to assess whether moderating effects

exist between the different paths. To ascertain whether the increase was significant, a p-value of < .05 was considered statistically significant at the 95% confidence level. If zero fell within the interval, the factor loadings would not be considered statistically significant; in contrast, if zero did not fall within this interval, the factor loadings were considered to be statistically significant (Hair et al., 2011; M. Kidd, personal communication, August 15, 2016; Vaske et al., 2015).

Table 4.7

R² Change and P-values for the Moderating Effects

Relationship/path		R² change	F- to remove	P-value
H11: JR*JD_JI	-> WE	0.00	0.00	0.90
H12: JR*JD_O	-> WE	0.00	0.21	0.60
H13: MT*JD_JI	-> WE	0.00	4.03	0.00
H14: MT*JD_O	-> WE	0.00	3.17	0.00
H15: JR*JD_JI	-> Stress	0.00	0.00	0.90
H16: JR*JD_O	-> Stress	0.00	0.51	0.40
H17: MT*JD_JI	-> Stress	0.00	0.00	0.90
H18: MT*JD_O	-> Stress	0.00	2.77	0.10

Next, to analyse the strengths, significance and direction of the hypothesised moderating effects in the structural model, the path coefficients were evaluated. To determine the significance of a hypothesised path, the researcher observed whether zero fell within the lower and upper bootstrapping values, and this analysis was conducted using a 95% confidence interval. Table 4.8 presents the data that was used to determine the relationships between the hypotheses.

Table 4.8

Moderating Path Coefficients

Relationship/path		Path coefficient	95% confidence interval (lower)	95% confidence interval (upper)	Significance
H11: JR*JD_JI	-> WE	-0.02	-0.167	0.092	Insignificant
H12: JR*JD_O	-> WE	-0.025	-0.151	0.116	Insignificant
H13: MT*JD_JI	-> WE	0.148	-0.01	0.294	Insignificant
H14: MT*JD_O	-> WE	-0.02	-0.231	0.071	Insignificant
H15: JR*JD_JI	-> Stress	0.024	-0.124	0.16	Insignificant
H16: JR*JD_O	-> Stress	-0.084	-0.19	0.018	Insignificant
H17: MT*JD_JI	-> Stress	0.081	-0.078	0.198	Insignificant
H18: MT*JD_O	-> Stress	0.127	-0.027	0.234	Insignificant

Hypothesis 11:   Job insecurity (ζ_1) moderates the relationship between job resources (η_3) and engagement (η_1).

The p-value of job demands as a moderator of the relationship between job resources and work engagement was found to be higher than .05 (p = 0.9). A p-value greater than 0.5 is an indication that the construct job insecurity did not have a statistically significant moderating influence on the relationship between job resources and work engagement. Additional PLS bootstrapping, on the moderating effect of job insecurity, revealed the same result. The PLS path coefficient was equal to -0.02, with zero falling in the 95% confidence interval. The specific information on the confidence of the lower and upper intervals is presented in Table 4.8 above. The findings stipulate that the proposed moderating effect of job insecurity on the relationship between job resources and work engagement was found to be *statistically not significant*. This contradicts previous literature findings (Bakker & Demerouti, 2014; Nahrgang et al., 2010; Van Wingerden et al., 2015) and should thus be explored further.

Hypothesis 12:   Overload (ζ_2) moderates the relationship between job resources (η_3) and engagement (η_1).

The p-value of overload as a moderator of the relationship between job resources and work engagement was found to be higher than .05 (p = 0.6). A p-value greater than 0.5 indicates that overload did not have a statistically significant moderating influence on the relationship

between job resources and work engagement. Additional PLS bootstrapping on the moderating effect of job overload revealed the same result. The PLS path coefficient was equal to -0.025, and zero fell in the 95% confidence interval. The specific information on the confidence of the lower and upper intervals is presented in Table 4.8 above. The findings stipulate that the proposed moderating effect of overload on the relationship between job resources and work engagement was found to be *statistically not significant*. This finding contradicts previous academic postulations (Bakker & Demerouti, 2014; Nahrgang et al., 2010; Van Wingerden et al., 2015) and thus should be explored further.

Hypothesis 13: Job insecurity (ζ_1) moderates the relationship between mental toughness (η_4) and engagement (η_1).

The p-value of job insecurity as a moderator of the relationship between mental toughness and work engagement was found to be less than .05 (p = 0.00). This finding, of a p-value less than 0.05, denotes a significant moderating relationship. However, additional PLS bootstrapping on the moderating effect of job insecurity revealed a different result. The PLS path coefficient was equal to 0.148, with zero located in the 95% confidence interval. Specific information on the confidence of the lower and upper intervals can be found in Table 4.8 above. Therefore, the findings stipulate that the proposed moderating effect of job insecurity on the relationship between mental toughness and work engagement was found to be statistically *not significant*. This result contrasts with previous research results (Bakker & Demerouti, 2014; Nahrgang et al., 2010; Van Wingerden et al., 2015) and should therefore be acknowledged and examined further.

Hypothesis 14: Overload (ζ_2) moderates the relationship between mental toughness (η_4) and work engagement (η_1).

The p-value of overload as a moderator of the relationship between mental toughness and work engagement was found to be less than .05 (p = 0.00). This finding, of a p-value less than 0.05, implies a significant moderating relationship. However, additional PLS bootstrapping on the moderating effect of overload revealed a different result. The PLS path coefficient was equal to -0.02, and zero was located in the 95% confidence interval. Specific information on the confidence of the lower and upper intervals can be found in Table 4.8

above. Therefore, the findings stipulate that the proposed moderating effect of overload on the relationship between mental toughness and work engagement was found to be statistically *not significant*. This result differs with previous research findings (Bakker & Demerouti, 2014; Nahrgang et al., 2010; Van Wingerden et al., 2015) and should therefore be acknowledged and examined further.

Hypothesis 15:   Job insecurity (ζ_1) moderates the relationship between job resources (η_3) and stress (η_2).

The p-value of job insecurity as a moderator of the relationship between job resources and stress was found to be higher than .05 (p = 0.9). Where a p-value is greater than 0.5, it is an indication that the construct job insecurity did not have a statistically significant moderating influence on the relationship between job resources and stress. Additional PLS bootstrapping, on the moderating effect of job insecurity revealed the same result. The PLS path coefficient was equal to 0.024, and zero fell in the 95% confidence interval. The specific information on the confidence of the lower and upper intervals is presented in Table 4.8 above. The findings stipulate that the proposed moderating effect of job insecurity on the relationship between job resources and stress was found to be *statistically not significant*. This finding contradicts previous literature (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; 2008; Nahrgang et al., 2010) and thus should be explored further.

Hypothesis 16:   Overload (ζ_2) moderates the relationship between job resources (η_3) and stress (η_2).

The p-value of overload as a moderator of the relationship between job resources and stress was found to be higher than .05 (p = 0.4). This p-value being greater than 0.5 indicates that overload did not have a statistically significant moderating influence on the relationship between job resources and stress. Additional PLS bootstrapping on the moderating effect of overload revealed the same result. The PLS path coefficient was equal to -0.084, and zero was located in the 95% confidence interval. The specific information on the confidence of the lower and upper intervals is presented in Table 4.8 above. The findings stipulate that the proposed moderating effect of overload on the relationship between job resources and stress was found to be *statistically insignificant*. This result conflicts with other academic sources

(Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; 2008; Nahrgang et al., 2010;) and thus should be explored further.

Hypothesis 17: Mental toughness (η_4) moderates the relationship between job insecurity (ζ_1) and stress (η_2).

The p-value of mental toughness as a moderator of the relationship between job insecurity and stress was found to be higher than .05 (p = 0.9). This finding (p > 0.05) indicates an insignificant moderating relationship, where mental toughness is thus not a moderator of the relationship between job insecurity and stress. Additional PLS bootstrapping on the moderating effect of mental toughness revealed the same result. The PLS path coefficient was equal to 0.081, with zero located in the 95% confidence interval. Specific information on the confidence of the lower and upper intervals can be found in Table 4.8 above. The findings stipulate that the proposed moderating effect of mental toughness on the relationship between job insecurity and stress was found to be *statistically not significant*. This insignificant relationship disagrees with other literature sources (Bakker & Demerouti, 2014; Gucciardi et al., 2015; Meriac et al., 2015; Van Wingerden et al., 2015) and therefore is acknowledged and should be considered for future research.

Hypothesis 18: Mental toughness (η_4) moderates the relationship between overload (ζ_2) and stress (η_2).

The p-value of mental toughness as a moderator of the relationship between overload and stress was found to be higher than .05 (p = 0.1). This finding (p > 0.05) indicates an insignificant moderating relationship, where mental toughness is thus not a moderator of the relationship between overload and stress. Additional PLS bootstrapping on the moderating effect of mental toughness revealed the same result. The PLS path coefficient was equal to 0.127, with zero falling in the 95% confidence interval. Specific information on the confidence of the lower and upper intervals can be found in Table 4.8 above. The findings stipulate that the proposed moderating effect of mental toughness on the relationship between overload and stress was found to be *statistically insignificant*. This insignificant finding conflicts with previous research (Bakker & Demerouti, 2014; Gucciardi et al., 2015; Meriac

et al., 2015; Van Wingerden et al., 2015) and therefore should be considered for future research.

4.4. Chapter summary

The objective of this chapter was to present and discuss the results obtained from the statistical analyses that were performed and discussed in Chapter 3. Firstly, an item analysis was performed on each subscale of each measurement to determine the psychometric soundness, in terms of the reliability of the items used in the measurement instruments. Once item analysis had been performed, partial least squares (PLS) structural equation modelling (SEM) was used to support the reliability of the different measurements and to confirm the fit of the measurement model. After establishing an acceptable measurement model fit, PLS (SEM) was utilised to analyse and investigate the relevant paths between the variables in order to confirm the structural model fit. Lastly, the final scores and hypotheses of both the main and moderating effects were interpreted.

When evaluating the *total scores*, the results of the item analysis indicated satisfactory evidence to corroborate the inclusion of the items in the measurement instruments of four of the five instruments. The Cronbach's alphas of internal consistency were acceptable (> 0.7), except for job demands, which had a value -0.055, thus signifying unsatisfactory internal consistency. The other internal consistency scores were corroborated by acceptable average inter-item correlations, except again for job demands, which had an inter-item correlation of -0.034, indicative of no correlation.

The lack of internal consistency within job demands, as well as the lack of inter-item correlation, warranted cause for concern. The Cronbach's alphas of the individual subscales of job demands were acceptable, as both scales were above .70 (overload = .77, job insecurity = .88). These results suggest that, although the Cronbach's alphas of the individual subscales were acceptable, the two subscales do not appear to aggregate to form the construct of job demands. Hence the job demands scale may not measure what it is intended to measure. Due to the fact that the Cronbach's alphas of the individual subscales were acceptable but the current job demands scale had questionable reliability, it was decided to separate the construct of job demands into its two sub-factors, viz. job insecurity and overload, and subsequently conduct further analyses as such.

The average inter-item correlations of the scales ranged between .34 and .77. These results are acceptable. It was concluded that the results of the item analysis were satisfactory and hence the subsequent analyses were performed.

All of the AVE values were close to 0.5 (overload had the lowest value of 0.35, but is still satisfactory). All of the scales passed the discriminate validity test, and it hence can be concluded that these constructs are unique and do not correlate highly with the other constructs. Acceptable measurement model fit was established (JD-R_i3 (reversed) was red-flagged). No items or subscales were removed after this stage either, to ensure interpretation of the results exactly as they were gathered by the research questionnaire. This serves the purpose of the researcher not to manipulate the results by either deleting items or improving measurement model fit. Next, PLS (SEM) was utilised to analyse and investigate the relevant paths between the variables in order to confirm the structural model fit.

Eighteen hypotheses were formulated in this research study; ten were main interaction effect relationships and eight moderating interactions. Of these eighteen hypotheses, a total of six were found to be significant. However, it is important to note that eight of the non-significant paths were all of the moderating effects. Hypotheses 2, 3, 6 and 8 of the main effects were found to be not statistically significant. This contradicts previous research endeavours, and the reasons for the insignificant relationships may be the result of many considerations and warrant further thought and investigation. Hypotheses 1, 4, 5, 7, 9 and 10 were shown to be statistically significant and thus in accordance with existing literature on these interactions.

Chapter 5 will discuss various managerial implications, recommendations and limitations as a result of the current research study. This will assist industrial psychologists, unit managers, supervisors, employers and human resources within the emergency services to identify problem areas within this industry, but also to highlight strengths that can be capitalised on (based on the findings stipulated in this chapter). The researcher's proposed strategies considered interventions at the task, individual, team and organisational levels. The results will be related back to the basic JD-R theory and will gauge the extent to which the current study's findings support the theory. Furthermore, various limitations of the present research study and recommendations for future research ventures will be acknowledged and discussed

CHAPTER 5

IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

5.1. Introduction

Thus far, Chapter 1 provided the context of the research study. It also explained how the research-initiating questions arose, as well as listed the specific research objectives. Following this, Chapter 2 presented a comprehensive literature review of the applicable variables, namely engagement, stress, job demands (i.e. job insecurity and overload), job resources and mental toughness. This resulted in the formulation of research hypotheses. Chapter 3 clarified the chosen research methodology, sample and statistical analyses that were utilised for the research. Chapter 4 reviewed the results of the study, and the applicable scores and subsequent conclusions drawn from the hypotheses.

Chapter 5 will discuss various managerial implications, recommendations and limitations as a result of the current research study. The researcher's proposed strategies considered interventions at the task, individual, team and organisational levels. This will assist industrial psychologists, line/unit managers, supervisors, employers and human resources within the emergency services to identify problem areas within this industry, but also to highlight strengths that can be capitalised on, based on the findings stipulated in Chapter 4. The results will be related back to the basic JD-R theory and will gauge the extent to which the current study's findings support the theory. Furthermore, this chapter will discuss various limitations of the present research study; and recommendations for future research ventures will be made and discussed.

5.2. Practical implications

The current study asks why there is variance in work engagement and stress between different emergency workers operating in different environments. The effects of salient resources and demands on stress and engagement were thus examined, further raising the question whether understanding these relationships and the various interactions between the proposed variables could improve the well-being and productivity of South African emergency personnel.

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Each one of the variables proposed for this research study plays a vital role in influencing both the performance and well-being of South African emergency personnel. Due to the fact that several of the hypothesised interactions were shown to be insignificant, there is still a need to gain a better understanding of this particular sample group's work context. The PLS path analyses provided valuable information regarding the amount of variance accounted for by the total model. The results of the PLS path analyses showed that the model accounted for only 38% of the variance observed in engagement, 26% of the variance in stress and 15% of the variance in mental toughness. This therefore signalled a need to better grasp the antecedents and interactions causing distress that emergency services personnel endure, as well as other ways to foster higher engagement levels among this group.

Moreover, eight of the non-significant relationships were all of the moderating effects. This contradicts previous research endeavours, and the reasons for the insignificant relationships may be the result of many considerations and warrant further thought and investigation.

Thus, for optimum benefit, both managerial efforts and interventions will be focused on for each variable, namely engagement, stress, job demands (i.e. job insecurity and overload), job resources and mental toughness.

This section is structured so that general implications that organisations, managers, supervisors and industrial psychologists can implement to tackle challenges related to the aforementioned constructs are addressed first. This is followed by the implications aimed at specific interventions for the problems that surfaced from the statistical results of the emergency services sample. The proposed strategies have considered interventions at the task, individual, team and organisational levels.

5.2.1 Increasing work engagement

When it is said that a business is profitable or a success, it in essence is the employees who are successful, as they are the driving forces behind the work that generates the profit. In a study on a sample of 50 businesses, it was shown that those firms with high employee engagement experienced a 19% increase in operating income and approximately 28% earnings per share growth. In contrast, companies with low levels of employee engagement

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had more than a 32% decrease in operating income and 11% decline in earnings per share. From data collected worldwide from top firms, the *Harvard Business Review* came to the realisation that 71% of employees believe that effective employee engagement is vital to the success of every business. The *Harvard Business Review* concluded that a highly engaged labour force results in business growth, a positive influence on the company's bottom line, a reduction in staff hiring and retention costs, increased creativity and innovation and increased levels of productivity (Kaliannana & Adjovu, 2015). Next, various interventions aimed at developing engagement will be discussed.

Firstly, at task level, research suggests that there is a positive relationship between psychological meaningfulness and work engagement. Thus, persons entering into a particular job need to be passionate about the work, thus safeguarding the potential to be psychologically engaged. This can be ensured in the recruitment and selection phase, when it can be determined what the candidate's intentions and motivations are for applying for the job. It was further shown that, by ensuring this, the positive interaction between psychological meaningfulness and work engagement can lead to other positive outcomes, such as organisational commitment (Geldenhuys, Laba & Venter 2014). Jeve et al., (2015) recommend that an employee's daily tasks should be focused on engagement opportunities.

Furthermore, research results from the emergency nursing profession indicate that engagement is an important buffer between job characteristics and the intention to leave the profession. Specifically, engagement was found to be affected by certain behavioural health practices, such as collaboration with other professionals, type of leadership, staffing concerns, opportunities for professional development, reward (recognition, respect, responsibility, appreciation, and personal attention), autonomy and shift work. Thus, these job characteristics should be acknowledged and attempts should be made adhere to them (Adriaenssens et al., 2015; Jeve et al., 2015).

At the individual level, various personality factors have been deemed by research to be valid predictors of work engagement. This is a significant finding for the purposes of recruitment and selection procedures when hiring and retaining the right people for the job. Specifically, the broad Big Five personality traits that predict work engagement are extraversion, openness to experience and conscientiousness. The work-related personality predictors are ambition,

interpersonal sensitivity and adjustment. Previous studies have often excluded openness to experience as a valid predictor, as it is perceived to be a weak antecedent for organisational outcomes. However, it emerged as the second strongest predictor (after emotional intelligence) in a recent study (Akhtar, Boustani, Tsivrikos & Chamorro-Premuzic, 2015). Relevant to that research study, one reason for this finding is that there is a link between openness to experience and resilience. Resilience is a significant predictor of engagement, as resilient individuals are able to control their circumstances successfully, which equips them with intrinsic motivation and energy to pursue their goals. Consequently, they are able to engage in their work tasks (Louw, 2014; Jeve et al., 2015; Zhu, Liu, Guo, Zhao & Lou, 2015).

Furthermore, due to the individualistic nature of fostering engagement, tailored programmes may be necessary to assist the individual in capitalising on his/her strengths and individual coping strategies that are best suited for him/her to be able to engage fully with their work.

Today's businesses are developing engagement by concentrating on alterations to job demands and job resources. Although these aspects are vital, businesses can make best use of their resources by predicting engagement earlier on in the employment process, namely in the selection process. Instead of expending resources on engagement-focused interventions at a later stage, it is proposed that a selection-based approach to engagement be used. To exploit one's competitive advantage, a selection-based approach to engagement is believed to be more effective than an intervention-based one (Akhtar et al., 2015; Louw, 2014).

At the team level, the above-mentioned personality traits become significant when individuals have to work within and co-operate as a team, ensuring good interdisciplinary group cohesion, creating mutual recognition and flexible shift scheduling among members. These team members need to be able to work together successfully, thus highlighting the importance of recruitment and selection of persons with the appropriate personality traits to function effectively as a team. Furthermore, a research study proposed that, for selection purposes, police management need to be aware of the significance of social support in the prevention of burnout, while encouraging supervisor support in operational designs. Other research studies have indicated that fostering participative, collaborative and empathic

leadership by supervisors is essential among emergency services personnel (Adriaenssens et al., 2015; Jeve et al., 2015; Louw, 2014).

At an organisational level, research suggests that a supportive organisational culture would be coherent with increased employee utilisation of flexible work arrangements, low turnover, high work engagement and low levels of psychological strain. Conversely, the opposite was found for impeding features of organisational culture. A negative correlation was found between the use of flexible work arrangements and work engagement, thus suggesting that flexible work arrangements are highly dependent on cultural norms. Interventions should focus on the business and employers creating a highly supportive organisational culture (Adriaenssens et al., 2015; Jeve et al., 2015; Timms et al., 2015). Jeve et al. (2015) recommend the following methods to develop an engagement-conducive work environment: specifying role expectations for achieving the business's purpose, selecting enthusiastic and competent employees, creating maintainable reward systems, supporting and valuing the employee, and creating feedback and support systems.

This need was further emphasised among emergency personnel, where the results of a study revealed that perceived organisational support for the use of strengths was strongly and positively related to work engagement. From both an individual and organisational perspective, knowledge of using an individual's strengths, as well as supporting the use of stress interventions, could aid businesses in understanding the relationship with work engagement (Botha & Mostert, 2014). In various other studies, a lack of supervisor or organisational support was shown to result in adverse organisational outcomes (Adriaenssens et al., 2015; Clark et al., 2014; Fiabane, Giorgi, Sguazzin & Argentero, 2013; Hargrove et al., 2013; Tucker, 2015; Tzoneva, 2012). In a further study, organisational justice was shown to positively predict work engagement. More specifically, it was indicated that organisational justice partially mediates the relationship between emotional intelligence and work engagement (Zhu et al., 2015).

The above arguments in existing research studies propose ways to foster work engagement among emergency personnel and indicate what the subsequent implications would be for managers. According to this research study's findings, further practical implications are offered and discussed.

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Firstly, this study's findings show that stress was significantly negatively related to work engagement (hypothesis 1). Thus, by reducing stress one may be able to foster work engagement. Various stress interventions are proposed in the next section, and are suggested to increase emergency personnel's levels of work engagement. Secondly, job resources were shown to be significantly related to work engagement (hypothesis 4), thus managers and employers should ensure that sufficient job resources are made available to emergency personnel. Broadly speaking, this entails that there is potential for advancement within their current roles, that growth opportunities are available to them and that they perceive adequate organisational and interpersonal support. Furthermore, mental toughness was shown to significantly predict work engagement (hypothesis 5). Hence, ensuring that emergency personnel are equipped with adequate personal resources, such as mental toughness, is a prerequisite to ensure they engage in their work. Various ways to foster mental toughness are offered in more detail in section 5.2.4 below. The relationship between the job demand sub-factors, namely job insecurity and overload, and work engagement was shown to be insignificant (hypotheses 2 and 3 respectively). Furthermore, all four of the moderating interactions that were proposed to influence work engagement (hypotheses 11, 12, 13 and 14) were found to be insignificant. Thus more research into these insignificant relationships, and what may be more relevant and significant antecedents of work engagement, is required before offering practical solutions.

5.2.2 Reducing stress

As reported by the South African Depression and Anxiety Group, stress is the result of a lack of resources to cope with everyday demands. In emergency services, this may be heightened by the fact that the job demands are often intense, placing immense pressure on both job and personal resources to compensate (Tzoneva, 2012). Thus, these individuals need to be equipped with the tools and skills necessary for sufficient personal resources, through training and on-going support.

Stress is not always harmful, as slight stress can motivate one to achieve a goal or meet deadlines, it fosters creativity and can inspire one to achieve. However, higher levels of stress and a lack of coping resources may result in (1) cognitive and emotional symptoms, such as poor memory, inability to concentrate, moodiness, feeling overwhelmed, loneliness and poor

judgement and (2) physical and behavioural symptoms, including reduced productivity, dizziness, feeling ill, absenteeism and aches and pains (Adriaenssens et al., 2015; Clark et al., 2014; Itzhaki et al., 2015 Tzoneva, 2012). When stress becomes dysfunctional, interventions are required. Suggestions from existing research will follow in an attempt to address the challenges posed by stress.

Firstly, a proactive approach would be to prevent dysfunctional stress from occurring, as knowing when to seek help could prevent more severe problems. Proactivity is possible by identifying the source of the stress. A lack of personal resources can contribute to the onset of dysfunctional stress, as suggested by previous literature and shown in the current study (hypothesis 9). However, previous literature also proposes that a lack of adequate job resources may contribute to the onset of dysfunctional stress (hypothesis 8); this was not corroborated in the current research study, where the relationship was shown to be insignificant.

Due to the contradictory findings, a broad perspective was taken and interventions aimed at increasing both job and personal resources to reduce stress were acknowledged and explored. Thus, the ideal situation would be a balance of an employee's workload and job and personal resources (Adriaenssens et al., 2015; Clark et al., 2014; Fiabane et al., 2013; Hargrove et al., 2013; Tzoneva, 2012).

Examples of job resources that possibly contribute to the onset of dysfunctional stress include lack of supervisor or organisational support, insufficient training programmes for coping strategies, little or no time to recover, lack of physical resources to get the job done (medical equipment and staff), etc. The personal resources involve a person not being mentally tough, lacking resiliency, having inefficient coping strategies and a lack of hardiness, etc. (Adriaenssens et al., 2015; Clark et al., 2014; Fiabane et al., 2013; Hargrove et al., 2013; Tzoneva, 2012).

Thus, to prevent stress, various interventions can be put in place, such as ensuring that emergency personnel have adequate coping strategies through training to develop personal resources, ensuring job resources are readily available, that workplace interventions are offered to enhance group cohesion and communication, that mentor programmes are

available, assisting with work-life balance and encouraging family support, etc. (Adriaenssens et al., 2015; Louw, 2014).

In addition to preventing sources of dysfunctional stress from arising, another approach to managing stress could be to exploit stress and nurture it into eustress (functional positive stress). Figure 5.1 below illustrates a model explaining various ways of managing eustress (Hargrove et al., 2013).
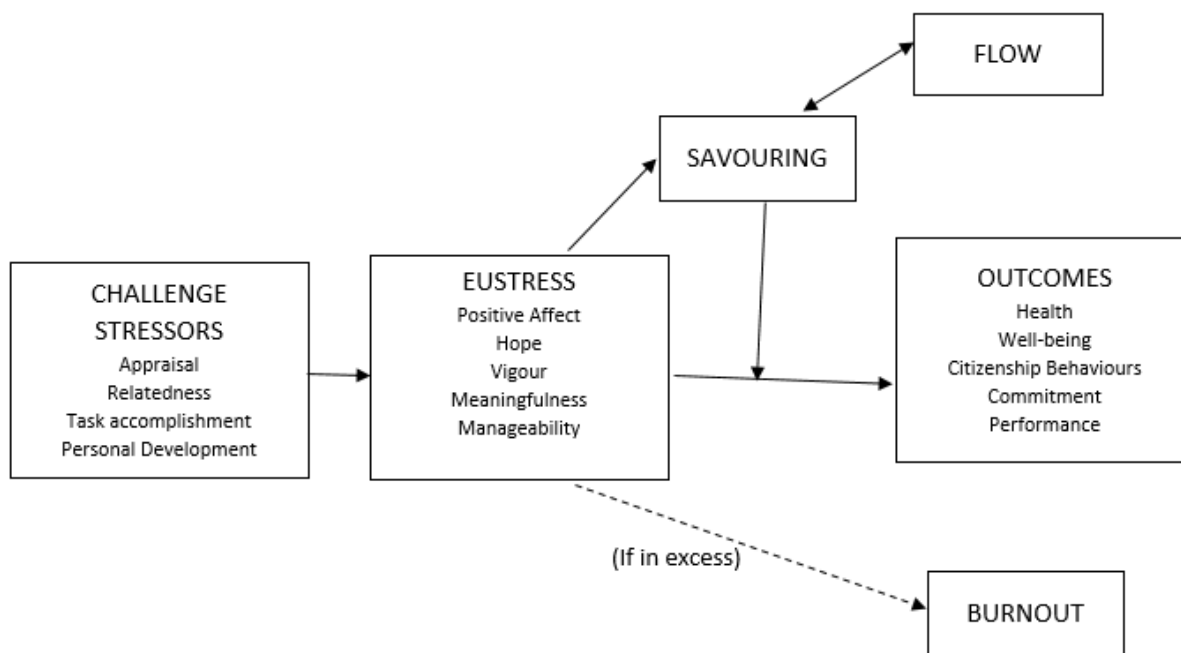
Figure 5.1: **Ways of managing eustress**

Firstly, as suggested earlier, the best approach is to identify the sources of stress, in this case the sources of eustress, and not just treat the symptoms. Thus, what aspects of an employee's work does he/she find the most engaging? The four particular aspects of stressors identified by various employees in a research study as being challenging included: work load, work pace, job complexity and responsibility. These were considered to be generally positive aspects for employees. Thus, interventions should focus their efforts on employing these demands so as to nurture the possibility of work engagement (Fiabane et al., 2013; Hargrove et al., 2013).

To promote positive stress, eustress should be a core focus area for employers to encourage and take every effort to guarantee that the initial response to a stressor be as positive as practically possible. Secondly, the concept of relatedness is essential; for a stressor to be seen

in a positive light, it also needs to be perceived as being related to either task achievement or personal development (Hargrove et al., 2013).

Thus, to savour eustress, managers and supervisors are recommended to foster meaningfulness (significance), mindfulness (paying attention on purpose, in the present moment, and non-judgmentally) and energy management. Savouring eustress means that individuals do not just avoid or cope with stress, but instead they enjoy and are elated by challenging stimuli (Fiabane et al., 2013; Hargrove et al., 2013).

It is proposed that the multiplier of these outcomes for businesses may be the concept of flow. According to Hargrove et al. (2013, p. 67), "flow is the zone of positive stress and peak performance in which time suspends, individuals lose themselves in activity, and they perceive a great sense of control over work". It is the ultimate form of eustress. Other positive outcomes that can be expected from eustress include health, well-being, citizenship behaviours, commitment and performance. However, if there is an excess of eustress, adverse organisational outcomes may result, such as burnout (Hargrove et al., 2013). It therefore is important to find an optimum balance between enough and too much eustress.

Emergency personnel endure trauma and harsh working conditions, and these circumstances may evoke adverse consequences such as distress. However, research shows that certain positive strategies may be able to promote positive outcomes, such as job or life satisfaction and, potentially, engagement. These positive strategies include, amongst others, resilience, mental toughness and posttraumatic growth (PTG). Hence, positive outcomes can be developed through interventions emphasising PTG, mental toughness, resilience and reducing job stress (Itzhaki et al., 2015).

A commonly proposed intervention strategy is the early treatment of distress through counselling or therapy services and employee assistance programmes. Upon considering the cost-effectiveness of early treatment, the long-term effectiveness is generally acknowledged, but many emergency-service organisations still dedicate only a small portion of their budgets towards employee-assistance plans. Adequate therapy can take months and be a costly process. In addition, early treatment of stress may be just "a drop in the ocean" in comparison

to the price of PTSD if left untreated. It is extremely expensive to train new employees and still attempt to maintain the investment of hiring these workers (Lorinc, 2016).

According to Tzoneva (2012) and Lorinc (2016), some general healthy habits to avoid dysfunctional stress include, amongst others: making time to relax, practising deep breathing, doing yoga, visualising, meditating, eating a healthy diet, exercising in an enjoyable way, getting involved in a hobby, getting enough rest, using positive self-talk, etc.

An important acknowledgement from the literature, as well as in reality, is that of stigma. It must be noted that, although there may be various stress interventions available to South African emergency personnel, the stigma surrounding the support services may deter them from making use of these.

As noted by Lorinc (2016), emergency service personnel work in an environment that values strength and resilience and often shuns those who cannot handle the work pressure. Lorinc (2016) also highlights that these workers endure organisational cultural difficulties, including bullying, institutional denial and indifference from the general public they help. Consequently, emergency service personnel often conceal their unrest and confusion. They work in a culture of having to be strong, "macho", being "on point" and showing no kind of weakness.

According to Tucker (2015), a sample of Pennsylvania police officers admitted that, if they perceived confidentiality issues or stigma in relation to support services for stress, they were discouraged from utilising the services made available to them. The study also revealed that, if these police officers perceive both general and organisational support for the use of the intervention services, they are more inclined to use the services. This is significant, because some organisations may recognise the need for and thus implement stress-intervention strategies, yet this does not matter if there is a stigma related to the use of support services, which means that stress goes untreated. Another article stated that a person can and will get better if he/she admits that there is a problem and has the drive to get help (Tzoneva, 2012).

Thus, in a nutshell, there may be various stress interventions available to South African emergency services, but the stigma surrounding the use of support services may deter them

from using these (Tucker, 2015). Possible reasons causing the stigma may be perceived lack of support, perceived stunt in career growth, or that this a "macho career" and asking for help is a sign of weakness. Thus, in summary, what can practically and realistically be done? The researcher suggests – and acknowledges that further research is needed to warrant these recommendations – creating a culture of perceived support, ensuring the availability of and supporting the use of support services, showing willingness to seek out help and possibly involving respected people within this community to talk about their experiences.

The above arguments offered by existing research studies propose ways to reduce distress and foster eustress among emergency personnel and what the subsequent implications would be for managers. In this research study's findings, specific practical implications are offered and discussed. Firstly, contradicting existing research, the relationship between job resources and stress was shown to be insignificant (hypothesis 8), hence more research into this relationship is required before offering practical solutions. Secondly, corroborating the existing literature, mental toughness was shown to significantly reduce stress (hypothesis 9). Thus, ensuring emergency personnel are equipped with adequate personal resources, such as mental toughness, is a prerequisite to ensuring reduced stress levels. When emergency personnel are equipped with mental toughness, they are better able to cope with demanding and taxing situations, more so than those individuals who lack the personal resources. Various ways to foster mental toughness are offered in more detail in section 5.2.4 below.

Moreover, job overload was shown to have a significant positive relationship with stress (hypothesis 7), indicating that the more demanding and challenging the job is perceived, the more the associated levels of stress will increase. This is quite difficult to manage, as the work load is determined by the high South African crime rate, which is a socio-economic issue and is difficult to control. However, to reduce overload, one could attempt to reduce the rate and quantity of work tasks by employing more personnel, and equipping them with psychological and emotional tools (discussed further in later sections). In contrast, job insecurity (also a sub-factor of job demands) was shown to have an insignificant relationship with stress (hypothesis 6), hence more research on this relationship is required before offering practical solutions. The researcher has to acknowledge these findings when attempting to draw inferences about job demands. Hence, more research is needed to better understand how

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to measure job demands among emergency personnel, and what the implications thereof would be.

Finally, all four moderating interactions that were proposed to influence stress (hypotheses 15, 16, 17 and 18) were found to be insignificant. Thus more research on these insignificant relationships and what may be more relevant and significant antecedents of stress is required before offering practical solutions.

5.2.3 Reducing job demands and ensuring sufficient job resources

The job demands–resources (JD-R) model underpins this research study and assumes that job demands, and job and personal resources may induce two different, but related, processes, namely a health-diminishing and a motivational process. The first process is an energetic one of wearing out, in which high job demands generally predict outcomes exhausting employees' mental and physical resources, potentially resulting in burnout and eventually in ill health. The second is a motivational process in which job resources are the most important predictors of work enjoyment, motivation and engagement. These effects are generally due to the fact that job demands cost effort and consume energetic resources, whereas job resources satisfy basic psychological needs (Angelo & Chambel, 2015; Bakker & Demerouti, 2014; De Beer et al., 2013; Hakanen et al., 2006; Nahrgang et al., 2010)

Work engagement and stress are individual and organisational outcomes of the interaction between the variables in the JD-R model, namely job resources, job demands and personal resources (Bakker, 2011). Therefore it will be advantageous for organisations to focus managerial efforts and interventions on the job resources, job demands and personal resources variables, with the objective of increasing work engagement and avoiding distress.

Throughout the job demands–resources (JD-R) literature, it is evident that workers achieve their best job performance in stimulating and creative work contexts. These environments enable work engagement. Both management and the individual employee are able to influence employees' job demands and resources and may indirectly affect engagement and performance. As managers are not always available for feedback, and today's businesses suffer at the hands of the economic climate, managers and employers are faced with having different priorities. Consequently, it seems necessary that employees organise their own

resources, and show proactive behaviour through job crafting (Bakker & Demerouti, 2014). In an emergency services context, this may prove more difficult, as the nature of the work is spontaneous and often unpredictable. However, existing literature offers interventions to reduce job demands and ensure sufficient job resources.

These interventions can be categorised into two aspects: (1) level – interventions aimed at the individual and organisation level and (2) target – the work context (job demands and resources) and individual (personal resources). The four proposed JD-R interventions displayed in Figure 5.2 below are (a) job redesign; (b) job crafting; (c) training; and (d) strengths-based intervention (Bakker & Demerouti, 2014). Each intervention will be discussed briefly below.
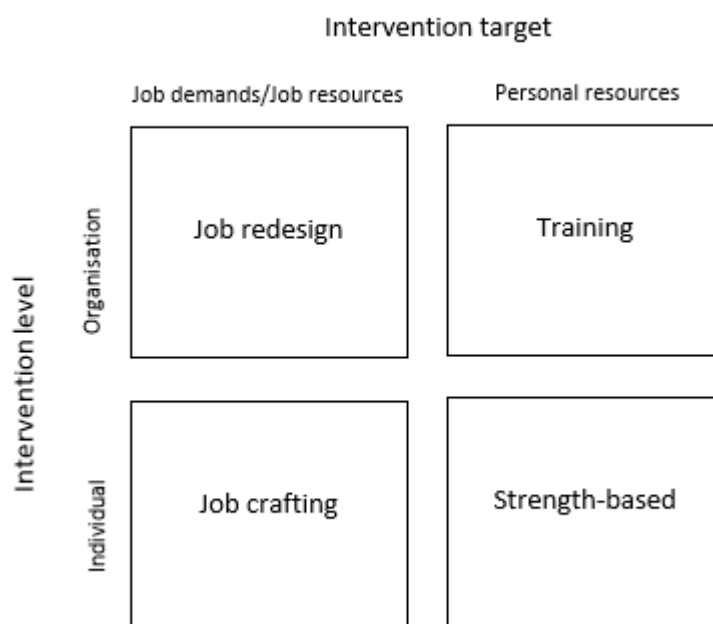
Figure 5.2: **JD-R Theory Interventions Organized in Terms of Intervention Target and Level (Bakker & Demerouti, 2014)**

Firstly, job redesign is an organisational level, structural intervention with the objective to change employee job demands and job resources, contributing to their well-being. This intervention communicates how jobs, tasks and roles are organised, performed and adapted. Additionally, it entails a focus on the influence of these constructions, performances and adaptations on individual, collective and business consequences. It can be explained as a process in which the business or supervisor alters elements of the employee's job conditions

(Bakker & Demerouti, 2014). In an emergency services context, this may prove more difficult, as the nature of the work is spontaneous and often unpredictable. However, by empowering these individuals to take charge of their own equipment and allowing for some flexibility – as much as is possible in such a context – they may be assisted in their perception of empowerment and autonomy.

Also, it should be noted that job overload was shown to have a significant positive relationship with stress (hypothesis 7), indicating that the more demanding and challenging the job is perceived, the more employees' stress levels will increase. This is quite difficult to manage, as the work load is determined by the high South African crime rate, which is a socio-economic issue that is difficult to control. However, to reduce overload, one can attempt to reduce the rate and quantity of work tasks by employing more personnel, and equipping them with psychological and emotional tools (discussed in later sections). In contrast, job insecurity (also a sub-factor of job demands) was shown to have an insignificant relationship with stress (hypothesis 6), hence more research into this relationship is required before offering practical solutions.

The researcher has to acknowledge these findings when attempting to draw inferences about job demands. Hence, more research is needed to better understand how to measure job demands among emergency personnel and what the subsequent implications would be.

The second proposed intervention, job crafting, is an individual-level intervention that is started by the employee. Workers may be proactive by adapting the design of their jobs; more specifically, by selecting tasks, negotiating different job content and allocating meaning to their work. Businesses can inspire job crafting behaviour by showing employees how they can shape and craft their job (Bakker & Demerouti, 2014). In an emergency services environment, this may be challenging due to the nature of the work. However, it is proposed that the employees could negotiate their work content by swapping and choosing shifts according to different locations and times, allowing them some flexibility and autonomy. Also, if these individuals are reminded of the meaningfulness of their work, it may foster work engagement; thus one suggestion is to create a "wall of fame" of their success stories and that this is put on display and shared with other staff members.

Thirdly, a valuable basis in human resources management is the training and development of employees. This is an organisational level intervention in which employees may obtain new competences, understanding and problem-solving abilities during training. Training and development can improve self-reported perceptions of personal resources, such as mental toughness, hence personal resources are flexible and can be enhanced to improve work engagement and performance (Bakker & Demerouti, 2014). It is further suggested that not only employees attend training, but also managers. The training courses could focus on how job resources can be increased through the provision of job characteristics (i.e. task significance, task identity, skill variety, feedback and autonomy). In the current research study, the relationship between job resources and mental toughness (hypothesis 10) was shown to be significant and positively related. This indicates that training could foster, develop and enhance the personal resource of mental toughness, giving these individuals the necessary tools to cope with their work.

The last proposed intervention is strength-based interventions. Workers who capitalise on their strengths in the workplace are considered to be self-efficient individuals. Thus, at an individual level a strong focus on personal resources is recommended. Practically, the strengths-based intervention can be implemented through individual feedback on their most valuable strengths. By keeping a daily record of work-related tasks, it can be determined when the personnel have insufficiently used their strengths. On the basis of this, various methods can be sought to assist the employee in learning ways to use his/her strengths more appropriately. This may enhance the employee's personal resources and work engagement. In contrast, if sufficient use of strengths is observed, recognition and reward systems can be linked to this and implemented (Bakker & Demerouti, 2014).

The researcher acknowledges and proposes that the aforementioned proposed JD-R interventions, namely job redesign, job crafting, training and strengths-based intervention, may not always be the most viable or easily implementable solution for this group, as their work is dictated by the state and crime levels of South Africa. Thus, the researcher attempted to explore further practical solutions.

Within the context of emergency services, various studies have focused specifically on the work context, as it is unique and a potential source of stress, as the personnel experience

traumatic events daily. This is significant for managers, supervisors and employers to consider for protecting their well-being. One particular research study showed that dealing with seriously injured children was the most traumatic part of their work (Minnie et al., 2015). As a result, they experience various adverse consequences, such as avoidance symptoms and use emotion-focused coping (Minnie et al., 2015). Various interventions focused on the work environment of an emergency service sample are proposed below.

Interventions targeted at job demands, job control and social support should be upheld. Lack of job control should be seen to by management, in which they guarantee bottom-up communication and consistent work meetings. This will aid in creating self-managing teams that ensure employee involvement and participation. In addition, a tolerant attitude towards individual and group differences in work procedures is crucial. Direct supervisors must be accessible to their subordinates, they should organise regular team meetings and give ample feedback related to performance and attitudes. Furthermore, supervisors need to be trained to identify the signs and symptoms of ill-coping among their subordinates. Due to the important role that colleagues play in the emergency services work context, it is vital that a strong team spirit is sought (Adriaenssens et al., 2015; Lorinc, 2016).

To deal with the fact that emergency services personnel are frequently exposed to traumatic incidents, managers and employers can provide training to prepare these people for the emotional effects of traumatic events, coping with bereaved family members, improve company support structures, offer regular debriefings and permanent counsellors, and provide co-curricular activities intended to aid in the development of resilience and their psychological well-being (Lorinc, 2016; Minnie et al., 2015). Another study recommends that a good fit between the individual and the job needs to be ensured. This can be implemented during the recruitment and selection phase (Adriaenssens et al., 2015).

Furthermore, research suggests that there is a shortage in some emergency service roles, such as nursing staff, thus interventions should be targeted at investing in the conservation of the human resources through various company-specific attraction and retention interventions (Adriaenssens et al., 2015).

Regarding physical resources, various literature sources recognise emergency personnel's perception of a lack of equipment being a concern. One study showed that Western Cape public emergency centres are currently poorly stocked with alternative airway devices (Jooste & Van Hoving, 2015). Many studies describe the industry as 'resource-limited' (Becker et al., 2015; Nicks, Henley, Mfinanga & Manthey, 2015), thus requiring appropriate resource management. The importance of adequate resources in the health-care industry is evident in its 'life and death' nature.

Lastly, on a much broader organisational and systems level, Lorinc (2016) suggests that PTSD should be perceived as a health-care and workplace-safety issue. Dysfunctional stress offers a potential onset for PTSD and should be considered in the same vein. The treatment of dysfunctional stress and PTSD should be reduced to regulating labour conditions. This is evident across the world, especially in countries such as Canada and America. Thus, although it may not be an immediate solution to the problem in South Africa, it is still a possibility.

A broader workplace PTSD policy has been applied in various international countries for any worker in any profession, as a result of feedback from a variety of employees as part of an all-inclusive rethink of workplace safety rules. This acknowledges the perceived need for such a policy, hence it is suggested that other countries and organisations follow suit (Lorinc, 2016).

5.2.4 Fostering mental toughness

Due to the stressful and demanding work environment of emergency personnel, the concept of stress seemed an inevitable consideration for this research sample. An additional valuable consideration for this research was to consider their coping strategies when dealing with their daily stress. Thus, the concept of mental toughness was proposed as being significant.

According to Gracia (2015), a coping strategy that may be successful in one context may not be as successful in another context, and vice versa. A reason for this is that different stress stimuli may provoke different methods of coping. Gradia (2015) offers the example of a stress study conducted among a sample of police officers concerning Internet child exploitation (ICE). This sample reported that viewing tactics, such as a gradual introduction to images, or defining when, where and how to view the images, aided them in lessening the

undesirable effects of viewing as a source of stress. However, these same tactics are unlikely to assist police officers whose stress is caused by their extreme workload or technology problems. Thus, when considering responses to stressors and coping strategies, it is important to acknowledge the specific stressors and actual reactions simultaneously to ensure complete comprehension of the results of the coping process (Gracia, 2015).

Another research study (Clark et al., 2014) acknowledged that a variety of sources of stress may elicit several coping strategies. Thus, in that particular study, the different coping strategies were categorised into two categories. The first category entailed dealing with the stressor using more positive ways, such as seeking emotional support from others, planning and organising to handle workloads, sharing difficult experiences with others, exercising, etc. The second category of coping involved avoiding the situation altogether, or trying to cope with the symptoms of stress through alcohol and drug use, overeating or under-eating, disengagement, apathy, procrastination and dropping out.

In being proactive toward developing mental toughness, the results of a research study of firefighters indicated that the combination of foregoing high levels of hostility and low levels of self-efficacy were strong predictors for the onset of symptoms of post-traumatic stress disorder (PTSD). The study aimed to highlight that one can be proactive in identifying risk factors that could lead to adverse consequences, such as PTSD or, in this case, dysfunctional stress (Heinrichs et al., 2005). Thus, it is proposed that recruitment and selection procedures should focus their efforts on personality traits associated with or similar to mental toughness, such as hardiness, resilience, etc. This could ensure the hiring of employees with mental toughness and to avoid hiring those who are mentally incapable to cope with their work.

Another intervention to assist emergency services personnel is one in which they are provided with adequate training to efficiently manage the multitude of stressors they experience. Employees need to be educated on how to recognise dysfunctional stress within themselves, their colleagues and their families. Also, once they are able to recognise this, they should be equipped with the right skills to build resilience or mental toughness. In addition, mentoring programmes should be introduced to help reduce anxiety and improve performance by offering attentive and intentional support. This could lead to lessened stress, increased self-esteem and improved capacity to cope with challenging situations (Clark et al., 2014; Tzoneva, 2012).

According to Scarnati (2000), the following are prerequisites for developing mental toughness: (1) develop competence. This entails being self-assured, thus more easily able to deal with stressful situations; (2) do what is right. A person's motivation should not only be to please others. They should define their value system and the principles upon which they base their decisions; (3) resist pressure and ensure delivery of quality work; (4) develop ample willpower to create a plan and follow it through to the end; (5) develop a positive sense of worth and self-confidence; (6) master emotions with rational thinking. One should control the panic instinct by intentionally taking a moment to evaluate the stressful situation; (6) emotional maturity is a veiled aggressive tool required for mental toughness; (7) develop perseverance, transform problems into challenges and develop positive strategies to deal with them; (8) develop career goals; (9) learn to say no; and (10) never enable others to mentally restrict a person (Scarnati, 2000).

Businesses need to accept that stress management, more particularly coping strategies, are not a "nice to have"; instead, they are necessary as they affect the bottom line (Tzoneva, 2012). According to Tucker (2015), police officers who perceive both general and organisational support for the use of support services, are more inclined to use the services. Thus perceived organisational support is necessary for emergency services to make use of the support services available to them.

In conclusion, developing mental toughness is an individual intervention, as it aims to mentally equip a person to cope adequately with stressors. As mentioned previously, different stressors elicit different coping strategies; thus, although it may not be easy to ensure, in practical terms the most viable intervention, theoretically, would be an individually tailored one. The individual needs to be willing to learn and apply what is necessary to be mentally tough. Team work within this industry is paramount and extremely valuable, thus team work should be supported and encouraged. Practically, at an organisational level, employers can recruit and select employees best suited for the job, provide individual or small group training focused on coping strategies, and make debriefings and support services readily available for both individuals and teams.

5.2.5 Summary

The current study asks why there is variance in work engagement and stress between different emergency workers operating within different environments. The effects of salient resources and demands on stress and engagement were thus examined. This further raised the question whether understanding these relationships and the various interactions between the proposed variables could improve the well-being and productivity of South African emergency personnel?

Due to the fact that several of the hypothesised interactions were shown to be insignificant, there still exists a need to gain a better understanding of this particular sample's work context. The PLS path analyses provided valuable information regarding the amount of variance accounted for by the total model. The results showed that the model accounted for only small amounts of the variance observed in engagement, stress and in personal resources. This therefore signals a need to better grasp the antecedents and interactions causing the distress endured by emergency services personnel, as well as other ways to foster higher levels of engagement among this group.

Moreover, eight of the non-significant relationships were all of the moderating effects. This contradicts previous research endeavours, and the reasons for the insignificant relationships may be the result of many considerations and warrant further thought and investigation. Thus, for optimum benefit, the focus was on both managerial efforts and interventions for each variable. In this section, both general implications and implications aimed at specific interventions for the problems that surfaced from the statistical results of the emergency services sample were addressed. The proposed strategies concerned interventions at the task, individual, team and organisational levels. This will assist employers, industrial psychologists and line managers to identify both problem areas and strengths within emergency services.

Thus, in summary, it is foreseen that the health-care industry will endure challenges in the near future. For emergency personnel who experience stress on a daily basis as a result of their work environment, this is significant. Various stress interventions are available to South African emergency services, but the stigma surrounding the use of support services may deter them from using them (Tucker, 2015). Potential reasons for the stigma may be perceived lack of support, perceived stunt in career growth, or that this a "macho career" and that asking for

help is a sign of weakness. Thus, in summary, what can be done from a practical and realistic point of view? The researcher suggests the need to create a culture of perceived support, ensure the availability of support services, show willingness to seek out help and to possibly involve respected people within this community to talk about their experiences.

It is suggested that a higher degree of employee engagement is required to enhance organisational performance and profitability (Jeve et al., 2015). This can be fostered by ensuring that everyday tasks be transformed into employee engagement opportunities.

Job demands and resources of South Africa emergency personnel are a significant consideration, given the stressful and demanding nature of their work. Their work is characterised by many "life and death" situations, thus highlighting the importance of understanding their work context. In addition, a common problem in this industry is the lack of physical resources. Thus, human resource departments need to acknowledge and act on the availability and efficiency of both personal and physical resources.

After considering the importance of stress, it seems both relevant and valuable to consider emergency personnel's coping strategies when dealing with their daily stress. According to Gracia (2015), a coping strategy that may be successful in one context may not be as successful in another context, and vice versa. The reason for this may be that different stress stimuli may provoke different methods of coping. Thus, when considering responses to stressors and coping strategies, it is important to acknowledge the specific stressors and reactions simultaneously to ensure a complete comprehension of the results of the coping process (Gracia, 2015).

5.3.   Limitations and recommendations

Despite the various contributions this research study has made, it also has several limitations. It is important to note that these limitations do not significantly undermine the results discussed in Chapter 4. The subsequent sections will discuss these limitations, and recommendations for future research will be offered.

5.3.1 Limitations

The following aspects are potential limitations of the study at hand. Therefore, when interpreting the results and drawing inferences, the following limitations of the study and what the respective influences on the findings may be, should be considered.

It must be noted that, although a sample size of 173 emergency services was adequate, a much larger sample size would have ensured that the results of this research study were more credible. Considering that the sample chosen was broad, covering various occupational groups such as nursing, fire-fighting, policing, ambulance personnel, paramedics, etc., the researcher expected a much greater response rate. Due to the scarcity of responses and very low participation rate (approximately 60 complete responses) by the end of 2015, it was decided by the researcher and the respective contact persons within the various organisations to extend the research process by a further year and to compile a paper and pencil version of the survey. This was done to increase both the response rate and the sample size. Due to the unpredictable and challenging nature of the work environments of emergency service personnel, it was acknowledged that this group may have been too busy to complete the survey, may not have had the time, may have forgotten about the survey or voluntarily chose not to participate. Moreover, the paper and pencil version of the questionnaire created optimal conditions for participants to leave out parts of the questionnaire. A final thought on the low participation rate could be that the contact persons did not forward the link to enough or the appropriate people, or that they did not adequately explain the expectations upon receipt of the e-mail.

Consequently, the limited size of the sample offers reason for concern regarding the generalisability of the results, the validity of the conclusions and the implications for the emergency services industry. Due to the sample size being small, and the complexity of the proposed models, the use of LISREL was limited to evaluating the structural model; however, PLS-SEM methodology was employed to accommodate for this. Furthermore, it is proposed that one of the reasons that several of the hypothesised relationships previously shown to be significant in the existing literature, but shown to be insignificant in this research study, could be the small sample size (M. Kidd, personal communication, August 15, 2016; Roux, 2010; Theron, 2013). Thus it is recommended that future research endeavours should strive for a much higher response rate.

All emergency service employees were asked to complete the study and only the ones who chose to respond contributed to the data obtained and ultimately influenced the conclusions drawn from the data. The fact that the sample was not selected randomly could contribute to unwanted selection bias (Babcock-Roberson & Strickland, 2010). For example, those employees who do not have access to a work e-mail, those that were out of office when the e-mail was sent, or those from other provinces (besides Gauteng and Western Cape) or organisations were all excluded from participation. Thus, this influenced the representativeness of the sample and consequent the generalisability of the results.

Self-report questionnaires could potentially lead to concerns of validity and self-report biases. In addition, the cross-sectional design of this study, combined with the self-report measures, effects certainty on which cause-and-effect relationships exist amongst the variables, and how they exist (Babcock-Roberson & Strickland, 2010), and may contribute to same-source or common method biases (Mahembe, 2010). To improve the accuracy and consistency of the reported research conclusions, it may be feasible to conduct a longitudinal study enabling the researcher to draw more definitive causal conclusions, to identify recurring behavioural patterns among emergency service workers, and to analyse changes over time (Langenhoven, 2015).

Another potential limitation of this research study is the confidentiality part of self-administered web-based surveys. Although the participants were assured of the confidentiality of their responses, they might have doubted this confidentiality clause in the informed consent document, with a consequent adverse impact on the authenticity of their responses (Langenhoven, 2015).

As mentioned by one of the participants, the Job Demands–Resources Scale (JDRS) contains several questions related to a person's relationship with supervisors. The participant noted that these items could not be answered by a self-employed person (the participant was employed as a contracted trauma surgeon).

This point was further highlighted by the fact that the reliability of the job demands scale was questioned as a result of the findings presented in Chapter 4 above. Firstly, it yielded an

unsatisfactory internal consistency value of -0.055. Moreover, it had an inter-item correlation of -0.034, which is indicative of no correlation. These results suggest that, although the Cronbach's alphas of the individual subscales were acceptable, the two subscales did not aggregate to form the construct of job demands. Hence the job demands scale may not measure what it is intended to measure. Thus, due to the fact that the Cronbach's alphas of the individual subscales were acceptable, but the current job demands scale had questionable reliability, it was decided to separate the construct of job demands into its two sub-factors, viz. job insecurity and overload. Thus, why did the items of the job demands section not accurately reflect this group's job demands? Were they irrelevant? This is an important limitation to note when interpreting the results. The researcher fully recognises that there are other factors influencing the endogenous variables included in the study, such as environmental and personal factors (Bakker et al., 2011). Thus, it is recommended that future research endeavours should aim to include and analyse the possibility of the inclusion of other variables influencing engagement and stress levels among emergency service personnel, and subsequently build these into the current proposed model.

Furthermore, item 3 of the Job Demands–Resources Scale was reverse scored and was red-flagged. Reversed items have been shown to reduce reliability. It is suggested that one could reword the item in a positive manner or delete the item, and then test for reliability. It has been shown that, by deleting an item, the validity improves without loss of reliability (Conrad et al., 2014).

Furthermore, the survey used in this research study was only made available in English, and the researcher is aware that South Africa has ten other official languages. There were participants whose home language was Afrikaans, Ndebele, Sepedi, Xhosa, Venda, Tswana, Southern Sotho, Zulu, siSwati or Tsonga. Hence these individuals may have struggled with understanding some items. In future, the influence of language on the understanding of the items should be explored and it should be ensured that language does not act as a barrier to the interpretation of questions and subsequent responses.

Mental toughness is a newly researched concept, thus researchers need to consider the broad definition when analysing the results and remain up to date with current literature on the topic. Also, the fact that many of these constructs have not been studied together in the way

that the hypothesised structural model proposes, and that there are many "unknown" cause-and-effect relationships, and unknown mediators and moderators influencing the interaction, (further illustrated by the results of the PLS path analyses, which showed that the proposed model accounted for only 38% of the variance observed in engagement, 26% of the variance in stress and 15% of the variance in personal resources), signals a need to better grasp the antecedents and interactions causing the distress that emergency services personnel endure.

The SOS has never been used in a South African workplace context, thus the findings need to be interpreted with caution. The results of this research study show that the Stress Overload Scale (SOS) obtained a Cronbach's alpha coefficient of .87, indicating high internal consistency reliability. No items were deleted, as none of the individual items negatively affected the coefficient. In addition, the internal consistency was verified by an average inter-item correlation of .77. The individual inter-item correlations were .46 and .49 respectively. These results demonstrate that the SOS measures what it is intended to measure. The Cronbach's alphas of the subscales were also acceptable, as both subscales were above .70 (event load = .91, personal vulnerability = .92). Thus, it was proven to be appropriate and valuable in a South African, as well as the emergency services, context.

5.3.2 Recommendations for future research

In addition to the recommendations on the various limitations proposed above, the following are further suggestions for future research ventures.

PTSD is a performance dysfunction in the workplace of emergency personnel. It is under-diagnosed and often overlooked. There is not a sufficient measuring instrument that can be used to identify PTSD in the workplace. Thus, it was decided to focus on the well-researched construct of stress. It may be valuable to develop an instrument that could be used to diagnose PTSD in the workplace so as to prevent and accurately measure the extent of and impact of PTSD among South African emergency personnel. Human resources have a responsibility to take care of and invest in the well-being of employees.

Little research has been conducted on PTSD in South African personnel, hence this stresses the importance of future research to determine what causes, influences and are consequences

of this construct, especially among a sample that may be highly susceptible to such a disorder.

Furthermore, an additional consideration is whether more grit is always superior, or whether there is some detriment to being a gritty person. It may be possible that there are some situations in which grit causes poorer performance. For example, grittier individuals may be less open to information that challenges their current beliefs, thus possibly being disadvantaged by judgment and decision-making biases. In addition, grittier individuals have the potential to miss out on new opportunities by continuing their course and remaining focused on their original goal (Duckworth & Eskreis-Winkler, 2013).

Moreover, eight of the non-significant relationships were all of the moderating effects. This contradicts previous research endeavours, and the insignificant relationships may be the result of many considerations and warrant further thought and investigation.

Future research should consider expanding the current hypothesised structural model by incorporating other potentially relevant latent variables. These variables include emotional intelligence, all or specific types of justice, organisational commitment, personality, etc. Specific studies on an emergency services sample acknowledge the importance of organisational culture (Adriaenssens et al., 2015; Jeve et al., 2015; Timms et al, 2015) and organisational support (Adriaenssens et al., 2015; Clark, et. al., 2014; Fiabane et al., 2013; Hargrove et al., 2013; Tzoneva, 2012).

As a result of the current research study, in which the reliability of the job demands scale was questioned as a result of the findings presented in Chapter 4, the researcher suggests investigating job demands in more detail. For instance, once broken up into job insecurity and overload, the construct job demands still did not indicate significant relationships, except for the relationship between overload and stress (hypothesis 7). Thus, job demands may be better understood according to the challenge-hindrance framework, in which stressors are either challenge-related (resulting in positive consequences) or hindrance-related (leading to negative outcomes). Other additional subscales/variables may be relevant in the make-up of job demands, and this warrants further investigation. Moreover, it is necessary to explore whether the job demands–resources model is the most relevant way of measuring emergency

service personnel's perception of their work environment, or whether another tool would be more appropriate, for example the Work Design Questionnaire.

The participants in the current research study had worked predominantly in the health services industry for between five and 10 years, after which there is a steady decline in number of years of service in the industry. Thus, it may be interesting to consider the candidates' stage of employment (i.e. newly hired, close to retirement) and/or their tenure, because it may influence their perceptions of their work environment and their job characteristics (Babcock-Roberson & Strickland, 2010).

5.4. Discussion

The objective of this research study was to test a proposed structural model that illustrates how salient job demands, job resources and personal resources influence engagement and stress among emergency personnel within the South African health services context. More specifically, the research study aimed to (1) determine the level of stress and work engagement among emergency personnel; (2) identify the most salient antecedents of variance in stress and work engagement; (3) as a consequence, propose and test an explanatory stress and engagement structural model, incorporating mental toughness as a personal resource; and (4) recommend practical interventions for emergency personnel in the health services that could decrease stress and improve work engagement.

The current study thus asks why there is variance in work engagement and stress between the different emergency workers operating within different environments. The effects of salient resources and demands on stress and engagement were thus explored and discussed.

Eighteen hypotheses were formulated in this research study; ten being main interaction effect relationships and eight being moderating interactions. Of these eighteen hypotheses, a total of six were found to be significant. However, it is important to note that eight of the non-significant paths were all of the moderating effects. Hypotheses 2, 3, 6 and 8 of the main effects were also found to be statistically insignificant. Unknown variables may moderate or mediate the relationship between these variables, therefore no direct relationship could be found. More research needs to be conducted on these specific relationships, as this contradicts previous research endeavours and the reasons for the insignificant relationships

may be the result of many considerations and warrant further thought and investigation. Furthermore, very little research was found on the specific variables and their moderating effects. Consequently, more research needs to be done on the moderating effects of the specific job resources, personal resources, job insecurity and overload. The non-significant paths might also be due to the inclusion of the job demands section of the Job Demands–Resources Scale, which was considered to be problematic, as explained earlier. The small sample size due to low participation rates could have also adversely influenced the results.

Hypotheses 1, 4, 5, 7, 9 and 10 were all shown to be statistically significant and thus in accordance with existing literature on these interactions. Hypothesis 1 explored the interaction between stress and work engagement. Hypothesis 4 examined the path between job resources and work engagement. Hypothesis 5 investigated the relationship between mental toughness and work engagement, while hypothesis 7 examined the path between overload and stress. Hypothesis 9 looked at the relationship between mental toughness and stress and, lastly, hypothesis 10 explored the interaction between job resources and mental toughness. Thus, the current study partially supports JD-R theory, with the measurement of job demands being red-flagged.

It is recommended that industrial psychologists, unit managers, supervisors, employers and human resources personnel within the emergency services use these results to identify problem areas within this industry, but also to highlight strengths that can be capitalised on.

5.5.   Chapter summary

By testing the main paths of the JD-R model and by exploring additional variables and relationships in the model, the present study has made a contribution to JD-R theory. The study has also added value to the newly researched concept of mental toughness, and thus contributes to literature on the concept within the health services industry. Furthermore, the study has added significant value to validating the Stress Overload Scale (SOS) in a South African context.

As a result of the current research study questioning the reliability of job demands as a whole construct, the researcher suggests looking into the construct of job demands in more detail. Although the construct was further broken down into its two sub-factors to improve the data

analyses, there still was a lot of uncertainty regarding the construct as a whole, and its relevance for this particular sample group, when analysing the impact of job demands on emergency service workers' level of stress and engagement. Moreover, the researcher suggests exploring whether the job demands–resources model is the most relevant way of measuring emergency service personnel's perceptions of their work environment, or whether another tool would be more appropriate.

The study also has contributed to the understanding of work engagement and stress among South African emergency services personnel in Gauteng and the Western Cape, South Africa. The reported research findings demonstrate the influence that job insecurity and overload, job resources and mental toughness have on work engagement and stress.

Furthermore, this research study is valuable to industrial psychologists, line/unit managers, supervisors, employers and human resources personnel within the emergency services, as these results have aimed to identify problem areas within the industry, but also highlight strengths that can be capitalised on.

In conclusion, this chapter has proposed practical managerial interventions to attend to the problems that were manifest in the results. The researcher's proposed strategies have considered interventions at the task, individual, team and organisational levels. Lastly, various limitations of the present research study, and recommendations for future research ventures, were acknowledged and discussed.

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