

The Role of the Line Manager in Promoting Well-being and  
Capability in Specialist Unit Ambulance Personnel

Christopher Leather, BSc.

Thesis submitted to the University of Nottingham for the  
degree of Doctor of Philosophy

September 2015

# CONTENTS

ABSTRACT .....	1
Keywords.....	2
CHAPTER 1: LITERATURE REVIEW .....	3
Overview .....	3
The role of social support in promoting and maintaining well-being.....	4
The importance of the line manager/supervisor on well-being .....	10
Supportive management and work attitudes.....	14
Management and employee performance.....	17
The relationship between manager behaviour and capability (efficacy) .....	23
The role of organizational culture.....	25
Stress in the ambulance service.....	27
Evaluating existing measures of social support .....	29
Setting the review parameters .....	30
Social support questionnaire (SSQ).....	32
Interpersonal Support Evaluation List (ISEL).....	34
Multidimensional Scale of Perceived Social Support (MSPSS) .....	36
Inventory of Supportive and Unsupportive Managerial Behaviours (ISUMB) and the competency based approach.....	38
Reflective summary .....	43
Research aims and hypotheses.....	45
CHAPTER 2: OVERVIEW OF METHODOLOGY .....	51
Design.....	51
Participants .....	51
Procedure.....	52
Focus groups: SMBi.....	58
Focus groups: Capability (efficacy) .....	61
Measures.....	64
Manager behaviour.....	64
Physical health and well-being.....	65
Symptoms of post traumatic stress disorder (PTSD) .....	67
Work burnout.....	68
Work engagement .....	69

Job satisfaction.....	71
Perceived Individual Work Capability (efficacy) .....	71
Intention to quit.....	75
Organizational commitment .....	76
Attitudes towards patient care .....	76
Collective capability (efficacy).....	80
Data analysis .....	81
<b>CHAPTER 3: DEVELOPING THE SUPPORTIVE MANAGER BEHAVIOUR INVENTORY .....</b>	<b>82</b>
Manager behaviour (SMBi) measure: The development (time 1).....	83
Principal axis factoring: The rules of factor loading.....	86
Principal axis factoring: The results .....	86
Confirmatory factor analysis: The debate about model fit indices .....	89
Confirmatory factor analysis: Assessing the results of the model fit tests.....	91
Confirmatory factor analysis: Latent and observed variables in CFA models .....	92
Confirmatory factor analysis: Assessing the models .....	93
Manager behaviour (SMBi) measure: The development (time 2).....	99
Confirmatory factor analysis: Assessing the model fit of the SMBi in the follow-up study. ....	102
<b>CHAPTER 4: DEVELOPING THE CAPABILITY (EFFICACY) MEASURES ....</b>	<b>106</b>
Capability: The development of measures .....	107
Individual capability (ICAP): The development (time 1) .....	110
Principal axis factoring: 16-item ICAP .....	114
Confirmatory factor analysis: 16-item ICAP.....	115
Collective capability (CCAP): The development (time 1) .....	123
Principal axis factoring: 9 item CCAP .....	126
Confirmatory factor analysis: Collective capability.....	128
The development of capability measures: Time 2 investigation .....	134
Individual capability: Time 2 investigation .....	136
Collective capability: Time 2 investigation.....	140
<b>CHAPTER 5: ASSESSING THE IMPACT OF MANAGER BEHAVIOUR USING CROSS-SECTIONAL ANALYSIS .....</b>	<b>144</b>
Selecting the cases .....	145
Preliminary data checks .....	149
Construct validity of measures .....	150

Manager behaviour.....	150
Capability .....	151
Correlations and descriptive statistics .....	153
Multiple linear regression analyses .....	154
Mediation analysis: The impact of perceived organizational support.....	163
Mediation models .....	168
Summary of the cross-sectional and mediation results .....	174
Structural Model .....	176
Capability .....	178
Well-being.....	178
Work attitudes .....	178
Model fit and relationships between variables .....	181
Interim conclusions.....	182
<b>CHAPTER 6: ASSESSING THE IMPACT OF MANAGER BEHAVIOUR USING LONGITUDINAL ANALYSIS .....</b>	<b>184</b>
Nested data: Time 2 investigation .....	186
Assessing the correlation matrices of participants in both study 1 and 2.....	188
Hierarchical regression analyses.....	193
Summary of the longitudinal results.....	218
<b>CHAPTER 7: DISCUSSION .....</b>	<b>219</b>
Summary of results .....	219
Reintegration with the literature.....	222
Capability reconsidered .....	232
Critical evaluation of the current research .....	234
Practical implications .....	236
Conclusion.....	240
Future research areas to be addressed .....	240
<b>REFERENCES .....</b>	<b>243</b>

## **Acknowledgements**

I cannot possibly do justice to the important contribution made by those around me. A few kind words on a page is not enough. I write this as a small token of my gratitude to those who guided me through this process. Your words and actions will continue to guide me throughout my life.

To my supervisors, Dr. Nigel Hunt and Professor Stavroula Leka: thank you for sharing your knowledge and expertise throughout. It has been a privilege. To Dr. Tony Zarola: none of this - or what comes next - would have been possible without you!

To my brother, Mike: no words can express how much of a positive influence you are in not only on me completing this work, but in tackling any and all challenges life brings. In my eyes, you are the most intelligent and inspirational of us all. To my mum and dad: you both have always been there to teach and guide me. You have shown me so much love and support it will last for eternity. I am so proud to be your son. To Gabi: mate, I could write an entire thesis just on you alone! You have always been there for me, day or night, and you are the best friend anyone could ask for. You are family to me! And Raddy: you made finishing this thesis enjoyable. Your intelligence and laughter made working through the night feel like the middle of the day. Finally, thank you to all my friends from our time at school, as undergraduates or wherever we met - the support and encouragement you have all shown me has been amazing. Thank you.

## **ABSTRACT**

The impact of line manager (supervisor) behaviour on employee well-being, work attitudes, performance and perceptions of organizational culture are assessed using a sample of specialist unit (S-Unit) ambulance personnel. Underpinning line manager behaviour was a 10 item, two-factor structure: supportive (six items) and unsupportive (four items) manager behaviour (see chapter 3). Analysis of manager behaviour on outcome variables was performed using cross-sectional (n = 473) and longitudinal, matched-cases, analysis (n = 242). Cross-sectional analysis (see chapter 5) revealed that supportive manager behaviour was significantly related to increased proximal and distal collective capability, individual capability (efficacy; see chapter 4), work engagement, attitudes towards patient care, organizational commitment, perceived organizational support and job satisfaction; and negatively related to symptoms of ill-health, burnout and intentions to quit. Unsupportive manager behaviour was observed to be significantly related to increased symptoms of ill-health and burnout. It was also found to be marginally related to symptoms of post-traumatic stress disorder. Longitudinal analysis (see chapter 6) revealed that supportive manager behaviour was linked to greater proximal collective capability and reduced intentions to quit. Unsupportive manager behaviour was found to be significantly related to increased reporting of symptoms of post-traumatic stress disorder and ill-health. Reverse causality testing was employed on the

longitudinal data and results showed that symptoms of ill-health may influence perceptions of unsupportive manager behaviour. The factor structure of manager behaviour is discussed and relationships (significant and non significant) are assessed against other research.

**Keywords**

manager behaviour; well-being; work attitudes; performance; organizational culture; cross-sectional; longitudinal.

## **CHAPTER 1: LITERATURE REVIEW**

### **Overview**

This chapter presents a review of the concepts, theories and models underpinning the current research and which help to inform its hypotheses and research objectives. First, the critical role of social support is discussed in relation to stress and well-being, along with the debate surrounding whether support acts as a moderator or a mediator. Second, the role of supportive - or unsupportive - management behaviour is examined in a number of different work-related contexts:

- The impact of manager behaviour on employee physical and psychological well-being;
- The effect of management behaviour on work attitudes e.g. job satisfaction and work engagement;
- The impact of manager behaviour on employee performance operationalised here as:
  - Self-efficacy or perceived capability;
  - Attitudes towards patient care;

Third, the direct and indirect link between management behaviour and perceived organizational support in relation to organizational culture is investigated. Fourth, sources of stress in ambulance work are considered as the sample on which the current research is based are ambulance workers. Given that a fundamental objective of this research is to develop a more specific measure of manager support, it is important to review



existing measures of support, both in the work domain and in other contexts, to demonstrate why a new measure is necessary. This review of existing measures is presented prior to the hypotheses being stated. The chapter concludes with a catalogue of tested hypotheses (both cross-sectional and longitudinal) as well as a statement of hypotheses exploring perceived organizational support as a mediator of the impact of manager behaviour.

### **The role of social support in promoting and maintaining well-being**

The consequences of both chronic and acute sources of work-related stress on employee health and well-being have been widely examined and evidence continually points to the negative effects of stress on sickness absence, staff turnover, presenteeism, negative work-life balance and mental health (Chartered Institute of Personnel and Development, 2007; Cooper & Dewe, 2008; Dewe, O'Discoll & Cooper, 2010; Health and Safety Executive, 2005, 2006, 2007a & 2007b; Hemp, 2004; Sainsbury Centre for Mental Health, 2007). According to the transactional model of stress (Cox & Griffiths, 2010; Leka, Griffiths & Cox, 2002), stress is defined as a negative reaction that emanates in the relationship between an individual (who possesses a set of beliefs, skills and motives) and an environment (or aspect of the environment) that is perceived as being threatening to them. A threatening environment is one in which an individual believes the demands of the situation are greater than their perceived abilities, skills and resources (Cox & Griffiths, 2010). The model (Cox & Griffiths, 2010; Leka, et al., 2002) postulates that support from

others is a core component of the cognitive calculation of resources vs. demands in the appraisal of deciding whether an environment is perceived as being difficult to cope with and is therefore a source of stress and thereby defined as a 'stressor'. The appraisal of an unfavourable - or stressful - environment precipitates a state of arousal, e.g. decreased metabolic activity and increased blood pressure and heart rate, which amplifies the likelihood of experiencing symptoms of ill-health when the reaction is prolonged (Dickerson & Zoccola, 2011).

In line with this contemporary model, social support has mitigating properties on the negative effects of stressors upon people's health and well-being (Dewe, et al., 2010). Dewe et al. (2010) and Leather, Lawrence, Beale, Cox & Dickson (1998) have identified that the theoretical relationship between support and strain can take a number of different pathways. First, support might act directly on the stressor, reducing its perceived level of threat. Second, support could directly increase well-being, thereby reducing the consequences of the stressor. Third, support might act between a stressor and associated strain to moderate and/or mediate the relationship. As different types and sources of support are believed to contribute to specific aspects of stress and strain (Beehr, 1995; Leather et al., 1998), it is unsurprising that there is no universal agreement regarding the correct theoretical direction, possibly alluding to the need for more sophisticated ways of researching the construct.

When accounting for the effect of support on well-being, evidence for the moderating role of support between stress and strain has been observed (Cohen & Wills, 1985). In their seminal paper, Cohen and Wills (1985) concluded that social integration - defined as being part of a network of people - and receiving functional support are two distinct processes. The term 'social support' is widely regarded as being someone's belief/perception that they are loved and valued by other significant individuals and wherein they are part of a network of people who provide help (emotional or practical) when needed (Taylor & Sherman, 2004; Wills, 1991).

Notwithstanding the importance of the literature on the moderating role of support, an increasing number of researchers (e.g. Manning-Walsh, 2005; Schradle & Dougher, 1985; Sherry, Law, Hewitt, Flett & Besser, 2008; Sun, Buys, Stewart, Shum & Farquhar, 2010; Uchino, 2009) suggest that support is better conceptualized as a mediator and as it is believed to have a protective influence over time (Rutter, 1987; Uchino, 2009). In support of this, Schradle & Dougher (1985) reviewed the social support literature and concluded that "some studies ... have failed to find any evidence of the buffering effect but have instead shown support to have an independent relationship with [a] disorder[s]" (p. 656). Rutter (1987) also suggested that factors in one's environment, e.g. support from others, potentially have the ability to increase an individual's coping ability when faced with situations/events that they perceive to be stressful. For example, Sun et al. (2010) reported that social support

mediated the relationship between stress and smoking behaviour in undergraduate and post graduate university students (n = 3,515), concluding that support was linked to reduced smoking. Similarly, Manning-Walsh (2005) reported that support from others mediated the negative effects of breast cancer treatment on quality of life in women (n = 100) concluding that as support increased, so does the patient's quality of life. Sherry et al. (2008) reported that the link between perfectionism - defined as feeling that one is not performing to a high enough standard compared to their peers - reduced mental health (e.g. depression) is mediated by social support.

In an attempt to better understand its effects, researchers have reliably reported that greater social support is linked to improved well-being through improved physiological and biochemical functioning, e.g. reduced heart rate, blood pressure and inflammation, and improved neuroendocrine responses to stressors (Bowen et al., 2013, Costanzo et al., 2005; Umberson, 1987). In support of this relationship, research has linked low levels of support to a number of illnesses, including: cardiovascular disease, strains of cancer and infection (Brummett et al., 2001; Frasure-Smith et al., 2000; Hibbard & Pope, 1993; Lee & Rotheram-Borus, 2001; Patterson et al., 1996; Rutledge et al., 2004; Welin, Larrson, Svardsudd & Tibblin, 1992).

Berkman and Syme (1979) are frequently cited as being the first investigators to robustly demonstrate the critical nature of social support

(e.g. Lewis & Rook, 1999; Lino, Portela, Camacho, Atie & Lima, 2013; Taylor & Sherman, 2004; Uchino, 2006; Umberson, 1987). They concluded that a greater level of social support is linked to an increased life expectancy of 2.3 years in males and 2.8 years in females. Improvements in scientific methodology enabled this relationship to be explored further and in their meta-analysis (n > 308,000), Holt-Lundstad, Smith and Layton (2010) concluded that individuals with relatively low levels of support were approximately twice as likely to have died compared to those individuals who had greater levels of support. Some authors have even suggested that the level of support predicting well-being and mortality is at least equal to - and possibly more influential than - other widely accepted disease risk factors, e.g. smoking, obesity and blood pressure (House, Landis & Umberson, 1988; Taylor & Sherman, 2004). In effect, one's social ties are linked to reducing the occurrence of stress reactions (Dickerson & Zoccola, 2011).

In addition to the physical health benefits of support, evidence has also been reported suggesting that relationships with significant others can improve psychological well-being e.g. increased, self-esteem, control and efficacy beliefs (Cohen, 2004). These, in turn, may reduce the occurrence of depression and anxiety and increase health behaviour in the recipient of support (DiMatteo, 2004; Ginzburg, Ein-Doe & Solomon, 2010; Shumakker & Hill, 1991; Wallston, Alagan, DeVellis & DeVellis, 1983). In relation to post-traumatic stress disorder (PTSD), research has reported that social support has mitigating properties on the onset and progression

of PTSD (e.g. Charuvastra & Cloitre, 2008; Kaspersen, Matthiesen & Gotestam, 2003; Koenen, Stellman, Stellman & Sommer, 2003; Schumm, Briggs-Phillips, Hobfoll, 2006).

As defined by the DSM-5, PTSD stems from "exposure to actual or threatened death, serious injury, or sexual violence" (p. 271). The reverse has also been observed. For example, Ullman and colleagues (Filipas & Ullman, 2001; Ullman, 1996; Ullman & Filipas, 2001) report that social isolation (perceived lack of support) or perceived negative social interactions (e.g. when veterans return home to an overarching public opinion that has been against military action or the sometimes negative social stigma towards victims of rape) are positively associated with symptoms of PTSD.

Social control theorists (e.g. Cohen, 1988; Lewis & Rook, 1999) suggest that people may feel a sense of internal responsibility to their significant others and thus keep to a healthier lifestyle (e.g. engage in regular exercise and improve their diet) or may be actively encouraged by their significant others to resist health-damaging activities (Callaghan & Morrissey, 1993; Lewis & Rook, 1999; Umberson, 1987). For example, it has been found that, over a three year period, greater social support is associated with reduced tobacco usage in both sexes and increased female physical activity and sleep (Umberson, 1992). In addition, the support from others post-trauma interacts with the triadic reciprocal determinism feedback system (Smith, Benight & Cielack, 2013) that

alters an individual's coping self-efficacy (Bandura, 1997; Schwarzer & Knoll, 2007). In simple terms, support received from others demonstrates to the individual that they can expect to receive necessary help (in the present and in the future) which reduces anxiety and the activation of the stress reaction (Bandura, 1997; Bowen et al., 2013; Schwarzer & Knoll, 2007; Smith et al., 2013; Uchino et al., 2013). Having social support also helps a victim to 'tell their story' which can be an important part of articulating a narrative interpretation of events that helps a victim make sense of what has happened (Joseph, 2000)

### **The importance of the line manager/supervisor on well-being**

As evidenced by the literature previously reviewed, the importance of social support as a precursor to well-being is clearly established. In the workplace, the line manager provides, potentially at least, an especially salient source of support (Arnold, Randel et al., 2010; Donaldson-Feilder, Yarker & Lewis, 2011). The current research focuses specifically on the impact of the relationship between the line manager and employees, in particular the implications of employee perceptions of supportive - or unsupportive - manager behaviour on employee well-being and work attitudes. In the current research, 'line manager' is a term utilized to encompass two organizational titles: managers and supervisors. This operational definition is made on the grounds that not all organizations use the same titles in their hierarchy. For example, some organizations elect not to utilize the title of 'supervisor'; however, a supervisor is still viewed as a line manager. According to the Chartered Institute of

Personnel and Development (CIPD; 2014), a line manager is defined as someone who, within the organization, is responsible for the performance outcomes and well-being of individuals and/or teams.

The impact of employees perceiving their line managers as being 'supportive' or 'unsupportive' has started to be researched in the literature. In their review of the precursors to work-related stress, Arnold, Randal et al., (2010) conclude that managerial support - or the lack of support - has an influence on employee coping. They suggest that support from one's supervisor is associated with improved coping which, in turn, has health-related outcomes in the medium- to long-term. For example, a supervisor has more authority over the workload and the manner in which the employee conducts their tasks. Having a manager who recognises when an employee is overworked and acts appropriately is likely to reduce the effects of the stressor. In relation to these consequences, research has found evidence to suggest that the level of perceived manager support has links to both physical and psychological well-being (e.g. Brown & O'Brian, 1998; Einarsen, & Mikkelsen, 2003; Greenglass, Fiksenbaum & Burke, 1994; Leyman & Gustafsson, 1996; Rayner & Cooper, 2006; Tepper, 2000;). For example, in their 14-month longitudinal investigation (n = 562), van Dierendonck, Haynes, Borrill & Stride (2004) examined the association of supervisor support with psychiatric symptoms of ill-health (e.g. depression and anxiety) and concluded that perceiving one's supervisor to be more supportive was linked with lower levels of symptom reporting. Gilbreath and Benson



(2004) also demonstrated the link between supportive supervision and psychological well-being. They concluded that, after controlling for support from work colleagues, family member and friends, age, health behaviours, and both stressful work and home events - supportive management was associated with reduced symptoms of psychiatric disorders e.g. anxiety, insomnia and depression.

Nielsen, Yarker, Brenner, Randall & Borg (2008) conclude that supportive management was linked to improved well-being, but their study utilized a measure of well-being that incorporated items of physical health, e.g. 'have you over the past two weeks felt active and energetic?' (p. 469).

Additional evidence has also been observed that links supportive supervision to employee levels of burnout. According to Schaufeli, Maslach and Mareck (1993), burnout is said to incorporate three elements: high emotional exhaustion, cynicism and reduced self-efficacy. Studies have identified a negative association between the level of perceived managerial support and work-related burnout (e.g. Brown & O'Brien, 1998), while others identified links between managerial support and aspects of burnout. For example, in a sample of Dutch teachers, supportive supervision and performance/role feedback from one's manager was observed to buffer the impact of high workload (overload) and reduce signs of emotional exhaustion and cynicism (Bakker, Demerouti & Euwema, 2005). Other studies have identified an association between support and individual levels of emotional exhaustion (e.g. Escriba-Aguir & Perez-Hoyos, 2007; Hetland, Sandal & Johnsen, 2007).

The literature also reveals that employee perceptions of working under unsupportive or abusive managers has been linked with a number of negative consequences. In Tepper's (2000) investigation, abusive supervision was defined as "sustained display of hostile verbal and nonverbal behaviours, excluding physical contact" (p. 178). In his six-month longitudinal investigation, non physical acts of abuse were found to be related to increased work-family conflict and symptoms of depression, anxiety and emotional exhaustion (Tepper, 2000). In other research, Tepper and colleagues (Tepper, 2007; Tepper, Duffy & Shaw, 2001; Zellars, Tepper & Duffy, 2002) identified that abusive supervision was associated with a range of negative consequences including reduced prosocial behaviour towards others in the organization and diminished compliance with organizational authority.

Other researchers have also identified both physical and psychological consequences of abusive supervision. For example, Ashforth (1994) reported links between tyrannical supervision and reduced employee self-esteem, productivity, team work and compliance with leader instruction. Ashforth (1994) also observed increased activation of the stress reaction, frustration and helplessness in employees with unsupportive supervisors/line managers. In his investigation, a tyrannical leader is defined as "someone lord[ing] power over others" (Ashforth, 1994; p. 1). In addition, negative and abusive supervision has been linked with reduced physical health and increased alcohol consumption (Bamberger & Bacharach, 2006). Links to mental health have also been observed. For

example, in a Swedish mental health sample (n = 64), Leymann & Gustafsson (1996) observed that fifty percent of those bullied displayed symptoms of post-traumatic stress disorder. Similar results have also been reported by Rayner & Cooper (2006) and Rayner, Hoel & Cooper (2002).

The underpinning message from the research around negative acts of managers is that behaviours appear to range from subtle acts of hostility to explicit acts of aggression. For example, the Negative Acts Questionnaire-Revised (NAQ-R; Einarsen, Hoel & Notelaers, 2009) identified three inter-related dimensions that escalated in terms of their level of aggression: work-related, person-related and physically intimidating bullying. Example items of each dimension are: "someone withholding information which affects your performance", "being humiliated or ridiculed in connection with your work" and "being shouted at or being the target of spontaneous anger" (p. 32). While the research generally agrees that negative behaviours equate to a spectrum of negative actions (e.g. Einarsen et al., 2009; Keashly & Harvey, 2005), the current research focuses on the actions that are less overtly aggressive and might therefore arguably be related to the 'work- and person-related' factors in the NAQ-R.

### **Supportive management and work attitudes**

Embedded in the literature is evidence linking managerial support to employee work attitudes, on the grounds that support is a valuable

resource (Attridge, 2009; Bakker & Demerouti, 2006; Bakker, Hakanen, Demerouti & Xanthopoulou, 2007) that helps people cope with the demands they face at work.

The Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2006) is a core theoretical component of the current research that builds upon the evidence relating to support as a resource. The JD-R model suggests that any work environment can be divided into two components: job demands and resources. According to the model, job demands are defined as any component of the job that - through sustained effort and/or skill - is associated with physical and/or psychological costs. Resources, on the other hand, are viewed as being "physical, psychological, social or organizational aspects of the job that are either functional in achieving work goals, reduce job demands and the associated costs, or stimulate growth, learning and development" (Bakker & Demerouti, 2006; p. 312).

Attridge's (2009) review of work-related factors that contribute to employee work engagement suggested that that supportive management has the potential to buffer the negative effects of poor work conditions and job demands. Researchers generally agree that employee work engagement is a multi-faceted construct incorporating three dimensions: a physical, emotional and cognitive component (Attridge, 2009). The physical component incorporates the physical time and energy employees put into their roles; the emotional component draws on the feelings of enjoyment and satisfaction in conducting work-related tasks; while the

cognitive element focuses on how much the employee becomes absorbed by his/her work (Attridge, 2009). This multifaceted nature of engagement means that there is conceptual overlap with other work attitudes, e.g. job satisfaction and intention to quit, since engaged employees are believed to perceive their workload to be relatively more manageable (Nelson & Simmons, 2003) and workload is linked to satisfaction and turnover intentions (e.g. Baruch-Feldman, Brondolo, Ben-Dayana & Schwartz, 2002; Mansell, Brough & Cole, 2006; Tepper, 2000).

Past research has identified links with other work attitudes. In their meta-analysis, Ng and Sorensen (2008) demonstrated the importance of supervisor support on job satisfaction, affective commitment and turnover intention compared to support from colleagues. They concluded that, in each case, supervisor support was a stronger positive predictor of job satisfaction (.52) and commitment (.48) and negative predictor of turnover intentions (-.36), compared to support from colleagues (.37, .28 and -.19, respectively). Further evidence was provided for the link between support from management and employee job satisfaction, organizational commitment and intention to quit. Mansell et al. (2006) concluded that, over a three year period, job satisfaction was positively associated with support from management. As well as finding well-being related consequences for unsupportive management, Tepper (2000) reported that employees who perceived their supervisor as consistently abusive were more likely to leave their role, compared to those who consistently viewed their supervisor as supportive.

## **Management and employee performance**

The literature reviewed so far demonstrates the link between the perceived level of support from line managers and the benefits of a manager being seen as supportive in terms of its advantages to employee well-being and work attitudes. Linked to these constructs is employee work-related performance (Bhanthumnavin, 2000 & 2003; King's Fund, 2012) since line managers have the ability to motivate and guide employees to improve their work-related productivity (Bhanthumnavin, 2003) and affect the employee's work environment (Bandura, 1997).

Researchers generally agree that work-related performance is a construct that comprises many different aspects that are - to some extent - dependent upon the organization's goals and aspirations (Campbell, 1992). As a result, employee performance is typically measured utilizing an algorithm developed by the organization that typically includes three components: time spent working, quantity and quality of work delivered (Bhanthumnavin, 2003; Swanson, 1999). For example, in the review of performance across disciplines, Holton (1999) discussed how each field (e.g. human resources, ethics, psychology and economics) has its own interpretation of performance and that, in every case, there was bias towards their targets stating that "each profession has defined performance in a way that fits its purpose" (p. 27).

In relation to health care, the relationship/interactions between professionals and services users has been observed to have important

health-related consequences (Laschinger & Leiter, 2006; Prins et al., 2010; West & Dawson, 2012). For example, in a study of Canadian nursing staff (n = 8,597), low employee work engagement and high symptoms of burnout were related to negative patient experiences, e.g. treatment errors, patient complaints and infections (Laschinger & Leiter, 2006). Similar results were observed in a Dutch study (Prins et al., 2010), which concluded that lower staff work-related burnout was associated with fewer procedural mistakes. Research also indicates that service user infection and mortality rate is lessened when healthcare professionals are more engaged in their work (West & Dawson, 2012). Since engagement is linked to the work environment, and an employee's line manager is a core component (King's Fund, 2012), the link between perceptions of supportive management and attitudes towards patients is a crucial avenue for exploration.

This is evidenced by the Francis QC report (2013) that was commissioned to examine the Staffordshire Trust's nursing practices in relation to the experience and quality of care provided to service users. The Francis report (2013) identified some important points relating to staff attitudes towards patients, noting that some staff treated service users with "callous indifference" and patients were suffering as a consequence (p.13). The Francis QC report (2013) suggested that one of the root causes of this was an unsupportive culture within the organization, stating that:

*"The culture at the Trust was not conducive to providing good care for patients or providing a supportive working environment for staff; there was an atmosphere of fear of adverse repercussions; a high priority was placed on the achievement of targets; the consultant body largely dissociated itself from management; there was a lack of openness and an acceptance of poor standards" (Francis QC, 2013; p. 13).*

In relation to employee's attitudes towards patients, nurses were exhibiting poor management - or perhaps a lack of management in some cases - and pressured to meet targets that pulled their attention away from patient care and experience. The link between supportive - or unsupportive - management and employee's attitudes towards their patients is therefore of significant practical importance and a critical avenue to explore.

Redmill (1997) identified that managers are an important 'cog' in the organizational 'clock' that represents its beliefs and practices surrounding employee safety at work. While it has been suggested that a culture of safety within an organization cannot be forced, the actions of managers are believed to be perceived by employees as promoting positive or negative safety practices, e.g. providing training opportunities or having a lax attitude on the need for skill development, respectively (Chmiel, 2000; O'Toole, 2002; Redmill, 1997; Vredenburg, 2002). Safety culture is defined as the "values, attitudes, competencies and patterns of behaviour ... of an organization's health and safety programmes" (Health



& Safety Commission, 1993; p. 4). The typical organization has often been described as implementing safety practices after-the-fact (Health & Safety Commission, 1993) and research has identified that these practices - or unsatisfactory safety-related behaviours - have in some cases, been a contributing factor in producing potentially dangerous work-related behaviours (Harvey et al., 2002; Hofmann & Stetzer, 1996).

Benefits of producing a positive safety culture are evident in the literature. For example, Chalk, Donald and Young (1997) reported that, in a UK based energy company, the implementation of safety programmes resulted in a fall in the rate of accidents, absence and sick leave (approximately 10% reduction in all three variables). James and Jones (1979) concluded that the rate of incidents within organizations was significantly lower when managers were more experienced, compared to relatively inexperienced managers. Seemingly, the relatively experienced managers were able to identify the potential work-related risk factors and better able to mitigate these effect of their employees through guidance (training) and support.

While employee performance may be organization and field specific, research has identified that employee self-efficacy is a critical contributor of effective performance (e.g. Bandura, 1997; Judge, Jackson, Shaw, Scott & Rich, 2007; Stajkovic & Luthans, 1998). Individual efficacy (or self-efficacy) is defined as "a generative capability in which cognitive, social, emotional, and behavioural subskills must be organized and effectively orchestrated to serve innumerable purposes" (Bandura, 1997;

p. 36-37. Collective efficacy (or collective capability of a group), on the other hand, is defined as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997; p. 477). Where self-efficacy focuses upon the perceptions of what an individual believes they are capable of, collective efficacy refers to what the group, as a whole, believe they are capable of.

Efficacy theory (Bandura, 1997) identifies four potential ways in which a line manager can influence how an employee perceives their ability to cope with work demands: i.e. through facilitating 'enactive mastery experience', providing 'verbal persuasion', contributing to 'physiological and affective state', and assisting with the 'integration of efficacy information'. Enactive mastery refers to the valuable process people go through when they persist in seeking to accomplish difficult tasks i.e. tasks that they may not initially succeed at completing. The key here is that the individual is more likely to remain committed to a difficult task if they have greater efficacy. Having a manager who demonstrates trust and confidence in an employee's ability is likely to increase perceptions of employee efficacy, which ultimately leads to improved performance in mastering the task or skill. Conversely, having a manager who undermines or shows little belief in an employee is likely to damage their efficacy level (Bandura, 1997).

Secondly, the verbal persuasion component suggests that a subordinate's efficacy could increase or decrease through verbal communication where having a line manager encourage, support and reward individuals for their effort and performance is believed to increase self-efficacy. Thirdly, the physiological and affective state of the employee is linked to efficacy beliefs since individuals attribute long-term stress reactions to limitations in their ability to cope with situations. Consequently, line managers who appropriately protect and manage the work environment to reduce the occurrence of the stress for their employees are likely to increase efficacy beliefs. Finally, as efficacy-related information arrives in many different forms, the integration of all the information to construct the complete efficacy picture for the individual is believed to be vital. Therefore, if an employee is perceiving their performance to be acceptable - perhaps evidenced by colleagues appreciation of their work - yet their manager does not demonstrate actions that are coherent with the others, it is likely to have a negative effect on employee efficacy. Conversely, having a manager whose input, advice, guidance and direction is coherent with the other indicators of performance is likely to reaffirm the employee's self-efficacy beliefs (Bandura, 1997).

Bandura (1997) makes the important point that reduced efficacy not only makes it more likely that someone will perform poorly on a task, but also that they will avoid attempting the task in future. In relation to the current study, there are two important meta-analytic investigations by Stajkovic and colleagues that demonstrate the well-established link

between efficacy and performance. The first, primarily related to individual self-efficacy, utilized 114 investigations (n = 21,616) and concluded that self-efficacy was "strongly and positively related to work-related performance" (Stajkovic & Luthans, 1998; p. 255). The second, primarily related to collective efficacy, utilized 69 investigations (n = 18,891) and concluded that collective efficacy was strongly and positively related to the performance of groups (Stajkovic, Lee & Nyberg, 2009). Support for the relationship between efficacy and performance has been observed elsewhere in the literature (e.g. Hansen, Ronnestad, Vegge & Raastad, 2012; MacPhee, Farro & Canetto, 2013; Salas & Cannon-Bowers, 2001). For example, research has observed that relatively low level of perceived self-efficacy - in addition to negative work career events - is associated with greater utilization of emotion-focused coping methods which is associated with reduced work-related performance (Stumpf, Brief & Hartman, 1987). In their review of efficacy, Gist and Mitchell (1992) reported that, while perceived efficacy is undoubtedly influenced by the skill level of the individual, there are a number of other factors that affect the individual's perception of efficacy, e.g. motivation and the demands of the task attempted.

### **The relationship between manager behaviour and capability (efficacy)**

While the above section outlines a unidirectional relationship between levels of support and capability, a two-way relationship/interaction between the constructs is also likely to be true, though here we refer to

*manager* capability (not employee efficacy). While its effects on levels of support are not explicitly tested in this research, it remains an important and potentially influential part of the process to explore the relationship between them. Presented here is an overview of some contemporary theories that demonstrate how capability can affect levels of support.

Bakker and Demerouti's (2006) JD-R model would categorise both efficacy and support as 'job resources'. These resources, according to the Iso-Strain model (Johnson & Hall, 1998), have the ability to interact with one another to help enable employees to overcome work demands.

According to the theory (Bakker & Demerouti, 2006; Johnsons & Hall, 1998), the negative effects of a demanding job, paired with little control of how tasks are conducted (Karasek, 1979), are somewhat mitigated when combined with high levels of appropriate support (Beeher, 1995; Cox & Griffiths, 2010; Johnson & Hall, 1998; Leather, Lawrence, Beale & Cox, 1998).

Self-efficacy has the potential to increase such supportive manager behaviours in a number of ways. Firstly, professional development is a key aspect of employee engagement and job satisfaction (Salas, Weaver & Shuffler, 2014). Thus, a manager who is capable of: i) identifying training and development opportunities that will benefit subordinates; ii) guiding them through the relatively unfamiliar processes/environments; and iii) integrating relevant information so as to derive an appropriate plan of action for both professional development and when the work

environment becomes stressful, is more likely to be viewed as supportive *and* competent (Cutler, 2014; Donaldson-Feilder et al., 2011; Salas et al., 2014; Tett, Guterman, Bleier & Murphy, 2000). The reverse applies for unsupportive/incapable managers. The interaction between support and capability will be returned to in the conclusion (chapter 7).

Xanthopoulou, Bakker, Demerouti and Schaufeli (2009) and Salanova, Schaufeli, Xanthopoulou and Bakker (2010) explicitly suggest that the relationship between resources and efficacy is likely to be cyclical by nature such that they might be conceptualised to exist in a mutually influencing spiral. This further attests to the possibility that support and capability might constitute a two-way relationship with increasing support being linked with increased efficacy and diminished support with lessening efficacy.

### **The role of organizational culture**

The Francis QC report (2013) emphasized that the culture of any health care organization is an important factor in establishing a good level of performance and is - to some extent - an antecedent of negative employee behaviours, e.g. creating an environment where poor performance is acceptable. Organizational culture is defined as the "behavioural norms and underlying beliefs and values that shape the way of doing things in the organization" (Zohar & Hofmann, 2012; p. 653). The line manager plays a critical role in establishing these norms and beliefs (Arnold, Randall et al., 2010). Research has identified that a

culture based on support - or little support - can have an adverse impact on its employees (de Silva, 2000; Tehrani, 2004, Yassen, 1995; Zohar & Hofmann, 2012). Research shows that a supportive culture or environment is a critical resource for an employee who has experienced a traumatic event and may be suffering with symptoms of PTSD or experiencing symptoms of secondary traumatic stress disorder (STSD; de Silva, 2000; Tehrani, 2004; Yassen, 1995). According to Yassen (1995), STSD is similar to PTSD, however, the symptoms are not caused by first-hand experiences, but rather hearing about events that happened to someone else or dealing with the consequences of the initial event as many emergency personnel have to do (Yassen, 1995).

Yassen (1995) states that, just as for PTSD, social support is an aspect of the work environment that cannot be overlooked. Here, the emphasis is on both the physical environment being appraised as safe and secure, and having a culture within the organization that fosters growth and recovery when needed. Yassen (1995) identifies the critical role of managers in this process stating that they should be sympathetic and accepting of the needs of their employees e.g. granting appropriate days for rest and recovery. People suffering trauma reactions have a pressing need to 'make sense of the event' or to articulate their thoughts and associated feelings (Joseph, 2000; Tehrani, 2004). Doing this requires others who will listen and help or encourage the person to tell their story or develop their narrative. Managers can help in this both by encouraging employees to

put across their view of events and establishing a culture of support within the work group or team (Tehrani, 2004).

In his review of support and trauma, Joseph (2000) draws attention to the research linking the social environment as a key component in the recovery from a trauma. The supportive - or unsupportive - culture has been observed to relate closely to individuals developing symptoms of PTSD and the time taken to recover (de Silva, 2000). The consequences of a culture not operating in a supportive manner can be observed when a community as a whole is effected by a traumatic experience, such as a natural disaster. Consequently, the effects can be more severe and longer lasting for individuals, compared to the severity and recovery time of a single individual being made the victim of a trauma (Wardak, 1993). In light of these links, the mediating role of perceived organizational support will be assessed in the current research, as well as the direct relationship between manager support and perceived organizational support.

### **Stress in the ambulance service**

The current research examines the role of the line manager in relation to the well-being, work attitudes, performance and culture of ambulance personnel who are trained to work in specialist groups alongside the police and fire and rescue services. While more detail of the sample is provided in chapter 2, the research is generally in agreement that the work environment of emergency service personnel is fraught with psychosocial hazards (potentially traumatic experiences) that may be



stress-inducing for those in attendance and/or for those around the individual directly affected by the events (Tehrani, 2004). In one report on the well-being of emergency service personnel, the authors concluded that "a substantial group of [those working in that sector] may need support in processing distressing incidents at work" (Clohessy & Ehlers, 1999; p. 251). According to Tehrani (2004), work-related traumatic events can be divided into four sub-groups, all of which could be experienced by this sample of ambulance personnel. These hazards are operational (e.g. chemical, biological, radiological and nuclear); criminal (e.g. victims of physical assault and mugging); interpersonal (e.g. experiencing victimisation first-hand or witnessing a friend/colleague being made the victim of abuse/aggression); and crash-related injuries (e.g. road, rail or air incident).

These features of ambulance work contribute to making ambulance personnel among the worst affected occupational groups for impaired psychological and physical well-being and diminished job satisfaction (Johnson et al., 2005; Smith & Roberts, 2003). For example, in one study of 617 ambulance personnel, 10% reported symptoms of depression and 22% reported symptoms of anxiety (Bennett, Williams, Page, Hood & Woollard, 2004). Van der Ploeg, & Kleber (2003) similarly reported that 10% of their ambulance personnel sample (n = 123) were reporting symptoms of PTSD, fatigue or burnout.

The underpinning message from the ambulance and emergency service literature appears clear: the roles undertaken by these occupational groups are fraught with hazards such that experiencing stress reactions to events is almost likely on a daily basis. In addition, the nature of tasks that they have to respond to could trigger not only symptoms of stress, but also symptoms of PTSD or STSD (Tehrani, 2004).

### **Evaluating existing measures of social support**

As already discussed, the construct of social support consistently receives support for its associations with psychological concepts, attitudes, behaviours and well-being. Its effects as an antecedent and a mediator are repeatedly confirmed (e.g. Brummett et al., 2001; Cohen, 2004; Manning-Walsh, 2005; Sun et al., 2010). Yet, assessment of this construct remains problematic, particularly across samples and contexts. Over the past decades social psychology has seen a dramatic increase in the development of various measures of social support. These are often used on a one-off occasion and their development is open to challenge and critique on the basis that evaluation of these measures is frequently biased and insufficient. Presented here is a more comprehensive review of the general state of social support measures.

Where published reliability and validity evidence is available, it is considered in the review below, e.g. in respect of:

- Social Support Questionnaire (SSQ)
- Interpersonal Support Evaluation List (ISEL)

- Multidimensional Scale of Perceived Social Support (MSPSS)
- Inventory of Supportive and Unsupportive Managerial Behaviour (ISUMB)
- Competency based approach

However, it is a weakness of a number of measures in this area that relatively little, if any, published psychometric evidence is available.

### *Setting the review parameters*

It is important to be clear on the direction this review will take when undertaking a task as wide and varied as reviewing existing measures of social support. Many of these measures are contextually restricted and unsuitable on a number of grounds. The large number of publications to date requires inclusion/exclusion criteria. Measures were excluded if they: i) presented little/no psychometric data to support their structure; ii) required a psychologist to be present in order to collect the support data; iii) were developed during clinical/medical trials, or iv) focused exclusively on family or some other single source of non-work support networks.

Accordingly, the Gore Social Support Index (Gore, 1978), Social Support Questionnaire (Wilcox, 1981), Quantitative Social Support Index (QSSI; Holahan and Moos, 1982), and Social Network List (SNL; Stokes, 1983) are discounted as they have limited reliability or validity figures available, making evaluation impossible. Instruments such as The Arizona Social Support Interview Schedule (Barrera, 1981), Kaplan's Social Support Vignettes (Kaplan, 1977), Social Stress and Support Interview (Jenkins,

Mann, Belsey, 1981), and the Interview Schedule for Social Interaction (Henderson, Duncan-Jones, Byrne and Scott, 1980) require the presence of a psychologist in order to assess the level of social support being reported by participants. As the current investigation is based on a questionnaire design and given to an entire organization with hundreds of employees, these methods have practical disadvantages and are not a viable option.

A number of other measures have been developed as part of clinical/medical trials. For instance, the Personal Resource Questionnaire (Brandt & Weinert, 1981) was based on spouses of individuals diagnosed with multiple sclerosis. The Family Behaviour Checklist (Schafer, McCaul & Glasgow, 1986) assessed support for diabetics. The MOS Social Support survey (Sherbourne & Stewart, 1991) examined perceived support for those with chronic health conditions, while the Duke-UNC Functional Social Support questionnaire (Broadhead, Gehlbach, De Gruy & Kaplan, 1988) measured support for caregivers. Since the current investigation is focusing on the work environment, these measures were not deemed reliable as the participants in the aforementioned studies were potentially coping with life threatening illness. The current investigation focuses on people dealing with very different issues.

A number of familial support measures were discounted, including: the Family Relationship Index (Billings and Moos, 1982), the Family Environment Scale (Moos & Moos, 1981), and the Perceived Social

Support from Family (Procidano & Heller, 1983), as the current investigation focuses on the specific level of support from a supervisor/line manager within an organizational context.

### *Social support questionnaire (SSQ)*

A twofold approach is common to most measures (e.g. Brim, 1974; Kelly, Munoz & Snowden, 1979; Medalie & Goldbourt, 1976; Renne, 1974; Weiss, 1974). This includes i) the quantification of a social network i.e. availability of others, and ii) judgements of one's satisfaction with the received support? For example, in a study on undergraduate students (n = 602), wherein the SSQ was developed (Sarason, Levine, Basham and Sarason, 1983) the authors derived 27 bipartite questions that represented various circumstances. The first part of each question requires the participant to list up to 9 individuals whom they perceive as support providers in each context. This produces a 'SSQN' score. The second part requires an overall rating of satisfaction with all the support received, ranging from very satisfied to very dissatisfied. This produces a 'SSQS' score.

There are a number of weaknesses in this methodology. There is an inherent contradiction within the measure as it is unlikely that someone will list an individual as a good source of social support if they are dissatisfied with the support they receive from them. In effect, the initial part of the assessment makes the second part obsolete. Due to the fact that the SSQ asks participants to report their satisfaction with support

providers and 'collates' them into an average SSQS score a 'poor' support provider could counter the effect of a 'good' support provider - a point that other researchers have also noted (Heitzmann & Kaplan, 1988). This is likely to contribute to a number of psychometric issues such as questionable internal coherence and external validity. Furthermore, as Sarason, Shearin, Pierce & Sarason (1987) report internal reliability estimates of 0.97 which approaches 'singularity' and suggests a lack of breadth in the measure (Kline, 2003). Examination of individual items reveals that many of the items are indeed very similar to one another . For example question 1: "*whom can you really count on to listen to you when you need to talk?*", question 23: "*Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?*" and question 25: "*whom can you really count on to console you when you are very upset?*" (Sarason et al., 1983; p. 1-6) all have an overlapping semantic content. At face value, it appears these would evoke the same response in a participant which would lead to an overlap between these supposedly independent items. Yet, with no reports of factor analyses being carried out, it is difficult to examine cross-loadings and the possibility of multicollinearity.

Without trying to draw too much emphasis on the fact that the investigation was on undergraduate students, this is a unique demographic with an equally unique environment. The authors somewhat acknowledge this, but they suggest that there is no reason their developed tool could not yield similar results from any other population.

This assumption remains to be empirically tested. However, there is research that suggests students typically suffer from more mental disorders, in comparison to non-students (Svanum & Zody, 2001) and, in relation to the current investigation, students have a very different 'network' implemented around them, compared to those in a healthcare setting. In one of the largest studies of student mental health, Adlaf, Gliksman, Demers and Newton-Taylor (2001) found that 34% of participants had some form of issue with their mental health as this is deemed a 'sensitive' period of life.

#### *Interpersonal Support Evaluation List (ISEL)*

Another tool fitting the inclusion criteria is the general population version of the ISEL (Cohen, Mermelstein, Kamarck & Hoberman, 1985). This is a measure that has been used in the past by other researchers spanning different continents including Europe (e.g. Christiaens, Hegadoren & Olson, 2015; Toro & Oko-Riebau, 2015) and Asia (e.g. Choo, Turk, Jae & Choo, 2015; Zhang, Wang, Chen, Zhou & Wang, 2015). At face value, the ISEL tackles the representativeness and generalizability-related issues associated with SSQ as the authors discuss the use of five general population samples in validating their tool. However, closer scrutiny of these samples reveals that they include samples of university students and of smokers taking part in a cessation programme.

Unlike the SSQ, the ISEL does not measure social structure and network size, but rather focuses on social function via the use of 40 specific

questions that assess perceived available support. The scale is subdivided into four distinct categories: appraisal, tangible, self-esteem, and belongingness, with an equal number of questions assigned to measure each subcategory, half of which use reverse scoring. The 'appraisal' items assess perceived availability of somebody to talk to and who one can receive advice from; 'tangible' refers to the availability of material aid in an emergency situation; 'self-esteem' involves comparison of one's self to others in a range of social networks. These comparisons require participants to provide a response to hypothetical scenarios and presume the level of support they would receive in each.

The model's four factor subcategory structure has been questioned by past research teams attempting to validate the measure. For example, Brookings and Bolton (1988) performed a confirmatory factor analysis, reporting high intercorrelations between the components. This suggests that the subcategories are too closely related and perhaps a unidimensional approach better describes this instrument. House and Kahn's (1985) analysis of the measure yielded a two-factor model: tangible support, and one factor encompassing the other three components as the second factor. Issues over the reliability of the subscales and their corresponding factor structure is therefore problematic.

Another issue relates to the response format employed in the measure. Each question is assessed on a four point rating scale and forcing a 'yes'



or 'no' response. Sarason et al. (1987) suggest that this can rapidly lead to 'ceiling' or 'basement' effects, while simultaneously creating problems with homogeneity of variance and decreasing its sensitivity to smaller differences. Unsurprisingly, the original researchers and others (e.g. Brookings & Bolton, 1988; Sarason et al., 1987) have reported a negative skew on many of the items which could easily be a product of the rating scale employed.

The current investigation utilizes a predominantly male population sample. While no gender bias is explicitly tested in the ISEL, the tool has been reported to be a better suited to women, rather than men (Sarason et al., 1987). Moreover, in Sarason et al.'s review, the measure failed to explain any more than 5% of the variance in correlations with physical and psychiatric symptomatology, and other measures used. On the basis on all the evidence provided, it was concluded that ISEL was unsuitable as a measure of support in the current research.

#### *Multidimensional Scale of Perceived Social Support (MSPSS)*

The MSPSS (Zimet, Dahlem, Zimet & Farley, 1988) is a 12-item instrument, designed to measure perceptions of social support from three distinct sources: friends, family and 'significant other', with an equal number of items assessing each component. It utilizes a 7-point Likert-like rating scale, where 1 = 'very strongly disagree' and 7 = 'very strongly agree'. The tool was developed on a sample of 175 Duke University psychology students.

This measure was also discounted on a number of grounds. First, although it attempts to integrate major sources of support, it overlooks that of work colleagues or managers, the importance of which has been recognised in previous work with specialised measures being developed to assess it (e.g. Work Environment Scale; Moos, 1981). Second, it is unlikely that the reported factor structure is, in fact, made up of three equal dimensions. For instance, items measuring support from a significant other use the term 'special person' which could easily be viewed as a friend or family member. Indeed, this is evidenced by the moderate to strong relationship ( $r = .63$ ) between the components of *friends* and *significant other*, suggesting a possible higher order factor structure. Indeed, Cheng and Chan (2004) reported that - through confirmatory factor analysis - a higher order factor structure was observed in the MSPSS in a sample of students in Hong Kong ( $n = 2105$ ). Conversely, in another study carried out in China (Chou, 2000), the MSPSS was found to have two factors (family and friends), rather than the three factors initially proposed by Zimet et al (1988).

Third, the statistical analysis - specifically the extraction algorithm - utilized by the researchers is flawed, in that they use Principle Components Analysis as opposed to Principle Axis Factoring which calculates sets of linear components in the data by analysing variance between items. Strictly speaking, the authors performed the wrong analytic technique and the problem with this is discussed in more detail later. Finally, test-retest reliability was obtained based on a sample of

only 69 participants, which is neither a large number to give a high level of confidence in this psychometric property, nor is it based on a population representative of that in the current research. This issue is similar to that found in the discussion of the SSQ and ISEL measures.

*Inventory of Supportive and Unsupportive Managerial Behaviours (ISUMB) and the competency based approach*

There is a clear lack of behavioural precision and specificity present in the instruments discussed above. This has practical implications since it is increasingly more difficult to reliably convey what 'supportive' - or 'unsupportive' - behaviour looks like in terms of specific behaviours/actions and is particularly true for the relationship between managers and their employees (Rooney & Gottlieb, 2007). However, there are two important contemporary exceptions: the Inventory of Supportive and Unsupportive Managerial Behaviours (ISUMB; Rooney and Gottlieb, 2007; Rooney, Gottlieb and Newby-Clarke, 2009) and the competency based approach to understanding important manager behaviours (Donaldson-Feilder, Yarker & Lewis, 2011; Yarker, Lewis & Donaldson-Feilder, 2008). Each of these measures is outlined and then critiqued.

The ISUMB derives from 64 supportive and 54 unsupportive manager behaviours that were divided into 14 sub-groups: eight positive and six negative. These sub-groups were: 'genuine concern', 'recognition', 'task guidance' and 'assistance', 'trustworthiness', 'professional development',

'open communication', 'reasonableness', 'encourages autonomy', 'apathy', 'untrustworthiness', 'bureaucratising', 'monitors face-time', 'limits decisional discretion' and 'undermining'. Then, using a sample (n = 247) of child welfare agents in Ontario, Canada, Rooney and Gottlieb (2007) performed principal axis factoring to assess the number of dimensions and associated items, reporting a three factor solution: two positive dimensions and one negative dimension.

Yarker et al. (2008) developed their competency-based approach to understanding the specific manager behaviours that promote - or hinder - employee health, well-being and work attitudes on the basis of qualitative and quantitative testing. Qualitative testing was conducted on 21 participants: 6 psychologists and 15 organizational stakeholders. From this phase of testing they derived 152 items that underwent principal components analysis (n = 292). From this analysis the authors grouped items into 'competencies'. Here, competencies refer to important skills, logically grouped together that enable individuals to conduct their job (Boyatzis, 1982; Garavan & McGuire, 2001; Woods & West, 2010). Yarker and colleagues' research divided the concept into four core competencies with each containing a further three sub-competencies: (1) managing emotions and having integrity ('integrity', 'managing emotions' and 'considerate approach'); (2) managing and communicating existing future work ('proactive work management', 'problem solving' and 'participative/empowering'), (3) reasoning/managing difficult situations ('managing conflict', 'use of organizational resources' and 'taking

responsibility for issues'), and (4) managing the individual within the team ('personally accessible', 'sociable' and 'empathetic engagement'). Yarker and colleagues utilized principal components analysis to derive the underpinning factor structure, concluding that supportive and unsupportive manager behaviour are opposite ends of the single underlying construct of support.

While these measures have undoubtedly made an important contribution to the field, there are a number of flaws in the research. Rooney and Gottlieb (2007) include items which, to many researchers, would be deemed to cross-load and therefore need removing. Field (2013) suggests that in order for an item to load onto a single dimension it must attain a value of .4 or above. The item 'asks me how I'm doing' loads onto one factor at .4 and another at -.5 and therefore loads onto two factors. In addition, they remove the item 'doesn't follow through on things' that simply "did not load onto their hypothesized dimension" (Rooney & Gottlieb, 2007; p. 197). This item, statistically speaking, loaded more strongly onto its respective factor, especially compared to the 'asks me how I'm doing' item (factor loadings for 'doesn't follow through on things' over the three reported dimensions: -.54, .27 and -.08). In addition, they included items such as 'goes to bat for me' which is vague and perhaps misleading across cultures.

The ISUMB was later subjected to confirmatory factor analytic procedures by Rooney, Gottlieb and Newby-Clarke (2009), the results of which

reaffirm concerns about the validity of the measure. They elected to reduce the number of the dimensions from the original three factors to two factors based on the assessment of the correlation between two of the original dimensions. However, the model fit indices were more supportive of the original three factor solution, compared to the revised two factor solution (three factor solution: GFI = .84, CFI = .93, RMSEA = .061, compared to two factors solution: GFI = .78, CFI = .90, RMSEA = .075).

The competency-based approach (Donaldson-Feilder et al., 2011; Yarker et al., 2008) has its own set of issues. Yarker and colleagues opted to utilise principal components analysis (PCA) which, strictly speaking, is not exploratory factor analysis (EFA). Rather than assessing underlying factors or dimensions based on communalities between items - which is the function of true EFC - PCA calculates sets of linear components in the data by analysing variance between items (Field, 2013; Tabachnik & Fidell, 2013). These tests are similar and can produce similar outputs, however, they are founded on different principles to serve distinct purposes. Since the current study aims to arrive at a theoretical solution to the data that could be useful to practitioners in multiple work settings, the appropriate method is EFA/principal axis factoring and is one of the reasons why Yarker et al's (2008) measure cannot be utilized. Other issues surrounding item wording also present themselves. Firstly, for example, items such as 'acts to keep the peace rather than resolve conflict issues' assumes that 'keeping the peace' and 'resolving conflict'

are distinct processes that also contradict one another. Furthermore, attempting to maintain a peaceful and productive work environment may mean a range of things, including: mediating between employees, relocation of one or more persons within the organization or providing a managerial perspective on the issue between employees. Many or some of these behaviours could also be viewed as conflict resolution strategies. Secondly, the item 'delegates work equally across the team' asserts that managers must assign employee workload based entirely upon current individual work volume. This fails to take into account factors such as employee health, ability (skills) and circumstances outside of the organization. Finally, this competency-based approach assumes that there is a universally agreed understanding of emotional language (e.g. 'panic' and 'rationality'). The issue here is that whatever one respondent understands by these concepts is relatively subjective and perhaps based on previous experiences. Consequently, the number of issues considered to weaken the validity of the measure meant that it was not deemed suitable for the current investigation.

The current research hopes to make a contribution to the field by developing a measure of specific manager behaviours that are perceived as being supportive and unsupportive by employees; while also addressing many of the methodological issues of the above measures. Chapter 2 provided details of the methodological framework in which the current research was conducted as well as providing the details of the focus groups utilized to develop the SMB measure.

Chapter 2 outlined a number of critical aspects of the development process. Firstly, it provided the detail surrounding the focus groups and initial number of items (70) produced. Secondly, it demonstrated that the measure had been utilized in unpublished MSc investigations and found to be a 14 item, two factor model. Thirdly, chapter two reported that this current research comprised two investigations: time 1 and time 2. The time 1 investigation was utilized to demonstrate the both the exploratory factor analysis of the 14 item model and its subsequent confirmatory factor analysis. The items derived from the time 1 SMB development became the cornerstone of overall assessment of the impact of manager behaviour on outcome variables. To demonstrate the robustness of the measure, the time 2 investigation was utilized to perform confirmatory factor analysis on the items derived from the time 1 study utilizing a different dataset. The 14 items can be seen in table 1.

### *Reflective summary*

While there is a varying degree to which authors report reliability and validity, a meta-analysis (Heitzmann and Kaplan, 1988) showed that support measures have varying degrees of communality to one another. In effect, this demonstrates that there is not a clear definition of support or a universally-accepted social support measure. In fact, almost 3 decades ago, Barrera (1986) suggested that researchers should cease attempting to derive a global definition of support in favour of definitions of support that are related to specific situations/contexts. In addition, there has been a tendency to overlook the negative aspect of social



networks, i.e. unsupportive behaviour (Thoits, 1982). Thoits (1982) suggests that support is conceptually often seen as the 'solution' or response to negative events (e.g. conflict). Ultimately, the possibility of unsupportive actions being an etiological factor/the origin of problems is relatively overlooked (Thoits, 1982). This is something that is ultimately addressed in the current research.

On a slightly different albeit related point, the majority of classical measures of support were developed in America in the 1980's (e.g. the SSQ, ISEL, MSPSS and many that were excluded early on). This period overlaps with one of the worst economic times in the USA since the Great Depression – a double dip recession, starting in 1980 and plunging again 1981. The consequences of this economic environment – including an elevated unemployment rate, budget deficits and very slow recovery – cannot be ignored as a potential influencing factor in the development of support measurement tools. While it is understandable why the construct of social support would have become a topic of academic interest in such a time, it is perhaps more likely that today people would need different types of social support, for different reasons.

Overall, a more behaviourally specific measure of manager support is warranted on the grounds that existing measures are often vague and imprecise; many existing measures have questionable applicability to the world of work; a number of existing measures lack detailed psychometric evidence or have been developed using poorly applied statistical

techniques; contain items which have ambiguous wording; or have been developed on clinical, student and other non work samples.

### **Research aims and hypotheses**

The studies reported above show that employee health and well-being is impacted upon by the psychosocial work environment in that people feel better both physically and mentally when the environment is not viewed as threatening to their well-being. Support has been shown to be an important factor in this favourable environment, with line managers being especially salient. Therefore, it becomes important to identify and establish which specific manager behaviours either promote or damage employee well-being, attitudes towards their work and level of performance. As evidenced by the Francis Report (2013), the supportive culture in an organization is a critical in promoting employee well-being, positive work attitudes and patient focused performance. One method of assessing the level at which an organization is seen as been supportive is through employees' judgements of perceived organizational support.

The aims of this research are therefore to:

- Identify the underpinning structure of supportive/unsupportive manager behaviour;
- Demonstrate the impact of supportive/unsupportive manager behaviours on a range of indicators of employee well-being, work attitude and performance;
- Examine whether perceived organizational support mediates the impact of manager behaviour on the outcome variables;
- Examine the impact of manager behaviour on outcomes utilizing both cross-sectional and longitudinal data in order to try and establish reliable and robust relationships.

The current research utilizes off-the-shelf measures for eight outcome measures: self-reported physical health (PHQ), symptoms of PTSD (PTSD), work engagement (WE), burnout (BO), employee intention to quit (ItQ), employee organizational commitment (OC), perceived organizational support (POS) and job satisfaction (JS). Bespoke measures are designed and developed for the input variable of manager behaviour, and the outcome variables of both individual and collective capability and attitudes towards patient care. The theoretical and practical reasoning behind the development of these measures can be found in chapter 2 (attitudes towards patients care), chapter 3 (manager behaviour) and chapter 4 (individual and collective capability/efficacy).

The details regarding the attitudes towards patient care (APC) measure is included in the methods chapter since the measure was in no way developed in the current research, while the other two measures underwent extensive psychometric development in the current research. For this reason, these measures are written up in their own chapters to appropriately demonstrate the psychometric properties of these newly designed measures. In order to effectively state the research hypotheses, the outcome of the dimension reduction processes of the measures needs to be mentioned here. The specific manager behaviour items revealed two underpinning factors: supportive (SMB) and unsupportive manager behaviours (USMB). Similarly, the items denoting collective capability were also found to be underpinned by two related factors: proximal capability (P.CCAP) and distal capability (D.CCAP). Proximal capability refers to the perceived ability of those working closely around the employee (e.g. ambulance team members), whereas distal collective capability refers to perceived ability in the wider organization (e.g. the S-Unit's ability to utilize its resources effectively and efficiently and to appropriately support its staff). All the items relating to individual capability (ICAP) were found to remain on a single dimension.

Presented below is a list of the relationships to be tested in the current research - utilizing cross-sectional and longitudinal data - with directional (one-tailed) hypotheses being made. Each of the hypotheses utilizes a specific code (e.g. H<sub>1</sub>) that will be referred to later in the thesis when discussing the results of the research. The hypotheses are:

- SMB will be positively and significantly related to the self-perceived level of P.CCAP (H<sub>1</sub>)
- USMB will be negatively and significantly related to the self-perceived level of P.CCAP (H<sub>2</sub>)
- SMB will be positively and significantly related to the self-perceived level of D.CCAP (H<sub>3</sub>)
- USMB will be negatively and significantly related to the self-perceived level of D.CCAP (H<sub>4</sub>)
- SMB will be positively and significantly related to the self-perceived level of ICAP (H<sub>5</sub>)
- USMB will be negatively and significantly related to the self-perceived level of ICAP (H<sub>6</sub>)
- SMB will be associated with improved self-reported physical health (H<sub>7</sub>)
- USMB will be associated with diminished self-reported physical health (H<sub>8</sub>)
- SMB will be associated with decreased reporting of symptoms of PTSD (H<sub>9</sub>)
- USMB will be associated with increased reporting symptoms of PTSD (H<sub>10</sub>)
- SMB will be significantly related to increased employee work engagement (H<sub>11</sub>)
- USMB will be significantly related to decreased employee work engagement (H<sub>12</sub>)

- SMB will be associated with a decrease reported symptoms of work-related burnout (H<sub>13</sub>)
- USMB will be associated with an increase in reported symptoms of work-related burnout (H<sub>14</sub>)
- SMB will be related to improved employee attitudes towards patient care (H<sub>15</sub>)
- USMB will be related to more negative employee attitudes towards patient care (H<sub>16</sub>)
- SMB will be significantly related to decreased in employee intention to quit (H<sub>17</sub>)
- USMB will be significantly related to increased employee intention to quit (H<sub>18</sub>)
- SMB will be significantly related to increased employee organizational commitment (H<sub>19</sub>)
- USMB will be significantly decrease employee organizational commitment (H<sub>20</sub>)
- SMB will be significantly and positively related to employee perceived organizational support (H<sub>21</sub>)
- USMB will be significantly and negatively related to employee perceived organizational support (H<sub>22</sub>)
- SMB will be significantly related to increased employee job satisfaction (H<sub>23</sub>)
- USMB will be significantly related to decreased employee job satisfaction (H<sub>24</sub>)

In addition to examining the relationships between each of these input and outcome variables, the potentially mediating role of perceived organizational support will also be assessed for each of the remaining outcome variables. Since the current research utilises the PROCESS tool (Hayes, 2012) - rather than utilize Baron & Kenny's (1986) three part model - the mediating potential is argued on the effect size (Preacher & Kelley, 2011). The argument for utilizing this methodology is presented in chapter 4, but the general hypothesis made is that perceived organizational support will, at least in part, mediate the relationship between manager behaviour and the various outcome variables.

## **CHAPTER 2: OVERVIEW OF METHODOLOGY**

### **Design**

This research is built upon two annual assessment questionnaires, entitled 'Resilience and Capability', used to gather quantitative data to facilitate the assessment of the impact of manager behaviour on a range of well-being and work attitude variables among ambulance personnel. In addition, the current research comprised two investigations: Time 1 and Time 2. Cross-sectional analysis was performed on the Time 1 investigation (see chapter 5) and the Time 2 study was designed as a follow-up investigation - conducted one year after the initial investigation - measuring the same variables. Longitudinal analyses were achieved through matching cases across Time 1 and Time 2.

### **Participants**

The research was conducted on all UK ambulance personnel employed in specialist Units designed to deliver an improved healthcare response in major incidents, e.g. transport, firearm, civil disorder, flooding, chemical, biological, radiological, and nuclear incidents. These Units will hereafter be termed 'S-Units'. This is a pseudonym requested by the Ambulance Services involved due to the highly confidential nature of some of the incidents they are required to attend e.g. suspected terrorist related incidents. These ambulance personnel are drawn from 16 S-Units located in 11 ambulance Trusts (some Trusts comprise two Units due to the size of the geographical area or population served). For the Time 1



investigation, the number of staff in each Unit ranged from 34 to 45. The total number of questionnaires sent out was 623 and 511 were returned (82.02% response rate overall; ranging from 64% to 94% between S-Units). Information regarding the role demographics for all participants is provided in chapter 3. For the Time 2 investigation, the total number of surveys sent out was 584 and 415 were returned (71.06% overall response rate; ranging from 50% to 100% between S-Units). Again, information regarding the role demographics for the Time 2 investigation can be seen in chapter 3.

### **Procedure**

The research was facilitated by an occupational psychology consultancy and initial liaison with the director established that the time window in which the data distribution and collection needed to be completed to meet the client organizations' requirements also met with academic requirements for the research.

All members of each S-Unit were invited to complete the 2014 Resilience and Capability survey. Participants were informed verbally about the nature of the study upon joining their Trust and were informed about their right to withdraw. They were provided with instructions about how to go about withdrawing and were informed that the completion of the survey would be taken as an indication that they consented to being included in the work - no signature was required. However, participants were asked to provide their initials and date of birth to facilitate matching responses

over time. The reason behind asking for this information was explained to participants. No participants who completed either of the questionnaires later expressed a desire to withdraw from the study.

For both studies, each member was given a questionnaire pack, containing four items:

- The Resilience and Capability survey, dated:
  - 2014 (time 1)
  - 2015 (time 2)
- Raffle ticket for each survey
- An addressed envelope for the return of the survey
- A 'frequently asked questions' information sheet, addressing 15 questions:
  - (1) What is this survey all about? *This is an S-Unit annual resilience and capability survey. The survey is designed to monitor S-Units and highlight any issues that might impact on the general preparedness and resilience of all S-Unit personnel.*
  - (2) What is the raffle ticket for? *Your time and effort in completing this survey is greatly appreciated and to demonstrate this there is an incentive for the return of completed surveys. If your Unit response rate reaches 60% - there will be one prize draw for those who returned their completed surveys in your Unit. The prize will be £50. If your*

*Unit response rate reaches 85% or higher - there will be two prize draws for those who returned their completed surveys in your Unit. Each prize will be £50. For the Unit that achieves the highest response rate and returns their surveys the quickest - a prize of £500 will be provided. Please remember to take one of the raffle tickets and keep it in a safe place. The other should remain on the returned survey.*

- (3) What happens to my information? *Each response to the survey is entered into a database and then analysed to explore whether your experiences are common to other S-Unit personnel either within your Unit or other S-Units. The research will look to see whether certain experiences have positive and/or negative effects on levels of preparedness and resilience.*
- (4) How will my responses be used? *Your responses will be added to the database and be combined with the responses received from other S-Unit personnel. The data then gets grouped together and look for patterns in the data. This helps to prioritise where action is needed to ensure S-Units remain healthy, resilient and prepared.*
- (5) Is my information safe? *Yes, your responses to the survey are completely safe. The data you provide is stored in a secure location that can only be accessed by the research team. Hard copies of the surveys are destroyed once the data*

*has been entered. Online surveys are entered directly into a secure database.*

- (6) Will anyone else see my individual response? *No. Your data is only seen by the research team. Any reports that are produced from this process will only show summary or aggregate level data so that no one individual can ever be identified.*
- (7) Why should I complete this survey? *Your views count. Without your responses there is no way of assessing the resilience of S-Unit personnel and no way of understanding what working life is like for you. The aim is to ensure that strong evidence is used to 'fight your corner' and to help improve the quality of working life as well as the levels of preparedness of all S-Units.*
- (8) What can expect to see in return for my efforts? *All S-Units will receive a localised report on the main findings from the survey. Hard copies of the report will also be made available.*
- (9) Why are there quite a lot of questions on this survey? *The aim of this survey is to provide an indication of what working life is like within the S-Unit environment. The Ambulance world of work is a complex place and there are lots of pressures and demands made of you each and every day. Enough questions need to be asked to develop an accurate picture that relates*

*to your working life within S-Unit. The length of the survey is an indication of the breadth, depth and quality of the assessment the research is looking to undertake.*

- (10) Will I receive any feedback? *Yes, S-Unit personnel will be invited to a feedback session on the findings and will be asked to discuss the findings.*
- (11) When can I expect to see the results from this survey? *The survey is being distributed to all S-Unit sites with the analysis of the survey being undertaken soon afterwards. Feedback sessions will be planned with each S-Unit as soon as possible thereafter where S-Unit personnel will receive a copy of their survey results.*
- (12) Who is interested in this information? *First and foremost, the results of annual survey should be of interest to everyone within your Unit. It is also of interest to those groups who are supporting the on-going development of S-Units. The information is also of interest to senior and executive management within all Ambulance Trusts.*
- (13) Why do you ask for my background information? *Where you are asked for it, the background information is only used to ensure that your responses to this survey can be matched with any previous questionnaires you have completed in relation to S-Unit working. This provides a means to track the work experience of S-Unit personnel and develop a much*

*better understanding of the impact of working life. It also helps to identify any key areas of support that are needed to ensure you remain healthy, happy and resilient.*

- (14) What can I expect to see that will be different as a result of this survey? *There cannot be any guarantee that managers will change as a direct result of your completion of this survey, the aim is to try to influence matters. As part of this survey, time will be spent monitoring whether or not the agreed actions have been completed. The survey findings from all S-Units will help set action plans at the National level.*
- (15) What if I have further questions about this survey? *Please do not hesitate to contact the research team if you have any further questions or concerns about the survey. Contact details are given on the survey and if you have a question about the questionnaire then please get in touch.*

Participants were asked to complete a survey and to keep hold of their corresponding raffle ticket - sending the counterpart back with their completed questionnaire. In addition, they were also instructed to place their survey in the envelope provided, seal it, sign over the seal if they wished, and return the envelope to their line manager. Line managers within the organizations were instructed to collect the sealed envelopes and return them unopened to the researcher via recorded delivery. All questionnaire packages were returned unopened and without the envelope seal being broken.

The raffle ticket was provided as an individual and a collective reward scheme was used to encourage participation in the study. At an individual level, participants were informed that if their Unit exceeded a 60% response rate there would be one winner receiving £50; and if the response rate exceeded 85% there would be a second ticket drawn for the same amount. Prize winners were only selected from the people who submitted a completed questionnaire. At the collective level, there was a £500 prize for the Unit who obtained the largest response rate in the shortest amount of time. These prizes were provided by the occupational psychology consultancy.

#### *Focus groups: SMBi*

While the initial development of the supportive manager behaviour inventory (SMBi) was not conducted as part of this research, details of this process will be included here to give a clearer understanding of its construction. To this end, it is important to note that the SMBi was developed on the basis of investigations in two ambulance services, two mental health trusts, two general hospital trusts, two community healthcare trusts, one rail operating company, a local authority and a media agency.

The process through which the SMBi was developed began by attaining an exhaustive list of specific manager behaviours. This was achieved through running focus groups wherein there were typically four or five people per group, however, attendance occasionally reached ten individuals per

session. Attendees were employed at a range of different organizational levels, ranging from front-line staff to high level management and data were gathered using the critical incident technique (Flanagan, 1954) and/or repertory grid methodology (Fransella, Bell & Bannister, 2004).

Where the critical incident technique was used, participants were asked to recall an occasion where a manager had been observed to behave in what was considered to be an especially 'supportive' and/or 'unsupportive' manner. The discussion then focused on indentifying the specific managerial behaviours involved in as precise a manner as possible.

Where the repertory grid technique was used, participants were first asked to identify managers whom they considered to be 'supportive' or 'unsupportive'. They were then asked to compare randomly selected combinations of three of the managers in terms of what two shared and made them differ from the third in terms of being 'supportive' or 'unsupportive'. In this way, a list of behaviours was generated that defined and differentiated a 'supportive' and 'unsupportive' manager. The above processes were performed until the data being collected reached saturation (i.e. no new behaviours were being uncovered). Once synonyms and antonyms were removed from the resulting list of manager behaviours, a pool of 70 discrete behaviours remained.

Following this qualitative phase, principal axis factoring was employed on the 70 manager behaviour items in order to establish its factor structure. This analysis was undertaken on each of the samples separately and



followed the same guidelines set out in chapter 3. These analyses consistently resulted in a 14-item two factor solution with nine supportive and five negatively worded items loading on to each factor respectively (see chapter 3, table 1 for a full list of these items). The tool was named the supportive manager behaviour inventory (SMBi) and its dimensions were subsequently named 'supportive' and 'unsupportive manager behaviours', respectively. It is at this point that the current research makes use of the SMBi tool; testing and refining the instrument using more appropriate and powerful statistical methods, i.e. confirmatory factor analysis.

The 14-item SMBi has been utilized in previous research studies, the details of which are included below, but these investigations were largely utilized in unpublished MSc research. For example, in one cross-cultural investigation (Houshmand, 2012) that utilized samples of assembly line employees, technicians and managers in Gothenburg, Sweden (n = 53) and Shanghai, China (n = 142). This investigation observed a two factor solution: supportive and unsupportive manager behaviour and acceptable coefficient alphas for these factors were found in both samples: Swedish supportive and unsupportive dimensions were observed at .92 and .76, respectively; and Chinese factors were .90 and .85, respectively.

Given that these unpublished studies have not been subjected to advanced peer review it is recognized that this is an insufficient level on which to base one's assessment of the validity of the SMBi.

Demonstrating the reliability and construct validity of the SMBi is of paramount importance to this research and therefore it was decided that it is the best interest of science to perform exploratory and confirmatory factor analyses on the 14 items in order to thoroughly and rigorously assess the psychometric properties of the measure.

It was, however, decided that there was little or no benefit to include analysis of the initial 70 manager behaviour items as the proposed analytic strategy includes exploratory factor analysis on the 14 item SMBi and subsequent confirmatory factor analysis. It is considered that detailed reporting of the EFA and then testing the theoretical factorial validity of the construct (Byrne, 2001) through confirmatory factor analysis is sufficient to demonstrate the psychometric properties of the SMBi. The 14 items in question are reported in the left-hand column in chapter 3, Table 1.

*Focus groups: Capability (efficacy)*

Three focus groups were held in each of the two initial Trusts where S-Units were established. Each focus group comprised four S-Unit operatives, thereby resulting in 12 operatives per Trust, and 24 overall. In addition, interviews were held in both Trusts with the S-Unit manager and the operations director responsible for the S-Unit. The national Unit co-ordinator and the national project lead were also interviewed as were two medical directors. In total, eight managerial and support personnel

were interviewed in addition to the 24 operatives. The interviews and focus groups were structured around the following questions:

- What types of incidents have you had to attend?
- What types of incidents might you have to attend?
- What is it about the day-to-day running of the S-Unit or the Trust that makes it easier or more difficult to meet the demands of the incidents you have to attend?
- Is there anything about interactions with other emergency service personnel that make it easier or more difficult to deal with the incidents you are called upon to attend?

The interviews and focus groups were all undertaken at the place of work and typically lasted between an hour and 90 minutes. The interviews and focus groups were not recorded at the request of those participating; however, detailed notes were kept. With regard to identifying a representative list of S-Unit incidents, operatives and managers were asked to provide a short summary that captured the basic nature of the scenario involved. They were also asked to indicate how easy or difficult they believed the incident would be to deal with. Following the interviews and focus groups, the list of scenarios generated was reviewed and the 16 most common situations were used as an item pool in the subsequent questionnaire. This list of incidents was also scrutinised in terms of their perceived difficulty in order to ensure that the final list comprised incidents of different degrees of operational and clinical difficulty. Similarly,

the list of features impacting on the day-to-day running of the S-Unit was reviewed and the nine most commonly referred to features were used in the subsequent questionnaire. The full list of hypothetical incidents and impacting features can be found in chapter 4, tables 6 and 10, respectively.

## Measures

### *Manager behaviour*

14 manager behaviour items were used to rate how often employees viewed their line manager exhibit specific behaviours. The behaviours (9 positive and 5 negatively worded) were scored on a five-point rating scale (1 = never to 5 = always). The items that were included were:

- Having a line manager who listens.
- Getting a simple thank you, 'pat on the back', or some other form of recognition from your line manager for a job well done.
- Your line manager appearing to treat all staff fairly.
- Your line manager making it clear what you are expected / needed to do.
- Working for a line manager who demonstrates a genuine interest in your well-being.
- Your line manager criticising the effort you put into your job.
- Your line manager being too quick to blame someone when there are any problems.
- Working for a line manager who makes him/her self available to their staff.
- Having to deal with unrealistic expectations from your line manager.
- Your line manager encouraging you to put across your point of view.

- Being asked by your line manager to do something one minute and something else the next.
- Your line manager demonstrating a genuine willingness to learn from others.
- Your line manager actively encouraging people to work together.
- Your line manager telling others what to do rather than listening to their views.

The process that was undertaken to select these 14 items - along with the dimension reduction method - is described in detail in chapter 3. The construct validity of the measure (and associated dimensions) is addressed in chapter 5.

#### *Physical health and well-being*

Schat, Kelloway and Desinarius's (2005) 14 item Physical Health Questionnaire was used to assess participants' self-reported frequency of experiencing a range of common symptoms of ill-health using a scale that ranging from 'not at all' (1) to 'all of the time' (7). The symptoms identified were:

- How often have you had difficulty getting to sleep at night?
- How often have you woken up during the night?
- How often have you had nightmares or disturbing dreams?
- How often has your sleep been peaceful and undisturbed? (reverse scored)
- How often have you experienced headaches?

- How often did you get a headache when there was a lot of pressure on you to get things done?
- How often did you get a headache when you were frustrated because things were not going the way they should have?
- How often have you suffered from an upset stomach (indigestion)?
- How often did you have to watch what you ate carefully to avoid stomach upsets?
- How often did you feel nauseated ("sick in your stomach")?
- How often did you suffer diarrhoea or were you constipated?
- How often have you had minor colds (that made you feel uncomfortable but didn't keep you sick in bed or make you miss work)?
- How often have you had respiratory infections more severe than minor colds (such as bronchitis, sinusitis, etc.) that "laid you low"?
- When you have had a bad cold or flu, how often does it last longer than it should?

In the original investigation, Schat et al. (2005) assessed the PHQ on hospital workers in Ontario, Canada (n = 496). They reported satisfactory coefficient alphas for each of the subscales: gastrointestinal problems (.83), headaches (.88), sleep disturbances (.80), and respiratory infections (.66). The current study examined the inter-scale correlations which showed moderate to high values ranging from .3 to .5 as a result of which the measure was used as a total score to reduce the possibility of multicollinearity. Coefficient alpha for the total scale was .88 (see chapter

5) which also points to an underpinning 'common core' linking the individual items and sub-scales.

*Symptoms of post traumatic stress disorder (PTSD)*

Weiss and Marmar's (1997) 22 item Impact of Event Scale - Revised (IES-R) was used to assess how often participants experienced symptoms of PTSD. A response format was employed ranging from 'not at all' (0) to 'extremely' (4). The symptoms identified were:

- Any reminder brought back feelings about it.
- I had trouble staying asleep.
- Other things kept making me think about it.
- I felt irritable and angry.
- I avoided letting myself get upset when I thought about it or was reminded of it.
- I thought about it when I didn't mean to.
- I felt as if it hadn't happened or wasn't real.
- I stayed away from reminders about it.
- Pictures about it popped into my mind.
- I was jumpy and easily startled.
- I tried not to think about it.
- I was aware that I still had a lot of feelings about it, but I didn't deal with them.
- My feelings about it were kind of numb.
- I found myself acting or feeling as though I was back at that time.



- I had trouble falling asleep.
- I had waves of strong feelings about it.
- I tried to remove it from my memory.
- I had trouble concentrating.
- Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea or a pounding heart.
- I had dreams about it.
- I felt watchful or on-guard.
- I tried not to talk about it.

Beck et al. (2008) assessed the psychometric properties of the IES-R and concluded that its three subscales: avoidance, intrusion and hyperarousal, had adequate internal consistency. Researchers also concluded that that these subscales had a relatively high degree of intercorrelation (Beck et al., 2008; Creamer, Bell & Failla, 2003). These high intercorrelations support Weiss and Marmar's original instructions that combining the scores of the three scales is best practice.

### *Work burnout*

Kristensen, Borritz, Villadsen and Christensen's (2005) work related burnout subscale from their Copenhagen Burnout Inventory (CBI) was used to measure participants' level of work burnout. Participants were asked about their prevalence of experiencing a number of indicators of burnout using a five-point scale: 'never/almost never' (0), 'seldom' (25),

'sometimes' (50), 'often' (75) or 'always' (100). The symptoms identified were:

- Do you feel worn out at the end of the working day?
- Are you exhausted in the morning at the thought of another day at work?
- Do you feel that every working hour is tiring for you?
- Do you have enough energy for family and friends during leisure time?
- Is your work emotionally exhausting?
- Does your work frustrate you?

It can be seen that only six items, rather than the seven developed by Kristensen et al. (2005), were used. The item 'do you feel burnt out because of work?' was not used. This decision was made on the grounds that, in a pilot investigation with the S-Unit staff, the use of the term 'burnout' was problematic as people (different ambulance workers) were found to have different interpretations of the definition of this construct. In Kristensen et al's. (2005) original investigation, conducted on human service sector workers (n = 1910), they observed a coefficient alpha of .87 for their work related burnout subscale.

### *Work engagement*

Schaufeli, Bakker and Salanova's (2006) nine item Utrecht Work engagement Scale (UWES-9) was used to measure participant engagement with their job. Participants were asked to indicate the extent

to which they agreed with a series of statements relating to experiencing dedication, absorption and vigour (the three components of work engagement). Responses were scored on a scale that ranged from 'strongly disagree' (1) to 'strongly agree' (7). The statements used were:

- At my work, I feel bursting with energy.
- At my job, I feel strong and vigorous.
- I am enthusiastic about my job.
- My job inspires me.
- When I get up in the morning, I feel like going to work.
- I feel happy when I am working intensely.
- I am proud of the work that I do.
- I am immersed in my work.
- I get carried away when I am working.

Shaufeli et al. (2006) advocated totalling the nine items, rather than breaking the scale down into its three sub-scales for two reasons. Firstly, in their national investigation, the internal consistency was observed to be  $> .9$ . Secondly, utilizing a single measure reduced problems associated with multicollinearity. In an effort to demonstrate the measure's construct validity, the researchers observed that the UWES-9 was negatively associated to the two dimensions of work burnout: exhaustion and cynicism. For example, Shaufeliu et al. (2006) identified that two of the UWES-9 dimensions: vigour and dedication were 'direct opposites' (p. 712).

### *Job satisfaction*

Warr, Cook and Wall's (1979) nine item job satisfaction scale was used to measure employee level of job satisfaction. Participants were asked to indicate their level of satisfaction/dissatisfaction with a number of aspects of the job using a response format that ranged from 'very dissatisfied' (1) to 'very satisfied' (7). The aspects listed were:

- The physical work conditions.
- The freedom to choose your own method of working.
- Your fellow co-workers.
- Your immediate supervisor / line manager.
- Your rate of pay.
- Your chance of promotion.
- The attention paid to the suggestions you make.
- Your hours of work.
- Your job security.

This job satisfaction measure combines two sub dimensions of job satisfaction: intrinsic and extrinsic job satisfaction (Fields, 2013).

Researchers (Abrahams & Hansson, 1996; Norman, Collins, Conner, Martin & Rance, 1995) assessed the reliability of combining the two subscales and reported alphas that ranged from .8 to .91.

### *Perceived Individual Work Capability (efficacy)*

Perceived individual capability was assessed using 16 items developed on the basis of interviews with S-Unit operatives, team leaders and

managers. Participants were asked to report how prepared they felt to deal with a series of hypothetical incidents that had been identified from preliminary qualitative investigations with S-Unit staff, their managers and the national body charged with regulating and directing the units (see Chapter 4 for a fuller account). The scale ranged from 'not prepared at all' (0) to 'completely prepared' (10). The scenarios presented were:

- Where an explosion has occurred on a commuter train stuck in tunnel and there are reports of many casualties with injuries.
- Where you are called to treat a patient trapped 50ft along a collapsed trench/culvert and where you can only gain entry from one end.
- Where a chlorine leak has occurred in a swimming pool during a swimming gala involving multiple schools and the fire service report the leak is still continuing and at least 25 children are requiring medical help.
- Where a large trench being dug to support the laying of 3ft diameter drainage pipes has collapsed onto those working in it, resulting in several casualties and lots of soil infill.
- Where a helicopter crashes into a tall building during busy commuter traffic and there are a large number of casualties.
- Where an 18 storey block of flats has suffered extensive damage following a terrorist incident. As many as 12 storeys of the building have been obliterated and there are known to be multiple casualties.

- Where you have been asked to respond to football stadium where you are receiving reports of multiple crush injuries as a result of a large crowd surge during a mass evacuation caused by a fire incident.
- Where a window cleaner has been injured 16 floors up on their hanging platform which, for some reason, is now inoperable.
- Where a large passenger aircraft has made an emergency landing, broken up on landing and caught fire; reports are being received that numerous passengers are seriously injured and some reported dead.
- Where there has been a serious road traffic accident (RTA) at a major Motorway intersection. A heavy goods vehicle (HGV) has left the carriageway while travelling across an overpass and fallen onto a bus travelling below. People are known to be trapped in the bus which still has the HGV on top of it.
- Where a motor cyclist is seriously injured and is trapped under a leaking chemical tanker that has jack-knifed. 15 bystanders are coughing.
- Where two patients need to be extricated from a collapsed bridge above running water and the depth of the water is unknown.
- Where a full and busy commuter train has derailed 450 metres away from the station platform during stormy (rain and windy) conditions. One carriage is on its side and there are reports of injuries. The power cable is still live.

- Where an explosion and fire, believed to be the result of a terrorist incident, has led to the partial sinking of a vessel. An unknown number of people are believed to be trapped.
- Where an underground escalator has collapsed during peak commuter traffic. There are reports of multiple casualties.
- Where a patient has been entrapped neck high in murky and rapid running water for over 30 minutes.

The construct validity of this measure is addressed in chapter 5.

#### *Perceived organizational support*

Five items from the Survey of Perceived Organizational Support were used (Eisenberger, Huntington, Hutchinson & Sowa, 1986; Rhoades & Eisenberger, 2002). Participants were asked about potential feelings they have towards their Trust and instructed to indicate the level to which they agreed with each statement. The scale ranged from 'strongly disagree' (1) to 'strongly agree' (7). The items used were:

- My Trust/organization values the contribution I make through my job.
- My Trust/organization really cares about my well-being.
- My Trust/organization cares about my general satisfaction at work.
- My Trust/organization cares about my opinions.
- My Trust/organization takes pride in my accomplishments at work.

Eisenberger et al. (1986) developed 17 items that were found to load onto a single factor. The authors subsequently suggest that it is

acceptable to use a reduced number of items. Satisfactory coefficient alphas (ranging from .74 to .95) have been observed by researchers for the full measure (Cropanzano, Howes, Grandey & Toth, 1997; Eisenberger, Cummings, Armeli & Lynch, 1997), and his review, Fields (2013) notes that many authors have chosen to go ahead with the original authors' directions and utilise a reduced number of items. These five items were selected as they were deemed most appropriate and had relatively high factor loadings as reported in the original investigation.

### *Intention to quit*

Participants were asked to answer one question from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins and Klesh, 1979) i.e. "I often think about quitting the S-Unit" using a response format that ranged from 'strongly disagree' (1) to 'strongly agree' (7).

The decision to utilize a single item, rather than the original three item measure, was taken in part due to the three items being largely paraphrases of one another, e.g. 'how likely is it that you will actively look for a new job in the next year?' and 'I will probably look for a new job in the next year' (Cook, Hepworth, Wall & Warr, 1981; p. 95). The problem here is that the combined three items would be too closely related to one another - a process described as 'bloated specifics' by Cattell (1973) - that reduces the validity of the measure. In addition, previous research has reported that single item measures of specific work related constructs



- including turnover intentions - are perfectly valid (Nagy, 2002; Wanous, Reichers & Hudy, 1997).

### *Organizational commitment*

Participants were presented with three items from Cook and Wall's (1980) Organization Commitment scale and asked to indicate their degree of agreement or disagreement using a response format from 'strongly disagree' (1) to 'strongly agree' (7). The items that were presented are:

- I am quite proud to be able to tell people who it is I work for.
- I sometimes feel like leaving my Ambulance Service for good.
- I'm not willing to put myself out just to help my Ambulance Service.

While it is acknowledged that this measure incorporates three subscales (each with three items) relating to organizational commitment: identification, involvement and loyalty, it has been reported that three items - one from each dimension - is adequate to assess each dimension when aggregated (Buchanan, 1974). Cook and Wall (1980) demonstrated the internal consistency of each of the three subscales in two studies (n = 390 & 260). For identification, they reported alphas of .74 and .71; for involvement, they reported .87 and .71; and for loyalty, they reported .82 and .60, respectively. The current study observed alphas of .67, .68 and .70 for the three item measure.

### *Attitudes towards patient care*

The basic objective in creating an attitude towards patients scale was to develop a measure that didn't simply describe ambulance workers'

feelings towards patients but which also reflected their perceived ability to deliver the highest possible level of patient care and their confidence that this is what they could deliver. This orientation was taken for two principal reasons. First, as evidenced by the Francis QC Report, issues surrounding the actual delivery of patient-focused care are of major concern in the contemporary healthcare setting. Second, the attitude towards patients scale was at least partly construed as a performance-related measure so the decision was made to use items that reflected the ability to meet patient needs and deliver a high quality patient care. Three items were therefore written:

- Given the current circumstances – individual and/or organizational – how confident are you that you can provide the highest level of patient care? (Scored from 0 = 'not at all confident' to 10 = 'completely confident')
- Do current circumstances – organizational and/or individual – help or hinder you in providing the highest possible level of patient care? (Scored from 0 = 'hinders a great deal' to 10 = 'helps a great deal')
- Are you finding it easier or harder than it used to be to spend as much time as you would like with patients? (Scored from 0 = 'a lot harder' to 10 = 'a lot easier')

In constructing these items, the decision was made either to (a) anchor self-ratings to some form of benchmark or comparison point e.g. previous availability to spend time with patients in item three; or (b) request

ratings that took current circumstances into account, as in items one and two. This construction also took account of the role of perceived self-efficacy in influencing behavioural outcomes in that ambulance workers' beliefs regarding their ability to deliver patient care are likely to play a part in the quality of care delivered (Bandura 1997).

As a means of demonstrating the validity of this measure a separate study was run wherein the three item attitude towards patients measure was included in a survey of 674 healthcare staff working in a general NHS Trust. In this separate study, seven attitude statements were also included that were derived from preliminary interviews with twelve healthcare staff in which they were asked for statements to describe how they felt towards patients and other service users. Seven statements were repeatedly generated from these interviews as listed below:

1. Working with patients is as rewarding as ever
2. Working with patients is as enjoyable as ever
3. It is getting harder to 'do your best' for every patient
4. I am losing some of my enthusiasm for caring for patients
5. There are an increasing number of days where I do what is needed for patients, the 'essentials', but nothing further
6. On a day-to-day basis I am becoming more withdrawn from patients
7. There is an increasing conflict between clinical care and performance targets

It is noticeable that these items reflect the concerns expressed in the Francis QC Report. Participants were asked to rate their degree of agreement or disagreement with each item using a 7-point rating scale where 1=strongly disagree and 7=strongly agree.

These seven items were subjected exploratory factor analysis using principal axis factoring and this resulted in a two-factor solution with two items in each factor. The first factor contained two positively worded items: 'working with patients is as rewarding as ever' and 'working with patients is as enjoyable as ever' (items 1 and 2, respectively); while the second contained two negatively worded items: 'there are an increasing number of days where I do what is needed for the patients, but nothing further' and 'on a day-to-day basis I am becoming more withdrawn from patients' (items 5 and 6, respectively). Item loading for this respective dimensions were as follows: item 1 = .94 and item 2 = .95 (positive patient attitudes) and item 5 = .74 and item 6 = .75 (negative patient attitudes).

Coefficient alpha for the three item attitude towards patients scale was .665 with a mean inter-item correlation of .4 which is acceptable for short scales with few constituent items (Cox & Ferguson, 1994). Total scores were then computed for the attitude towards patients measure and the two factors resulting from the principal axis factoring of the seven attitude statements. As expected, the attitude towards patients scale was positively and significantly correlated with the positively worded attitude

factor ( $r = .34$ ;  $p < .001$ ) and negatively correlated with the negatively worded attitude factor ( $r = -.35$ ;  $p < .001$ ). In short, the validity of the attitude towards patients scale is demonstrated by the findings that it correlates positively with views that working with patients remains rewarding and enjoyable and negatively with the items signalling some degree of withdrawal from patients.

### *Collective capability (efficacy)*

Collective capability was assessed utilizing a bespoke 9-item measure describing aspects of joint working, with the focus being on the individual team, S-Unit, Trust or other emergency service with whom they came into contact. The process of how these items were developed during focus groups has been described above. Participants were asked how certain they are that the situation described applied to them given their personal S-Unit experiences. Each item was rated on a 11 point rating scale that ranged from 'not at all certain' (0) to 'completely certain' (10). The items were:

- That you will be able to depend on your team colleagues to work safely whatever the incident?
- That you will be able to depend on your team colleague's ability to do what is asked of them?
- That your colleagues will possess the technical abilities to deal with (larger scale) major incidents?

- That your colleagues will have the physical stamina required for large scale incidents?
- That sufficient continuation training will be provided for your role?
- That you will be able to depend on the Fire Brigade at an incident?
- That you will be able to depend on the police at an incident?
- That sufficient systems of support (e.g. counselling) will be provided to you following an incident?
- That your 'Trust' will fully utilise the capability of S-Unit?

See chapter 4 for an in depth discussion of the development of this measure and chapter 5 for its construct validity.

### **Data analysis**

Data were initially entered in and analysed using SPSS 21 and, when appropriate, further analyses were performed using AMOS 20. More detail of statistical techniques performed will be provided in subsequent chapters.

## **CHAPTER 3: DEVELOPING THE SUPPORTIVE MANAGER**

### **BEHAVIOUR INVENTORY**

As previously concluded (Chapter One) there is a great deal of evidence demonstrating the importance of manager behaviour and its significant effects on well-being, performance, culture and work attitudes (e.g. Attridge, 2009; Bakker et al., 2007; Bandura, 1997; Bhanthumnavin, 2000 & 2003; de Silva, 2000; Escriba-Aguir & Perez-Hoyos, 2007; Gilbreath & Benson, 2004; MacPhee et al., 2013; Ng & Sorensen, 2008; Nielsen et al., 2008; Prins et al., 2010; Rayner & Cooper, 2006; Tehrani, 2004; van Dierendonck et al., 2004; West & Dawson, 2012; Yassen, 1995; Zahar & Hofmann, 2012). While much of this research has made important contributions to the field, there are areas of concern and weakness that need to be addressed.

The current research hopes to make a contribution to the field by developing a measure of specific manager behaviours that are perceived as being supportive and unsupportive by employees; while also addressing many of the methodological issues discussed in chapter 1. Chapter 2 provided details of the methodological framework in which the current research was conducted as well as providing the details of the focus groups utilized to develop the SMB measure.

Chapter 2 outlined a number of critical aspects of the development process. Firstly, it provided the detail surrounding the focus groups and initial number of items (70) produced. Secondly, it demonstrated that the

measure had been utilized in unpublished MSc investigations and found to be a 14 item, two factor model. Thirdly, chapter two reported that this current research comprised two investigations: time 1 and time 2. The time 1 investigation was utilized to demonstrate the both the exploratory factor analysis of the 14 item model and its subsequent confirmatory factor analysis. The items derived from the time 1 SMB development became the cornerstone of overall assessment of the impact of manager behaviour on outcome variables. To demonstrate the robustness of the measure, the time 2 investigation was utilized to perform confirmatory factor analysis on the items derived from the time 1 study utilizing a different dataset. The 14 items can be seen in table 1.

### **Manager behaviour (SMBi) measure: The development (time 1)**

The development of the manager behaviour measure utilized all available participants since all S-Unit personnel had a manager to reference since the top-level 'directors' of the S-Unit were not included in the current research. Consequently, the sample totalled 511 participants: 97 team leaders, 376 operatives, 9 managers, 6 operations officers, 3 training managers, 15 team educators, and 5 participants who failed to provide details regarding their role .

The variables were assessed to ascertain information regarding the distribution of data. Results indicated that data are within acceptable limits for Skew and Kurtosis (both within +/- 2) indicating that data are normally distributed (Miles & Shevlin, 2005). The Kaiser-Meyer-Olkin



measure of sampling adequacy (KMO) revealed a collective value of .96 and individual items ranged from .91 to .98, suggesting that the pattern of correlations within the data are clearly sufficient for exploratory factor analysis (Field, 2013; Hutcheson & Soufroniou, 1999). Items were also checked for extreme multicollinearity - a problem in exploratory factor analysis - and results indicated that items were not overly correlated with one another (determinant > 0.00001; Field, 2013).

Table 1 displays the response frequency of each SMBi item . It can be seen that the mean scores range from 2.04 to 4.10. However, since the results from the exploratory analysis (table 2) show a two factor solution - identical to the applied research projects studies mentioned earlier - in which positive and negatively worded items load onto separate dimensions. The values for the positively worded items range from 3.65 to 4.10, compared to the range for negatively worded items that range from 2.04 to 2.52. From these figures it can be seen that participants are reporting that, on average, they observe positive behaviours more frequently, compared to negatively toned behaviours.

**Table 1: 14-item SMBi response frequency statistics (time 1)**

Item	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	Mean Score (SD)
	%	%	%	%	%	
<b>1.</b> Having a line manager who listens	1.6	4.9	19.2	32.5	41.9	4.08 (.97)
<b>2.</b> Getting a simple thank you, 'pat on the back', or some other form of recognition from your line manager for a job well done	3.3	7.8	22.7	33.9	32.3	3.84 (1.07)
<b>3.</b> Your line manager appearing to treat all staff fairly	3.3	5.5	18.8	33.5	38.9	3.99 (1.05)
<b>4.</b> Your line manager making it clear what you are expected/needed to do	1.8	5.7	14.7	40.1	37.8	4.06 (.95)
<b>5.</b> Working for a line manager who demonstrates a genuine interest in your well-being	2.5	4.9	16.8	31.3	44.4	4.10 (1.01)
<b>6.</b> Your line manager criticising the effort you put into your job	32.5	40.7	17.0	7.8	2.0	2.06 (.99)
<b>7.</b> Your line manager being too quick to blame someone when there are any problems	34.6	37.2	15.3	10.0	2.9	2.09 (1.08)
<b>8.</b> Working for a line manager who makes him/her self available to their staff	2.2	6.7	17.8	38.6	34.8	3.97 (.99)
<b>9.</b> Having to deal with unrealistic expectations from your line manager	32.9	42.5	15.9	5.9	2.9	2.04 (.99)
<b>10.</b> Your line manager encouraging you to put across your point of view	3.5	8.8	23.3	36.6	27.8	3.76 (1.06)
<b>11.</b> Being asked by your line manager to do something one minute and something else the next	24.1	40.1	19.8	12.1	3.9	2.32 (1.09)
<b>12.</b> Your line manager demonstrating a genuine willingness to learn from others	3.3	10.8	26.8	35.8	23.3	3.65 (1.05)
<b>13.</b> Your line manager actively encouraging people to work together	1.2	5.7	21.9	34.6	36.6	4.00 (.96)
<b>14.</b> Your line manager telling others what to do rather than listening to their views	17.8	37.6	25.2	13.5	5.9	2.52 (1.11)

### **Principal axis factoring: The rules of factor loading**

Exploratory factor analysis (EFA) was undertaken to identify the factor structure of the SMBi. The process was implemented utilizing strict rules and criteria with the aim of producing a strong and reliable factor structure. Firstly, a minimum value of .4 must be observed between an item and dimension (Field, 2013). Secondly, there must be at least a difference of .2 between the loading on that dimension and the item loading on any of other factors. For example, if one item correlated at with a dimension at the level of .42 and another at .35 this item would be deemed to be too closely related to both factors and would therefore need to be removed and the exploratory factor analysis performed again. Conversely, an item that correlated with one dimension at the level of .55 and another at .35 would be deemed acceptable as it complied with both of the rules.

### **Principal axis factoring: The results**

All variables complied with rules regarding loading onto a single factor and therefore no items were removed. The analysis revealed a two factor solution (as shown in table 2) where all positively worded items load onto one factor, named 'supportive manager behaviour' (factor one), and the negatively worded items load onto another factor, named 'unsupportive manager behaviour' (factor two). The supportive manager behaviour factor accounted for 59.82% of the variance, compared to the unsupportive manager behaviour factor which accounted for 7.85% of the variance. In addition, direct oblimin rotation was used since it was

reasoned that the resulting factors would correlate with each other. Confirming this, analysis revealed a substantial negative correlation ( $r = -.68$ ) between the two factors. As recommended by Field (2013), the number of suitable factors was determined on the basis of dimensions with eigenvalues greater than 1 and analysis of the scree plot. As shown in table 2, factor one and two revealed eigenvalues of 8.68 and 1.47, respectively. In addition, the scree plot displayed these two factors situated to the left of the point of inflection (indicative of the suitable number of factors).

**Table 2: SMBi principal axis factoring item loading**

Item	Rotated Factor Loadings		Item Code
	Factor 1	Factor 2	
1. Having a line manager who listens	<b>.83</b>	-.09	S1
2. Getting a simple thank you, 'pat on the back', or some other form of recognition from your line manager for a job well done	<b>.85</b>	.02	S2
3. Your line manager appearing to treat all staff fairly	<b>.78</b>	-.08	S3
4. Your line manager making it clear what you are expected/needed to do	<b>.88</b>	.04	S4
5. Working for a line manager who demonstrates a genuine interest in your well-being	<b>.89</b>	-.02	S5
6. Your line manager criticising the effort you put into your job	.09	<b>.74</b>	U1
7. Your line manager being too quick to blame someone when there are any problems	-.10	<b>.78</b>	U2
8. Working for a line manager who makes him/her self available to their staff	<b>.86</b>	.05	S6
9. Having to deal with unrealistic expectations from your line manager	.04	<b>.85</b>	U3
10. Your line manager encouraging you to put across your point of view	<b>.81</b>	.03	S7
11. Being asked by your line manager to do something one minute and something else the next	-.12	<b>.69</b>	U4
12. Your line manager demonstrating a genuine willingness to learn from others	<b>.76</b>	-.09	S8
13. Your line manager actively encouraging people to work together	<b>.87</b>	.01	S9
14. Your line manager telling others what to do rather than listening to their views	-.26	<b>.52</b>	U5
<b>Eigenvalues</b>	<b>8.68</b>	<b>1.47</b>	

Note: Factor loadings above .40 are shown in bold

It can be seen in table 2 that individual items are accounting for between 58% and 79% of the variance within the supportive dimension (items 12 and 5, respectively); and between 27% and 72% of the variance within the unsupportive dimension (items 14 and 9, respectively). These are indicative of a well-fitting model as they are above the recommended minimum of 16% proposed by Stevens (2002). However, it can then be identified that while all items adequately load onto a dimension, not all items load as strongly as others. The results indicate that the supportive items are statistically representing 'supportive manager behaviour', compared to the items that represent 'unsupportive manager behaviour'.

### **Confirmatory factor analysis: The debate about model fit indices**

Currently, the range of potential fit indices has been described as a "smorgasbord" (Byrne, 2001; p.87) as there so many to select from and authors suggesting that "if all the indices lead to similar conclusions, the issue of which indices to report is a matter of personal preference" (Ullman, 2013; p.725). In many cases the scientific community has yet to agree as to what constitute acceptable results for even just one test of model fit (Byrne, 2001; Jackson, Gillaspay & Purc-Stephenson, 2009; Ullman, 2013). As a result, the utility and appropriateness of a range of model fit statistics will be discussed here.

In an attempt to attain some direction, Jackson et al's (2009) review of confirmatory factor analytic procedures was used as a guide or reference

point. They identified the frequency with which individual model fit indices were utilized in previous research (n=194). The five most frequently reported model fit indices were:

- Chi-square ( $\chi^2$ ; 89.2%)
- Comparative fit index (CFI; 78.4%) (Bentler, 1990)
- Root mean square error of approximation (RMSEA; 64.9%) (Steiger & Lind, 1980)
- Tucker-Lewis index (TLI; 46.4%) (Tucker & Lewis, 1973)
- Goodness-of-fit index (GFI; 34.0%)

Therefore it was decided that these five indices would be reported in the current research. In addition, the literature presents arguments for the inclusion of the standardized root mean square residual (SRMR) (Byrne, 2001; Hu & Bentler, 1999; Ullman, 2013) and RMSEA 90% confidence intervals (Byrne, 2001; MacCallum, Browne & Sugawara, 1996).

While the inclusion of the  $\chi^2$  test is relevant and necessary, it is unwise to ignore its flaws. Ullman (2013) reports that this tests reacts negatively to sample sizes which are both relatively large and small, with trivial differences between sample and estimated population being exaggerated in large samples and inaccuracies distributing  $\chi^2$  in small samples. Other authors concur with this point suggesting that it is not uncommon for well-fitting models to obtain substandard  $\chi^2$  results (Byrne, 2001). It is in part the reason researchers have developed additional fit statistics to circumvent the problems associated with  $\chi^2$  test (Bentler, 1990; Bollen,

1989; Hu & Bentler, 1995; James, Mulaik & Brett, 1982; MacCallum, et al., 1996; Steiger & Lind, 1980). However, as Ullman (2013; p.720) reports, "one very rough 'rule of thumb', directly related to the  $\chi^2$  value is that a good-fitting model may be indicated when the ratio of the  $\chi^2$  to the degrees of freedom is less than 2". For this reason this ratio ( $\chi^2/df$ ) is also displayed in table 3.

### **Confirmatory factor analysis: Assessing the results of the model fit tests**

In order to more fully understand these model fit tests, one must understand what the results mean in relation to the model being tested. It is not in the remit of this research to provide a detailed mathematical review, however, provided below is information for each of the tests reported here and guidelines that authors (Bollen ,1989; Byrne, 2001, Hu & Bentler, 1995 & 1999, Tucker & Lewis, 1973) suggest are satisfactory results:

- $\chi^2 p$  value > .05
- $\chi^2/df$  < 2
- GFI > .95
- SRMR < .08
- TLI > .95
- CFI > .95
- RMSEA < .06



Classified as 'incremental indexes of fit' (Byrne, 2001; Hu & Bentler, 1995), the TLI and CFI are measures of complete covariation measuring the hypothesized model against a specified norm or standard (Byrne, 2001), whereas the GFI test - classified as an 'absolute index of fit' (Byrne, 2001; Hu & Bentler, 1995) - verifies the covariation in the sample that is also explained by the sum (Byrne, 2001). The RMSEA value is an estimative procedure, analysing how well the model fits with the population with unknown parameters optimally estimated (Brown & Cudeck, 1993). Finally, the SRMR assesses the average difference between variances and covariances of both the sample tested and estimated population, with smaller values representing better fitting models (Tabachnick & Fidell, 2013).

### **Confirmatory factor analysis: Latent and observed variables in CFA models**

The components of the model are represented using different shapes and either directional or bi-directional arrows. Circles represent latent variables (i.e. supportive and unsupportive manager behaviour) and rectangles represent observed (measured) variables (i.e. those variables labelled 'U1-5' and 'S1-9'). Implied relationships between variables are demonstrated using arrows: directional arrows (only one arrowhead) indicates a direct relationship between an observed and latent variable; bi-directional arrows (arrowhead at both ends) indicates a relationship between latent variables; and absence of any arrow implies and unanalyzed relationship between observed and/or latent variables.

## **Confirmatory factor analysis: Assessing the models**

Confirmatory factor analysis was performed on the SMBi items for a number of reasons, especially (a) this is a relatively new measure; (b) results from previous studies were never published and, therefore, are not falsifiable; and (c) the results from the exploratory factor analysis were not entirely acceptable. Confirmatory factor analysis was performed using AMOS 22 utilizing the 'maximum likelihood' estimation procedure.

Figure 1: 14-item SMBi CFA model

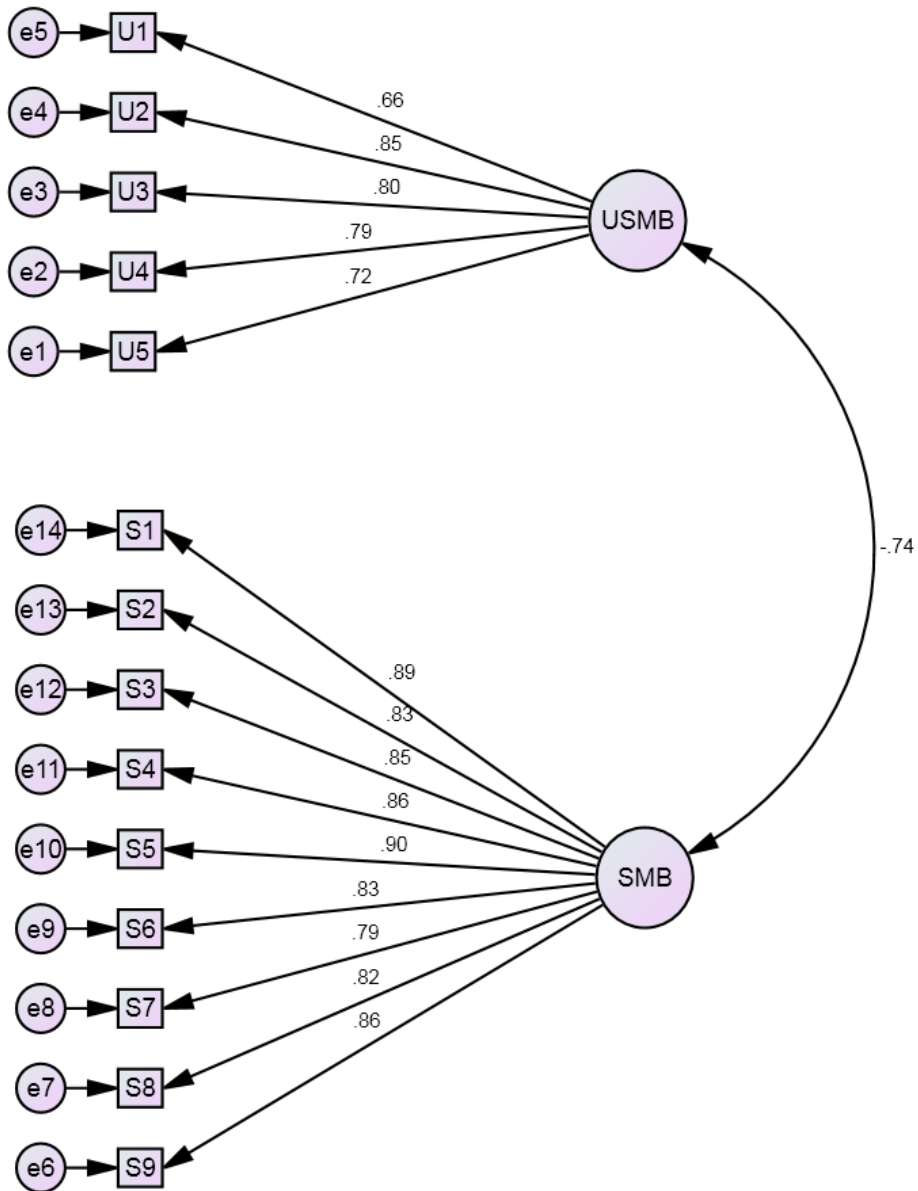


Figure 1 graphically represents the factor structure for the 14-item SMBi revealed by the exploratory factor analysis procedure. The standardized regression weights of model variables are displayed next to each arrow connecting latent to observed variable or latent to latent variable. It can be seen that the standardized factor loading ranged from .66 (U1) to .85 (U2) for USMB, compared to .79 (S7) to .90 (S5) for SMB. This indicated greater variation in the USMB, compared to the SMB dimension (.19 and .11, respectively). At this point there are no substantial issues with the model and a discussion of model fit statistics is presented below.

**Table 3: SMBi confirmatory factor analysis model fit statistics (time 1)**

<b>Version</b>	<b><math>\chi^2</math></b>	<b><math>\chi^2/df</math></b>	<b>GFI</b>	<b>SRMR</b>	<b>TLI</b>	<b>CFI</b>	<b>RMSEA</b>
<b>1:</b> 14-item	295.80(76);p<.001	3.89	.92	.04	.96	.96	.08
<b>2:</b> 10-item	89.39(34);p<.001	2.63	.97	.03	.98	.99	.06
<b>3:</b> <sup>90%</sup> : 10-item	90.88(34);p<.001	2.67	.96	.03	.98	.98	.06
<b>4:</b> <sup>85%</sup> :10-item	85.78(34);p<.001	2.52	.96	.03	.98	.98	.06

Note:

- Numbers **not** presented in bold refer to the number of items tested in a model
- Percentages presented in superscript refer to the percentage of the population included in the models

From table 3 it can be seen that model version 1 (derived from the exploratory factor analysis procedure) was found to have substandard model fit indices on many of tests. This model failed to obtain a  $\chi^2$  *p* value above .05 and a  $\chi^2/df$  below 2 (Bollen, 1989; Byrne, 2001; Ullman,

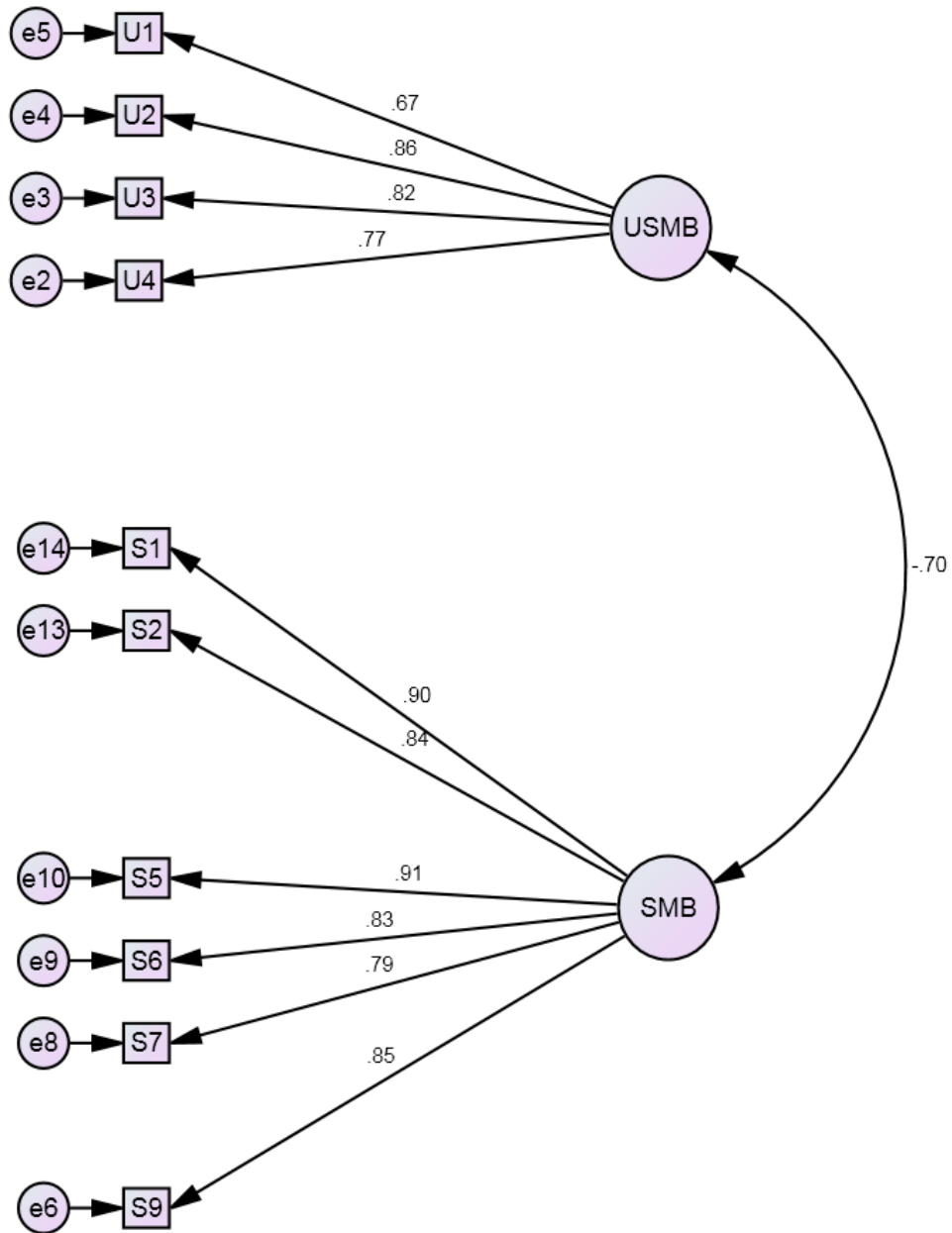
2013). It also failed to achieve a RMSEA value below .06 (Byrne, 2001; Hu & Bentler, 1999). Finally, it was observed that model version one could not achieve the acceptable GFI value of  $>.95$  (Byrne, 2001; Hu & Bentler, 1995).

It did, however, ascertain acceptable values for the other model fit indices: SRMR value  $<.08$  (Ullman, 2013); and a CFI and TLI value  $>.95$  (Byrne, 2001; Hu & Bentler, 1999; Tucker & Lewis, 1973). Unfortunately, on balance, it is not possible to conclude that this model is as good as it might be as too many of the fit indices are not supportive of the model and, therefore, post-hoc model modifications are needed. Error covariances and standardized residuals greater than 2.58 were therefore used as the basis for modifying the initial model in terms of identifying indicators whose deletion would improve model fit (Byrne, 2001)

Model version 2 (graphically represented in figure two) displays the fit indices for the revised 10-item SMBi measure. The four items removed from the 14-item version were:

- Your line manager telling others what to do rather than listening to their views (U5)
- Your line manager appearing to treat all staff fairly (S3)
- Your line manager making it clear what you are expected/needed to do (S4)
- Your line manager demonstrating a genuine willingness to learn from others (S8)

**Figure 2: 10-item SMBi CFA model**



The revised model (version 2: 10-items) achieved satisfactory values for five of the model fit tests: GFI, SRMR, TLI, CFI and RMSEA (Byrne, 2001; Hu & Bentler, 1995; Hu & Bentler, 1999; Tucker & Lewis, 1973; Ullman, 2013). In addition, the RMSEA confidence intervals values (.04 to .07) suggest that one can be 90% certain that the specified model represents the population between the levels of 'good fit' (Hu & Bentler, 1999) and 'reasonable fit' (Browne & Cudeck, 1993). Assessing Ullman's (2013) 'rule of thumb' regarding the  $\chi^2/df$  reveals a value of 2.63 that is closer to the desired value of 2, compared to the previous model and is arguably acceptable on the grounds that the specified parameters are relatively vague.

At this point, the revised 10-item measure appears reliable, however, as a consequence of modifying the model post-principal axis factoring, there was a need to perform confirmatory factor analysis on model version 2 (10-items). Ideally, this would have been done by splitting the original sample into two or three equal data sets, however, due to the relative limited sample size ( $n=511$ ) this was not possible. In an attempt to overcome this, two random samples of 90% and 85% were used to retest model version 2. These two sets of confirmatory factor analytic procedures are labelled in table three as 'version 3 90%' and 'version 4 85%'.

It can be seen from table 3 that the results from these confirmatory factor analytic procedures arrived at similar results, compared to the revised

'model version 2: 10:items'. However, not displayed in table 3 are the RMSEA confidence intervals for the 90% and 85% samples. These results were shown to be similar to that found in model version 2, with results of .05 to .08 and .04 to .08, respectively. On these grounds, the items in model version 2 of the SMBi will be computed into their respected factor structure (i.e. supportive and unsupportive manage behaviour) and used to assess the relationship with the studies outcome variables (e.g. job satisfaction, work engagement and organizational commitment).

### **Manager behaviour (SMBi) measure: The development (time 2)**

The current research was able to perform a second investigation utilizing the same S-Unit personnel. As such, it enabled an additional layer of scientific rigor to be applied to the current research. Here, it enabled the 10-item SMBi measure observed in the initial investigation to be thoroughly re-tested using a new dataset. In validating the SMBi measure in the time 2 investigation, all 415 participants were included in the analysis and the sample incorporated: 'S-Unit managers' (7), 'S-Unit operations managers' (5), 'training managers' (1), 'team leaders' (76), 'team educators' (15), 'operatives' (297), 'lead paramedics' (3), and participants who did not provide information regarding their role (11). Of these 415 participants, 348 were male, 59 were female and 8 people did not provided details regarding their gender.

Considering that the original investigation reported pre factor analytic checks based on 14 items, rather than just the 10 items investigated in



the time 2 study, it was decided that it would be of value to perform these again. Subsequently, the distribution of data was assessed as being 'normal', i.e. skew and kurtosis were within Miles and Shevlin's (2005) +/- 2 limit. Multicollinearity was ruled out as the determinant was observed as being  $> 0.00001$ . The collective KMO value was observed at .95, rather than the .96 observed in the time 1 study, and the range for the time 2 individual KMO values was observed between .92 and .97. As in the original investigation, the results indicated that the data was sufficient for factor analysis.

**Table 4: 10-item SMBi response frequency statistics (time 2)**

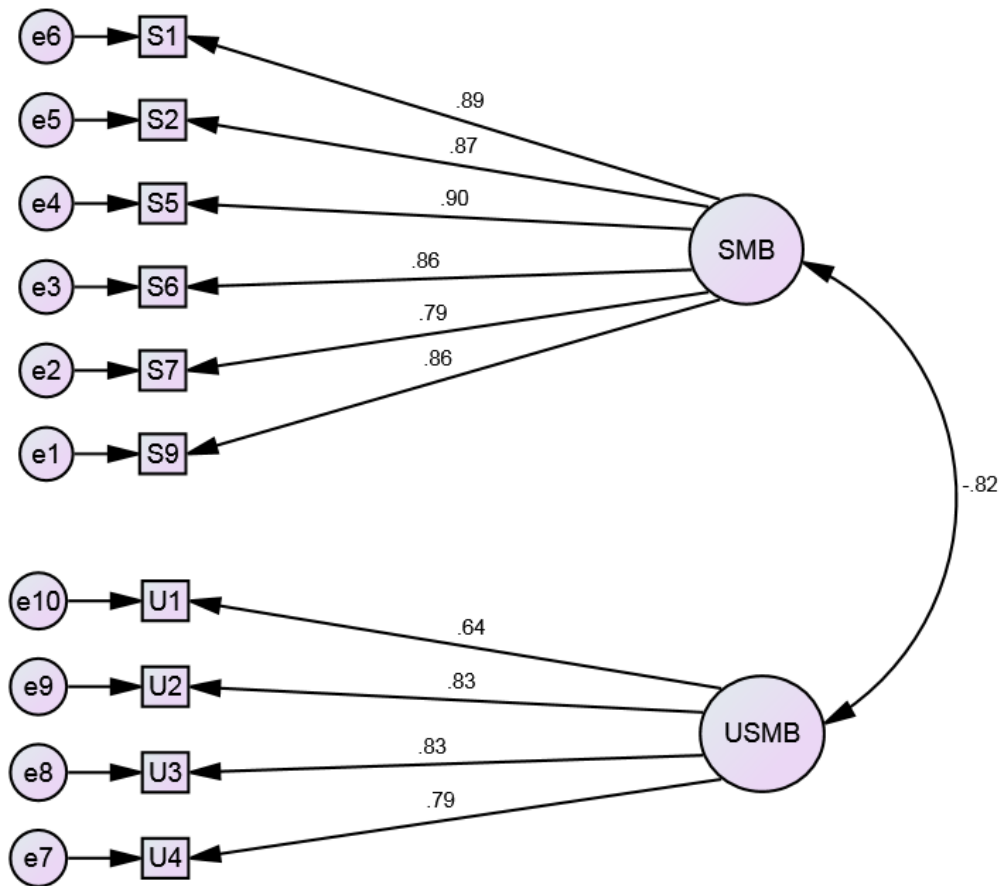
Item	Never %	Rarely %	Sometimes %	Often %	Always %	Mean (SD)
1. Having a line manager who listens	3.4	6.5	17.1	35.4	37.6	3.97 (1.06)
2. Getting a simple thank you, 'pat on the back', or some other form of recognition from your line manager for a job well done	4.1	9.2	22.2	36.6	28.0	3.75 (1.09)
3. Working for a line manager who demonstrates a genuine interest in your well-being	5.1	6.0	16.4	33.7	38.8	3.95 (1.12)
4. Your line manager criticising the effort you put into your job	28.9	44.3	17.6	6.3	2.9	2.10 (0.98)
5. Your line manager being too quick to blame someone when there are any problems	31.8	38.6	15.7	10.1	3.9	2.16 (1.10)
6. Working for a line manager who makes him/her self available to their staff	1.9	8.9	17.8	37.8	33.5	3.92 (1.02)
7. Having to deal with unrealistic expectations from your line manager	30.1	45.5	16.6	5.5	2.2	2.04 (0.94)
8. Your line manager encouraging you to put across your point of view	4.1	11.6	24.6	37.1	22.7	3.63 (1.08)
9. Being asked by your line manager to do something one minute and something else the next	21.2	42.7	21.9	9.6	4.6	2.34 (1.06)
10. Your line manager actively encouraging people to work together	2.4	7.2	19.0	38.6	32.8	3.92 (1.01)

Table 4 shows the response frequency for each of the 10 SMBi items. The items for both supportive and unsupportive manager behaviour maintained their codes that were presented in table 2. It can be seen here that the mean for the supportive manager behaviour items ranged from 3.63 to 3.97 and the unsupportive items ranged between 2.04 to 2.34. This indicates that, generally speaking, participants are reporting that they are observing more positive manager behaviours more frequently, compared to the negative manager behaviours reported here. It can also be seen in table 4 that there is a sizable minority of participants reporting that they either 'never' or 'rarely' observe their manager to exhibit supportive behaviours and that they 'often' or 'always' observe their manager to exhibit negative manager behaviours. For example, 15.7% of participants reported that their line manager never or rarely encouraged them to put them to put forward their views, and 14.2% of employees reported that their line manager asked them to do one thing one minute and something else the next either often or always.

**Confirmatory factor analysis: Assessing the model fit of the SMBi in the follow-up study.**

As in the original investigation, the analysis was performed utilizing AMOS 22 and employed the 'maximum likelihood' estimation algorithm.

**Figure 3: 10-item SMBi model (time 2)**



It can be seen from Figure 3 that the standardized beta weights are displayed along the single headed arrows linking items to their dimension. It can be seen that, for supportive manager behaviour (SMB), the items ranged from .79 (S7) to .90 (S5) and items for unsupportive manager behaviour (USMB) ranged from .64 (U1) and .83 (U2 & U3). While these item loading are all considered satisfactory (Byrne, 2001; Field, 2013; Tabachnick & Fidell, 2013), it can be argued that, overall, the slightly higher item loading for the supportive dimension, compared to the unsupportive factor, revealed that the supportive items are representing their factor to a slightly better degree.

**Table 5: SMBi confirmatory factor analysis model fit statistics (time 2)**

Version	$\chi^2$	$\chi^2/df$	GFI	SRMR	TLI	CFI	RMSEA
1: 10-item	72.49(34); $p < .001$	2.13	.97	.02	.99	.99	.05

As in the original investigation, it can be seen from table 5 that, under confirmatory factor analytic procedures, the 10-item SMBi measure achieved satisfactory values for five of the model fit tests: GFI, SRMR, TLI, CFI and RMSEA (Byrne, 2001; Hu & Bentler, 1995; Hu & Bentler, 1999; Tucker & Lewis, 1973; Ullman, 2013). Similarly, the RMSEA confidence intervals values matched those observed in the original investigation (.04 to .07), suggesting that the model is representative of the population (Browne & Cudeck, 1993; Hu & Bentler, 1999). In addition, the  $\chi^2/df$  value has been reduced from 2.63 in the original model

to 2.13 in the time 2 model. This has almost reached Ullman's (2013) 'rule of thumb' of 2 and is supportive of the 10-item model.

The aim of this chapter has been to demonstrate the psychometric properties of the SMBi measure and to begin to build up the evidence base to support the accuracy and validity of the measure. In an effort to further demonstrate these, the construct validity of the SMBi is addressed in chapter 5 by looking at the relationships between manager behaviour and a range of well-being and work attitude variables (e.g. work engagement and organizational commitment). These relationships are then compared to previous studies in the literature surrounding supportive and unsupportive manager behaviour.

## **CHAPTER 4: DEVELOPING THE CAPABILITY (EFFICACY) MEASURES**

Self-efficacy theory (Bandura, 1997) recognizes that people have a varied set of self-assessed skills and traits that affect their performance in given situations. The theory contends that these skills and traits are an individual's beliefs about their own functioning and performance (i.e. efficacy) within a given domain. Self-efficacy theory also acknowledges that an individual's performance may vary based on the situation they encounter since efficacy beliefs are founded on individual's thought processes, motivation and psychological state both before and during a given event. In essence, self-efficacy theory attempts to quantify how capable someone feels about how they would perform in any specific situation. With this in mind, it was decided that the phrase 'self-efficacy' was too opaque and that, from a practitioner's stand point, it was beneficial to refer to self-efficacy as 'capability'. Throughout this study the term 'capability' - rather than 'efficacy' - is used when referring to the development of the items.

Bandura discourages the use of 'off the shelf' general efficacy measures and champions the development of items that are specific and relevant to the situations and circumstances faced by those participants in the study (Bandura, 1997). He argues that "items [that] are usually cast in general form [require] participants to guess what the unspecified situational particulars might be" (p.39). Consequently, Bandura (1997) put forward a number of suggestions for researchers to follow when measuring

individual's perceived capability. Firstly, he suggests developing items that do not just assess judgements of motor acts - i.e. dividing complex actions into their sub-skills (e.g. assessing the perceived capability of a football player by measuring their level of efficacy to run, kick the ball and tackle the opposition). Secondly, it is recommended that researchers utilize 'experts' in the field they are studying. This is to aid in the process of producing items that assess capability beliefs with reference to specific situations and differ in their perceived level of difficulty. Thirdly, Bandura encourages researchers to utilize a unipolar rating scale that ranges from (0) 'completely inefficacious' to (10) 'complete efficacious' as response scales utilizing fewer points have been found less sensitive and more unreliable (Bandura, 1997; Streiner & Norman, 1989). Fourthly, Bandura advocated that researchers utilize efficacy items that cover a range of difficulties. Finally, researchers are cautioned about another aspect of the response format: differentiating between statements of intent and perceived capability. Items should clearly represent participants perceived capability in a given and specific situation. The development of the capability items in the current study followed the guidelines set by Bandura (1997).

### **Capability: The development of measures**

As discussed in chapter 3, the current study comprises an original investigation (time 1) and a follow-up study (time 2) that were conducted approximately one year apart. In relation to this chapter, the time 1 investigation was utilized to conduct the initial development of capability



measures to be included in the wider investigation regarding the impact of manager behaviour. The time 2 study was primarily used as a basis to conduct confirmatory factor analysis on a different data set in an effort to demonstrate the psychometric properties of all measures.

A detailed account of the processes undertaken for the development of the capability measures is provided below. The reader is first guided through the time 1 investigation of the individual, then the collective capability development procedure. The details of the time 2 investigation are presented after the time 1 study. It is important to note that the, software (SPSS 21 & AMOS 22), processes (e.g. 'maximum likelihood' estimation procedure, exploratory and confirmatory factor analysis) and tolerances (e.g. those regarding exploratory factor analysis factor loadings and confirmatory factor analysis model fit statistics) were identical to those described in chapter 3.

Chapter 2 outlined the details regarding the people attending the focus groups and the processes that were undertaken during these session. On the basis of these focus groups, 16 individual and 9 collective capability items were selected. Individual capability items were those derived from the list of scenarios that frontline S-Unit staff could/have attended and collective capability items were those derived from the questions regarding work environment factors that made incidents easier or more difficult to deal with. The items included in the individual and collective capability measures can be seen in tables 6 and 10, respectively. All

capability items were assigned an item code as it enabled the production of clear and concise figures (models) and tables where appropriate. It also serves as an aid for the reader to follow what items have been included - or removed - throughout the development processes. Critically, in line with Bandura's (1997) principles, individual capability items were selected to ensure that the items included had a wide range of difficulty levels (as assessed by managers and project leaders at both the organizational and national level).

The analysis of all capability items would only include those staff at the level of operative and team leader as they are the members of the organization who are consistently exposed to the scenarios (hypothetical or otherwise) developed to assess individual capability and who encounter all of the work experiences assessed in the collective capability items. The sample utilized to develop both individual and collective capability measures in the time 1 investigation was 473 participants: 97 team leaders and 376 operatives. Managers (9), operations officers (6), training managers (3), team educators (15), and those who failed to provide details regarding their role (5) were removed from this phase of the analysis. With regards to the gender of the participants, the study included 397 males, 72 females and 4 people who did not state their gender.

The data pertaining to all the time 1 capability items (individual and collective) were checked to ensure it was suitable for exploratory factor

analytic procedures. For both individual and collective capability items, the data were observed to be normally distributed (Skew and Kurtosis both within +/- 2; Miles & Shevlin, 2005) and fell within Field's (2013) recommended tolerances of multicollinearity (determinant > 0.00001). For the 16 individual capability items, the overall KMO value was observed at .95 and item KMO values ranged from .87 to .98. For the 9 collective capability items, the overall KMO was observed at .85 and item KMO values ranged from .78 to .93. This suggested that the pattern of correlations within the data are clearly sufficient for exploratory factor analysis (Field, 2013; Hutcheson & Soufroniou, 1999).

### **Individual capability (ICAP): The development (time 1)**

It was decided that the individual capability measure could be developed using 16 items. These items are displayed in table 6 and the items were assigned a code (ICAP\_A to ICAP\_P). The 'ICAP' refers to the type of capability being assessed (e.g. individual) and the letter 'A' to 'P' represented a specific item within that measure.

**Table 6: ICAP items and code**

<b>Item</b>	<b>Code</b>
<ul style="list-style-type: none"><li>• Where an explosion has occurred on a commuter train stuck in a tunnel and there are reports of many casualties with injuries.</li></ul>	ICAP_A
<ul style="list-style-type: none"><li>• Where you are called to treat a patient trapped 50ft along a collapsed trench/culvert and where you can only gain entry from one end.</li></ul>	ICAP_B
<ul style="list-style-type: none"><li>• Where a chlorine leak has occurred in a swimming pool during a swimming gala involving multiple schools and the fire service report the leak is still continuing and at least 25 children are requiring medical help.</li></ul>	ICAP_C
<ul style="list-style-type: none"><li>• Where a large trench being dug to support the laying of 3ft diameter drainage pipes has collapsed onto those working in it, resulting in several casualties and lots of soil infill.</li></ul>	ICAP_D
<ul style="list-style-type: none"><li>• Where a helicopter crashes into a tall building during busy commuter traffic and there are a large number of casualties.</li></ul>	ICAP_E
<ul style="list-style-type: none"><li>• Where an 18 storey block of flats has suffered extensive damage following a terrorist incident. As many as 12 storeys of the building have been obliterated and there are known to be multiple casualties.</li></ul>	ICAP_F
<ul style="list-style-type: none"><li>• Where you have been asked to respond to a football stadium where you are receiving reports of multiple crush injuries as a results of a large crowd surge during a mass evacuation caused by a fire incident.</li></ul>	ICAP_G
<ul style="list-style-type: none"><li>• Where a window cleaner has been injured 16 floors up on their hanging platform which, for some reason, is now inoperable.</li></ul>	ICAP_H
<ul style="list-style-type: none"><li>• Where a large passenger aircraft has made an emergency landing, broken up on landing and caught fire, reports are being received that numerous passengers are seriously injured and some reported dead.</li></ul>	ICAP_I
<ul style="list-style-type: none"><li>• Where there has been a serious RTA at a major Motorway intersection. An HGV has left the carriageway while travelling across an overpass and fallen onto a buss travelling below. People are known to be trapped in the bus which has the HGV on top of it.</li></ul>	ICAP_J
<ul style="list-style-type: none"><li>• Where a motor cyclist is seriously injured and is trapped under a leaking chemical tanker that has jack-knifed. 15 bystanders are coughing.</li></ul>	ICAP_K
<ul style="list-style-type: none"><li>• Where two patients need to be extracted from a collapsed bridge above running water and the depth of the water is unknown.</li></ul>	ICAP_L
<ul style="list-style-type: none"><li>• Where a full and busy commuter train has derailed 450metres away from the station platform during stormy (rain and windy) conditions. One carriage is on its side and there are reports of injuries. The power cable is still live.</li></ul>	ICAP_M
<ul style="list-style-type: none"><li>• Where an explosion and fire, believed to be the result of a terrorist incident, has led to the partial sinking of a vessel. An unknown number of people are believed to be trapped.</li></ul>	ICAP_N
<ul style="list-style-type: none"><li>• Where an underground escalator has collapsed during peak commuter traffic. There are reports of multiple casualties.</li></ul>	ICAP_O
<ul style="list-style-type: none"><li>• Where a patient has been entrapped neck high in murky and rapid running water for over 30 minutes.</li></ul>	ICAP_P

Table 7 presents the frequency of response (%), mean and standard deviation (SD) of each individual capability items. This information enables the identification of any response patterns and anomalies. The mean responses from the 16 items ranged from 6.7 (ICAP\_N) to 7.9 (ICAP\_J) and the modal response was '8' indicating that, generally speaking, participants were indicating that they felt more prepared than unprepared in dealing with incidents. In addition, as the results from the principal axis factoring (discussed below; see in table 8) suggested a one-factor solution. In addition, the average response on individual capability tends towards the 'prepared', rather than 'unprepared' end of the scale.

**Table 7: 16-item ICAP response frequency statistics**

Item Code	Not at all prepared '0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'	Completely prepared '10'	Mean (SD)
	%	%	%	%	%	%	%	%	%	%	%	
ICAP_A	.6	.2	.4	2.3	1.5	3.4	9.3	21.6	34.0	16.9	9.7	7.6 (1.7)
ICAP_B	1.7	.6	1.5	1.7	3.2	3.2	8.2	21.6	30.9	18.2	9.3	7.4 (2.0)
ICAP_C	.2	0	.4	2.3	1.3	2.5	10.1	18.0	29.4	23.5	12.3	7.8 (1.6)
ICAP_D	1.3	1.1	2.3	2.1	2.5	6.6	11.8	21.1	27.1	16.1	8.0	7.2 (2.0)
ICAP_E	.2	.4	.4	1.3	1.5	4.9	9.9	21.1	29.4	19.9	11.0	7.7 (1.6)
ICAP_F	1.1	1.3	1.3	2.1	5.1	7.6	11.8	18.6	27.3	15.6	8.2	7.1 (2.0)
ICAP_G	.4	.4	.4	1.9	4.7	5.9	10.6	20.9	30.2	15.9	8.7	7.4 (1.8)
ICAP_H	.2	.4	1.5	1.9	1.5	3.6	7.8	14.6	32.1	25.8	10.6	7.8 (1.7)
ICAP_I	.4	.2	.4	1.9	3.0	5.1	11.2	16.1	32.1	19.7	9.9	7.6 (1.7)
ICAP_J	.2	0	.6	.6	2.1	3.2	8.0	13.7	33.2	26.4	11.8	7.9 (1.5)
ICAP_K	.4	.2	.8	1.3	1.9	4.9	10.6	18.4	33.8	18.6	9.1	7.6 (1.7)
ICAP_L	.2	.8	1.5	2.5	1.7	5.7	8.7	17.3	30.7	21.1	9.7	7.5 (1.8)
ICAP_M	.2	.6	.4	1.9	1.7	3.8	11.2	21.1	31.5	18.0	9.5	7.6 (1.7)
ICAP_N	2.5	.4	4.0	4.7	7.6	8.2	13.1	20.9	17.8	12.7	8.0	6.7 (2.3)
ICAP_O	.6	.4	1.1	1.5	1.3	5.7	9.5	19.7	31.3	18.2	10.8	7.6 (1.8)
ICAP_P	1.1	1.5	2.3	2.7	2.7	4.0	8.7	16.9	30.4	21.4	8.2	7.3 (2.1)

### **Principal axis factoring: 16-item ICAP**

The 16 ICAP items were subjected to principal axis factoring, utilizing the direct oblimin rotation algorithm as it was believed that any dimensions that may be found would be correlated to one another. The same rules regarding item factor loading were applied here that were followed during the SMBi development (see section 'Principal axis factoring: The rules of factor loading' for details).

**Table 8: ICAP principal axis factoring item loading**

Item Code	Factor Loading
ICAP_A	.83
ICAP_B	.68
ICAP_C	.85
ICAP_D	.73
ICAP_E	.86
ICAP_F	.84
ICAP_G	.89
ICAP_H	.69
ICAP_I	.90
ICAP_J	.85
ICAP_K	.87
ICAP_L	.77
ICAP_M	.88
ICAP_N	.71
ICAP_O	.88
ICAP_P	.68
Eigenvalue	10.80

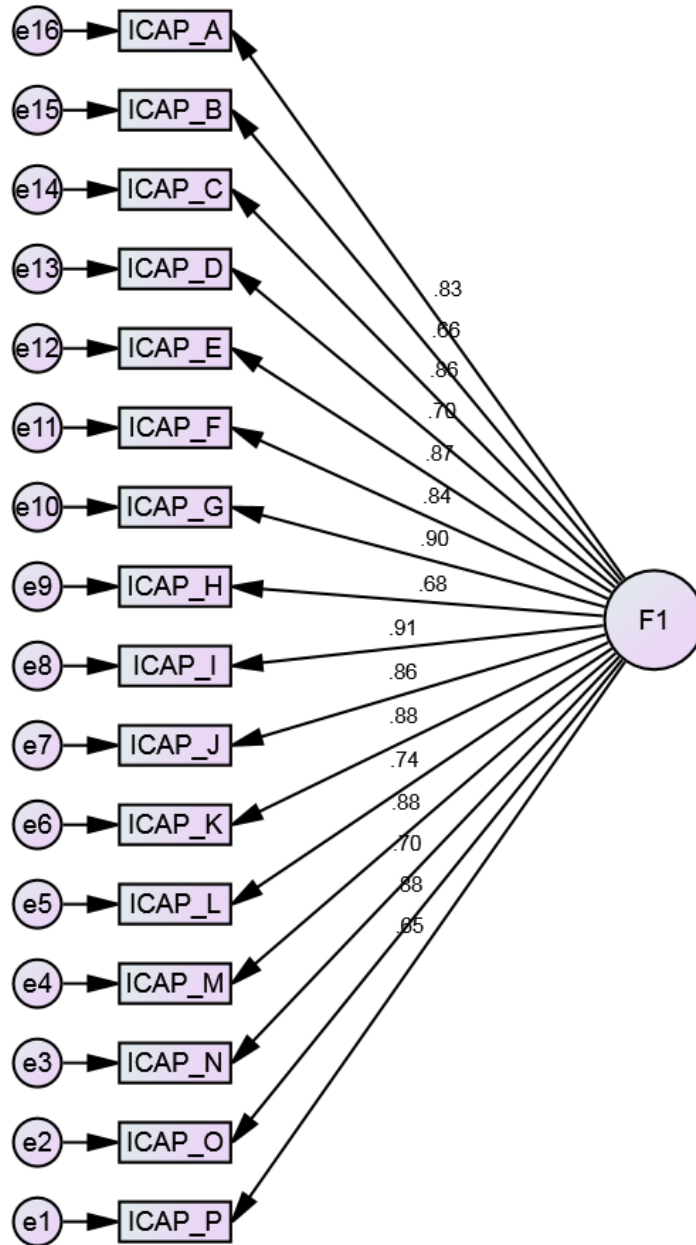
The results from the exploratory factor analysis revealed a one factor solution. All 16 items were incorporated into a single dimension that accounted for 67% of the variance. It could also be observed in the scree plot that the point of inflection was in support of a one factor solution (Field, 2013). Therefore, this factor was named 'individual S-Unit capability'. Individually, the items can be seen to account from between 46% (ICAP\_B & ICAP\_P) and 81% (ICAP\_I) of the variance within the dimension itself. This is greater than the required 16% suggested by Stevens (2002).

### **Confirmatory factor analysis: 16-item ICAP**

Figure 4 graphically represents the ICAP single dimension item structure derived from the exploratory factor analytic procedure. The standardized regression weights of each item can be seen on the arrow linking the latent variable (F1; ICAP) and the observed variables (ICAP\_A to ICAP\_P).



**Figure 4: 16-item ICAP model (time1)**



It can be seen from figure 4 that these standardized regression weights for item factor loading ranges from .65 (ICAP\_P) to .91 (ICAP\_I). These initial statistics were supportive of a well fitting model (e.g. Byrne, 2001; Tabachnick & Fidell, 2013; Tucker & Lewis, 1973) and inspection of relevant model fit statistics (see table 9) was undertaken.

**Table 9: ICAP confirmatory factor analysis model fit statistics (time 1)**

Version	$\chi^2$	$\chi^2/df$	GFI	SRMR	TLI	CFI	RMSEA
<b>1</b> : 16-items	1171.22(104); p<.001	11.26	.76	.06	.84	.89	.15
<b>2</b> : 7-items	48.75(14); p<.001	3.48	.97	.02	.98	.99	.07
<b>3</b> <sup>90%</sup> : 7-items	49.18(14); p<.001	3.51	.97	.02	.98	.99	.08
<b>4</b> <sup>85%</sup> :7-items	50.28(14); p<.001	3.59	.97	.02	.98	.99	.08

Note:

- Numbers **not** presented in bold refer to the number of items tested in a model
- Percentages presented in superscript refer to the percentage of the population included in the models

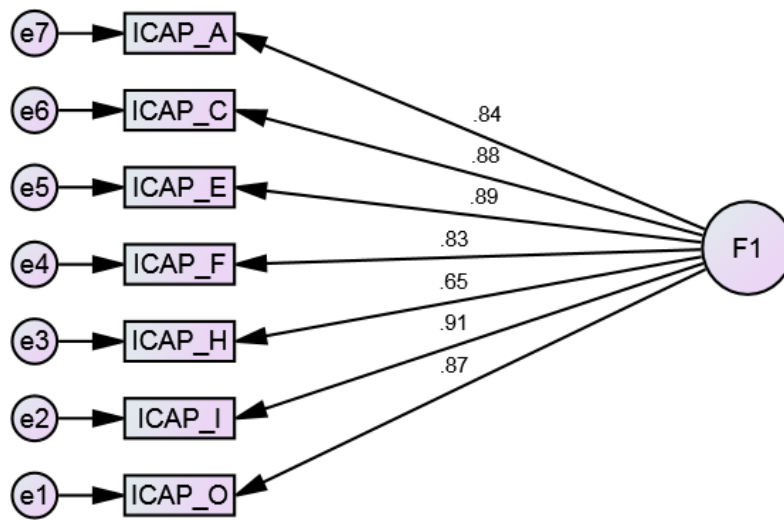
From table 9, it can be seen that all but the SRMR model fit statistics for 'version 1: 16-items' are unsatisfactory (see chapter 3) indicating that the model needed to be revised. Following the guidelines set by Byrne, 2001, these revisions were conducted by assessing error covariances and standardized residuals > 2.58.

Consequently, nine items were removed from the original model and the revised ICAP model 'version 2: 7 items' is graphically represented in figure 5. The nine items removed from the model were:

- ICAP\_B: Where you are called to treat a patient trapped 50ft along a collapsed trench/culvert and where you can only gain entry from one end
- ICAP\_D: Where a large trench being dug to support the laying of 3ft diameter drainage pipes has collapsed onto those working in it, resulting in several casualties and lots of soil infill
- ICAP\_G: Where you have been asked to respond to a football stadium where you are receiving reports of multiple crush injuries as a result of a large crowd surge during a mass evacuation caused by a fire incident
- ICAP\_J: Where there has been a serious RTA at a major Motorway intersection. An HGV has left the carriageway while travelling across an overpass and fallen onto a bus travelling below. People are known to be trapped in the bus which has the HGV on top of it.
- ICAP\_K: Where a motorcyclist is seriously injured and is trapped under a leaking chemical tanker that has jack-knifed. 15 bystanders are coughing.
- ICAP\_L: Where two patients need to be extracted from a collapsed from a collapsed bridge above running water and the depth of water is unknown

- ICAP\_M: Where a full and busy commuter train has derailed 450 metres away from the station platform during stormy (rain and windy) conditions. One carriage is on its side and there are reports of injuries. The power cable is still live.
- ICAP\_N: Where an explosion and fire, believed to be the result of a terrorist incident, has led to the partial sinking of a vessel. An unknown number of people are believed to be trapped.
- ICAP\_P: Where a patient has been entrapped neck high in murky and rapid running water for over 30 minutes.

**Figure 5: 7-item ICAP model (time 1)**



The standardized regression weights are once again displayed next to the directional arrow linking the latent to observed variable. From figure 5, it can be seen that these values are acceptable, ranging from .65 (ICAP\_H) to .91 (ICAP\_I).

Referring back to table 9, the model fit statistics for 'version 2: 7 items' obtained much more satisfactory results; GFI, SRMR, TLI and CFI all achieved at least their required value, indicating a well fitting model. In addition, it can be seen that results for the  $\chi^2/df$  and RMSEA tests obtained values only slightly above their desired level (see chapter 3). The confidence intervals for the RMSEA model fit statistic also demonstrated that the value could be as low as .05 - below the desired level of .06 (e.g. Byrne, 2001).

As outlined in chapter 3, the issues regarding sample size meant that the dataset could not be separated and, therefore, the revised model needed to be re-confirmed using the original sample (n = 473). As in chapter 3, 90% and 85% samples were used to overcome this issue (labelled as 'version 3<sup>90%</sup>' and 'version 4<sup>85%</sup>' in table 9). The model fit statistics from the random samples in models 3 and 4 were similar to those found in the revised model. Consequently, the current research employed these 7-items as the measure of individual capability. These items being:

- ICAP\_A: Where an explosion has occurred on a commuter train stuck in a tunnel and there are reports of many casualties with injuries

- ICAP\_C: Where a chlorine leak has occurred in a swimming pool during a swimming gala involving multiple schools and the fire service report the leak is still continuing and at least 25 children are requiring medical help
- ICAP\_E: Where a helicopter crashes into a tall building during busy commuter traffic and there are a large number of casualties
- ICAP\_F: Where an 18 storey block of flats has suffered extensive damage following a terrorist incident. As many as 12 storeys of the building have been obliterated and there are known to be multiple casualties
- ICAP\_H: Where a window cleaner has been injured 16 floors up on their hanging platform which, for some reason, is now inoperable
- ICAP\_I: Where a large passenger aircraft has made an emergency landing, broken up on landing and caught fire, reports are being received that numerous passengers are seriously injured and some reported dead
- ICAP\_O: Where an underground escalator has collapsed during peak commuter traffic. There are reports of multiple casualties

The reader is now led through the time 1 investigation and development of the collective capability measure.

## Collective capability (CCAP): The development (time 1)

On the basis of the discussions with study experts, it was decided that the development of a collective capability measure would commence with nine items. These items can be seen in table 10 along with their assigned code. The 'CCAP' represents the development of a collective capability measure and the 'A' to 'I' represents a specific item.

**Table 10: CCAP items and code**

Collective capability items	Item Code
<ul style="list-style-type: none"><li>• That you will be able to depend on your team colleagues to work safely whatever the incident?</li></ul>	CCAP_A
<ul style="list-style-type: none"><li>• That you will be able to depend on your team colleague's ability to do what is asked of them?</li></ul>	CCAP_B
<ul style="list-style-type: none"><li>• That your colleagues will possess the technical abilities to deal with (larger scale) major incidents?</li></ul>	CCAP_C
<ul style="list-style-type: none"><li>• That your colleagues will have the physical stamina required for larger scale incidents?</li></ul>	CCAP_D
<ul style="list-style-type: none"><li>• That sufficient continuation training will be provided for your role?</li></ul>	CCAP_E
<ul style="list-style-type: none"><li>• That you will be able to depend on the Fire Brigade at an incident?</li></ul>	CCAP_F
<ul style="list-style-type: none"><li>• That you will be able to depend on the Police at an incident?</li></ul>	CCAP_G
<ul style="list-style-type: none"><li>• That sufficient systems of support (e.g. counselling) will be provided to you following an incident?</li></ul>	CCAP_H
<ul style="list-style-type: none"><li>• That your 'Trust' will fully utilise the capability of S-Unit?</li></ul>	CCAP_I



The response pattern for the nine collective capability items was examined (table 11). It can be seen here that the mean response for each of the nine items ranged from 4.0 (CCAP\_I) to 8.3 (CCAP\_B). It can be seen here that the modal response for the nine collective capability items was '8' indicating that, generally, S-Unit personnel are indicating that they are more certain than uncertain about the dependability of those around them. However, one item (ICAP\_I) relating to the Trust utilizing the S-Unit appropriately obtained values much lower than the others, indicating that employees are uncertain about the way the S-Unit is being used.

Moving ahead slightly, the results from the exploratory factor analysis (table 12) revealed a two factor solution. The items in each dimension were assessed and the two factors are named 'proximal collective capability' (factor 1) and 'distal collective capability' (factor 2). The details of the exploratory factor analytic procedure is presented below, however, understanding the underlying factor structure at this point enables discussion regarding how participants responded to each dimension. For instance, on a scale that could range from '0' to '10', the mean response for the proximal items ranged from 7.8 (CCAP\_D) to 8.3 (CCAP\_B); whereas the response for the distal items ranged from 4.0 (CCAP\_I) to 7.5 (CCAP\_G). Most notably, participants generally reported more positive beliefs about their proximal collective capability, compared to their beliefs related to distal collective capability.

**Table 11: 9-item CCAP response frequency statistics**

Item Code	Not at all certain '0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'	Completely certain '10'	Mean (SD)
	%	%	%	%	%	%	%	%	%	%		
CCAP_A	.2	0	.2	.6	1.3	3.6	6.6	14.0	28.3	24.7	20.5	8.2(1.5)
CCAP_B	.2	.2	0	.4	2.1	3.6	6.1	12.9	22.0	29.2	23.3	8.3 (1.6)
CCAP_C	.2	0	.2	.6	1.3	5.1	6.1	17.3	27.9	24.1	17.1	8.0 (1.5)
CCAP_D	.2	.6	.4	3.0	1.9	6.1	6.1	12.7	30.2	21.4	17.3	7.8 (1.9)
CCAP_E	1.3	1.3	1.5	4.2	5.5	9.1	13.3	19.2	22.2	15.2	7.2	6.9 (2.1)
CCAP_F	.2	1.3	2.3	1.9	3.4	7.2	13.1	16.3	29.8	13.7	10.8	7.2 (2.0)
CCAP_G	0	.2	1.7	1.3	3.4	7.0	10.1	19.2	30.2	14.4	12.5	7.5 (1.8)
CCAP_H	4.0	3.4	5.7	6.1	7.8	14.2	13.5	12.7	16.5	10.8	5.3	5.9 (2.6)
CCAP_I	15.0	7.4	7.4	13.5	13.3	13.3	11.4	7.4	7.4	2.3	1.5	4.0 (2.7)

### **Principal axis factoring: 9 item CCAP**

Principal axis factoring was undertaken to derive the underlying factor structure of the nine collective capability items. The rules of factor loading are detailed in chapter 3. From table 12, it can be seen that all nine items met the necessary criteria for factor loading and that the analysis revealed a two factor solution where the items 'A' to 'D' - relating to the capability of one's self and immediate colleagues - load onto a factor, named 'proximal collective capability', and items 'E' to 'I' - relating to the capability of the organization - load onto another factor, named 'distal collective capability'. Proximal collective capability was found to account for 51.5% of the variance and, whereas distal collective capability was found to account for an additional 17.9% of the variance within the data. The utilization of the direct oblimin rotation algorithm was found to be justified as factors were observed to significantly positively correlated with one another ( $r = .42$ ).

Supporting evidence for the two factor solution was provided by both eigenvalues and analysis of the corresponding scree plot. It can be seen in table 12 that eigenvalues for both factors are  $>1$ . In addition, the scree plot and its associated 'point of inflection' was observed to support a two factor solution (Filed, 2013).

**Table 12: CCAP principal axis factoring item loading**

Item Code	Rotated Factor Loading	
	Factor 1	Factor 2
CCAP_A	<b>.92</b>	-.02
CCAP_B	<b>.94</b>	-.07
CCAP_C	<b>.88</b>	.08
CCAP_D	<b>.75</b>	.05
CCAP_E	.19	<b>.60</b>
CCAP_F	-.01	<b>.75</b>
CCAP_G	-.02	<b>.79</b>
CCAP_H	-.05	<b>.68</b>
CCAP_I	< .01	<b>.56</b>
Eigenvalues	4.64	1.61

Note: Factor loadings above .40 are shown in bold

It can be seen in table 12 that items loading onto factor 1 (proximal collective capability) explain between 88% and 56% of the variance, compared to the items loading onto factor 2 (distal collective capability) that explain between 62% and 31% of the variance in the data. These item loadings were found to be in excess of the recommended minimum of 16% (Stevens, 2002). The reader is now directed through the confirmatory factor analytic procedure of the collective capability items (time 1).

### **Confirmatory factor analysis: Collective capability**

Confirmatory factor analysis was performed on the two factor (proximal and collective capability): nine-item solution that was observed in the exploratory factor analysis procedure. This model is depicted graphically in figure 6 showing the standardized regression weights of each item along the arrow linking the latent and the observed variables.

**Figure 6: 9-item CCAP model (time 1)**

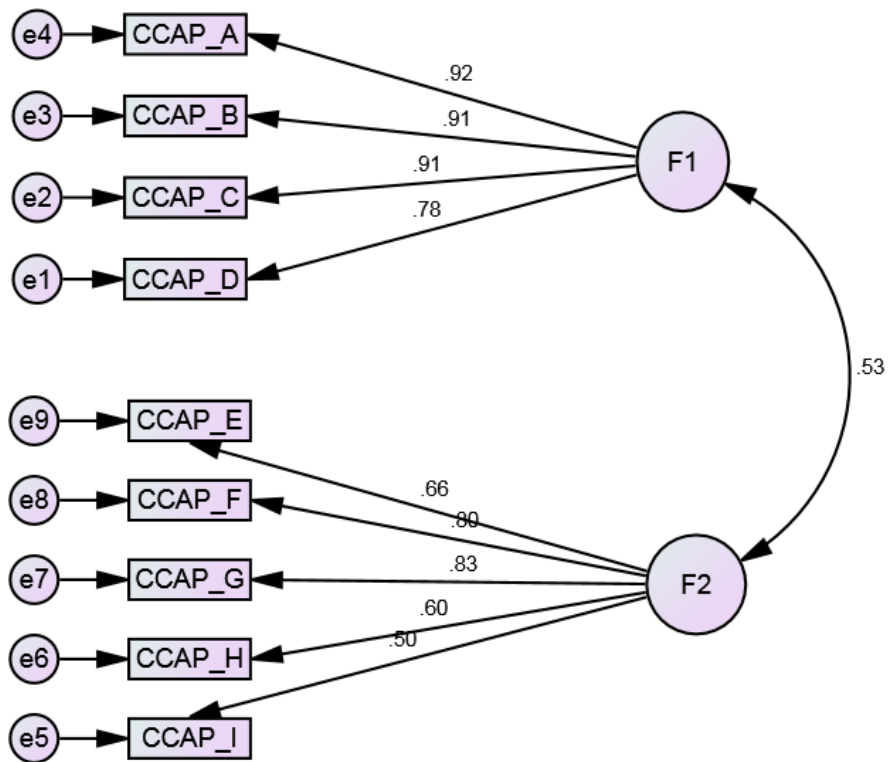


Figure 6 shows that the nine items have relatively strong relationships with their respective dimension. Furthermore, the items loading onto the first dimension (F1; proximal collective capability) have standardized regression weights ranging from .78 to .92, compared to the items that load onto the second dimension (F2; distal collective capability) that ranged from .50 to .83, indicating that relative strength of items for proximal collective capability is, generally, greater than that of the items relating to distal collective capability (Byrne, 2001; Tabachnick & Fidell, 2013)

**Table 13: CCAP confirmatory factor analysis model fit statistics (time 1)**

<b>Version</b>	<b><math>\chi^2</math></b>	<b><math>\chi^2/df</math></b>	<b>GFI</b>	<b>SRMR</b>	<b>TLI</b>	<b>CFI</b>	<b>RMSEA</b>
<b>1: 9-items</b>	233.20(26); p < .001	8.97	.89	.07	.89	.92	.13
<b>2: 7-items</b>	36.10(13); p = .001	2.78	.98	.03	.98	.99	.06
<b>3<sup>90%</sup>: 7-items</b>	27.09(13); p = .012	2.08	.98	.03	.99	.99	.05
<b>4<sup>85%</sup>: 7-items</b>	30.47(13); p = .004	2.34	.98	.03	.99	.99	.06

Note:

- Numbers **not** presented in bold refer to the number of items tested in a model
- Percentages presented in superscript refer to the percentage of the population included in the models

Table 13 shows that the model fit indices for model 'version 1: 9-items' were inspected and have less than satisfactory results, suggesting the model needed to be modified (see chapter 3). Again, utilizing the guidelines set out by Byrne (2001) relating to error covariances and

standardized residuals, the model was altered and two items were removed. These were:

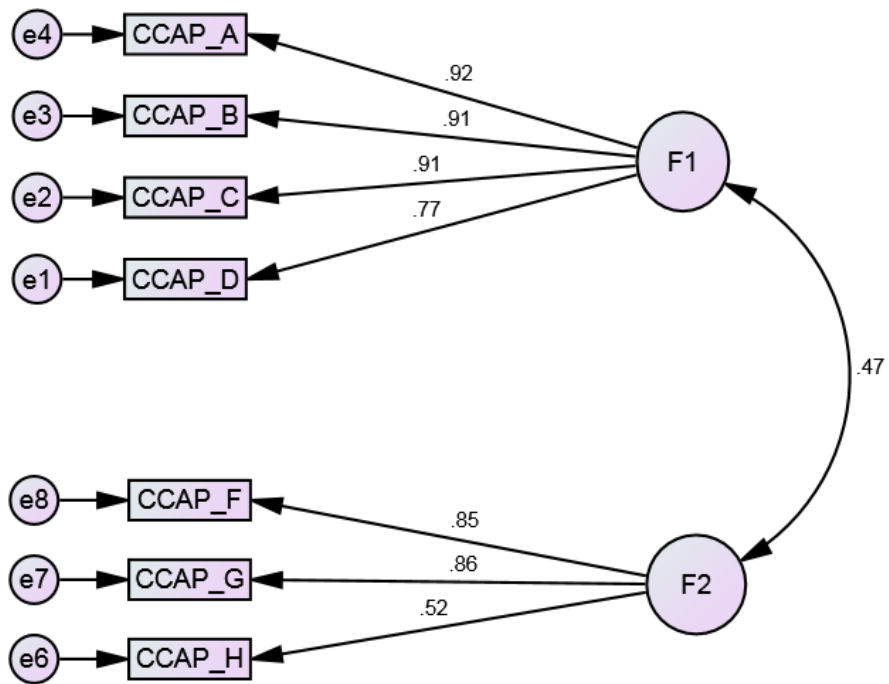
- CCAP\_E: That sufficient continuation training will be provided for your role?
- CCAP\_I: That your 'Trust' will fully utilise the capability of S-Unit?

The revised model ('version 2: 7-items') is depicted in figure 7. It can be seen here that the standardized regression weights for F1 (proximal collective capability) ranged from .77 to .92, and from .52 to .85 for F2 (distal collective capability). These item loadings were supportive of a well fitting model (e.g. Byrne, 2001; Tabachnick & Fidell, 2013; Tucker & Lewis, 1973).

The model fit statistics (table 13) provide a similar conclusion. The model fit indices for model 'version 2: 7-items' were more satisfactory compared to the original model as five model fit statistics (GFI, SRMR, TLI, CFI & RMSEA) had acceptable results (see chapter 3). The RMSEA confidence intervals showed that the likely 'true' value falls between .04 and .09. The upper confidence interval is greater than ideal (Byrne, 2001), however, on balance more model fit statistics were observed to support the 7-item model, compared to those that implied it was unacceptable.



**Figure 7: 7-item CCAP model (time 1)**



The issue regarding re-confirming the revised model and sample size of the time 1 investigation have been discussed in both this chapter and chapter 3. The same method of overcoming this issue is employed in the development of the 7-item collective capability measure (i.e. the same 90% and 85% sample employed in the time 1 individual capability investigation were utilized).

Table 13 shows that the model fit statistics for models 3 (90%) and 4 (85%) obtained similar satisfactory model fit indices, compared to model 2 (see chapter 3). Subsequently, in relation to the current research, proximal collective capability was measured using four items and distal collective capability was measured using three items. The items for proximal collective capability were:

- CCAP\_A: That you will be able to depend on your team colleagues to work safely whatever the incident?
- CCAP\_B: That you will be able to depend on your team colleague's ability to do what is asked of them?
- CCAP\_C: That your colleagues will possess the technical abilities to deal with (larger scale) major incidents?
- CCAP\_D: That your colleagues will have the physical stamina required for larger scale incidents?

The items for distal collective capability were:

- CCAP\_F: That you will be able to depend on the Fire Brigade at an incident?
- CCAP\_G: That you will be able to depend on the Police at an incident?
- CCAP\_H: That sufficient systems of support (e.g. counselling) will be provided to you following an incident?

### **The development of capability measures: Time 2 investigation**

The reader is now guided through the process of conducting the confirmatory factor analytic procedures on both individual and collective capability measures in that were undertaken in the time 2 investigation. This investigation was conducted to attempt to overcome the initial sample size issues discussed both in this chapter and chapter 3. The time 2 investigations (individual and collective capability) again used only frontline S-Unit employees. Subsequently, the sample size was reduced from the 415 employed in the time 2 SMBi development investigation in chapter 3, to 372 participants (75 team leaders and 297 operatives). The same pre factor analytic checks were made to ensure the data were suitable for the relevant scientific processes. Results were observed indicating that data were normally distributed (skew and kurtosis within +/- 2; Miles & Shevlin, 2005) and the determinant for both measures was observed > 0.00001 (as recommended by Field, 2013). For the individual collective capability items, the overall KMO value was observed at .93 and the item KMO values ranged from .89 to .98. For the collective capability

items, the overall KMO value was observed at .83 and item KMO values ranged from .75 to .95. These results indicated that the data were suitable for factor analytic processes (Field, 2013).

As with the time 1 investigation, the reader is presented with the details of individual capability measure development and then the collective capability development. For both time 2 investigations, the item codes for each item matches that assigned in the time 1 investigation. See table 6 for the individual capability items and table 10 for the collective capability items.

### **Individual capability: Time 2 investigation**

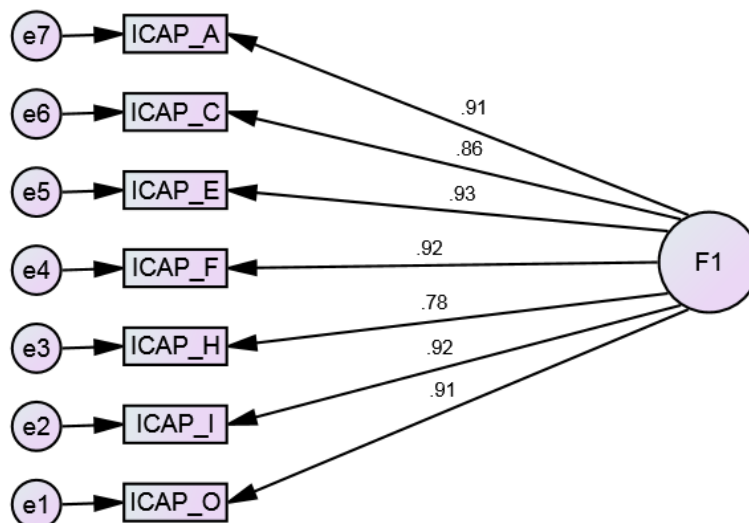
The response frequency of each of the seven individual capability items was calculated and reported in table 14. It can be seen here that the mean responses from the items ranged from 6.8 (ICAP\_F) to 7.4 (ICAP\_C & ICAP\_H). This range is comparably smaller than that observed for the initial 16 items. Again, the modal response was '8' indicating that, generally speaking, participants were indicating that they felt more prepared than unprepared in dealing with incidents.

**Table 14: 7-item ICAP response frequency statistics (time 2)**

Item Code	Not at all prepared '0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'	Completely prepared '10'	Mean (SD)
	%	%	%	%	%	%	%	%	%	%	%	
ICAP_A	.8	1.1	1.9	3.0	1.9	4.0	10.2	19.6	32.0	17.7	7.8	7.3 (1.9)
ICAP_C	.8	.8	1.9	2.2	2.4	4.6	10.5	16.4	30.1	22.3	8.1	7.4 (1.9)
ICAP_E	.8	.5	3.2	2.4	2.2	3.8	10.2	19.6	29.0	21.5	6.7	7.3 (2.0)
ICAP_F	1.6	2.2	2.4	4.0	3.2	8.1	12.9	20.2	23.4	15.3	6.7	6.8 (2.2)
ICAP_H	.8	1.1	1.9	3.0	2.7	6.2	8.9	16.4	28.8	21.2	9.1	7.4 (2.0)
ICAP_I	1.6	.8	1.6	2.4	3.2	4.8	10.2	20.7	25.8	21.5	7.3	7.3 (2.0)
ICAP_O	.8	1.9	2.4	2.4	3.0	5.6	10.2	16.9	33.1	16.1	7.5	7.2 (2.1)

The seven item model was subjected to the confirmatory factor analytic procedure. Figure 8 graphically represents this model. The standardized regression weights ranged from .78 (ICAP\_H) to .93 (ICAP\_E).

**Figure 8: 7-item ICAP model (time 2)**



**Table 15: ICAP confirmatory factor analysis model fit statistics (time 2)**

Version	$\chi^2$	$\chi^2/df$	GFI	SRMR	TLI	CFI	RMSEA
1: 7-items	115.67(14); p <.001	8.26	.93	.02	.95	.97	.14

Compared to the original investigation that achieved four satisfactory model fit indices, table 15 shows that the time 2 investigation into the 7-item individual capability measure achieved satisfactory values for three tests: SRMR, TLI and CFI. The GFI value is only slightly below the desired .95 level (Byrne, 2001; Hu & Bentler, 1995; Hu & Bentler, 1999; Tucker & Lewis, 1973; Ullman, 2013).

The observed RMSEA value with its associated confidence intervals (.12 to .16) indicated that the model is no longer representative of the population (Browne & Cudeck, 1993; Hu & Bentler, 1999). In support of the current findings, research has found that the RMSEA value (and associated confidence intervals) are influenced by sample size and model complexity, wherein relatively small sample sizes and/or models with a large number of parameters are likely to produce inflated RSMSEA values (MacCallum et al., 1996). Since the number of participants has decreased from 473 (time 1) to 372 (time 2). The research suggested that). As stated earlier, the time 2 investigation into collective capability is presented next.



### **Collective capability: Time 2 investigation**

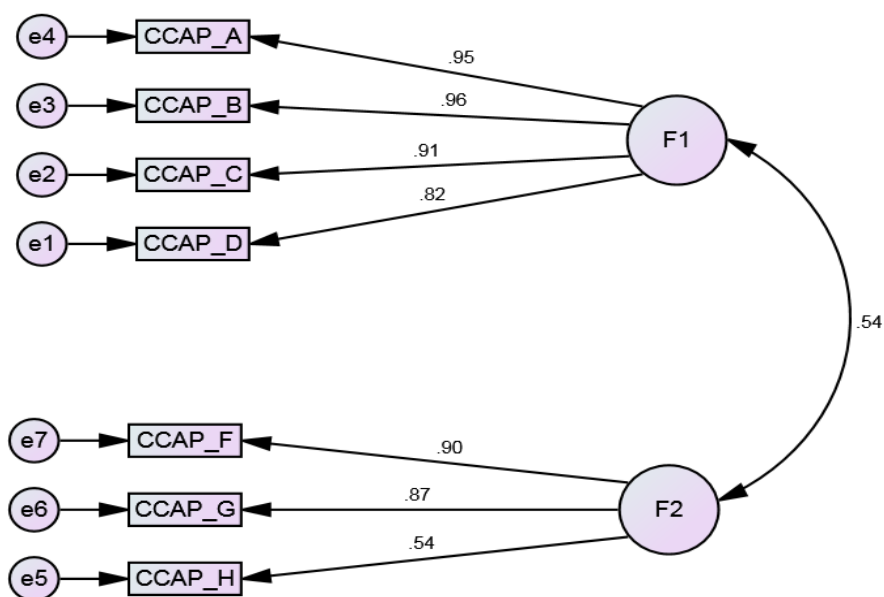
The response frequency of each of the seven collective capability items (four proximal and three distal collective capability) was calculated and reported in table 16. The proximal collective capability items ranged from 7.5 (CCAP\_D) to 8.0 (CCAP\_B), whereas the distal collective capability items ranged from 4.6 (CCAP\_H) to 5.9 (CCAP\_G). Mean responses indicated that participants are feeling relatively more certain about the capability their S-Unit colleagues, compared to the perceived capability of other emergency services and their Trust.

**Table 16: 7-item CCAP response frequency statistics (time 2)**

Item Code	Not at all prepared '0'	'1'	'2'	'3'	'4'	'5'	'6'	'7'	'8'	'9'	Completely prepared '10'	Mean (SD)
	%	%	%	%	%	%	%	%	%	%	%	
CCAP_A	.5	.8	.8	.8	1.9	5.6	5.1	13.4	29.3	27.7	14.0	7.9 (1.8)
CCAP_B	.3	.8	1.1	.8	2.2	3.2	5.6	12.9	29.0	28.8	13.3	8.0 (1.7)
CCAP_C	.5	.3	2.2	1.6	1.6	3.5	5.6	17.2	30.6	24.7	12.1	7.8 (1.8)
CCAP_D	1.1	1.1	1.3	1.3	2.4	4.0	11.3	17.7	25.5	23.7	10.5	7.5 (2.0)
CCAP_F	1.1	1.6	2.2	2.4	3.8	6.7	12.9	20.4	25.8	17.7	5.4	7.0 (2.1)
CCAP_G	.3	1.3	1.3	1.6	4.0	5.1	9.4	20.4	29.8	20.7	5.9	7.3 (1.9)
CCAP_H	4.8	4.0	9.4	7.3	6.7	12.1	11.6	11.8	17.5	10.2	4.6	5.6 (2.8)

The seven item model was subjected to the confirmatory factor analytic procedure. Figure 9 graphically represents this model. It can be seen here that the standardized regression weights for proximal collective capability (F1) ranged from .82 (CCAP\_D) to .96 (CCAP\_B), whereas the regression weights for distal collective capability (F2) ranged from .54 (CCAP\_H) to .90 (CCAP\_F).

**Figure 9: 7-item CCAP model (time 2)**



**Table 17: CCAP confirmatory factor analysis model fit statistics (time 2)**

Version	$\chi^2$	$\chi^2/df$	GFI	SRMR	TLI	CFI	RMSEA
1: 7-items	98.32(13); $p < .001$	7.56	.93	.04	.94	.96	.13

Table 17 shows that the time 2 collective capability measure achieved two satisfactory (SRMR & CFI) and two marginally satisfactory (GFI & TLI) model fit statistics (see chapter 3). As with the time 2 individual capability investigation, the RMSEA value - and associated confidence intervals (.11 & .16) - were observed to be less than satisfactory (Browne & Cudeck, 1993; Hu & Bentler, 1999), but the research suggesting how the RMSEA value can become overinflated due to sample size has already been discussed (MacCallum et al., 1996).

## **CHAPTER 5: ASSESSING THE IMPACT OF MANAGER BEHAVIOUR USING CROSS-SECTIONAL ANALYSIS**

The objectives of this chapter are to explore the cross-sectional relationships between supportive and unsupportive manager behaviour on the various indicators of well-being and work attitude employed in this investigation. As a precursor to this examination, the possibility that the data are nested (thereby requiring multi-level analysis) is first explored. As will be shown, the data were not found to be nested and multi-level analysis was therefore not required. Rather, correlation and regression analysis is used to examine the association between manager behaviour (supportive and unsupportive) and work attitudes and well-being. The extent to which perceived organizational support mediates the link between manager behaviour and the various outcomes and structural modelling of the data are also presented.

The reasoning behind including both regression analysis and structural modelling is twofold. Firstly, structural modelling enables the inclusion of multiple outcome variables, where regression analysis does not. Secondly, the modelled data groups outcome variables into related factors and assesses the relationships with two relevant control variables. Finally, including all the relevant study variables in a single model, rather than analyses the individual relationships, reduces the likelihood of type one and two error.

## **Selecting the cases**

As with the validation of the capability measures, the cross-sectional study utilized the 473 participants who defined their role as being an 'operative' or 'team leader'. See chapter 4 for the details regarding gender and job role demographics. The primary reason behind selecting only operatives and team leaders was that operatives and team leaders are those who, within the S-Unit, engage with service users face-to-face and have to work in conditions which, according to the DSM, could cause symptoms of PTSD - a principal area of investigation in this research.

### **Nested data: Time 1 investigation**

As the current study utilizes participants employed in 16 Unit there is a possibility that there might be some dependency in the data, i.e. residuals becoming correlated. These patterns, if found in the data, would violate the assumptions of multiple linear regression and the data would be defined as being 'nested'. Nested data requires multilevel modelling as this analytical technique is designed to bypass the assumption of independence between cases (Field, Miles & Field, 2014). Field et al's. (2014) guide to multilevel modelling emphasizes the importance of checking whether there is significant variation across the levels of data. They stress that if there is not a significant difference between groups then multilevel modelling is not necessary and any of the general linear model tests (e.g. multiple linear regression and ANOVA) is more than adequate. Therefore, appropriate steps were taken to identify whether multilevel modelling is required in this study.

The first step involved selecting the appropriate centring method for the data (i.e. group vs. grand mean centring). Research has identified that centring (either group or grand mean) is beneficial and an important process since it reduces multicollinearity between predictor variables and improves model stability (Field et al., 2014; Kreft & de Leeuw, 1998). Following the advice of Enders and Tofighi (2007), utilized in the current study is group mean centring of the variables as this research is focused on identifying associations between variables at 'level 1' (e.g. supportive manager behaviour and attitudes towards patient care) and identifying (and accounting for) whether the Unit is having an impact on the relationships between input and outcome variables. The process of achieving group mean centred data involves selecting the level at which the 'group' is defined (in the current research the group is identified as each of the 16 Units). Next, selecting a specific variable (e.g. supportive manager behaviour) and calculating the mean value for each group. For example, identify the mean value for supportive manager behaviour in each of the 16 Units. Then, once these values have been identified, subtract the group mean score from the raw score (i.e. raw score minus group mean value). This process is then repeated for all study variables. In relation to the current study, this process was performed for all 16 variables across all 16 Units. The group mean data transformation procedure was performed on IBM SPSS (version 21) software.

Following the centring of the study variables the question regarding whether the data are nested is addressed. This question is answered by

comparing a baseline model - restricting the model's ability to vary across a contextual variable, i.e. Units - to a model in which the intercept is allowed to vary. Comparisons are made through the utilization of both Akaike's information criterion (AIC) and Schwarz's Bayesian criterion (BIC) which are relatively similar to one another in that they are goodness-of-fit statistics (Field et al. 2014). Importantly, the actual value reported for a single model if of relatively little importance, however, comparison of the tests between models - i.e. comparing the baseline model (model 1) to the model in which the intercept is allowed to vary (model 2) - is of critical importance whereby a smaller value represents a better fitting model (Field et al. 2014). For example, obtaining a model 1 AIC value of 2743.06 and a model 2 AIC value 2675.76 would be an indicator of nested data. Further analysis would be required to reveal whether this difference is significant, however, the decrease would imply a better fitting model. The same example would apply for the BIC values with models 1 and 2 and, subsequently, a significant decrease would signify that multilevel modelling is required.

The data were transferred onto Microsoft Excel (2007) and saved as a 'CSV (comma deleted)' file. They were then accessed and analysed using R (version 3.1.1.) and its companion software RStudio. Four of its packages were also installed: 'car', 'ggplot2', 'nlme' and 'reshape' in accordance to the instructions set out in Field et al's (2014) guide.



**Table 18: AIC and BIC values for time 1 data**

	Model 1		Model 2	
	AIC	BIC	AIC	BIC
SMB	2872.87	2881.17	2874.87	2887.33
USMB	2473.26	2481.57	2475.26	24887.72
P.CCAP	2965.86	2974.17	2967.86	2980.32
D.CCAP	2854.39	2862.69	2856.39	2868.84
ICAP	3504.29	3512.59	3506.29	3518.75
PHQ	3587.50	3595.80	3589.50	3601.95
PTSD	3632.14	3640.44	3634.14	3646.60
WE	3318.03	3326.33	3320.03	3332.49
BO	5618.35	5626.65	5620.35	5632.80
APC	2824.00	2832.31	2826.00	2838.46
ItQ	1881.34	1889.65	1883.34	1895.80
OC	2611.46	2619.76	2613.46	2625.92
POS	3045.75	3054.06	3047.75	3060.21
JS	3212.06	3220.37	3214.06	3226.52

Notes:

- SMB = supportive manager behaviour; USMB = unsupportive manager behaviour; P.CCAP = proximal collective capability; D.CCAP = distal collective capability; ICAP = individual capability; PHQ = symptoms of ill-health; PTSD = post traumatic stress disorder; WE = employee work engagement; BO = work burnout; APC = attitudes towards patient care; ItQ = intention to quit; OC = organizational commitment; POS = perceived organization support; JS = job satisfaction

It can be seen from table 18 that for all the variables included in the current research, each model did not improve when the model intercept was permitted to vary according to the Units (i.e. model 2 AIC and BIC

values are **greater** than those found in model 1). This indicates that the data are not nested and multilevel modelling is not required (Field et al. 2014). Referring back to the correlations reported above, all significant associations were analysed using multiple linear regression.

### **Preliminary data checks**

Before conducting the multiple linear regression analyses, the study variables underwent a series of tests to ensure that the current data do not violate the assumptions of linear models of regression. Following the instruction of Berry (1993), Field (2013), and Gelman and Hill (2007), the study variables were checked for additivity and linearity, independent errors, homoscedasticity, normally distributed errors, external 'third variables' in the models, multicollinearity, and non-zero variance. While some of these tests are relatively self-explanatory, others are less so. Presented here are some examples of how the data was deemed appropriate for multiple linear regression analysis.

Utilizing the Durbin-Watson test, the data were checked for independent errors (i.e. study observations are required to be independent and uncorrelated). Employing Field's (2013) rule-of-thumb, values were checked and ensured to be no less than 1 and no greater than 3. All of the variables used were found to be within these limits. Heteroscedasticity was rejected on the basis that the variance of residuals for supportive and unsupportive manager behaviour were approximately equal at each level of response. The assumption relating to no perfect multicollinearity

between predictor variables was verified and found to be acceptable ( $r = -.62$ ). The normal distribution of variables was assessed utilizing graphical representations and found to have the desired inverted 'u' pattern and skew and kurtosis values remained within Miles and Shevlin's (2005)  $\pm 2$  guidelines.

## **Construct validity of measures**

### *Manager behaviour*

A key aim of this thesis is to demonstrate the psychometric properties of the all measures developed in Chapters 3 and 4. To this end, it is important to assess how these measures align with the literature. Researchers have reported that supportive supervision is linked with improved psychological well-being and positive work attitudes. For example, Ng and Sorensen (2008) found that managerial support was linked to improved job satisfaction, organizational commitment and reduced intentions to quit. Gilbreath & Benson (2004) and van Dierendonck et al. (2004) both observed that supportive management was linked to reduced symptoms of mental ill-health, e.g. depression and anxiety. Gilbreath & Benson (2004) also observed that support was linked to reduced insomnia as well. From the research, one would therefore expect that increased support will be linked with improved well-being and more positive work attitudes. Table 19 (correlation statistics) shows that supportive manager behaviour is indeed found to be associated with improved well-being (e.g. reduced symptoms of ill-health, PTSD and

burnout) and more positive work attitudes (e.g. increased work engagement, greater job satisfaction and reduced intention to quit). It would be expected that the reverse would be true for unsupportive manager behaviour.

### *Capability*

In addition, Bandura's (1997) efficacy theory (on which these measure of collective and individual capability are based) suggests that efficacy is influenced through the actions of others around them - a term Bandura coined 'vicarious experience' - whereby individuals' assessment of their own level of capability is mediated through a role model. Therefore, on the basis of efficacy theory, one would expect that negative line manager behaviour, e.g. having your line manager being too quick to blame someone when there is a problem (coded 'U2' in chapter 3), would be associated with decreased capability. Conversely, one would expect that supportive manager behaviours, e.g. having your line manager encouraging people to work together (coded 'S9' in chapter 3) is associated with increased capability. From table 19, it can be seen that supportive manager behaviour has a significant positive association with all three capability measures. It can also be seen that unsupportive manager behaviour has a significant negative association with collective capability and that, while the correlation coefficient is non significant for unsupportive manager behaviour and individual capability, the direction of the relationship ( $r = -.06$ ) is in the predicted direction.

**Table 19: Descriptive statistics for cross-sectional study**

	SMB	USMB	P.CCAP	D.CCAP	ICAP	PHQ	PTSD	WE	BO	APC	ItQ	OC	POS	JS	Mean	SD
SMB	$\alpha$ .94														23.83	5.30
USMB	-.62**	$\alpha$ .87													8.46	3.51
P.CCAP	.31**	-.25**	$\alpha$ .93												32.27	5.92
D.CCAP	.23**	-.17**	.42**	$\alpha$ .75											20.58	5.28
ICAP	.10*	-.06	.45**	.36**	$\alpha$ .94										50.10	10.44
PHQ	-.20**	.20**	-.27**	-.26**	-.31**	$\alpha$ .88									33.51	11.42
PTSD	-.13**	.15**	-.20**	-.13**	-.30**	.48**	$\alpha$ .96								7.33	11.68
WE	.19**	-.10*	-.42**	.37**	.46**	-.35**	-.24**	$\alpha$ .90							43.81	8.55
BO	-.26**	.26**	-.32**	-.33**	-.36**	.60**	.38**	-.55**	$\alpha$ .81						217.49	99.77
APC	.20**	-.13**	.36**	.32**	.38**	-.25**	-.14**	.44**	-.39**	$\alpha$ .82					17.72	5.09
ItQ	-.25**	.17**	-.36**	-.29**	-.28**	.33**	.20**	-.56**	.46**	-.36**	N/A				2.95	1.87
OC	-.17**	.13**	-.28**	-.34**	-.29**	.36**	.20**	-.65**	.52**	-.39**	.58**	$\alpha$ .67			10.00	4.05
POS	.21**	-.14**	.24**	.49**	.25**	-.25**	-.08*	.40**	-.39**	.37**	-.27**	-.51**	$\alpha$ .95		15.26	6.62
JS	.47**	-.33**	.48**	.46**	.37**	-.40**	-.24**	.54**	-.53**	.41**	-.50**	-.54**	.55**	$\alpha$ .81	41.66	8.03

Notes:

- SMB = Supportive manager behaviour; USMB = Unsupportive manager behaviour; P.CCAP = Proximal collective capability; D.CCAP = Distal collective capability; ICAP = Individual capability; PHQ = Symptoms of ill-health; PTSD = Post traumatic stress disorder symptoms ; WE = Work engagement; BO = Work burnout; APC = Attitude towards patient care; ItQ = Intention to quit; OC = Organizational commitment; POS = Perceived organizational support; JS = Job satisfaction.
- Reliability estimates (coefficient alpha) shown in diagonal.
- A reliability estimate for intention to quit is not valid because the measure consists of a single item.
- \* =  $p < .05$ ; \*\* =  $p < .01$  (one-tailed).

## **Correlations and descriptive statistics**

The results from correlating supportive and unsupportive manager behaviour against the study outcome variables reveals associations in-line with the directions hypothesized. Specifically, supportive manager behaviour positively correlates with proximal and distal collective capability, individual capability, work engagement, attitudes towards patient care, organizational commitment, perceived organizational support, and job satisfaction; while negatively correlating with symptoms of ill-health, PTSD, work burnout, and intention to quit. The converse is true for unsupportive manager behaviour. All but the relationship between unsupportive manager behaviour and individual capability had statistically significant associations at the .05 level or beyond.

Following the correlation analysis, tests of multiple linear regression were performed on each dependent variable that was observed to be significantly associated with the input variables. Input variables were entered on the first step and each model is discussed in detail.

## Multiple linear regression analyses

**Table 20: Regressing proximal collective capability onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	27.05	2.10		12.89	< .001
Supportive manager behaviour	.28	.06	.25	4.45	< .001
Unsupportive manager behaviour	-.17	.09	-.10	-1.76	.079

Note:  $R = .32$ ,  $R^2 = .10$ ;  $p < .001$

From table 20 it can be seen that only supportive manager behaviour has a significant independent effect on proximal collective capability. The Beta weights reveal that increased supportive manager behaviour is related to a greater belief that one's S-Unit team can successfully cope with the demands of the job. Collectively, both manager behaviour dimensions accounted for 10% of the variance in proximal collective capability.

**Table 21: Regressing distal collective capability onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	<i>p</i>
Constant	16.33	1.92		8.45	< .001
Supportive manager behaviour	.20	.06	.20	3.49	.001
Unsupportive manager behaviour	-.06	.09	-.04	-.70	.485

Note:  $R = .23$ ,  $R^2 = .05$ ;  $p < .001$

Table 21 shows that only supportive manager behaviour had a significant independent effect on distal collective capability. The Beta weights showed that increased supportive manager behaviour is related to enhanced employee perception that those outside of their immediate team have the capability to support the role of the S-Unit. Collectively, both supportive and unsupportive manager behaviour accounted for 5% of the variance.

**Table 22: Regressing individual capability onto supportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	<i>p</i>
Constant	48.63	2.21		22.05	< .001
Supportive manager behaviour	.19	.09	.10	2.07	.039

Note:  $R = .10$ ,  $R^2 = .01$ ;  $p = .039$



The correlation between unsupportive manager behaviour and individual capability was not significant and therefore not tested using regression (as stated above). Table 22 revealed that supportive manager behaviour is significantly related to individual capability such that supportive supervision is related to increased individual capability (efficacy). This relationship accounted for 1% of the variance.

**Table 23: Regressing symptoms of ill-health onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	p
Constant	36.69	4.16		8.81	<.001
Supportive manager behaviour	-.27	.12	-.13	-2.21	.028
Unsupportive manager behaviour	.40	.19	.12	2.11	.035

Note: R = .22, R<sup>2</sup> = .05; p < .001

From table 23 it can be seen that both supportive and unsupportive manager behaviour had a significant independent effect on symptoms of ill-health. Greater supportive manager behaviour was associated with reduced symptoms of ill-health, while unsupportive manager behaviour is related to a greater reporting of stress symptoms. The standardized Beta weights for supportive (-.13) and unsupportive manager behaviour (.12) revealed a similar effect strength. Cumulatively, the two manager behaviour factors accounted for 5% of the variance.

**Table 24: Regressing symptoms of PTSD onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	7.14	4.32		1.66	.099
Supportive manager behaviour	-.13	.13	-.06	-.98	.328
Unsupportive manager behaviour	.38	.19	.11	1.94	.053

Note:  $R = .16$ ,  $R^2 = .02$ ;  $p = .003$

It can be seen from table 24 that, strictly speaking, neither supportive nor unsupportive manager behaviour have a significant independent effect on symptoms of PTSD. However, it can be seen that the unsupportive manager behaviour p-value (.053) is very close to being statistically significant showing that unsupportive manager behaviour is associated with increased symptoms of PTSD. Cumulatively, both manager behaviour factors accounted for 2% of the variance.

**Table 25: Regressing work engagement onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	35.07	3.14		11.18	< .001
Supportive manager behaviour	.34	.09	.21	3.61	< .001
Unsupportive manager behaviour	.08	.14	.04	.60	.552

Note:  $R = .19$ ,  $R^2 = .04$ ;  $p < .001$

Table 25 revealed that only supportive manager behaviour had a significant independent effect on work engagement. The Beta weights show that supportive manager behaviour has a positive effect on employee work engagement. Cumulatively, both manager behaviour factors accounted for 4% of the variance.

**Table 26: Regressing work burnout onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	260.00	33.73		7.17	< .001
Supportive manager behaviour	-3.15	1.06	-.17	-2.97	.003
Unsupportive manager behaviour	4.33	1.61	.15	2.69	.007

Note:  $R = .29$ ,  $R^2 = .08$ ;  $p < .001$

Table 26 showed significant independent effects for both supportive and unsupportive manager behaviour on work burnout. Specifically, supportive manager behaviour is related to reduced work burnout, while unsupportive manager behaviour is associated with an increase in it. From the standardized Beta weights it can be seen that there is little difference between the strength of effects for supportive (-.17) and unsupportive (.15) manager behaviour. Cumulatively, both manager behaviour factors accounted for 8% of the variance.

**Table 27: Regressing attitudes towards patient care onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	p
Constant	13.53	1.87		7.26	< .001
Supportive manager behaviour	.18	.06	.19	3.29	.001
Unsupportive manager behaviour	-.02	.08	-.01	-.23	.821

Note:  $R = .20$ ,  $R^2 = .04$ ;  $p < .001$

Table 27 showed that only supportive manager behaviour had a significant independent effect on attitudes towards patients with increased supportive manager behaviour being associated with more positive attitudes towards patients. Cumulatively, supportive and unsupportive manager behaviour factors accounted for 4% of the variance.

**Table 28: Regressing intention to quit onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	4.94	.68		7.31	< .001
Supportive manager behaviour	-.09	.02	-.24	-4.27	< .001
Unsupportive manager behaviour	.01	.03	.01	.21	.831

Note:  $R = .25$ ,  $R^2 = .06$ ;  $p < .001$

Table 28 showed that only supportive manager behaviour had a significant independent effect on intention to quit, such that supportive manager behaviour is associated with reduced employee intention to leave their role. Cumulatively, the two manager behaviour factors accounted for 6% of the variance.

**Table 29: Regressing organizational commitment onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	12.44	1.49		8.33	< .001
Supportive manager behaviour	-.12	.04	-.15	-2.60	.010
Unsupportive manager behaviour	.04	.07	.03	.56	.575

Note:  $R = .17$ ,  $R^2 = .03$ ;  $p = .001$

Table 29 revealed that only supportive manager behaviour had a significant independent effect on organizational commitment. Since a low score for commitment indicates a more positive attitude towards the organization, the Beta weight indicates that increased supportive manager behaviour is related to increased organizational commitment. Table 6 also showed that both manager behaviour factors accounted for 3% of the variance.

**Table 30: Regressing perceived organizational support onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	p
Constant	9.65	2.42		3.98	< .001
Supportive manager behaviour	.25	.07	.20	3.40	.001
Unsupportive manager behaviour	-.03	.11	-.02	-.26	.795

Note:  $R = .21$ ,  $R^2 = .04$ ;  $p < .001$

The results displayed in table 30 showed that supportive manager behaviour is significantly independently related to employee beliefs about how much they are supported by their organization. Beta weights reveal that supportive manager behaviour is taken as a sign that the organization values them as an employee. Cumulatively, supportive and unsupportive manager behaviour dimensions accounted for 4% of the variance.

**Table 31: Regressing job satisfaction onto supportive and unsupportive manager behaviour**

Variable	b	SE(B)	$\beta$	t	$p$
Constant	27.41	2.65		10.33	< .001
Supportive manager behaviour	.65	.08	.43	8.21	< .001
Unsupportive manager behaviour	-.14	.12	-.06	-1.18	.239

Note:  $R = .47$ ,  $R^2 = .22$ ;  $p < .001$

From table 31, it can be seen that only supportive manager behaviour has a significant independent effect. Beta weights reveal that the more supportive the manager behaviour observed, the greater the employees' job satisfaction. Cumulatively, both manager behaviour factors accounted for 22% of the variance.

## **Mediation analysis: The impact of perceived organizational support**

As discussed in the opening chapter, research suggests that employees and employers have beliefs regarding what is expected from one another. This is often described as a 'reciprocal exchange agreement' (Robinson & Rousseau, 1994) whereby the organization provides a working environment in which the employee can feel safe and secure in their role with opportunities for career progression and the employee reciprocates by being loyal to the organization. Critical to this, however, is that employees believe that management can be trusted to provide support when their employees require it (Cutler, 2014; Guest & Conway, 2002; Woods & West, 2010). The support received - or not received - by line manager is viewed as upholding - or breaking - this psychological contract (Hog & Vaughan, 2011).

Perceived organizational support theory (Eisenberger et al., 1986) suggests that employees gather organization-related information and form an overall general belief about how much - or little - the organization values and cares about them as people. Eisenberger et al (1986) reported that employees who believe they are valued, cared for and respected by the organization have improved work performance, e.g. reduced absenteeism. From an organizational hierarchy perspective, line managers are often the main source of interaction between an employee and management personnel. Therefore, it is important to assess the relationship between the observed behaviour from line managers



(supportive and unsupportive) on well-being, work attitudes and performance variables as it might be mediated through perceived organizational support. This link was explored in the current study as it can be hypothesized that if there is a significant relationship between supportive and/or unsupportive manager behaviour on the outcome variables measured here, one would also expect there to be an indirect relationship between these predictor variables on the outcome variables through perceived organizational support.

Mediation analysis was performed utilizing the PROCESS tool (Hayes, 2012) installed onto SPSS (version 21). Assessment of whether mediation had occurred was made on the basis of the indirect effect confidence intervals and the effect size was inferred using Preacher and Kelley's (2011) kappa-squared test.

The majority of previous studies assessing mediation do not utilize the same methodology. Typically, researchers have employed Baron and Kenny's (1986) three part model wherein mediation is said to have occurred if significant regressions are found between (1) the input predicting the outcome variable; (2) the input predicting the mediator variable; and (3) regressions from both the input and mediator predicting the outcome variable, wherein the strength of the predictor on the outcome variable has been reduced, compared to the strength of the relationship found in part 1. If part 3 still reveals a significant relationship, mediation is said to have occurred. In relation to this process, Field

(2013) highlighted a weakness embedded within this process regarding how much of a reduction is required in the third part of the model for mediation to have occurred?

In an attempt to find a solution to this question, researchers have turned to changes in significant levels (i.e.  $p < \text{or} > .05$ ), however, this process encourages people to think in terms of black-and-white or right-or-wrong, wherein mediation has or has not occurred depending on whether the value is  $p = .49$  or  $.51$ , respectively. The Sobel test (Sobel, 1982) offered an alternative as it calculates the indirect effect (mediated relationship) and assesses its significance, however, this method has been found to be unreliable in relatively small samples (Field, 2013). Now with the advent of Hayes's PROCESS tool calculating indirect confidence intervals is no longer as difficult as it was previously and it also circumvents many of the issues discussed here.

This raises an important research question: what does this mean for the current research and is it possible to conclude that 'perfect' mediation has occurred? Researchers generally fall into two camps when defining this concept (Field, 2013). As alluded to earlier, some argue that perfect mediation has occurred when the significance value for the direct relationship becomes greater than the  $.05$  level, whereas others suggest that the beta weight must be 'completely wiped out' (Field, 2013; p. 408). As stated earlier, the current research has avoided the all-or-nothing principle in relation to relying entirely on the p-value to base its

conclusions, therefore, unless the unstandardized beta weight is observed to be exactly zero and the current study takes the approach that there is a partial mediation occurring. As an aid to the reader, the current research will still display the mediation analyses similar to the methodology of Baron and Kenny (1986) as it is potentially a visual tool to aid readers in interpreting results.

It is also acknowledged that there are a number of ways in which one can assess the relative effect size of mediation. Option one, the index of mediation, is a partially standardized measure of the indirect effect - is primarily utilized in meta-analytic studies as it is able to cope with different measures of psychological constructs. For example, in relation to the current research (chapter 3), the strength of the index of mediation would be evident if the current study employed both the Inventory of Supportive and Unsupportive Managerial Behaviours (ISUMB; Rooney & Gottlieb, 2007; Rooney et al., 2009) with the Competency Based Approach to Understanding Important Manager Behaviours (Donaldson-Fielder et al., 2011; Yarker et al., 2008). Option two, the ' $P_M$ ' test, is an assessment of the indirect effect size relative to one of the total effect of the predictor or the direct effect of the predictor. As this test is not fixed in terms of the parameters it measures, research has found it to be relatively unstable (MacKinnon, 2008). Option three, the ' $R_M$ ' test, expresses the  $P_M$  value as a ratio over the direct effect (Field, 2013). Option four, the ' $R^2_M$ ' test, assesses the cumulative variance that is shared by the predictor and mediator variables on the outcome variable.

The issues are that the direct and indirect effects cannot be assessed individually and results are not capped between zero and one (Field, 2013). Notwithstanding the importance of all measures, the current research selected option five, Preacher and Kelley's (2011) kappa-squared ( $k^2$ ) test, that calculates both the indirect effect and the maximum possible indirect effect for the model. It then conveys this as a ratio bound between 0 and 1 where values around 0 represent that the effect of the mediated process is relatively small, whereas values tending toward 1 suggest the opposite (Field, 2013; Preacher & Kelley, 2011). In addition, the authors suggested guidelines relating to the strength of the mediation: a value around .01 represents a relatively small effect, a value roughly .09 indicates a more moderate effect, and values greater than (or close to) .25 indicate a large effect.

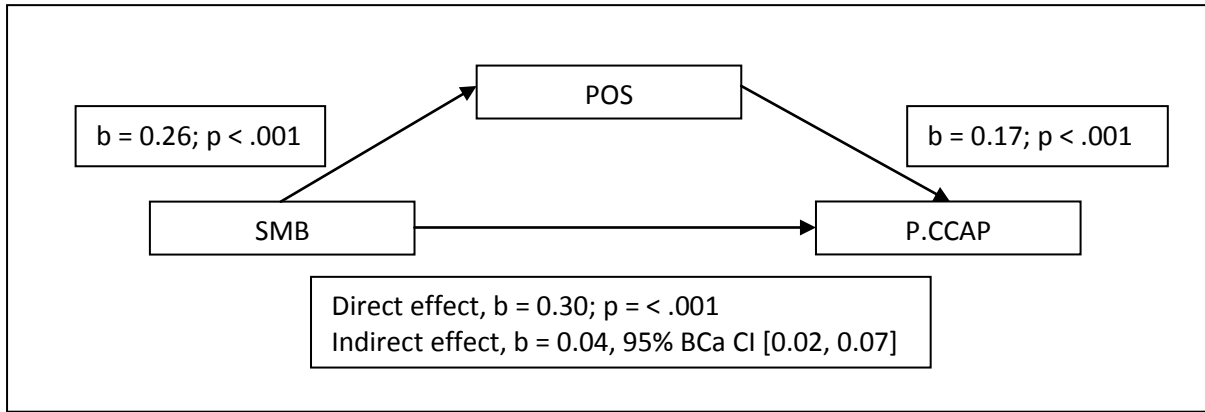
As Baron and Kenny (1986) note, there must be (1) a significant relationship between the predictor and mediator variables and (2) significant relationships between the predictor and outcome variables. From Table 30, it can be seen that supportive manager behaviour was significantly related to perceived organizational support ( $b = .25$ ;  $p < .001$ ) but unsupportive manager behaviour was not significantly related ( $b = -.03$ ;  $p = .795$ ). Consequently, it was only appropriate to analyse supportive manager behaviour as a predictor variable in the mediation models.

The above multiple linear regression analyses also show the 10 outcome variables that were appropriate for mediation analysis. These are: proximal collective capability ( $b = .28$ ;  $p < .001$ ); distal collective capability ( $b = .20$ ;  $p = .001$ ); individual capability ( $b = .19$ ;  $p = .039$ ); symptoms of ill-health ( $b = -.27$ ;  $p = .028$ ); work engagement ( $b = .34$ ;  $p < .001$ ); burnout ( $b = -3.15$ ;  $p = .003$ ); attitudes towards patient care ( $b = .18$ ;  $p = .001$ ); intention to quit ( $b = -.09$ ;  $p < .001$ ); organizational commitment ( $b = -.12$ ;  $p = .010$ ); and job satisfaction ( $b = .65$ ;  $p < .001$ ). Appropriate commentary is provided for each mediation model.

### **Mediation models**

#### *Supportive manager behaviour on proximal collective capability*

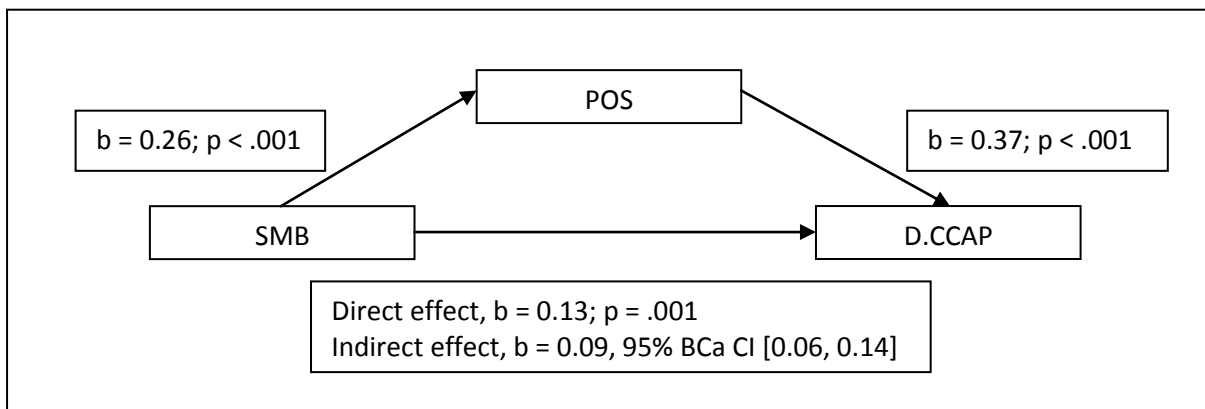
There was a significant indirect effect of supportive manager behaviour (SMB) on proximal collective capability (P.CCAP) through perceived organizational support (POS),  $b = 0.04$ , BCa CI [0.02, 0.07]. This represents a small to moderate effect,  $k^2 = .04$ , 95% BCa CI [.02, .06]. As the  $k^2$  statistic is bound between 0 and 1, it is possible to infer the percentage of variance explained by the indirect effect (Field, 2013). In relation to this model, the indirect effect was found to account for 4% of the variance.



### *Supportive manager behaviour on distal collective capability*

There was a significant indirect positive effect of supportive manager behaviour (SMB) on distal collective capability (D.CCAP) through perceived organizational support (POS),  $b = 0.09$ , BCa CI [0.06, 0.14].

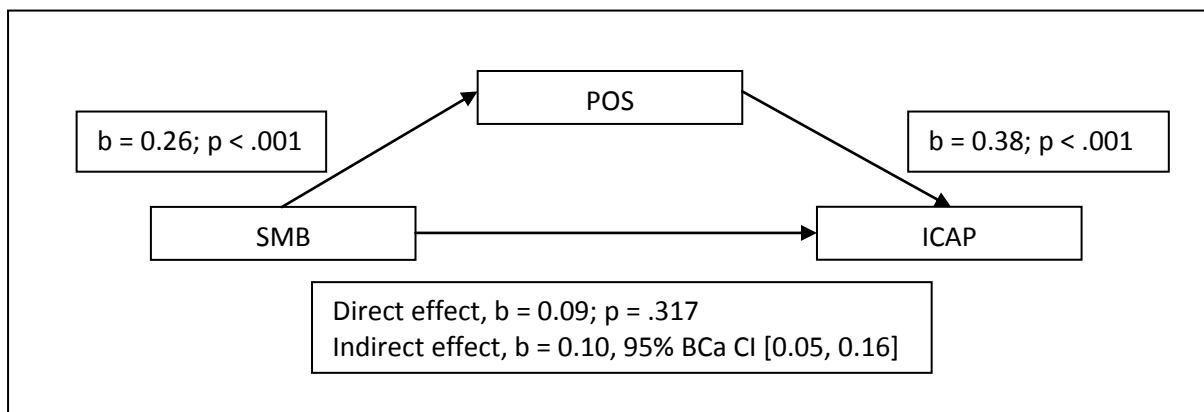
This represents a moderate effect,  $k^2 = .10$ , 95% BCa CI [.06, .14], accounting for 10% of the variance.



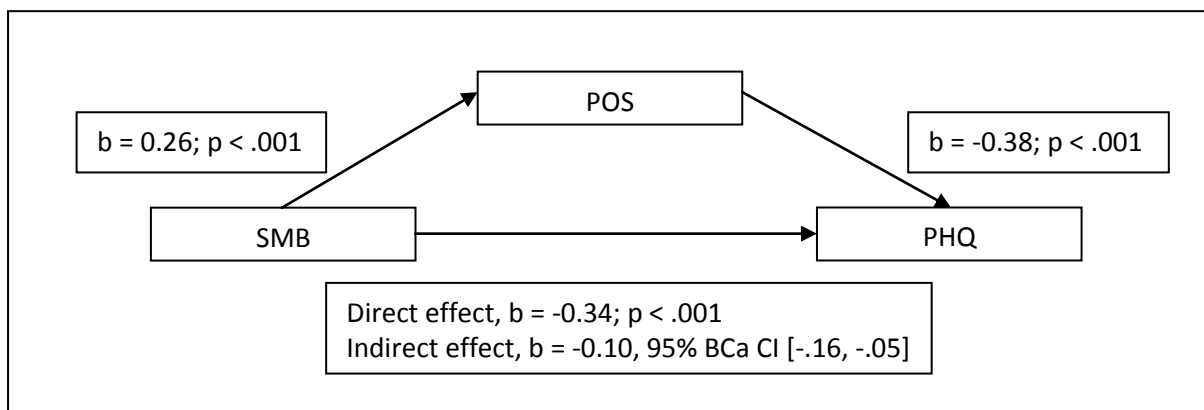
### *Supportive manager behaviour on individual capability*

It can be seen that the direct relationship has been reduced dramatically ( $b = 0.09$ ) which is important evidence towards the influence of perceived

organizational support in the model presented here. It can also be seen that there was a significant indirect effect of supportive manager behaviour (SMB) on individual capability (ICAP) through perceived organizational support (POS),  $b = 0.10$ , BCa CI [0.05, 0.16]. This represents a relatively small to medium effect,  $k^2 = .05$ , 95% BCa CI [.02, .08]. In this interaction, the indirect effect accounts for 5% of the variance.

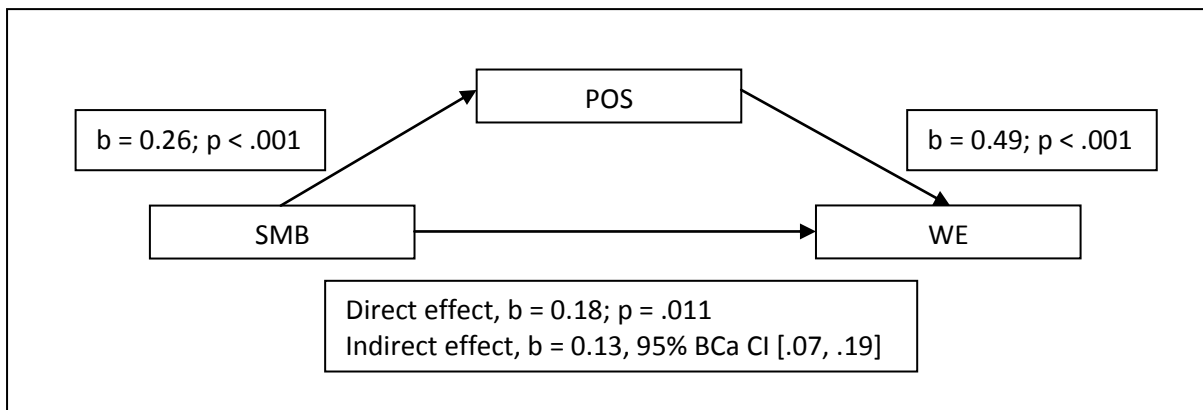


There was a significant indirect negative effect of supportive manager behaviour (SMB) on symptoms of ill-health (PHQ) through perceived organizational support (POS),  $b = -.10$ , BCa CI [-.16, -.05]. This represents a relatively small effect,  $k^2 = .04$ , 95% BCa CI [.02, .07]. In this interaction, the indirect effect accounts for 4% of the variance.

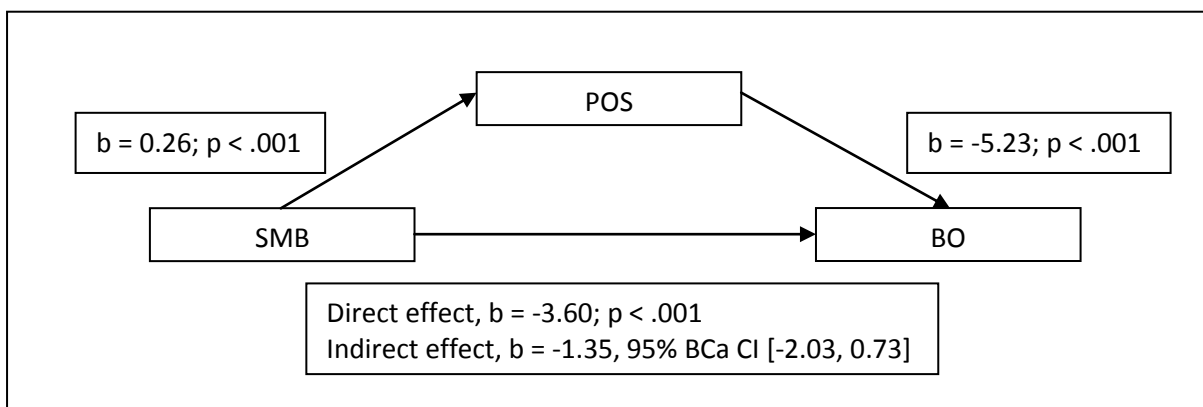


### *Supportive manager behaviour on work engagement*

There was a significant positive indirect effect of supportive manager behaviour (SMB) on work engagement (WE) through perceived organizational support (POS),  $b = .13$ , BCa CI [.07, .19]. This represents a small to moderate indirect effect,  $k^2 = .08$ , 95% BCa CI [.05, .12], that accounted for 8% of the variance.



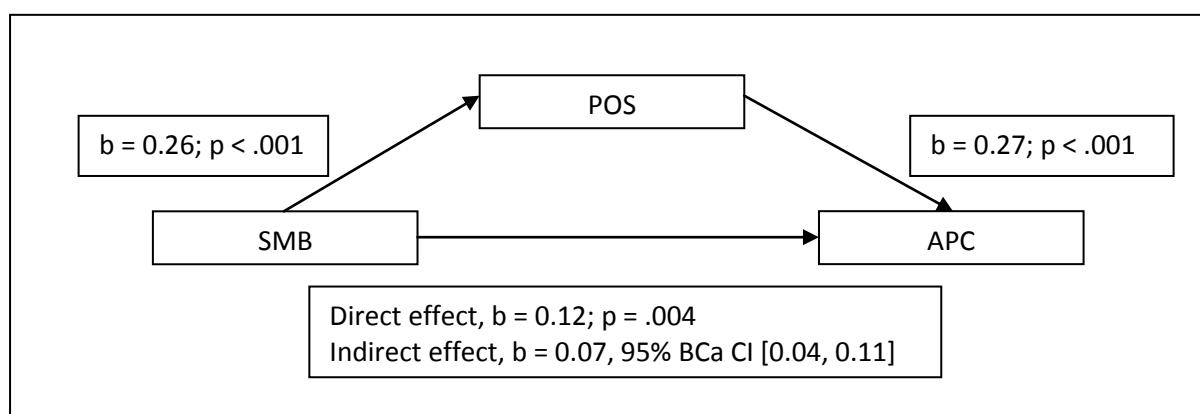
There was a significant negative indirect effect of supportive manager behaviour (SMB) on employee burnout (BO) through perceived organizational support (POS),  $b = -1.35$ , BCa CI [-2.03, 0.73]. This represents a small to moderate indirect effect,  $k^2 = .07$ , 95% BCa CI [.04, .11], that accounted for 7% of the variance in the model.



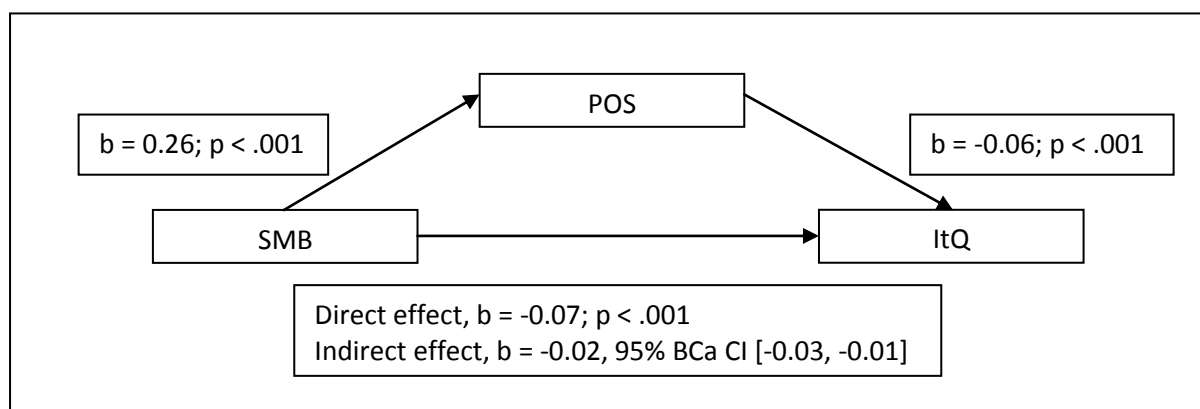


## Supportive manager behaviour on attitudes toward patient care

There was a significant positive indirect effect of supportive manager behaviour (SMB) on attitudes towards patients (APC) through perceived organizational support (POS),  $b = 0.07$ , BCa CI [0.04, 0.11]. This represents a small to moderate indirect effect,  $k^2 = .07$ , 95% BCa CI [.04, .11], that accounted for 7% of the variance in the model.

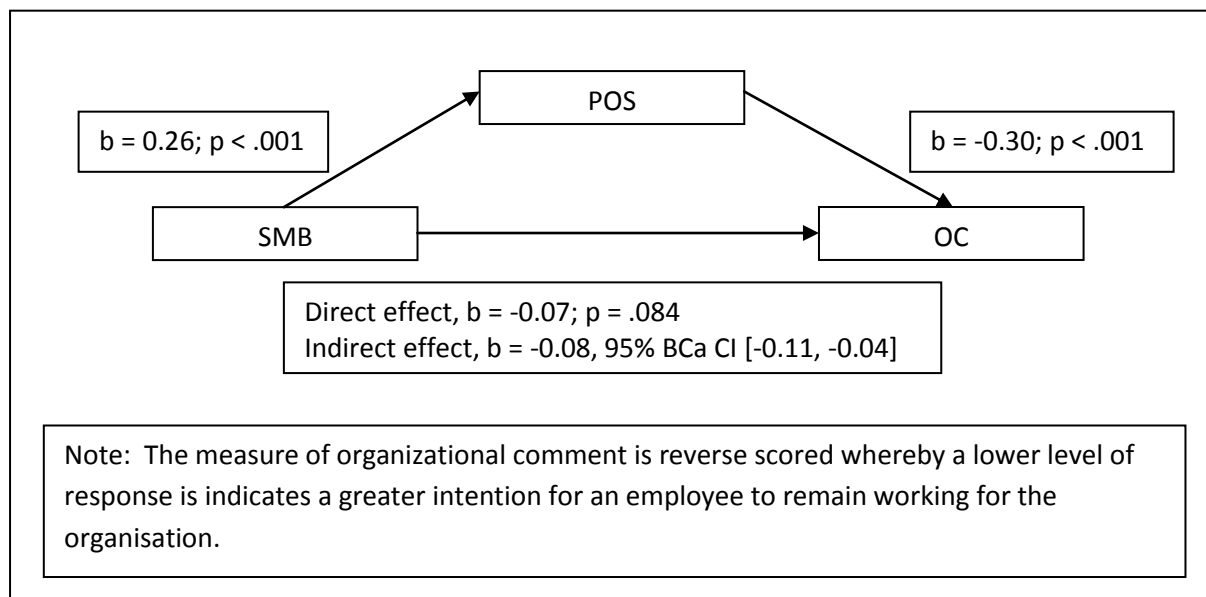


There was a significant negative indirect effect of supportive manager behaviour (SMB) on intention to quit (ItQ) through perceived organizational support (POS),  $b = -0.02$ , BCa CI [-0.03, -0.01]. This represents a small to moderate indirect effect,  $k^2 = .05$ , 95% BCa CI [.02, .07], that accounted for 5% of the variance.



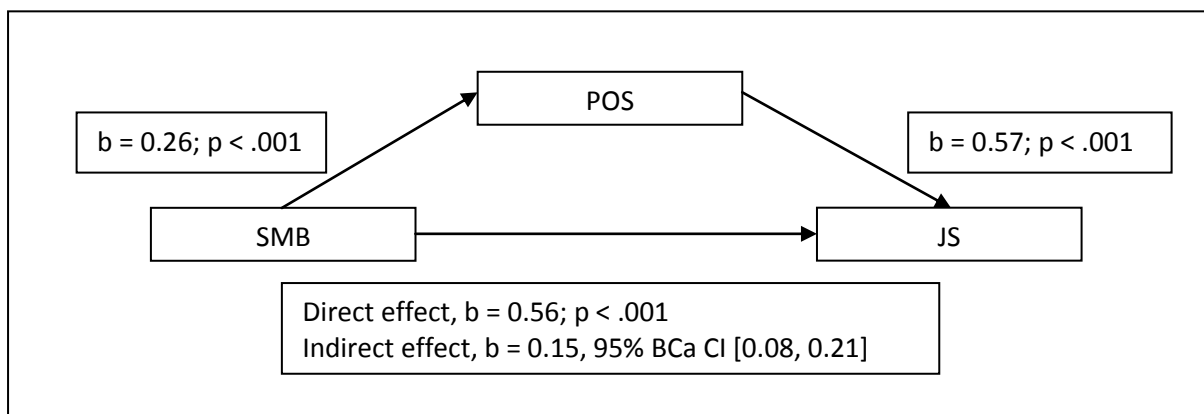
### *Supportive manager behaviour on organizational commitment*

It can be seen that there is evidence that suggests perceived organizational support is important in the relationship between supportive manager behaviour and organizational commitment as shown in the beta weight between these two variables has almost been reduced to zero ( $b = -0.07$ ). Unsurprisingly, results indicated a significant indirect effect of supportive manager behaviour (SMB) on organizational commitment (OC) through perceived organizational support (POS),  $b = -0.08$ , BCa CI [-0.11, -0.04]. This represents a moderate indirect effect,  $k^2 = .11$ , 95% BCa CI [.06, .15], and accounted for 11% of the variance in the model.



### *Supportive manager behaviour on job satisfaction*

There was a significant positive indirect effect of supportive manager behaviour (SMB) on job satisfaction (JS) through perceived organizational support (POS),  $b = 0.15$ , BCa CI [0.08, 0.21]. This represents a relatively moderate indirect effect,  $k^2 = .11$ , 95% BCa CI [.06, .15], that accounted for 11% of the variance in the model.



### **Summary of the cross-sectional and mediation results**

The results presented in this chapter have identified that supportive manager behaviour had a significant positive direct effect on proximal collective capability, distal collective capability, individual capability, work engagement, attitudes towards patient care, organizational commitment, perceived organizational support and job satisfaction. Results also showed that supportive manager behaviour had a significant negative relationship with symptoms of ill-health, symptoms of PTSD, work burnout and intention to quit.

From the mediation tests, it can be seen that, supportive manager behaviour - through perceived organizational support - increased distal

collective capability, organizational commitment and job satisfaction at a level described as 'moderate' (Field, 2013; Preacher & Kelley, 2011). This same interaction was found to also be related to increased proximal collective capability, individual collective capability, work engagement and attitudes towards patient care; and decreased symptoms of ill-health, work burnout and intention to quit at a 'small to moderate' level (Field, 2013; Preacher & Kelley, 2011).

The multiple linear regression and mediation analyses presented in this chapter reveal an important aspect of the dynamic relationship between an employee, their manager and their organization. It appears that when employees observe their manager behaving in a supportive manner toward them the effect is improved well-being and work attitudes. In addition, results suggest that employees then perceived this behaviour from their manager as being representative of the support provided by their organization, the effect of which is potentially reflected in improved work attitudes from the employee. Evidently, manager behaviour affects employee's well-being, work attitudes and performances both directly and indirectly through perceived organizational support. This is an important finding since it demonstrates the importance of studying managers in organizations as their impact is likely to be observed in numerous ways. In an effort to integrate these results into the literature, social exchange theory (Thibaut & Kelley, 1959) supports the interaction between supportive manager behaviour and improved work attitudes. This theory

suggests that employees compare the reward they receive from their organization (e.g. support, job security and wage) against their personal expenditures (emotional, physical and psychological). Employees who have a favourable relationship between costs and rewards are understood to attach greater value to being a part of the organization more and are willing to invest more time and energy into their work role (Hogg & Vaughan, 2011).

The influence of support on employee well-being can also be explained using Bakker and Demerouti's (2006) Job Demands-Resources (JD-R) model, wherein positive manager behaviour is viewed as a resource for employees that decreases the demands of the role and subsequently reduces the psychological and physiological costs associated with the demands. The lack of resources - manifest through observing unsupportive manager behaviour - does not protect employees from the associated physical and psychological costs of the job demands and employees' well-being deteriorates. Evidence to support this point was observed as unsupportive manager behaviour was found to increase symptoms of ill-health and work burnout, and decrease individual capability.

### **Structural Model**

Where regression analysis is only able to integrate a single dependent variable with its algorithm, structural equation modelling is designed to include multiple dependent variables in a single analysis/model.

Nevertheless, including 12 outcome measure was not an option since

some variables are likely to be related to one another. Therefore, an appropriate means of grouping outcome variables into coherent dimensions was explored. The JD-R model (Bakker & Demerouti, 2006; Bakker et al., 2007) suggests that individual capability, and proximal and distal collective capability are defined as 'resources', whereas the variables: symptoms of ill-health, PTSD and burnout are 'demands' when negatively toned (as in the current research). The remaining outcome variables: attitudes towards patients, intention to quit, organizational commitment, perceived organizational support, and job satisfaction, are conceptually work attitudes and could be either a job demand or resource depending on how they are toned and/or a product of the work environment. For example, being satisfied with your job (job satisfaction) is likely to help an employee overcome some relatively minor job demands they face. However, if an employee is unhappy with their role (perhaps resulting from a lack of progression opportunity), resulting in greater energy expenditure, this could be perceived as another demanding characteristic that they must deal with. On this conceptual differences, three exploratory factor analyses were run: one containing the job demand variables, one incorporating the job resources; and one assessing the work attitudes. Parallel to the processes that occurred in chapters 3 and 4, the direct oblimin rotational algorithm was employed to assess the relationships between constructs.

### *Capability*

Focussing on the three capability measures, results from exploratory factor analysis revealed a one factor solution (eigenvalue of 1.81) that explained 60.56% of the variance. Individual factor loadings were as follows: individual capability = .62, proximal collective capability = .72, and distal collective capability = .58. The correlation matrices showed that inter-scale relationships ranged between .36 and .45. These moderate relationships (Field, 2013) suggested that direct oblimin was the correct rotational model to employ.

### *Well-being*

Similarly, the scales incorporating the hypothesised 'well-being' variable were found to load onto a single dimension (eigenvalue of 1.99), explaining 66.85% of the variance. Factor loadings were as follows: symptoms of ill-health = .87, PTSD = .56, and burnout = .69. Inter-scale correlations ranged from .38 to .60, alluding to the appropriateness to direct oblimin rotation.

### *Work attitudes*

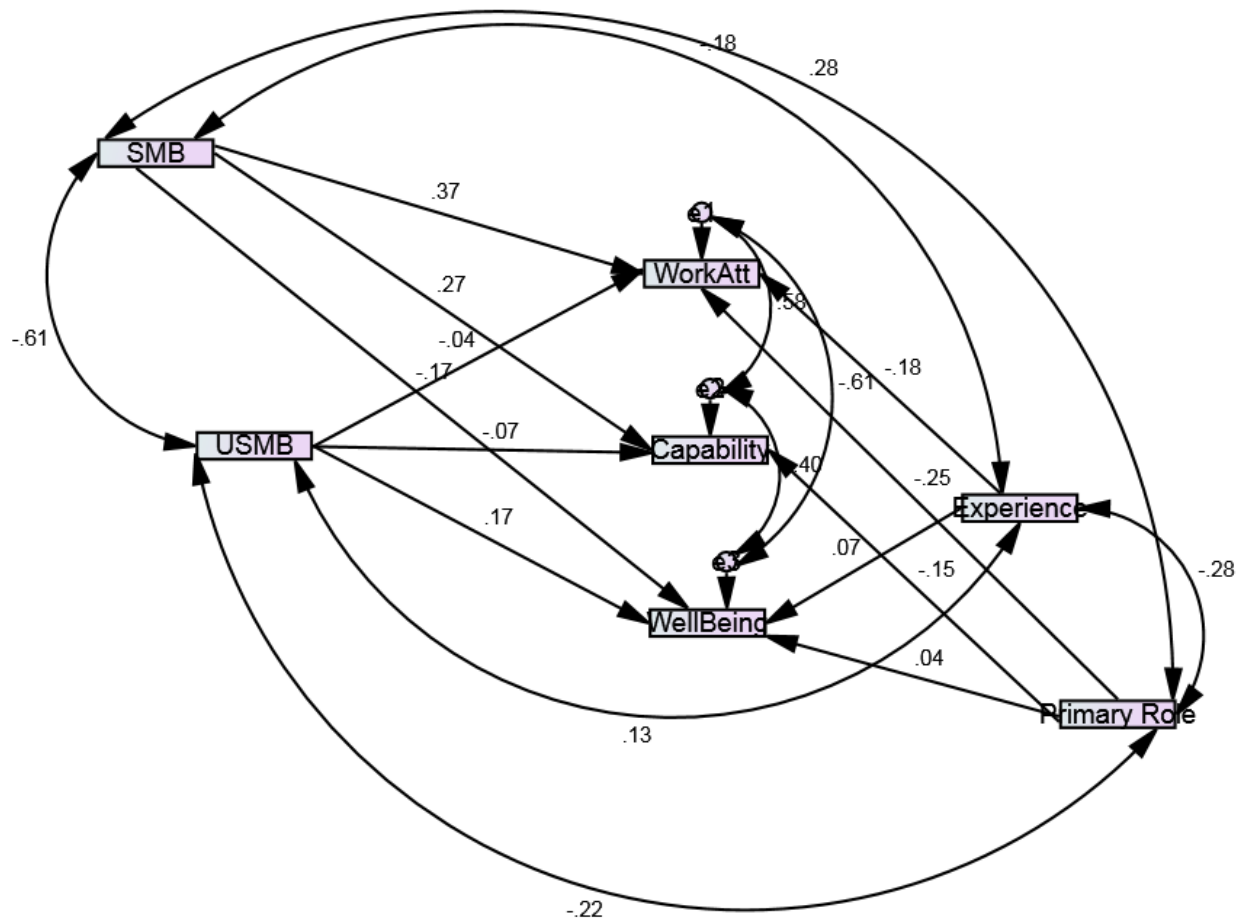
As hypothesised, the scales that were believed to assess work attitudes loading onto a single factor (eigenvalue of 3.38) and explained 66.17% of the variance. Factor loadings were as follows: attitudes towards patients = .55, intention to quit = -.66, organizational commitment = -.80, perceived organizational support = .59, and job satisfaction = .74. For all three factor analyses reported here, the models followed the rules set out

in chapter 3 and their dimension reduction was supported by the *point of inflection* on the scree plot (Field, 2013).

The three outcome variables (capability, well-being and work attitudes) were modelled (regressed onto) the measures of supportive and unsupportive manager behaviour. This model also includes two control variables: 'primary role' and 'experience' (in months). Primary role is eligible for inclusion in this specific instance since, like gender, there are only two categories: team leader and operative.

It is expected that supportive manager behaviour will positively influence work attitudes and capability beliefs, whilst reducing symptoms of illness. The reverse is expected with regards to unsupportive manager behaviour.





### **Model fit and relationships between variables**

The model fit statistics indicated that the hypothesised relationships were a good fit to the data: TLI = 1.00, SRMR = .01, CFI = 1.00, GFI = 1.00; RMSEA < .01;  $\chi^2 = .272(1)$ ,  $p = .602$  (Byrne, 2001; Ullman, 2013). The control variables reported that operatives had relatively poorer work attitudes (-8.12;  $p < .001$ ) e.g. increased intention to leave and perceived there to be less organizational support; and reduced beliefs about their own capability as that as the capability of the people around them (-3.04;  $p = .002$ ), compared to those employed as team leaders. Job role had no significant impact on employee well-being (5.45;  $p = .410$ ). Employee experience was significantly related to better work attitudes (-.27;  $p < .001$ ), but not significantly related to well-being (.48;  $p = .091$ ). The significant relationships are somewhat expected since, in term of the organizational hierarchy, team leaders are above operatives and thus exposed to a greater amount of organization-related information and is likely to feel more important to the organization. In addition, the 'team leader' position holds greater power and responsibility, something that employees in these positions could perceive as an organisational-held belief that they are more capable than those employed as operatives. The finding that employee level of experience is positively related to work attitudes also makes sense as the more invested someone is into an organisation, the less likely they are to hold negative views of the company.

Taking these control variables into account, supportive manager behaviour was found to be significantly related to improved work attitudes (1.81;  $p < .001$ ), a greater capability beliefs (.86;  $p < .001$ ) and better health (-3.56;  $p = .004$ ). Unsupportive manager behaviour is significantly related to reduced level of physical health (5.54;  $p = .002$ ), but not work attitudes (-.27;  $p = .50$ ) and capability beliefs (-.337;  $p = .22$ ). Discussed here are unstandardized regression weights, however, embedded into the model are the standardized regression coefficients for each of the relationships reported here. These standardized coefficients show that supportive manager behaviour has the biggest influence on work attitudes, compared to its relationship with both capability and well-being. The results also indicate that the influence of supportive and unsupportive manager behaviour is relatively equal, albeit reversed, on employee well-being.

### **Interim conclusions**

As was pointed out at the start of this chapter, structural modelling enables the inclusion of multiple outcome variables, where regression analysis does not. Additionally, the modelled data groups outcome variables into related factors and assesses the relationships with two relevant control variables. Finally, including all the relevant study variables in a single model, rather than analyses the individual relationships, reduces the likelihood of type one and two error.

Comparison between cross-sectional results and the data modelling revealed an important pattern: both sets of analyses showed that supportive manager behaviour was a significant influence on the majority of outcome variables, the only exception being that increased support did not predict diminished symptoms of PTSD. Similarly, in both cross-sectional and in the data modelling, unsupportive manager behaviour was significantly or marginally related to well-being, rather than performance and work attitudes.

In chapter 7, further reflection on these results will suggest a parallel with Herzberg, Mauser, Peterson and Capwell's (1957) two-factor theory of job satisfaction. Specifically, supportive and unsupportive relationships with managers might operate in two distinct ways on elements of well-being, performance and work attitudes. In line with the JD-R model, supportive relationships might act as a resource increasing well-being, perceived capability and positive work attitudes. Unsupportive relationships, on the other hand, are likely to increase demands and have the opposite effects (Bakker & Demerouti, 2006). These ideas are outlined more fully in the concluding chapter (chapter 7).

## **CHAPTER 6: ASSESSING THE IMPACT OF MANAGER BEHAVIOUR USING LONGITUDINAL ANALYSIS**

As previously mentioned, the current study utilized a repeated measures questionnaire design for two reasons. Firstly, as shown in chapters 3 and 4, the time 2 investigation enabled the researcher to perform confirmatory factor analytic procedures on the measures developed in this study. Secondly, this facilitated further examination of the psychometric properties of the manager behaviour measure as well as a closer examination of the direction of the relationship between manager behaviour and the various outcome measures. Specifically, the time 2 investigation provided the opportunity to analyse the relationships between predictor and outcome variables longitudinally. In these analyses - hierarchical linear regression - the time 1 level of the outcome variable is statistically controlled for by being entered in the first step. Entering the time 1 predictor on the second step then permits examination of the extent to which the input variable (e.g. supportive manager behaviour) predicts a change in the outcome variable (e.g. job satisfaction) over time. Reverse causality can also be assessed in these analyses by, for example, examining whether the outcome variable (e.g. job satisfaction) at time 1 predicts a change in the input variable (e.g. supportive manager behaviour) from time 1 to time 2 (Zapf, Dormann & Frese, 1996).

The time 2 investigation obtained data from 415 S-Unit personnel, made up of: 7 managers, 5 operations managers, 1 training manager, 75 team leaders, 15 team educators, 297 operatives, 3 lead paramedics, 1 acting

team leader and 11 participants who did not disclose their role. Again, the key area of investigation is focused primarily on operatives and team leaders as this sample make up the majority of the data (90% of the time 2 sample) and are these whom directly interact with service users. In addition, these participants are the likely personnel to be found with symptoms of PTSD - a variable measured in this investigation - as a result of their work environment (i.e. treating patients whom have obtained serious injuries or have died). In addition, it is primarily the operative and team leader who have to work in the potentially difficult and extreme circumstances that S-Unit staff may face and which can be a substantial source of stress (Bennett et al., 2004; Clohessy & Ehlers, 1999; Johnson et al., 2005; Smith & Roberts, 2003; van der Ploeg & Kleber, 2003).

Using participant initials and dates of birth, responses from operatives and team leaders were matched across time 1 and 2 surveys. In total, there were 242 cases available for longitudinal analysis comprising 48 team leaders and 194 operatives. Preliminary checks were made to ensure that the data was suitable for hierarchical multiple regression analysis. Results indicated that the data was normally distributed and values for skew and kurtosis did not exceed Miles and Shevlin's (2005) +/- 2 limit.

## **Nested data: Time 2 investigation**

Following the same strategy employed in chapter 5, the time 2 data was checked for patterns of nested data. Again, the data was group mean centred (Enders & Tofighi, 2007) using IBM SPSS (version 21), and assessed on the basis of observed values reported from Akaike's information criterion (AIC) and Schwarz's Bayesian criterion (BIC). These tests were computed using R (version 3.1.1.) and RStudio. The packages utilized were 'car', 'ggplot2', 'nlme' and 'reshape'.

**Table 32: AIC and BIC values for time 2 data**

	Model 1		Model 2	
	AIC	BIC	AIC	BIC
SMB	1490.39	1497.36	1492.39	1502.85
USMB	1248.09	1255.06	1250.09	1260.55
P.CCAP	1587.48	1594.45	1589.48	1599.94
D.CCAP	1469.18	1476.15	1471.18	1481.63
ICAP	1856.22	1863.19	1858.22	1868.67
PHQ	1923.90	1930.87	1925.90	1936.35
PTSD	1940.43	1947.40	1942.43	1952.89
WE	1724.42	1731.39	1726.42	1736.88
BO	2923.70	2930.67	2925.70	2936.16
APC	1463.26	1470.23	1465.26	1475.72
ItQ	951.82	958.79	953.82	964.27
OC	1129.09	1136.06	1131.09	1141.55
POS	1538.86	1545.83	1540.86	1551.31
JS	1646.80	1653.77	1648.80	1659.25

Notes:

- SMB = supportive manager behaviour; USMB = unsupportive manager behaviour; P.CCAP = proximal collective capability; D.CCAP = distal collective capability; ICAP = individual capability; PHQ = physical health questionnaire; PTSD = post traumatic stress disorder; WE = employee work engagement; BO = work burnout; APC = attitudes towards patient care; ItQ = intention to quit; OC = organizational commitment; POS = perceived organization support; JS = job satisfaction

Table 32 shows that - as with table 18, the models for all variables did not improve when enabling the intercept to vary according to Trust.

Subsequently, correlation and hierarchical multiple linear regression



analysis was employed to assess the relationships between manager behaviour and outcome variables longitudinally.

### **Assessing the correlation matrices of participants in both study 1 and 2**

The purpose of this chapter was to demonstrate the relationships between input and outcome variables over time, utilizing hierarchical linear regression. This investigation utilized a matched case design that took those participants who had completed both the time 1 and time 2 investigations. Again, utilizing only operatives and team leaders (see chapter 5), there were 242 individuals used for this analysis. Reported in tables 33 and 34 are the cross-sectional results for each investigation. The difference between the information reported in table 33 and that shown in table 19 (the cross-sectional analysis performed on the time 1 data in chapter 5) is reduced number of people used to perform the correlation test. As in table 33, table 34 reports the correlation statistics for the study variables using the 242 participants who had also completed the time 1 investigation. This was done to ensure that a significant correlation (using the 242 participants) was achieved on at least one of the investigations for it to be deemed appropriate to be included in the hierarchical regression analysis.

Looking at the two predictor variables: supportive and unsupportive manager behaviour, it can be seen from table 33 that supportive manager behaviour significantly correlated with all 12 outcome variables, whereas

unsupportive manager behaviour failed to significantly correlate with individual capability and attitudes towards patient care. It can also be seen that, for supportive manager behaviour, statistical significance was observed at the level of  $< .01$  for 11 out of 12 outcome variables, whereas unsupportive manager behaviour was observed to correlate at the level of  $< .01$  for 6 out of 12 outcome variables. The correlation statistics also revealed that, significant or otherwise, the associations were in the hypothesised directions.

**Table 33: Correlation and descriptive statistics for measures at time 1: Matched cases only**

	SMB	USMB	P.CCAP	D.CCAP	ICAP	PHQ	PTSD	WE	BO	APC	ItQ	OC	POS	JS	Mean	SD
SMB	α .93														24.33	4.86
USMB	-.61**	α .86													8.14	8.14
P.CCAP	.42**	-.30**	α .90												32.48	5.65
D.CCAP	.36**	-.29**	.45**	α .75											20.57	5.38
ICAP	.13*	-.05	.43**	.34**	α .93										53.18	10.61
PHQ	-.28**	.26**	-.33**	-.29**	-.35**	α .88									32.95	11.35
PTSD	-.18**	.15*	-.16*	-.13**	-.27**	.49**	α .95								6.73	10.70
WE	.26**	-.13*	.43**	.40**	.43**	-.35**	-.22**	α .91							44.70	8.95
BO	-.31**	.26**	-.32**	-.42**	-.39**	.62**	.35**	-.55**	α .81						207.02	99.26
APC	.23**	-.12	.39**	.33**	.41**	-.24**	-.04	.49**	-.38**	α .63					18.12	5.23
ItQ	-.31**	.17**	-.46**	-.37**	-.34**	.40**	.20**	-.56**	.50**	-.39**	N/A				2.57	1.75
OC	-.28**	.15*	-.36**	-.44**	-.34**	.41**	.20**	-.66**	.59**	-.47**	.59**	α .68			9.78	4.17
POS	.27**	-.14*	.29**	.52**	.29**	-.28**	-.02	.41**	-.42**	.44**	-.28**	-.55**	α .95		15.67	6.73
JS	.47**	-.31**	.51**	.54**	.43**	-.41**	-.20**	.53**	-.56**	.48**	-.51**	-.58**	.59**	α .60	42.64	7.97

Notes:

1. SMB = Supportive manager behaviour; USMB = Unsupportive manager behaviour; P.CCAP = Proximal collective capability; D.CCAP = Distal collective capability; ICAP = Individual capability; PHQ = Physical health questionnaire; PTSD = Post traumatic symptoms of distress; WE = Work engagement; BO = Work burnout; APC = Attitude towards patient care; ItQ = Intention to quit; OC = Organizational commitment; POS = Perceived organizational support; JS = Job satisfaction.
2. Reliability estimates shown in diagonal.
3. A reliability estimate for intention to quit is not valid because the measure consists of a single item.
4. \* =  $p < .05$ ; \*\* =  $p < .01$  (one-tailed).

From table 34, it can be seen that, again, supportive manager behaviour was significantly correlated with all 12 outcome variables. Here, contrary to what was observed in the time 1 (n = 242) investigation, it can be seen that unsupportive manager behaviour was significantly correlated with individual capability ( $r = -.20$ ;  $p < .01$ ) and attitude towards patient care ( $r = -.24$ ;  $p < .01$ ). The reverse was observed to be true for organizational commitment ( $r = .10$ ;  $p > .05$ ). All outcome variables, except perceived organizational support, were observed to be in the hypothesised direction. For both supportive and unsupportive manager behaviour, perceived organizational support was observed to be in a counterintuitive direction. In an effort to put some further explanation to these findings, one can see from tables 55 and 56 that, when analysed utilizing hierarchical regression, supportive manager behaviour ( $b = .02$ ;  $p = .809$ ) and unsupportive manager behaviour ( $b = -.09$ ;  $p = .390$ ) were observed to be non significant. This suggests that the reason for the counter intuitive findings might lie in the correlation of manager behaviour factors with other variables in the matrix.

**Table 34: Correlation and descriptive statistics for measures at time 2: Matched cases only**

	SMB	USMB	P.CCAP	D.CCAP	ICAP	PHQ	PTSD	WE	BO	APC	ItQ	OC	POS	JS	Mean	SD
SMB	a .95														23.16	5.74
USMB	-.77**	a .87													8.53	3.52
P.CCAP	.42**	-.29**	a .95												31.16	6.89
D.CCAP	.36**	-.27**	.50**	a .75											20.29	5.48
ICAP	.20**	-.20**	.35**	.46**	a .97										52.28	12.58
PHQ	-.30**	.35**	-.21**	-.29**	-.20**	a .90									36.26	13.37
PTSD	-.16*	.18**	-.21**	-.21**	-.09	.53**	a .96								9.68	14.02
WE	.26**	-.23**	.29**	.39**	.7**	-.46**	-.21**	a .91							42.71	9.31
BO	-.34**	.33**	-.32**	-.35**	-.36**	.69**	.43**	-.58**	a .86						245.45	116.19
APC	.23**	-.24**	.20**	.32**	.36**	-.32**	-.14*	.44**	-.44**	a .65					17.38	5.33
ItQ	-.35**	.30**	-.23**	-.31**	-.29**	.48**	.22**	-.54**	.57**	-.33**	N/A				3.30	1.95
OC	-.07**	.10	-.08	.16*	-.13	.26**	.06	-.27**	.30**	-.26**	.43**	a .70			13.10	2.85
POS	-.29**	.28**	-.26**	-.40**	-.43**	.41**	.10	-.66**	.55**	-.41**	.67**	.66**	a .96		15.01	7.02
JS	.54**	-.44**	.46**	.57**	.47**	-.41**	-.14*	.58**	-.57**	.42**	-.58**	-.27**	-.62**	a .82	40.76	8.66

Notes:

1. SMB = Supportive manager behaviour; USMB = Unsupportive manager behaviour; P.CCAP = Proximal collective capability; D.CCAP = Distal collective capability; ICAP = Individual capability; PHQ = Symptoms of ill-health; PTSD = Post traumatic symptoms of distress; WE = Work engagement; BO = Work burnout; APC = Attitude towards patient care; ItQ = Intention to quit; OC = Organizational commitment; POS = Perceived organizational support; JS = Job satisfaction.
2. Reliability estimates shown in diagonal.
3. A reliability estimate for intention to quit is not valid because the measure consists of a single item.
4. \* =  $p < .05$ ; \*\* =  $p < .01$  (one-tailed).

## **Hierarchical regression analyses**

A series of hierarchical regression analyses were performed wherein the impact, over time, of supportive and unsupportive manager behaviour was separately examined for those outcome variables found to correlate with supportive and/or unsupportive manager behaviour at either time 1 and/or time 2. Outcome variable at time 1 (e.g. job satisfaction) are entered into the regression equation at step 1, then the manager behaviour variable (supportive or unsupportive) at time 1 is regressed onto the same outcome variable (e.g. job satisfaction) at time 2. Supportive and unsupportive manager behaviour was assessed individually to better understand their relationships with outcome variables and enable efficient reverse causality testing since it requires the manager behaviour variable to be entered as an outcome variable.

**Table 35: SMB (time 1) and P.CCAP (time 1) on P.CCAP (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	12.44	2.29		< .001
P.CCAP (time 1)	.58	.07	.47	< .001
Step 2				
Constant	9.10	2.51		< .001
P.CCAP (time 1)	.48	.08	.40	< .001
SMB (time 1)	.26	.09	.19	.003

Note:  $R^2 = .22$  for Step 1;  $\Delta R^2 = .03$  for Step 2 (ps = .003)

From table 35 it can be seen that, once baseline levels of proximal collective capability were accounted for, supportive manager behaviour at time 1 was found to be positively associated with increased employee proximal collective capability beliefs at time 2 ( $b = .26$ ;  $p = .003$ ). These results were also supported by those observed in the time 1 cross-sectional investigation (see table 20). Comparison between the standardized Beta weights revealed that the strength of the relationship had decreased slightly in the longitudinal analysis ( $\beta = .19$ ), compared to that found in the time 1 investigation ( $\beta = .25$ ). Reverse causality was assessed and rejected ( $b = .03$ ;  $p = .624$ ) and, therefore, one can reject the null hypothesis and conclude that the perceptions of manager support predict an increase in proximal collective capability over time ( $H_1$ ).

**Table 36: USMB (time 1) and P.CCAP (time 1) on P.CCAP (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	12.44	2.29		< .001
P.CCAP (time 1)	.58	.07	.47	< .001
Step 2				
Constant	15.17	2.84		<.001
P.CCAP (time 1)	.54	.07	.44	< .001
USMB (time 1)	-.20	.12	-.10	.109

Note:  $R^2 = .22$  for Step 1;  $\Delta R^2 = .23$  for Step 2 (ps = .109)

From table 36, it can be seen that, when the baseline level of proximal collective capability had been accounted for, unsupportive manager behaviour at time 1 was not associated with a significant decrease on employees proximal collective capability at time 2 ( $b = -.20$ ;  $p = .109$ ). These results reaffirmed those found in the cross-sectional analysis (see table 20) that found unsupportive manager behaviour was not significantly associated with employee proximal collective capability beliefs ( $b = -.17$ ;  $p = .079$ ). Therefore, one must accept the null hypotheses.



**Table 37: SMB (time 1) and D.CCAP (time 1) on D.CCAP (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	6.44	1.05		< .001
D.CCAP (time 1)	.67	.05	.66	< .001
Step 2				
Constant	5.35	1.47		< .001
D.CCAP (time 1)	.65	.05	.64	< .001
SMB (time 1)	.06	.06	.06	.288

Note:  $R^2 = .44$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .288$ )

Contrary to what was observed in the cross-sectional investigation (see table 21), it can be seen from table 37 that supportive manager behaviour at time 1 was not observed to have a significant increase on employee distal collective capability beliefs at time 2 ( $b = .06$ ;  $p = .288$ ), when the baseline level of distal collective capability is taken account of.

Consequently, on the basis of the longitudinal analysis, one must accept the null hypothesis.

**Table 38: USMB (time 1) and D.CCAP (time 1) on D.CCAP (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	6.44	1.05		< .001
D.CCAP (time 1)	.67	.05	.66	< .001
Step 2				
Constant	6.87	1.44		< .001
D.CCAP (time 1)	.67	.05	.65	< .001
USMB (time 1)	-.04	.08	-.02	.665

Note:  $R^2 = .44$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .665$ )

It can be seen from table 38 that unsupportive manager behaviour at time 1 did not significantly decrease employees distal collective capability beliefs at time 2 ( $b = -.04$ ;  $p = .665$ ), when baseline levels of distal collective capability were accounted for. This non significant relationship was also observed in the cross-sectional investigation (see table 21). Consequently, one must accept the null hypothesis.

**Table 39: SMB (time 1) and ICAP (time 1) on ICAP (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	25.02	3.74		< .001
ICAP (time 1)	.51	.07	.43	< .001
Step 2				
Constant	22.98	4.95		< .001
ICAP (time 1)	.51	.07	.43	< .001
SMB (time 1)	.10	.15	.04	.528

Note:  $R^2 = .19$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .528$ )

Contrary to what was observed in the cross-sectional investigation (see table 22), It can be seen from table 39 that supportive manager behaviour at time 1 did not significantly increase employee individual capability beliefs at time 2 ( $b = .10$ ;  $p = .528$ ), when baseline levels of individual capability were accounted for. Therefore, one must accept the null hypothesis.

**Table 40: USMB (time 1) and ICAP (time 1) on ICAP (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	25.02	3.74		< .001
ICAP (time 1)	.51	.07	.43	< .001
Step 2				
Constant	26.40	4.23		< .001
ICAP (time 1)	.51	.07	.43	< .001
USMB (time 1)	-.15	.22	-.04	.483

Note:  $R^2 = .19$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .483$ )

It can be seen from Table 40 that unsupportive manager behaviour at time 1 was not observed to be associated with a significant decrease in employee job satisfaction ( $b = -.15$ ;  $p = .483$ ), when baseline levels of individual capability were accounted for. Subsequently, one must accept the null hypothesis.

**Table 41: SMB (time 1) and PHQ (time 1) on PHQ (time 2)**

	B	SE B	$\beta$	p
Step 1				
Constant	5.79	1.64		.001
PHQ (time 1)	.93	.05	.79	< .001
Step 2				
Constant	10.36	3.63		.005
PHQ (time 1)	.905	.05	.77	< .001
SMB (time 1)	-.16	.12	-.06	.160

Note:  $R^2 = .62$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .160$ )

Contrary to what was observed in the cross-sectional investigation (see table 23), It can be seen from Table 41 that supportive manager behaviour at time 1 was not observed to be associated with a significant decrease in employee reporting of symptoms of ill-health at time 2 ( $b = -.16$ ;  $p = .160$ ), when baseline levels of symptoms of ill-health were accounted for. As a result, one must accept the null hypothesis.

**Table 42: USMB (time 1) and PHQ (time 1) on PHQ (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	5.79	1.64		.001
PHQ (time 1)	.93	.05	.79	< .001
Step 2				
Constant	3.31	1.87		.077
PHQ (time 1)	.89	.05	.76	< .001
USMB (time 1)	.44	.16	.11	.007

Note:  $R^2 = .62$  for Step 1;  $\Delta R^2 = .01$  for Step 2 (ps = .007)

From table 42, it can be seen that unsupportive manager behaviour was positively related to symptoms of ill-health at time 2 ( $b = .44$ ;  $p = .007$ ), even after the baseline symptoms of ill-health had been accounted for ( $b = .89$ ;  $p < .001$ ). The results observed in the time 1 investigation (see table 23) also identified that unsupportive manager behaviour was linked to increasing symptoms of ill-health. Comparison of the standardized Beta weights revealed similar results. For the cross-sectional investigation the  $\beta = .12$ , and for the longitudinal analysis the result was  $\beta = .11$ .

However, it was not entirely possible to reject the null hypothesis ( $H_8$ ) as reverse causality was assessed and evidence suggested that symptoms of ill-health was positively associated with unsupportive manager behaviour ( $b = .05$ ;  $p = .014$ ). These findings are focused on at the end of this chapter

**Table 43: SMB (time 1) and PTSD (time 1) on PTSD (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	4.82	.89		< .001
PTSD (time 1)	.72	.07	.55	< .001
Step 2				
Constant	7.89	4.04		.052
PTSD (time 1)	.71	.07	.54	< .001
SMB (time 1)	-.12	.16	-.04	.438

Note:  $R^2 = .30$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .438$ )

From table 43 it can be seen that supportive manager behaviour at time 1 did not significantly reduce employee symptoms of PTSD at time 2 ( $b = -.12$ ;  $p = .438$ ), when baseline levels of symptoms of PTSD had been accounted for. These results reaffirmed those found in the cross-sectional analysis (see table 24) that found supportive manager behaviour was not significantly associated with symptoms of PTSD ( $b = -.13$ ;  $p = .328$ ). Therefore, one must accept the null hypotheses.

**Table 44: USMB (time 1) and PTSD (time 1) on PTSD (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	4.82	.89		< .001
PTSD (time 1)	.72	.07	.55	< .001
Step 2				
Constant	1.29	1.98		.516
PTSD (time 1)	.70	.07	.54	< .001
USMB (time 1)	.45	.23	.11	.047

Note:  $R^2 = .30$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .047$ )

The results from the cross-sectional analysis (see table 24) showed that unsupportive manager behaviour was marginally, but not significantly associated with symptoms of PTSD ( $b = .38$ ;  $p = .053$ ). It can be seen from table 44 that, in the longitudinal analysis, unsupportive manager behaviour was positively associated with increased employee reporting of symptoms of PTSD at time 2 ( $b = .45$ ;  $p = .047$ ), when the baseline level of symptoms of PTSD had been accounted for. Reverse causality was assessed and rejected ( $b = .03$ ;  $p = .210$ ) and, therefore, one can reject the null hypothesis ( $H_{10}$ ) and conclude that perceptions of unsupportive manager behaviour predict an increase in reporting symptoms of PTSD over time.



**Table 45: SMB (time 1) and WE (time 1) on WE (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	15.66	2.49		< .001
WE (time 1)	.61	.06	.58	< .001
Step 2				
Constant	16.94	3.12		< .001
WE (time 1)	.62	.06	.59	< .001
SMB (time 1)	-.07	.10	-.04	.497

Note:  $R^2 = .40$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .497$ )

Contrary to what was observed in the cross-sectional investigation (see table 25), it can be seen from Table 45 that supportive manager behaviour at time 1 was not observed to be associated with a significant increase in employees work engagement at time 2 ( $b = -.07$ ;  $p = .497$ ), when baseline levels of work engagement were accounted for.

Subsequently, one must accept the null hypothesis.

**Table 46: USMB (time 1) and WE (time 1) on WE (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	15.66	2.49		< .001
WE (time 1)	.61	.06	.58	< .001
Step 2				
Constant	16.31	2.91		< .001
WE (time 1)	.60	.06	.58	< .001
USMB (time 1)	-.06	.15	-.02	.667

Note:  $R^2 = .40$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .667$ )

From table 46 it can be seen that unsupportive manager behaviour at time 1 did not significantly reduce employee work engagement at time 2 ( $b = -.06$ ;  $p = .667$ ), when baseline levels of work engagement had been accounted for. These results reaffirmed those found in the cross-sectional analysis (see table 25) where unsupportive manager behaviour was not significantly associated with work engagement ( $b = .08$ ;  $p = .552$ ).

Therefore, one must accept the null hypotheses.

**Table 47: SMB (time 1) and BO (time 1) on BO (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	88.32	13.20		< .001
BO (time 1)	.76	.06	.65	< .001
Step 2				
Constant	108.40	36.44		.003
BO (time 1)	.75	.06	.64	< .001
SMB (time 1)	-.73	1.24	-.03	.555

Note:  $R^2 = .42$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .555$ )

Contrary to what was observed in the cross-sectional investigation (see table 26), it can be seen from Table 47 that supportive manager behaviour at time 1 was not observed to be associated with a significant decrease in employees symptoms of burnout at time 2 ( $b = -.73$ ;  $p = .555$ ), when baseline levels of employee symptoms of burnout were accounted for. Subsequently, one must accept the null hypothesis.

**Table 48: USMB (time 1) and BO (time 1) on BO (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	88.32	13.20		< .001
BO (time 1)	.76	.06	.65	< .001
Step 2				
Constant	76.15	17.28		< .001
BO (time 1)	.74	.06	.63	< .001
USMB (time 1)	1.92	1.76	.06	.276

Note:  $R^2 = .42$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .276$ )

Contrary to what was observed in the cross-sectional investigation (see table 26), It can be seen from Table 48 that unsupportive manager behaviour at time 1 was not observed to be associated with a significant increase in employees reported symptoms of burnout at time 2 ( $b = 1.92$ ;  $p = .276$ ), when baseline levels of employee burnout were accounted for. Subsequently, one must accept the null hypothesis.

**Table 49: SMB (time 1) and APC (time 1) on APC (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	10.25	1.15		< .001
APC (time 1)	.39	.06	.39	< .001
Step 2				
Constant	9.73	1.80		< .001
APC (time 1)	.39	.06	.38	< .001
SMB (time 1)	.03	.07	.02	.706

Note:  $R^2 = .15$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $p_s = .706$ )

Contrary to what was observed in the cross-sectional investigation (see table 27), It can be seen from Table 49 that supportive manager behaviour at time 1 was not observed to be associated with a significant increase in employee attitudes towards patient care at time 2 ( $b = .03$ ;  $p = .706$ ), when baseline levels of attitude towards patient care were accounted for. Subsequently, one must accept the null hypothesis.

**Table 50: USMB (time 1) and APC (time 1) on APC (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	10.25	1.15		< .001
APC (time 1)	.39	.06	.39	< .001
Step 2				
Constant	11.75	1.46		< .001
APC (time 1)	.38	.06	.37	< .001
USMB (time 1)	-.16	.10	-.10	.099

Note:  $R^2 = .15$  for Step 1;  $\Delta R^2 = .01$  for Step 2 ( $ps = .099$ )

From table 50 it can be seen that unsupportive manager behaviour at time 1 did not significantly reduce employee attitudes towards patients at time 2 ( $b = -.16$ ;  $p = .099$ ), when baseline levels of attitudes towards patient care had been accounted for. These results reaffirmed those found in the cross-sectional analysis (see table 27) that found unsupportive manager behaviour was not significantly associated with attitudes towards patient care ( $b = -.02$ ;  $p = .821$ ). Therefore, one must accept the null hypotheses.

**Table 51: SMB (time 1) and ItQ (time 1) on ItQ (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	1.78	.19		< .001
ItQ (time 1)	.59	.06	.53	< .001
Step 2				
Constant	3.52	.63		< .001
ItQ (time 1)	.53	.06	.48	< .001
SMB (time 1)	-.07	.02	-.16	.005

Note:  $R^2 = .28$  for Step 1;  $\Delta R^2 = .02$  for Step 2 ( $ps = .005$ )

From table 51, it was observed that supportive manager behaviour at time 1 had a significant negative association with employee intention to quit ( $b = -.07$ ;  $p = .005$ ) when baseline intention to quit was controlled for.

These findings were similar to those observed in the cross-sectional analysis (see table 28) that showed supportive manager behaviour was associated with reduced employee intention to quit ( $b = -.09$ ;  $p < .001$ ).

Comparison of the related standardized Beta weights revealed that the strength of this relationship was greater in the cross-sectional investigation ( $\beta = -.24$ ), compared to the relationship observed in the longitudinal investigation ( $\beta = -.16$ ). Reverse causality was assessed and rejected ( $b = -.32$ ;  $p = .113$ ) and, therefore, one can reject the null hypothesis ( $H_{17}$ ) and conclude that perceptions of manager support predict a decrease in intention to quit.

**Table 52: USMB (time 1) and ItQ (time 1) on ItQ (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	1.78	.19		< .001
ItQ (time 1)	.59	.06	.53	< .001
Step 2				
Constant	1.37	.30		< .001
ItQ (time 1)	.57	.06	.51	< .001
USMB (time 1)	.06	.03	.10	.077

Note:  $R^2 = .28$  for Step 1;  $\Delta R^2 = .01$  for Step 2 (ps = .077)

From table 52, it can be seen that there is, strictly speaking, not a significant relationship between unsupportive manager behaviour at time 1 and employee intention to quit at time 2 ( $b = .06$ ;  $p = .077$ ), when intention to quit at time 1 has been accounted for. Importantly though, while this relationship fails to reach the  $<.05$  level of statistical significance, the p-value is relatively close to this point and, therefore, the effect could be argued to be marginal. While statistical significance was not achieved, the direction of the Beta weights revealed that unsupportive behaviour was related to greater employee intention to quit. This was in line with the stated hypothesis ( $H_{18}$ ).



**Table 53: SMB (time 1) and OC (time 1) on OC (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	4.17	.54		< .001
OC (time 1)	.67	.05	.65	< .001
Step 2				
Constant	5.69	1.37		< .001
OC (time 1)	.67	.05	.63	< .001
SMB (time 1)	-.06	.05	-.06	.226

Note:

- $R^2 = .42$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .226$ )
- The measure of organizational commitment is reverse scored whereby a lower level of response indicates a greater intention for an employee to remain working for the company.

Contrary to what was observed in the cross-sectional investigation (see table 29), it can be seen from table 53 that, when baseline organizational commitment had been accounted for, supportive manager behaviour at time 1 did not significantly increase employees organizational commitment at time 2 ( $b = -.06$ ;  $p = .226$ ). Subsequently, one must accept the null hypothesis.

**Table 54: USMB (time 1) and OC (time 1) on OC (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	4.17	.54		< .001
OC (time 1)	.67	.05	.65	< .001
Step 2				
Constant	4.16	.70		< .001
OC (time 1)	.67	.05	.65	< .001
USMB (time 1)	.00	.06	.00	.983

Note:

- $R^2 = .42$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .983$ )
- The measure of organizational comment is reverse scored whereby a lower level of response indicates a greater intention for an employee to remain working for the company.

From table 54 it can be seen that unsupportive manager behaviour at time 1 did not significantly reduce employee organizational commitment at time 2 ( $b = .00$ ;  $p = .983$ ), when baseline levels of organizational commitment had been accounted for. These results reaffirmed those found in the cross-sectional analysis (see table 29) where unsupportive manager behaviour was not significantly associated with organizational commitment ( $b = .04$ ;  $p = .575$ ). Therefore, one must accept the null hypotheses.

**Table 55: SMB (time 1) and POS (time 1) on POS (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	4.72	.89		< .001
POS (time 1)	.66	.05	.63	< .001
Step 2				
Constant	4.33	1.84		.019
POS (time 1)	.65	.05	.63	< .001
SMB (time 1)	.02	.08	.01	.809

Note:  $R^2 = .40$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .809$ )

Contrary to what was observed in the cross-sectional investigation (see table 30), it can be seen from table 55 that supportive manager behaviour at time 1 was not observed to be associated with a significant increase in employees beliefs that their organization supported them at time 2 ( $b = .02$ ;  $p = .809$ ), when baseline levels of perceived organizational support were accounted for. Subsequently, one must accept the null hypothesis.

**Table 56: USMB (time 1) and POS (time 1) on POS (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	4.72	.89		< .001
POS (time 1)	.66	.05	.63	< .001
Step 2				
Constant	5.56	1.32		< .001
POS (time 1)	.65	.05	.62	< .001
USMB (time 1)	-.09	.11	-.04	.390

Note:  $R^2 = .40$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .390$ )

From table 56 it can be seen that unsupportive manager behaviour at time 1 did not significantly reduce employee beliefs that their organization supported them at time 2 ( $b = -.09$ ;  $p = .390$ ), when baseline levels of perceived organizational support was accounted for. These results reaffirmed those found in the cross-sectional analysis (see table 30) where unsupportive manager behaviour was not significantly associated with perceived organizational support ( $b = -.03$ ;  $p = .795$ ). Therefore, one must accept the null hypotheses.

**Table 57: SMB (time 1) and JS (time 1) on JS (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	11.22	2.34		< .001
JS (time 1)	.69	.05	.64	< .001
Step 2				
Constant	10.71	2.65		< .001
JS (time 1)	.68	.06	.627	< .001
SMB (time 1)	.04	.10	.02	.673

Note:  $R^2 = .41$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .673$ )

Contrary to what was observed in the cross-sectional investigation (see table 31), it can be seen from Table 57 that supportive manager behaviour at time 1 was not observed to be associated with a significant increase in employee job satisfaction ( $b = .04$ ;  $p = .673$ ), when baseline levels of perceived organizational support were accounted for.

Subsequently, one must accept the null hypothesis.

**Table 58: USMB (time 1) and JS (time 1) on JS (time 2)**

	b	SE B	$\beta$	p
Step 1				
Constant	11.22	2.34		< .001
JS (time 1)	.69	.05	.64	< .001
Step 2				
Constant	12.24	2.99		< .001
JS (time 1)	.68	.06	.63	< .001
USMB (time 1)	-.07	.14	-.03	.583

Note:  $R^2 = .41$  for Step 1;  $\Delta R^2 < .01$  for Step 2 ( $ps = .583$ )

From table 58 it can be seen that unsupportive manager behaviour at time 1 did not significantly reduce employee job satisfaction at time 2 ( $b = -.07$ ;  $p = .583$ ), when baseline levels of employee job satisfaction were accounted for. These results reaffirmed those found in the cross-sectional analysis (see table 31) where unsupportive manager behaviour was not significantly associated with job satisfaction ( $b = -.14$ ;  $p = .239$ ).

Therefore, one must accept the null hypotheses.

## **Summary of the longitudinal results**

The longitudinal analysis provided evidence for three directional relationships: supportive manager behaviour on proximal collective capability, unsupportive manager behaviour on symptoms of PTSD and supportive manager behaviour on intention to quit. These three relationships were all observed to be in their hypothesised direction: supportive manager behaviour increased proximal collective capability and decreased intention to quit; and unsupportive manager behaviour increased reporting of symptoms of PTSD. The data reported that there was evidence that unsupportive manager behaviour increased symptoms of ill-health, however, the data also showed that it is possible that symptoms of ill-health was related to an increase in perceiving one's manager as being unsupportive.

While some models were approaching statistical significance, e.g. unsupportive manager behaviour on intention to quit ( $p = .077$ ); the other study outcome variables (longitudinal models) were not observed to have a statistically significant relationship with supportive or unsupportive manager behaviour. Discussion of the results in terms of how they fit within the existing literature is presented in the chapter 7. This includes theories that attempt to account for the reasoning as to why supportive and unsupportive manager behaviour are often not observed to be statistically significant with the same outcome variables - albeit reversed, and why there were only four statistically significant longitudinal results.

## **CHAPTER 7: DISCUSSION**

First, this chapter presents an overview of the results reported in the thesis and addresses whether they are in line with - or run counter to - the hypotheses stated in the introduction. Second, the research findings are reintegrated with the literature with arguments being made regarding the extent to which the current results support or contradict past research and models. Third, the researcher presents a critical evaluation of the current research and puts forward potential research ideas that could follow on from this thesis. Fourth, practical implications are advanced that speculate on a manager training and selection programme that could improve the way managers are perceived by their subordinates. Finally, the researcher presents some concluding thoughts regarding the nature of the study and the gap that the research attempted to address.

### **Summary of results**

The current study observed 13 significant cross-sectional results and one that was marginally significant (i.e. unsupportive manager behaviour on symptoms of PTSD;  $p = .053$ ). In terms of the hypotheses tested, supportive manager behaviour was found to be positively associated with: proximal ( $H_1$ ) and distal collective capability ( $H_3$ ); individual capability ( $H_5$ ); work engagement ( $H_{11}$ ); attitudes towards patient care ( $H_{15}$ ); organizational commitment ( $H_{19}$ ); perceived organizational support ( $H_{21}$ ); and job satisfaction ( $H_{23}$ ). Supportive manager behaviour was found to be negatively associated with: symptoms of ill-health ( $H_7$ ); burnout ( $H_{13}$ ); and intention to quit ( $H_{17}$ ). For these relationships there is therefore



evidence to reject the null hypothesis. The only outcome variable not observed to be significantly associated with supportive manager behaviour was symptoms of PTSD (H<sub>9</sub>). This result was not expected and meant that the mediating role of perceived organizational support between supportive manager behaviour and symptoms of PTSD would not be assessed.

Unsupportive manager behaviour was observed to be significantly associated with increased symptoms of ill-health (H<sub>8</sub>) and burnout (H<sub>14</sub>). For these variables, there is therefore evidence to suggest that the null hypothesis can again be rejected. Unsupportive manager behaviour was also observed to be marginally associated with symptoms of PTSD (H<sub>10</sub>). No significant associations were observed between unsupportive manager behaviour and proximal (H<sub>2</sub>) and distal collective capability (H<sub>4</sub>), individual capability (H<sub>6</sub>), work engagement (H<sub>12</sub>), attitudes towards patient care (H<sub>16</sub>), intention to quit (H<sub>18</sub>), organizational commitment (H<sub>20</sub>), perceived organizational support (H<sub>22</sub>), and job satisfaction (H<sub>24</sub>).

It is important to note that while this study identified a number of non significant cross-sectional results, these relationships were nevertheless all in the hypothesised direction. That is, unsupportive manager behaviour is negatively related to proximal and collective capability, individual capability, work engagement, attitudes towards patient care, organizational commitment, perceived organizational support and job satisfaction; and positively associated with intention to quit. Since

unsupportive manager behaviour was not observed to have a significant relationship with perceived organizational support, assessing the mediating potential of perceived organizational support between unsupportive manager behaviour and outcome variables was not attempted. This observation was unexpected and was not in line with the hypotheses of this research. The reasoning behind not measuring the mediating role of perceived organizational support with unsupportive manager behaviour on outcome variables has been discussed in detail in chapter 5.

The longitudinal data analysis revealed four significant results. Over time, supportive manager behaviour was observed to be significantly related to increased proximal collective capability ( $H_1$ ) and decreased intention to quit ( $H_{17}$ ); whereas unsupportive manager behaviour was associated with increased symptoms of ill-health ( $H_8$ ) and PTSD ( $H_{10}$ ). Reverse causality was tested for  $H_1$ ,  $H_{10}$  and  $H_{17}$  and no evidence was observed, however, there was evidence to suggest that symptoms of ill-health were influencing perceptions of unsupportive manager behaviour ( $H_8$ ).

The relationship between supportive manager behaviour and distal collective capability, organizational commitment and job satisfaction was observed to be mediated by perceived organizational support at a 'moderate' level (Fildes, 2013; Preacher & Kelley, 2011). The relationships were in the hypothesised direction, i.e. perceived organizational support was positively related to proximal and distal collective capability,

individual capability, work engagement, attitudes towards patient care, organizational commitment and job satisfaction; and negatively associated with symptoms of ill-health, burnout and intentions to quit. Perceived organizational support was found to mediate the relationship between supportive manager behaviour and proximal collective capability, individual capability, work engagement, and attitudes towards patient care at a level that fell between 'small' and 'moderate' (Field, 2013; Preacher & Kelley, 2011). These results demonstrate the positive connection between the level of perceived support from a line manager and the perceived level of organizational support. In effect, these relationships demonstrate the importance that managers are perceived as being supportive as their actions are reflected (at least in part) in employee's attitudes and perceptions of the organization as a whole. This relationship is discussed in detail later.

### **Reintegration with the literature**

The findings reported here are in accord with some published findings but also at odds with other research. In relation to employee well-being, the current study observed negative significant (or marginal) cross-sectional results between supportive manager behaviour and both employee burnout and symptoms of ill-health. Unsupportive manager behaviour was found to be positively related to symptoms of PTSD, ill-health and burnout. The longitudinal analysis reaffirming the link between unsupportive manager behaviour and symptoms of PTSD. These results were congruent with research that has identified links between the

support received from a line manager and physical and psychological health (e.g. Brown & O'Brian, 1998; Einarsen & Mikkelsen, 2003; Greenglass et al., 1994; Leyman & Gustafsson, 1996; Rayner & Cooper, 2006). For example, van Dierendonck et al. (2004) concluded that the level of perceived support received from management was negatively related to experiencing symptoms of depression and anxiety. Tepper (2000) concluded that abusive supervision was linked to greater psychological distress. Gilbreath and Benson (2004) observed the same relationship as van Dierendonck et al (2004), but also linked supervision to levels of insomnia, where supportive management was associated with reduced symptom reporting. Bakker et al. (2005) linked levels of supportive management to reduced emotional exhaustion.

The finding that reverse testing of unsupportive manager behaviour and symptoms of ill-health produced a significant result was surprising and seemingly incongruent with the above research as it suggested that feeling unwell was linked to greater perceptions of unsupportive management. Zapf et al. (1996) reported the need to test models using measures at all time points since, in their review of stress literature, they noted that the majority of research was being conducted on cross-sectional data and that it was therefore likely some relationships would be identified as impacting on one another bi-directionally. This appears to be the case with unsupportive manager behaviour and symptoms of ill-health. There is research that demonstrates that those illness (suboptimal health) can create a cycle effect where when an individual becomes

unwell and they subsequently become more detached from their social groups and this results in them being less able to receive support from others (Jones & Bright, 2001).

The current research identified cross-sectional relationships between supportive manager behaviours and increased work engagement, decreased intention to quit, and higher organizational commitment and job satisfaction. These findings are congruent with those of other researchers who have identified that levels of line manager supervision were associated with job satisfaction (Mansell et al., 2006; Ng & Sorensen, 2008; Rhoades & Eisenberger, 2002), employee turnover (Ng & Sorensen, 2008) commitment to the organization (Ng & Sorensen, 2008; Rhoades & Eisenberger, 2002), and work engagement (Bakker et al., 2007).

While Tepper (2000) observed that abusive supervision was linked to greater intentions to quit the current research did not identify confirm this relationship . This might, however, be due to the conceptual distinction between unsupportive supervision and abusive management since Tepper (2000) utilized more overtly hostile manager behaviour items, compared to the current investigation. This would support the construction of the NAQ-R (Einarsen, et al., 2009) in which it is suggested that negative behaviours fall on a continuum from 'work related bullying', e.g. 'someone withholding information which affects your performance' to 'physically intimidating bullying', e.g. 'threats of violence or physical abuse' (p. 32).

Perhaps it is the exposure to more serious aggressive behaviour from managers that is associated with turnover intentions.

Bandura (1997), Bhanthumnavin (2000 & 2003), Judge et al. (2007), King's Fund, (2012) and Stajkovic & Luthans (1998) reported a manager's level of support to predict employee performance. The current research supports these findings in that significant cross-sectional relationships were found between supportive management and both increased levels of perceived capability and attitudes towards patient care. Focusing firstly of the positive relationships between supportive management and proximal and collective capability and individual capability, the current research agrees with Bandura's (1997) theory of efficacy, since supportive management - possibly through enactive mastery, verbal persuasion, affective states and integration of performance-related information - is believed to have positive implications for performance.

Unsupportive manager behaviour, on the other hand, was not observed to be associated with the current study's performance-related outcome variables. This is somewhat incongruent with Bandura's (1997) efficacy theory which would suggest that unsupportive manager behaviour would decrease proximal and distal collective capability and individual capability. Perhaps, compared to supportive manager behaviour, negative manager behaviour is only affecting two out of the four efficacy building constructs: affective states and integrating of performance-related information. It might be argued that unsupportive management - through these

processes - could reduce capability by unwittingly encouraging an employee to behave in an unproductive manner, e.g. erratically and/or through negative feedback on employee performance, e.g. berating someone who was not at fault for an issue. However, the same argument cannot be made for the other two efficacy constructs: enactive mastery and verbal persuasion. While these constructs are likely to increase capability beliefs when utilized effectively, the omission of these two factors may not lead to diminished capability beliefs. Overall, the results provide evidence that are congruent with the conclusions drawn by Gist and Mitchell (1992) i.e. that there are many factors that increase efficacy that do not centre around skill level. Plausibly, these might include the resources at hand to assist an employee which would encompass the availability of social support (Bakker & Demerouti, 2006; Cooper & Dewe, 2008; Dewe et al. 2010)

The positive cross-sectional relationship between supportive manager behaviour and perceived organizational support is important evidence to support those researchers who argue that the two constructs are related (Joseph, 2000; Tehrani, 2004; Yassen, 1995); while the results relating to unsupportive manager behaviour and perceived organizational support counter this point. Assumptions regarding the differences between these entities are made - based on past research - later in the discussion. However, the relationship between supportive manager behaviour and perceived organizational support seems to agree with the belief that managers have a role in developing the general culture within an

organization through their actions with employees (Arnold, Randall et al., 2010; Zohar & Hofmann, 2012). These results provide evidence which agrees with previous research (Chalk, et al., 1997; de Silva, 2000; James & Jones, 1979; Tehrani, 2004; Yassen, 1995; Zohar & Hofmann, 2012) that suggests that the actions of managers have the potential to affect the culture of an organization, and subsequently effect subordinate well-being, work attitudes and performance. While it was never the intention of the current research to identify full mediation (see chapter 5), the results are important in an organizational context as all models were accounting for variance and some were observed to be categorized as 'moderate'.

Parallels between the two factors observed with respect to line manager behaviour can be made with Herzberg et al's. (1957) two-factor theory of job satisfaction. This theory suggests that there are conceptual differences between job satisfaction and dissatisfaction (Furnham, 2008; Herzberg et al., 1957). Job satisfaction is believed to be positively related to the nature of work and its consequences (e.g. career progression, achievement and recognition), whereas dissatisfaction is associated with the work environment (e.g. negative interactions with colleagues and supervisors, and constraining company rules and regulations). The theory proposes that the presence of the factors associated with an adequate environment would produce a 'neutral' response, rather than generate feelings of satisfaction. Satisfaction can only be realized when appropriate work-related factors are attained (Furnham, 2008; Herzberg et al., 1957).



Like Herzberg's (1957) theory, the effects of supportive management on capability (efficacy) were observed in the cross-sectional data; and as support was associated with improved proximal capability over time, it might be argued that support is positively related to capability. This would be congruent with the JD-R model (Bakker & Demerouti, 2006) as it would suggest that support acts as resources and thereby reduce work demands - a trend that was consistently observed in the cross-sectional data. Unsupportive management, on the other hand, was not observed to be associated with capability in the cross-sectional or the longitudinal sample. This may allude to the fact that unsupportive behaviour would not be classified as a resource and therefore not be associated with the benefits (e.g. improved well-being and work attitudes). In addition, the effects of unsupportive manager behaviour may need to be accounted for along with the frequency of the observed negative behaviours. These possible operational differences between the two manager behaviour constructs may account for the non significant results observed between unsupportive manager behaviour and outcome variables: proximal and distal collective capability, individual capability, work engagement, attitudes towards patient care, intention to quit, organizational commitment and perceived organizational support and job satisfaction.

The current research also adds value to leadership research. 'New-Genre' leadership (Avolio, Walumbwa & Weber, 2009) has become more popular, compared to contemporary theories (Avolio, 2005). The current focus for researchers is less focused on the interaction between leaders and

followers and more interested on identifying specific behaviours that are linked to "visionary, inspirational messages; emotional feelings; ideological and moral values; individualized attention; and intellectual stimulation" (Avolio et al., 2009; p. 428). For example, within transformational leadership a leader is required to exhibit the behaviours that will encourage individuals to direct and manage their resources towards a common goal (Avolio et al., 2009). This process involves the leader being identifiable with the follower on an individual level. Similarly, authentic leadership (Avolio & Gardner, 2005) suggest that the behaviour of management is critical in establishing leadership credentials amongst the followers. According to the model, there are four factors that make up authentic leadership, "balanced processing, internalized moral standards, relational transparency, and self awareness" (Avolio et al., 2009; p. 424). Fundamental to each of these dimensions is the nature of the interaction between the leader and follower. For example, having 'moral standards' requires a leader, manager or supervisor to control their behaviour towards followers. Likewise, awareness requires the knowledge of how his/her actions and behaviours are perceived. The Leader-Member Exchange (LMX) model of leadership also incorporates this focus towards individual consideration for followers under the guise of an exchange dynamic between two individuals (Avolio et al., 2009). The question then arises: what does this consideration for each individual look like in terms of specific actions and behaviours; and what are the actions that a leader should - and should not - demonstrate towards their followers? Woods

and West (2010) identified that there is substantial overlap between the concepts of leadership and management. For example, they argue that both managers and leaders have to perform the same tasks, in that it is often the manager's role to motivate (lead) their subordinates through the myriad of potential work tasks, and leaders must perform managerial tasks (organise) their followers to better accomplish their goals/targets. To this end, the current research has contributed to the leadership literature, in that it has identified specific behaviours that leaders can employ to manage their followers.

A key objective for this future research is to identify and map out the relationship between more organizationally focused constructs, e.g. perceived organizational support, and specific measures of manager behaviour. Organizational support theory (Eisenberger et al., 1986) posits that there are three principal antecedents of perceived organizational support, i.e. perceived fairness, supervisor support and job and work conditions (Rhoades & Eisenberger, 2002). This focuses attention upon the importance of being able to identify precisely which supervisor/line manager behaviours convey and signify support or, alternatively, a lack of it.

Two possible mediation models follow from this. The first is that manager behaviour contributes positively - or negatively - to perceived organizational support which, in turn, is responsible for the impact on subsequent well-being, work attitudes and behaviour. In this formulation,

perceived organizational support is the mediator influencing the impact of manager behaviour. However, a model of reversed relationships is also possible. Here, organizational level constructs are operationalized in terms of the people and processes that give them meaning and substance. This would include the behaviours exhibited by both line and other managers in an organization. Here, manager behaviour might be the mediator which is in part responsible for the impact of perceived organizational support upon work behaviour, attitudes and employee well-being.

Both of these alternative models could be tested to identify the nature of the relationships involved although the use of longitudinal data would be needed to more closely identify patterns of influence. In longitudinal data, for example, levels of manager behaviour (or perceived organizational support) at time 1 could be used as mediators of any change in the outcome measure (dependent variable) between time 1 and time 2. This type of longitudinal design would help to make the direction of influence easier to specify.

Similar mediation based analyses would apply to examining the association between manager behaviour and leadership. Put simply, is the impact of leadership communicated through the actions and behaviours of the leader/manager? Transformational leadership, for example, involves leaders treating people with what is termed 'individualised consideration' (Bass, 1985). Leader-Member exchange is assumed to be built upon a

developing degree of social exchange based reciprocity (Wayne, Shore & Liden, 1997) wherein the follower is believed to reciprocate (e.g. in terms of effort and commitment ) on the basis of perceived favourable treatment by the line manager. The obvious question that follows is what behaviour by a manager signifies favourable treatment or included individualized consideration? Framed as a testable research question: does manager (or leader) behaviour mediate the impact of leadership style (or approach) on work behaviour, attitudes and well-being?

### **Capability reconsidered**

While the focus of this thesis was never on the relationship between employee capability and support, there are some important preliminary results embedded in the correlation statistics (tables 19, 33 & 34) and regression analyses (see below). Individual capability, proximal and distal collective capability were all significantly and positively correlated with perceived supportive manager behaviour. Subsequent regression analysis of capability items on supportive manager behaviour in the time 1 data revealed that proximal ( $\beta = .29$ ;  $p < .001$ ) and distal collective capability ( $\beta = .13$ ;  $p = .007$ ) had significant positive independent effects on the perceived supportiveness of the manager's behaviour. Individual capability was not found to be significantly related to supportive manager behaviour ( $\beta = -.08$ ;  $p = .097$ ), but the cumulative effect of all capability variables was significant ( $p < .001$ ) and explained 11% of the variance. The regression analysis for individual capability on unsupportive manager behaviour was performed on the time 2 data (table 34) since as that was

the only dataset that was found to have a significant correlation between these two variables. Nevertheless, a significant negative relationship was observed ( $\beta = -.18$  ;  $p = .003$ ) that explained 3% of the variance. It is acknowledged that the data here does not represent managerial capability, rather that of the subordinates they manage. This is an avenue of research that could follow this investigation.

Using the data at present, the differences between capability items and the outcome variable they are observed to be significantly related to are expected. For supportive manager behaviour: the effect accumulates in groups with capable individuals promoting more capable team members, resulting in a group of highly efficacious individuals. The process is therefore somewhat circular. For unsupportive manager behaviour: the effects are on each individual who comes to their own conclusion about their level of capability. They are relatively unaware of the effect unsupportive manager behaviour has on others.

Returning to the main aim of this study, there are two main conclusions from these correlation and regression statistics. Firstly, they support the two-factor support model since both supportive and unsupportive manager behaviours were observed to significantly regress onto capability items that the other did not. One would expect that if the manager behaviours were actually all loading onto a single factor, these results would not occur. Rather, the results would mirror each other with only the sign (positive or negative) differing.

## **Critical evaluation of the current research**

A strength of the current research is its utilization of a range of relevant statistical techniques. Starting with the development of three measures (manager behaviour, individual and collective capability), the current research made use of exploratory and confirmatory factor analytic techniques on one sample with re-confirmation on a second sample. No assumption was made regarding the need for multi-level modelling. The data was assessed for nested properties and the results showed that multiple linear regression was the most suitable method of analysing the relationship between study variables. Two methods of assessing direct relationships were utilized: cross-sectional and longitudinal analysis. While it is recognised that neither is able to establish causation, the ability to test study variables in reverse order in the longitudinal sample provided evidence (in three out of the four significant relationships) that manager behaviour was having an effect on the outcome variable, rather than the other way around.

The weaknesses of the current study centre around two points: primarily the number of participants gathered in the time 2 investigation and the time gap between the investigations. Theoretically, the overall number of participants gathered in the time 2 study should have at least matched or surpassed the number in the time 1 investigation. In relation to the cross-sectional data, the worst affected areas of this research were the re-confirmation sample for the capability items (chapter 4) - as demonstrated by the inflated (less satisfactory) RMSEA values. The knock

on effect was also felt in the number of matched-cases for longitudinal analysis. The analyses revealed that there were only four significant longitudinal results. It might be that the sample size obtained was not large enough to detect relatively small effects and that with an increased sample and with a larger sample some of these relationships would achieve statistical significance. Using GPower (version 3.1), a post-hoc power analysis was performed and it revealed that for identifying medium ( $f_2 = .15$ ) and large ( $f_2 = .35$ ) effect sizes, the power was satisfactory (alpha level  $> .99$ ). However, for small effect sizes ( $f_2 = .02$ ), power was not as strong at .48.

The time period between the two investigations (approximately one year) may have enabled other organizational factors to affect the relationships between manager behaviour on outcome variables and it would be advantageous to statistically control for these effects. For example, it may have been the case that elements of organizational change have taken place that have disturbed the status quo. Identification and inclusion of these factors in the research is likely to improve the strength of the relationships between managers and employee well-being, work attitudes, performance and perceptions of how supportive an organization's culture is.

From the verbal feedback received, the issue of data collection seemed to stem from a lack of trust from the employees in some of the participating Trusts. They expressed concerns regarding providing the demographic



details, as some believed that their organization would open the envelope containing the questionnaires. In hindsight, it could have been advantageous to provide each Trust with a drop-box that could only be accessed by the research team. This would have eliminated the need for employees to pass the questionnaire - albeit in a sealed envelope - to their line manager.

While a number of the effect sizes reported in the results have been small to moderate, it is important to note that small effect sizes can also be important. Dewberry (2004), for example, notes that a 1% increase in performance would be of considerable value to an organization even if it represents a relatively small effect size. Given the current concern in healthcare organizations surrounding negative treatment of patients, the cross-sectional finding that, cumulatively, supportive and unsupportive manager behaviour account for 4% of the variance in attitudes towards patient care could therefore be of considerable practical value. This conclusion would be further substantiated by the size of the indirect effect in the mediation analysis where the impact of supportive manager behaviour on attitudes towards patient care - mediated by perceived organizational support - was 7%.

### **Practical implications**

The current research has implications for a number of work psychology-related fields. Within the management selection domain, the current research helps to provide a framework which can be used by assessors

who are judging candidates for management positions. For example, this could be achieved through assessors employing competency-based interview techniques (Furnham, 2008) whereby the applicant is asked to recount situations when, acting as a line manager, they demonstrated supportive behaviours towards their subordinates. Assessments could also be made utilizing role playing wherein a candidate is presented with an employee with a work-related issue and the applicant must demonstrate how they would handle the situation. Similarly, an assessment of the applicant could be undertaken wherein their perceptions of important behaviours within the work environment are assessed. The assessment could include the perceived consequences for the employee as an individual and the organization as a collective.

As alluded to earlier, the current research also has implications for the current management within an organization. The specific behaviours associated with positive and negative management can be utilized to develop current managers within an organization into more supportive individuals. This could be achieved through a development programme whereby managers - individually and collectively - are presented with scenarios whereby a line manager is engaging with a subordinate. In these scenarios, the delegate would view the interaction and decide whether it demonstrated supportive or unsupportive management behaviours. The media could be presented through actors (films), written text and/or verbal communication. Delegates would then provide their interpretation of the interaction and their reasoning behind why they

perceived the manager to be supportive or unsupportive. This would aid in the discussion of specific manager behaviours and how they are perceived as being supportive or unsupportive. Delegates would then be asked to suggest what impact the actions of the line manager has on the subordinate and, by extension, the organization. The training should also be focused on providing a strong evidence base that shows the importance of supportive manager behaviour and the damage caused by the negative behaviours. Through a 360 degree assessment, comparisons could be made between managers perception of their behaviour, compared to assessments made of them by their subordinates. Gaps between manager and employee ratings - whereby subordinates reported an elevated rate of negative behaviours and reduced occurrence of positive behaviours - could be addressed through supportive training and followed up during performance reviews (the potential training programme is discussed in detail later).

The implementation of supportive management practices is likely to increase the health and well-being of the workforce of any organization, especially those who, like ambulance personnel, work in environments that are relatively likely to produce symptoms of PTSD in the workforce. The knock-on effect of this would be felt in the economy as fewer days would be lost from sickness, absence and turnover and improved work attitudes and performance. This would address many of the issues that the Francis QC (2013) report alluded to in the assessment of the Staffordshire NHS Healthcare Trust. Since this is such a critical issue, the

training programme could be evaluated against the factors reported above to ensure improvements are made within the organization.

Given the pattern of results observed in the regression analyses, an important conclusion to draw is that it is not enough simply to try and reduce unsupportive manager behaviour. Rather, supportive manager behaviour needs to be the focus and objective of training and development activity since it was supportive behaviour that, in general, had the greater number of positive (beneficial) impacts upon the measured indicators of employee well-being, perceived capability, work engagement, organizational commitment, job satisfaction, intention to quit and perceived organizational support.

The finding that, longitudinally, unsupportive manager behaviour is associated with increased reporting of symptoms of PTSD points to the need for victims of trauma to be able to articulate an account, or narrative, of their experiences that allows them to make sense of events and the role that social support can play in facilitating the achievement of such an account (Joseph, 2000). Unsupportive manager behaviour might work against the realization of such an account either because the ambulance worker does not feel supported by their line manager or - to make matters worse - the line manager's behaviour and orientation or approach sets the tone for a generally unsupportive workplace culture (Zohar & Hofmann, 2012).

## **Conclusion**

The current research has sought to address lack of behavioural specificity regarding levels of manager supportiveness and provide an impetus to researchers looking at the leadership construct in a similar vein.

Regarding the association between manager behaviour and outcome variables, the research has also attempted to provide longitudinal statistical analytic techniques to a field that is occupied largely by cross-sectional research. From a human resources point of view, this work has attempted to be a contributing factor in promoting the well-being, work attitudes and performance of ambulance personnel - individuals who, due to health economics, are typically under pressure to perform to the highest standards and who have elevated risks of ill-health as a consequence of their work environment (Keogh, 2013). The Francis QC (2013) identified that performance was a critical area for developmental and subsequently, the current research constructed a bespoke measure of ambulance personnel capability (efficacy). Overall, the research has shown that supportive managers are a critical component in the development of employee well-being, positive work attitudes and performance.

## **Future research areas to be addressed**

A management selection and training programme has all ready been mentioned as a key feature of the development process that should follow on from the current research. The content of this programme has been speculated upon, but any management training process must be

evaluated against relevant outcomes (e.g. job satisfaction) to ensure that it is meeting the needs of those it attempts to help. Without adequate evaluation, it is possible that specific manager behaviours will be overlooked and as this research has identified, this could have substantial consequences on the employees and organization as a whole. To this end, it is also important that the behaviours identified in this research are tested and verified in other contexts (organizational and cultural) to better understand the pattern of how behaviours are 'read', interpreted and internalized by employees on a more general level. This process is likely to identify other behaviours that are important to employees who work in different fields and cultures. Knowledge of these behaviours would aid in providing bespoke training to organizations. Notwithstanding the position the managerial staff are subjected to, further research could assess the consequences (positive or negative) the managers face as a result of implementing any new organizational policies/practices. In effect, the consequences of their supportive - or unsupportive - actions are not understood. The question then becomes: are there any negative effects on managers well-being, work attitudes and performance?

The assessment of employee and manager individual differences is also a critical avenue to pursue post-research and a number of relationships could be tested:

- Indirect (mediatory) relationship between manager behaviour on outcome variables, via individual differences;

- Direct relationship between subordinate individual differences and their perceptions of manager behaviour;
- Direct relationships between manager individual differences and observed supportive and unsupportive manager behaviour

For example, it is possible that trends exist whereby individuals (subordinates) who score relatively highly on a specific personality trait (e.g. 'hardiness') are more resilient (protected against) negative manager behaviours, compared to their counterparts. On the other hand, those who are more sensitive to their environment may be more susceptible to psychosocial hazards (e.g. unsupportive manager behaviour). This information could be relayed to managers in terms of how to become more aware of their need to be supportive to their subordinates as part of the (as yet theoretical) 360 degree training and assessment programme. In addition, identification of traits that are linked to patterns of supportive or unsupportive behaviour (e.g. if conscientious managers were reliably more likely to demonstrate supportive behaviour) would be advantageous in the management selection process as it would provide another tool to select or promote the appropriate candidate(s).

## REFERENCES

Abraham, J. D., & Hansson, R. O. (1996). Gender differences in the usefulness of goal-directed coping for middle-aged and older workers.

*Journal of Applied Social Psychology, 26(8), 657-669.*

Arnold, J., Randall, R., Patterson, F., Silvester, J., Robertson, I., Cooper, C., Burnes, B., Swailes, S., Harris, D., Axtell, C., Hartong, D. D. (2010).

Work Psychology: Understanding Human Behaviour in the Workplace.

Pearson.

Adlaf, E. M., Gliksman, L., Demers, A., & Newton-Taylor, B. (2001). The prevalence of elevated psychological distress among Canadian

undergraduates: findings from the 1998 Canadian Campus

Survey. *Journal of American College Health, 50(2), 67-72.*

Ashforth, B. E. (1994). Petty tyranny in organizations. *Human Relations, 47, 755-778.*

Attridge, M. (2009). Measuring and managing employee work

engagement: A review of the research and business literature. *Journal of*

*Workplace Behavioural Health, 24, 383-398.*



Avolio, B. J. (2005). *Leadership Development in Balance: Made/Born*. Hillsdale, NJ: Erlbaum.

Avolio, B. J., & Gardner, W. L. (2005). Authentic leadership development: Getting to the root of positive forms of leadership. *Leadership Quarterly, 16*, 315–338.

Avolio, B. J., & Walumbwa, F. O., & Weber, T. J. (2009). Leadership: Current theories, research, and future directions. *Annual Psychological Review, 60*, 421-429.

Bakker, A. B., & Demerouti, E. (2006). The job-demands-resources model: State of the art. *Journal of Managerial Psychology, 22*(3), 309-328.

Bakker, A. B., Demerouti, E., & Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *Journal of Occupational Health Psychology, 10*, 170–180.

Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost engagement, particularly when job demands are high. *Journal of Educational Psychology, 99*(2), 274–284.

Bamberger, P. A., & Bacharach, S. B. (2006). Abusive supervision and subordinate problem drinking: Taking resistance, stress, and subordinate personality into account. *Human Relations, 59*, 1-30.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Barrera, M. (1981). Social support in the adjustment of pregnant adolescents: Assessment issues. *Social Networks and Social Support, 4*, 69-96.

Barrera Jr, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology, 14*(4), 413-445.

Baruch-Feldman, C., Brondolo, E., Ben-Dayan, D., & Schwartz, J. (2002). Sources of social support and burnout, job satisfaction, and productivity. *Journal of Occupational Health Psychology, 7*, 84-93.

Beck, J. G., Grant, D. M., Read, J. P., Clapp, J. D., Coffey, S. F., Miller, L. M., & Palyp, S. A. (2008). The impact of event scale-revised: Psychometric properties in a sample of motor vehicle accident survivors. *Journal of Anxiety Disorders, 22*, 187-198.

Beehr, T. A. (1995). *Psychological Stress in the Workplace*. London: Routledge.

Bennett, P., Williams, Y., Page, N., Hood, K., & Woollard, M. (2004). Levels of mental health problems among UK emergency ambulance workers. *Emergency Medicine Journal, 21*, 235-236.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238-246.

Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up study of Alameda county residents. *American Journal of Epidemiology, 109*, 186-204.

Berry, W. D. (1993). Understanding regression assumptions. Sage: University Paper Series on Quantitative Applications in the Social Sciences, 07-092. Newbury Park, CA: Sage.

Bhanthumnavin, D. (2000). Importance of supervisory social support and its implications for HRD in Thailand. *Psychology and Developing Societies: A Journal, 12*(2), 155-167.

Bhanthumnavin, D. (2003). Perceived social support from supervisor and group members' psychological and situational characteristics as predictors of subordinate performance in Thai Work Units. *Human Resources Development Quarterly 14*(1), 79-97.

Billings, A. G., & Moos, R. H. (1982). Social support and functioning among community and clinical groups: A panel model. *Journal of Behavioral Medicine, 5*(3), 295-311.

Bollen, K. A. (1989). *Structural Equations with Latent Variables*. New York: Wiley.

Bowen, K. S., Birmingham, W., Uchino, B. N., Carlisle, M., Smith, T. W., & Light, K. C. (2013). Specific dimensions of perceived support and ambulatory blood pressure: Which support functions appear most beneficial and for whom? *International Journal of Psychophysiology, 88*, 317-324.

Boyatzis, R. E. (1982). *The competent manager: A model for effective performance*. John Wiley & Sons.

Brandt, P. A., & Weinert, C. (1981). The PRQ-a social support measure. *Nursing research, 30*(5), 277-280.

Brim, J. (1974). Social network correlates of avowed happiness. *Journal of Nervous and Mental Disease*, 58, 432-439.

Broadhead, W. E., Gehlbach, S. H., De Gruy, F. V., & Kaplan, B. H. (1988). The Duke-UNC Functional Social Support Questionnaire: Measurement of social support in family medicine patients. *Medical Care*, 709-723.

Brookings, J. B., & Bolton, B. (1988). Confirmatory factor analysis of the interpersonal support evaluation list. *American Journal of Community Psychology*, 16(1), 137-147.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing Structural Equation Models* (pp. 445-455). Newbury Park, CA: Sage.

Brown, C., & O'Brien, K. M. (1998). Understanding stress and burnout in shelter workers. *Professional Psychology: Research and Practice*, 29(4), 383-385.

Brummett, B. H., Barefoot, J. C., Siegler, I. C., Clapp-Channing, N. E., Lytle, B. L., Bosworth, H. B., Williams, R. B. Jr., & Mark, D. B. (2001). Characteristics of socially isolated patients with coronary artery disease who are at elevated risk for mortality. *Psychosomatic Medicine, 63*, 267-272.

Buchanan, B. (1974). Building organizational commitment: The socialization of managers in work organizations. *Administrative Science Quarterly, 19*, 533-546.

Byrne, B. M. (2001). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*. Lawrence Erlbaum Associates: London.

Callaghan, P., & Morrissey, J. (1993). Social support and health: A review. *Journal of Advanced Nursing, 18*, 203-210.

Cammann, C., Fichman, M., Jenkins, D., & Klesh, J. (1979). The Michigan organizational assessment questionnaire. Unpublished manuscript, University of Michigan, Ann Arbor, Michigan.

Campbell, J. P. (1992). Modelling the performance prediction problem in individual and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology*, Vol. 2 (pp. 687–732). Palo Alto, CA: Consulting Psychologists Press.

Cattell, R. B. (1973). *Personality and Mood by Questionnaire*. San Francisco, Jossey-Bass.

Chalk, J., Donaldson, I., & Young, S. (1997). Safety teams: Using team work to improve organizational performance. *Occupational Psychologist*, *April*, 5-10.

Chartered Institute of Personnel and Development. (2007). *Recruitment, retention and turnover*. London: CPD.

Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annual Review of Psychology*, *59*, 301-328.



Cheng, S. T., & Chan, A. C. (2004). The multidimensional scale of perceived social support: Dimensionality and age and gender differences in adolescents. *Personality and Individual Differences, 37*(7), 1359-1369.

Chmiel, N. (2000). Safety at work. I. N, Chmiel (Ed.), *Work and Organizational Psychology: A European Perspective* (pp. 255-273). Oxford: Blackwell.

Choo, J., Turk, M. T., Jae, S. Y., & Choo, I. H. (2015). Factors associated with health-related quality of life among overweight and obese Korean women. *Women & Health, 55*(2), 152-166.

Chou, K. L. (2000). Assessing Chinese adolescents' social support: The multidimensional scale of perceived social support. *Personality and Individual Differences, 28*(2), 299-307.

Christiaens, I., Hegadoren, K., & Olson, D. M. (2015). Adverse childhood experiences are associated with spontaneous preterm birth: A case-control study. *BMC Medicine, 13*(1), 124.

CIPD. (2014). The role of the line manager downloaded from <http://www.cipd.co.uk/hr-resources/factsheets/role-line-managers-hr.aspx>.

Clohessy, S., & Ehlers, A. (1999). PTSD symptoms, response to intrusive memories and coping in ambulance service workers. *British Journal of Clinical Psychology, 38*, 251-265.

Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychology, 7*, 269-297.

Cohen, S. (2004). Social relationships and health. *American Psychologist, 59*, 676-684.

Cohen, S., Mermelstein, R., Kamarck, T., & Hoberman, H. M. (1985). Measuring the functional components of social support. In *Social Support: Theory, Research and Applications* (pp. 73-94). Springer Netherlands.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310-357.

Cook, J. D., Hepworth, S. J., Wall, T. D., & Warr, P. B. (1981). *The Experience of Work: A Compendium and Review of 249 Measures and their Use*. Academic Press: London.

Cook, J., & Wall, T. D. (1980). New work attitude measures of trust, organizational commitment and personal need for non-fulfilment. *Journal of Organizational and Occupational Psychology*, 53, 39-52.

Cooper, C. L., & Dewe, P. J. (2008). Well-being: Absenteeism, cost and challenges. *Occupational Medicine*, 58, 522-524.

Costanzo, E. S., & Lutgendorf, S. K., Sood, A. K., Anderson, B., Sorosky, J., & Lubaroff, D. M. (2005). Psychosocial factors and interleukin-6 among women with advanced ovarian cancer. *Cancer*, 104, 305-313.

Cox, T., & Ferguson, E. (1994). Measures of the subjective work environment. *Work and Stress*, 8, 98-109.

Cox, T., & Griffiths, A. (2010). Work-related stress: A theoretical perspective. In S. Leka & J. Houdmont (Eds.), *Occupational Health Psychology* (31-56). Wiley-Blackwell: Chichester.

Creamer, M., Bell, R., & Failla, S. (2003). Psychometric properties of the impact of events scale-revised. *Behaviour Research and Therapy*, *41*, 1489-1496.

Cropanzano, R., Howes, J. C., Grandey, A. A., & Toth, P. (1997). The relationship of organizational politics and support to work behaviours, attitudes and stress. *Journal of Organizational Behavior*, *18*, 159-180.

Cutler, A. (2014). Making a difference in changing times: The value of research in challenging traditional training practice and supporting collaborative learning. In *Promoting Change through Action Research* (pp. 87-99). Sense Publishers.

da Silva, P. (2000). Cultural aspects of post-traumatic stress disorder. In W. Yule (Ed.), *Post-Traumatic Stress Disorders: Concepts and therapy*, 116-138. Wiley: Chichester.

Dewberry, C. (2004). *Statistical Methods for Organizational Research*. London: Taylor-Francis.

Dewe, P. J., O'Driscoll, M. P., Cooper, C. L. (2010). *Coping with Work Stress: A Review and Critique*. Wiley-Blackwell: Chichester.

Dickerson, S. S., & Zoccola, P. M. (2011). Toward a biology of social support. In S. J. Lopez & C. R. Snyder (Eds.), *The Oxford Handbook of Positive Psychology* (519-526). Oxford: New York.

DiMatteo, M. R. (2004). Social support and patient adherence to medical treatment: A meta-analysis. *Health Psychology, 23*, 207-218.

Donaldson-Feilder, E., Yarker, J., & Lewis, R. (2011). *Preventing Stress in Organizations: How to Develop Positive Managers*. Wiley Blackwell: Chichester.

DSM: *Diagnosis and Statistical Manual of Mental Disorders*. American Psychiatric Publishing: Washington, DC: London.

Einarsen, S., Hoel, H., & Notelaers, G. (2009). Measuring exposure to bullying and harassment at work: Validity, factor structure and psychometric properties of the Negative Acts Questionnaire-Revised. *Work and Stress, 23*(1), 24-44.

Einarsen, S., & Mikkelsen, E. G. (2003). Individual effects of exposure to bullying at work. In S. Einarsen, H. Hoel, & C. Cooper (Eds.). *Bullying and Emotional Abuse in the Workplace: International Perspectives in Research and Practice* (127-144). Taylor-Francis: New York.

Eisenberger, R., Cummings, J., Armeli, S., & Lynch, P. (1997). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology, 75*(1), 51-59.

Eisenberger, R., Huntington, R., Hutchinson, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology, 71*, 500-507.

Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods, 12*(2), 121-138.

Escribà-Agüir, V., & Pérez-Hoyos, S. (2007). Psychological well-being and psychosocial work environment characteristics among emergency medical and nursing staff. *Stress and Health, 23*, 153-160.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. Sage: Los Angeles.

Field, A., Miles, J., & Field, Z. (2014). *Discovering Statistics Using R*. London: Sage.

Fields, D. L. (2013). *Taking the Measure of Work: A Guide to Validated Scales for Organizational Research and Diagnosis*. Information Age Publishing: Charlotte, NC.

Filipas, H. H., & Ullman, S. E. (2001). Social reactions to sexual assault victims from various support sources. *Violence and Victims, 16*(6), 673-692.

Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, 51(4), 327.

Francis, R. QC Report (2013). Report of the mid Staffordshire NHS foundation trust public inquiry: Executive summary. Downloaded from: [www.official-documents.gov.uk](http://www.official-documents.gov.uk).

Fransella, F., Bell, R., & Bannister, D. (2004). A manual for repertory and technique. Chichester: John Wiley & Sons, Ltd.

Frasure-Smith, N., Lesperance, F., Gravel, G., Masson., A., Juneau, M., Talajic, M., & Bourassa, M. G. (2000). Social support, depression, and mortality during the first year after myocardial infarction. *Circulation*, 1919-1924.

Furnham, A. (2008). *The Psychology of Behaviour at Work: The Individual in the Organization*. Taylor & Francis: New York.



Garavan, T. N., & McGuire, D. (2001). Competencies and workplace learning: Some reflections on the rhetoric and the reality. *Journal of Workplace Learning, 13*, 144-164.

Gelman, A., & Hill, J. (2007). Data analysis using regression and multilevel/hierarchical models. Cambridge: Cambridge University Press.

Gilbreath, B., & Benson, P. G. (2004). The contribution of supervisor behaviour to employee psychological well-being. *Work and Stress, 18*, 3, 255-266.

Ginzburg, K., Ein-Doe, T., & Solomon, Z. (2010). Comorbidity of posttraumatic stress disorder, anxiety and depression: A 20-year longitudinal study of war veterans. *Journal of Affective Disorders, 123*, 249-257.

Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review, 17*(2), 183-211.

Gore, S. (1978). The effect of social support in moderating the health consequences of unemployment. *Journal of Health and Social Behavior*, 157-165.

Greenglass, E. R., Fiksenbaum, L., & Burke, R. J. (1994). The relationship between social support and burnout over time in teachers. *Journal of Social Behavior & Personality*, 9(2), 219-230.

Guest, D. E., & Conway, N. (2002). Communicating the psychological contract: an employer perspective. *Human Resource Management Journal*, 12(2), 22-38.

Hansen, E. A., Ronnestad, B, R., Vegge, G., & Raastad, T. (2012). Cyclists' improvement of pedaling efficacy and performance after heavy strength training. *International Journal of Sports Physiology and Performance*, 7, 313-321.

Harvey, J., Erdos, G., Bolam, H., Cox, M. A., Kennedy, J. N. P., & Gregory, D. T. (2002). An analysis of safety culture in highly regulated environment. *Work and Stress*, 16(1), 18-36.

Hayes, A. F. (2012). An analytical primer and computation tool for observed variable moderation, mediation, and conditional process modeling. Retrieved from <http://www.afhayes.com/public/process2012.pdf>.

Health and Safety Commission. (1993). Third report of the Advisory Committee on the safety nuclear installations - Organising for safety. London: Health and Safety Commission.

Health and Safety Executive. (2005). Psychosocial Working Conditions in Great Britain 2005. London: HSE.

Health and Safety Executive. (2006). Stress-Related and Psychological Disorders. London: HSE.

Health and Safety Executive. (2007a). Violence at Work. London: HSE.

Health and Safety Executive. (2007b). Self-Reported Work-Related Illness and Workplace Injuries in 2005/06: Results from the labour Force Survey. Caerphilly: HSE Information Services.

Heitzmann, C. A., & Kaplan, R. M. (1988). Assessment of methods for measuring social support. *Health Psychology, 7*(1), 75.

Hemp, P. (2004). Preseneeism: At work- but out of it. *Harvard Business Review, 49*-58.

Henderson, S., Duncan-Jones, P., Byrne, D. G., & Scott, R. (1980). Measuring social relationships. The interview schedule for social interaction. *Psychological Medicine, 10*(4), 723-734.

Herzberg, F., Mausner, B., Peterson, O., & Capwell, D. (1957). Job attitudes: Review of research and opinion. Pittsburgh, PA: Psychological Services of Pittsburgh.

Hetland, H., Sandal, G. M., & Johnsen, T. B. (2007). Burnout in the information technology sector: Does leadership matter? *European Journal of Work and Organizational Psychology, 16*(1), 58-75.

Hibbard, J. H., & Pope, C. R. (1993). The quality of social roles as predictors of morbidity. *Social Science and Medicine*, 36, 217-225.

Hofmann, D. A., & Stetzer, A. (1996). A cross-sectional investigation of factors influencing unsafe behaviours and accidents. *Personnel Psychology*, 49(2), 307-339.

Hog, M. A., & Vaughan, G. M. (2011). *Social Psychology*. London: Pearson.

Holahan, C. J., & Moos, R. H. (1982). Social support and adjustment: Predictive benefits of social climate indices. *American Journal of Community Psychology*, 10(4), 403-415.

Holton, E. F., III. (1999). Performance domains and their boundaries. *Advances in Developing Human Resources*, 1, 26-46.

Holt-Lunstad, J., Smith, T. B., & Layton, B. (2010). Social relationships and mortality: A meta-analysis. *PLOS Medicine*, 7, e1000316. doi: 10.1371/journal.pmed.1000316.

House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen and S. L. Syme (Eds.) *Social Support and Health*, 83-108. New York: Academic Press.

House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241(4865), 540-545.

Houshmand, T. (2012). Supportive and unsupportive managerial behaviours in a national context: A cross-cultural study between Sweden and China. University of Nottingham. Unpublished Applied Research Project.

Hu, L-T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural Equation Modeling: Concepts, Issues and Applications* (pp. 76-99). Thousand Oaks, CA: Sage.

Hu, L-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling: A Multidisciplinary Journal*, 6, 1-55.

Hutcheson, J. E., & Sofroniou, N. (1999). *The Multivariate Social Scientist*. London: Sage.

Jackson, D. L., Gillaspay, Jr, J. A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological Methods, 14*(1), 6-23.

Jones, A. P., & James, L. R. (1979). Psychological climate: dimensions and relationships of individual and aggregated work environment perceptions. *Organizational Behaviour and Human Performance, 23*, 201-50.

James, L. R., Mulaik, S. A., & Brett, J. M. (1982). *Causal analysis: Assumptions, models and data*. Beverly Hills, CA: Sage.

Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., Millet, C. (2005). The experience of work-related stress across occupations. *Journal of Managerial Psychology, 20*(2), 178-187.

Jenkins, R., Mann, A. H., & Belsey, E. (1981). The background, design and use of a short interview to assess social stress and support in research and clinical settings. *Social Science & Medicine. Part E: Medical Psychology*, 15(3), 195-203.

Joseph, S. (2000). Social support and mental health following trauma. In W. Yule (Ed.), *Post-Traumatic Stress Disorders: Concepts and Therapy*, 71-91. Wiley: Chichester.

Judge, T. A., Jackson, C. L., Shaw, J. C., Scott, B. A., & Rich, B. L. (2007). Self-efficacy and work related performance: The integral role of individual differences. *Journal of Applied Psychology*, 92(1), 107-127.

Kaplan, A. (1977). Social support: The construct and its measurement. Unpublished bachelor of arts thesis, Brown University, Providence, RI.

Kaspersen, M., Matthiesen, S. B., & Gotestam, K. G. (2003). Social network as a moderator in the relation between trauma exposure and trauma reaction: A survey among UN soldiers and relief works. *Scandinavian Journal of Psychology*, 44(5), 415-423.



Keashly, L., & Harvey, S. (2005). Emotional abuse in the workplace. In S. Fox & P.E. Spector (Eds.), *Counterproductive behavior. Investigations of actors and targets* (pp. 201-235). Washington, DC: American Psychological Association.

Kelly, J. G., Munoz, R. F., & Snowden, L. R. (1979). Characteristics of community research projects and the implementation process. *Social and Psychological Research in Community Settings*, 343-363.

Keogh, B. (2013). Review into the quality of care and treatment provided by 14 hospital trusts in England: Overview report. NHS Report.

King's Fund. (2012). Downloaded from:

[http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/leadership-for-engagement-improvement-nhs-final-review2012.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/leadership-for-engagement-improvement-nhs-final-review2012.pdf)

Kline, P. (2003). *The New Psychometrics: Science, Psychology and Measurement*. Routledge: London

Koenen, K. C., Stellman, J. M., Stellman, S. D., & Sommer Jr, J. F. (2003). Risk factors for course of posttraumatic stress disorder among Vietnam veterans: A 14-year follow-up of American legionnaires. *Journal of Consulting and Clinical Psychology, 71*(6), 980-986.

Kreft, I. G. G., & de Leeuw, J. (1998). *Introducing multilevel modeling*. London: Sage.

Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005). The Copenhagen burnout inventory: A tool for the assessment of burnout. *Work & Stress, 19*(3), 192-207.

Laschinger, H. K. S., & Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *The Journal of Nursing Administration, 36*(5), 259-267.

Leather, P., Lawrence, C., Beale, D., Cox, T., & Dickson, R. (1998). Exposure to occupational violence and the buffering effects of intra-organizational support. *Work and Stress, 12*(2), 161-178.

Lee, M., & Rotheram-Borus, M. J. (2001). Challenges associated with increased survival among parents living with HIV. *American Journal of Public Health, 91*, 1303-1309.

Leka, S., Griffiths, A., & Cox, T. (2002). Guidance on work organisation and stress. Geneva: World Health Organization.

Lewis, M. A., & Rook, K. S. (1999). Social control in personal relationships: Impact on health behaviours and psychological distress. *Health Psychology, 18*(1), 63-71.

Leymann, H. & Gustafsson, A. (1996). Mobbing at work and the development of post-traumatic stress disorders. *European Journal of Work and Organizational Psychology, 5*, 251-275.

Lino, V. T. S., Portela, M. C., Camacho, L. A. B., Atie, S., & Lima, M. J. B. (2013). Assessment of social support and its association to depression, self-perceived health and chronic diseases in elderly individuals residing in an area of poverty and social vulnerability. *Assessment of Social Support to Elderly in Brazil 8*(8), e71712.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149.

MacPhee, D., Farro, S., & Canetto, S. S. (2013). Academic self-efficacy and performance of underrepresented STEM majors: Gender, ethnic, and social class patterns. *Analyses of Social Issues and Public Policy, 13*(1), 347-369.

MacKinnon, D. P. (2008). Introduction to statistical mediation analysis. Mahwah, NJ: Erlbaum.

Manning-Walsh, J. (2005). Social support as a mediator between symptom distress and quality of life in women with breast cancer. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 34*(4), 482-493.

Mansell, A., Brough, P., & Cole, K. (2006). Stable predictors of job satisfaction, psychological strain, and employee retention: An evaluation of organizational change within the New Zealand customs service. *International Journal of Stress Management, 13*(1), 84-107.

Medalie, J. H., & Goldbourt, U. (1976). Angina pectoris among 10,000 men: II. Psychosocial and other risk factors as evidenced by a multivariate analysis of a five year incidence study. *The American Journal of Medicine*, 60(6), 910-921.

Miles, J., & Shevlin, M. (2005). *Applying Regression and Correlation*. London: Sage.

Moos, R. H. (1981). *Work Environment Scale Manual* (2nd ed.). Palo Alto, CA: Consulting Psychologists Press.

Moos, R. H., & Moos, B. S. (1981). Manual for the family environment scale. *Consulting Psychologists Press*, 50, 33-56.

Nelson, D. L., & Simmons, B. L. (2003). Health psychology and work stress: A more positive approach. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 97-119). Washington, DC: American Psychological Association.

Nagy, M. S. (2002). Using a single-item approach to measure facet job satisfaction. *Journal of Occupational and Organizational Psychology, 75*, 77-86.

Ng, T. W. H., & Sorensen, K. L. (2008). Toward a further understanding of the relationships between perceptions of support and work attitudes. *Group and Organization Management, February*, 1-26.

Nielsen, K., Yarker, J., Brenner, S-O., Randall, R., Borg, V. (2008). The importance of transformational style for the well-being of employees working with older people. *Journal of Advanced Nursing, 63(5)*, 465-475.

Norman, P., Collins, S., Conner, M., Martin, R., & Rance, J. (1995). Attributions, cognitions, and coping styles: Teleworkers' reactions to work-related problems. *Journal of Applied Social Psychology, 25(2)*, 117-128.

O'Toole, M. (2002). The relationship between employees' perceptions of safety and organizational culture. *Journal of Safety Research, 33(2)*, 231-243.

Patterson, T. L., Shaw, W. S., Semple, S. J., Cherner, M., McCutchan, J. A., Atkinson, J. H., Grant, I., & Nannis, E. (1996). Relationship of psychosocial factors to HIV progression. *Annals of Behavioural Medicine*, *18*, 30-39.

Preacher, K. J., & Kelley, K. (2011). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods*, *16*(2), 93-115. doi: 10.1037/a0022658.

Prins, J. T., Hoekstra-Weebers, J. E. H. M., Gazendam-Donofrio, S. M., Dillingh, G. S., Bakker, A. B., Huisman, M., Jacobs, B., & van der Heijden, F. M. M. A. (2010). Burnout and engagement among resident doctors in the Netherlands: A national study. *Medical Education*, *44*, 236-247.

Procidano, M. E., & Heller, K. (1983). Measures of perceived social support from friends and from family: Three validation studies. *American Journal of Community Psychology*, *11*(1), 1-24.

Rayner, C., & Cooper, C. L. (2006). Workplace bullying. In E. K. Kelloway, J. Barling, & J. J. Hurrell, Jr (Eds.). *Handbook of Workplace Violence* (pp. 121-146). London: Sage.

Rayner, C., Hoel, H., & Cooper, C. L. (2002). *Bullying at work: What we know, who is to blame, and what can we do?* London: Taylor Francis.

Redmill, R. (1997). Practical risk management: In F. Redmill and C. Dale (Eds.), *Life Cycle Management for Dependability*. London: Springer-Verlag.

Renne, K. S. (1974). Measurement of social health in a general population survey. *Social Science Research*, 3(1), 25-44.

Rhoads, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology*, 87(4), 698-714.

Robinson, S. L., & Rousseau, D. M. (1994). Violating the psychological contract: Not the exception but the norm. *Journal of organizational behavior*, 15(3), 245-259.



Rooney, J. A. and Gottlieb, B. H. (2007). Development and initial validation of a measure of supportive and unsupportive managerial behaviors, *Journal of Vocational Behavior*, 71(2), 186-203.

Rooney, J. A., Gottlieb, B. H., & Newby-Clark, I. R. (2009). How support-related managerial behaviours influence employees: An integrated model. *Journal of Managerial Psychology*, 24(5), 410-427.

Rutledge, T., Reis, S. E., Olson, M., Owens, J., Kelsey, S. F., Pepine, C. J., Mankad, S., Rogers, W. J., Merz, C. N. B., Sopko, G., Cornell, C. E., SHaraf, B., & Matthews, K. A. (2004). Social networks are associated with lower mortality rates among women with suspected coronary disease: The National Heart, Lung, and Blood Institute-sponsored Women's Ischemia Syndrome Evaluation study. *Psychosomatic Medicine*, 66, 882-888.

Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American journal of orthopsychiatry*, 57(3), 316.

Sainsbury Centre for Mental Health. (2007). *Mental Health at Work: Developing the business case. Policy Paper 8.* London: Sainsbury Centre for Mental Health.

Salanova, M., Schaufeli, W.B., Xanthopoulou, D., & Bakker, A.B. (2010). The gain spiral of resources and work engagement: Sustaining a positive worklife. *Work Engagement: A Handbook of Essential Theory and Research*, 118-131.

Salas, E., & Cannon-Bowers, J. A. (2001). The science of training: A decade of progress. *Annual Review of Psychology*, 52, 471-499.

Salas, E., Weaver, S. J., & Shuffler, M. L. (2014). In S. W. J. Kozlowski (Ed.) *The Oxford Handbook of Organizational Psychology: Volume 1*, pp.330-372.

Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The social support questionnaire. *Journal of Personality and Social Psychology*, 44(1), 127.

Sarason, B. R., Shearin, E. N., Pierce, G. R., & Sarason, I. G. (1987). Interrelations of social support measures: Theoretical and practical implications. *Journal of Personality and Social Psychology*, 52(4), 813-832.

Schafer, L. C., McCaul, K. D., & Glasgow, R. E. (1986). Supportive and nonsupportive family behaviors: Relationships to adherence and metabolic control in persons with type I diabetes. *Diabetes Care*, 9(2), 179-185.

Schat, A. C. H., & Kelloway, E. K., & Desmarais, S. (2005). The physical health questionnaire (PHQ): Construct validation of a self-report scale of somatic symptoms. *Journal of Occupational Health Psychology*, 10(4), 363-381.

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study, *Educational and Psychological Measurement*, 66(4), 701-716.

Schaufeli, W. B., Maslach, C., & Marek, T. (1993). Professional burnout: Recent developments in theory and research. Philadelphia: Taylor & Francis.

Schumm, J. A., Briggs-Phillips, M., & Hobfoll, S, E. (2006). *Journal of Traumatic Stress, 19(6), 825-836.*

Schumm, J. A., Briggs-Phillips, M., & Hobfoll, S. E. (2006). Cumulative interpersonal traumas and social support as risk and resiliency factors in predicting PTSD and depression among inner-city women. *Journal of Traumatic Stress, 19(6), 825-836.*

Schradle, S. B., & Dougher, M. J. (1985). Social support as a mediator of stress: Theoretical and empirical issues. *Clinical Psychology Review, 5(6), 641-661.*

Schwarzer, R., & Knoll, N. (2007). Functional roles of support within the stress and coping process: A theoretical and empirical overview. *International Journal of Psychology, 42(4), 243-252.*

Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social Science & Medicine, 32(6), 705-714.*

Sherry, S. B., Law, A., Hewitt, P. L., Flett, G. L., & Besser, A. (2008). Social support as a mediator of the relationship between perfectionism and depression: A preliminary test of the social disconnection model. *Personality and Individual Differences, 45*(5), 339-344.

Shumaker, S. A., & Hill, D. R. (1991). Gender differences in social support and physical health. *Health Psychology, 10*(2), 102-111.

Smith, A. J., Benight, C. C., & Cieslak, R. (2013). Social support and postdeployment coping self-efficacy as predictors of distress among combat veterans. *Military Psychology, 5*(25), 452-461.

Smith, A., & Roberts, K. (2003). Interventions for post-traumatic stress disorder and psychological distress in emergency ambulance personnel: A review of the literature. *Emergency Medicine Journal, 20*, 75-78.

Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological Methodology 1981* (pp. 290-312). San Francisco: Jossey-Bass.

Stajkovic, A. D., Lee, D., & Nyberg, A. J. (2009). Collective efficacy, group potency, and group performance: Meta-analysis of their relationships, and test of mediation model. *Journal of Applied Psychology, 94*, 814-828.

Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin, 124*(2), 240-261.

Steiger, J. H., & Lind, J. C. (1980). Statistically based test for the number of common factors. Paper presented at the Psychometric Society Annual Meeting, Iowa City, IA.

Stevens, J. P. (2002). *Applied Multivariate Statistics for the Social Sciences*. Hillsdale, NJ: Erlbaum.

Stokes, J. P. (1983). Predicting satisfaction with social support from social network structure. *American Journal of Community Psychology, 11*(2), 141-152.

Streiner, D. L., & Norman, G. R. (1989). Health measurement scales: A practical guide to their development and use. Oxford: Oxford University Press.

Stumpf, S. A., Brief, A. P., & Hartman, K. (1987). Self-efficacy expectations and coping with career-related events. *Journal of Vocational Behavior*. 31, 91-108.

Sun, J., Buys, N. J., Stewart, D. E., Shum, D., & Farquhar, L. (2010). A study of the prevalence of current tobacco use in university students and its association with stress, depression, coping strategies, and attitude regarding to exposure to smoking. Australasian Society of Behavioral Health and Medicine. <http://hdl.handle.net/10072/41997>

Svanum, S., & Zody, Z. B. (2001). Psychopathology and college grades. *Journal of Counseling Psychology*, 48(1), 72.

Swanson, R. A. (1999). Foundations of performance improvement and implications for practice. *Advances in Developing Human Resources*, 1, 1-25.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics*. Pearson: Boston.

Taylor, S. E., & Sherman, D. K. (2004). Positive psychology and health psychology: A fruitful liaison. In P. A. Linley and S. Joseph (Eds.), *Positive Psychology in Practice*, 305-319. Wiley & Sons; New Jersey.

Tehrani, N. (2004). *Workplace Trauma: Concepts, Assessment and interventions*. Taylor: New York.

Tepper, B. J. (2000). Consequences of abusive supervision. *Academy of Management Journal*, 43, 178-190.

Tepper, B. J. (2007). Abusive supervision in work organizations: Review, synthesis and research agenda. *Journal of Management* 33(3), 261-289.

Tepper, B. J., Duffy, M. K., & Shaw, J. D. (2001). Personality moderators of the relationships between abusive supervision and subordinates' resistance. *Journal of Applied Psychology*, 86, 974-983.



Tett, R. P., Guterman, H. A., Bleir, A., & Murphy, P. J. (2000). Development and content validation of a hyperdimensional taxonomy of managerial competence. *Human Performance*, 5, 97-108.

Thoits, P. A. (1982). Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. *Journal of Health and Social behavior*, 145-159.

Toro, P. A., & Oko-Riebau, M. (2015). Social support and stress among homeless adults in Southern Poland. *Journal of Community Psychology*, 43(4), 430-446.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 38, 1-10.

Uchino, B. N. (2006). Social support and health: A review of physiological processes potentially underlying links to disease outcomes. *Journal of Behavioural Medicine*, 4(29), 377-387.

Uchino, B. N. (2009). Understanding the links between social support and physical health: A life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science, 4*(3), 236-255.

Uchino, B. N., Bosch, J. A., Smith, T. W., Carlisle, M., Light, K. C., Heaney, J., & O'Hartaigh, B. (2013). Relationships and cardiovascular risk: Perceived spousal ambivalence in specific relationship context and its links to inflammation. *Health Psychology 32*(10), 1067-1075.

Ullman, J. B. (2013). Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (Eds.), *Using Multivariate Statistics*, (pp. 681-785). Pearson: Boston.

Ullman, S. E. (1996). Social reactions, coping strategies, and self-blame attributions in adjustment to sexual assault. *Psychology of Women Quarterly, 20*, 505-526.

Ullman, S. E., & Filipas, H. H. (2001). Predictors of PTSD symptoms severity and social reactions in sexual assault victims. *Journal of Traumatic Stress, 14*(2), 369-389.

Umberson, D. (1987). Family status and health behaviours: Social control as a dimension of social integration. *Journal of Health and Social Behaviour, 28*, 306-319.

Umberson, D. (1992). Gender, marital status and the control of health behaviour. *Social Science and Medicine, 34*(8), 907-917.

van der Ploeg, E., & Kleber, R. J. (2003). Acute and chronic job stressors among ambulance personnel: Predictors of health symptoms. *Occupational and Environmental Medicine, 60*, 140-146.

van Dierendonck D., Haynes C., Borril C. & Stride C. (2004). Leadership behavior and subordinate well-being. *Journal of Occupational Health Psychology, 9*, 165-175.

Vredenburgh, A. G. (2002). Organizational safety: Which management practices are most effective in reducing employee injury rates? *Journal of Safety Research, 33*(2), 259-276.

Wallston, B. S., Alagna, S. W., DeVellis, B. M., DeVellis, R. F. (1983). Social support and physical health. *Health Psychology, 2*(4), 367-391.

Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82*, 247-252.

Wardak, A. W. H. (1993). The psychiatric effects of war stress on Afghan society. In J. P. Wilson & B. Raphael (Eds.), *International Handbook of Traumatic Stress Syndromes*. New York: Plenum Press.

Warr, P. B., Cook, J. D., & Wall, T. D. (1979). Scales for the measurement of work attitudes and psychological well-being. *Journal of Occupational and Organizational Psychology, 58*, 229-242.

Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management Journal, 40*(1), 82-111.

Weiss, R. (1974). The provisions of social relations. In Z. Rubin (Ed.).  
Doing unto Others. Englewood Cliffs, New Jersey: Prentice-Hall

Weiss, D. S., & Marmar, C. R. (1997). The impact of event scale-revised.  
In J. P. Wilson & T. M. Keane (Eds.), *Assessing Psychological Trauma and  
PTSD* (pp. 399-411). New York: Guilford Press.

Welin, L., Larsson, B., Svardsudd, T. B., & Tibblin, G. (1992). Social  
network and activities in relation to mortality from cardiovascular  
diseases, cancer and other causes: A 12 year follow up of the study of  
men born in 1913 and 1923. *Journal of Epidemiology and Community  
Health, 46*, 127-132.

West, M. A., & Dawson, J. F. (2012). Employee engagement and NHS  
performance. Downloaded from:  
[http://www.kingsfund.org.uk/sites/files/kf/employee-engagement-nhs-  
performance-west-dawson-leadership-review2012-paper.pdf](http://www.kingsfund.org.uk/sites/files/kf/employee-engagement-nhs-performance-west-dawson-leadership-review2012-paper.pdf)

Wilcox, B. L. (1981). Social support, life stress, and psychological  
adjustment: A test of the buffering hypothesis. *American Journal of  
Community Psychology, 9*(4), 371-386.

Wills, T. A. (1991). Social support and interpersonal relationships. In M. S. Clark (Ed.), *Prosocial Behaviour*, 265-289. Newbury Park, CA: Sage.

Woods, S. A., & West, M. A. (2010). *The Psychology of Work and Organizations*. Seng Lee Press: Singapore.

Xanthopoulou, D., Bakker, A.B., Demerouti, E., & Schaufeli, W.B. (2009). Reciprocal relationships between job resources, personal resources, and work engagement. *Journal of Vocational Behavior*, 74(3), 235-244.

Yarker, J., Lewis, R., & Donaldson-Feilder, E. (2008). Management competencies for preventing and reducing stress at work: Identifying and developing the management behaviours necessary to implement the HSE Management Standards: Phase two. Health and Safety Executive.

Yassen, J. (1995). Preventing secondary traumatic stress disorder. In C. R. Figley (Ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in Those Who Treat the Traumatized*, 178-208. Brunner-Routledge: New York.

Zapf, D., Dormann, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with Reference to methodological issues. *Journal of Occupational Health Psychology, 1*(2), 145-169.

Zellars, K. L., Tepper, B. J., & Duffy, M. K. (2002). Abusive supervision and subordinates' organizational citizenship behavior. *Journal of Applied Psychology, 86*, 1068-1076.

Zhang, S., Wang, H., Chen, C., Zhou, J., & Wang, X. (2015). Efficacy of Williams LifeSkills Training in improving psychological health of Chinese male juvenile violent offenders: A randomized controlled study. *Neuroscience Bulletin, 31*(1), 53-60.

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41.

Zohar, D. M., & Hofmann, D. A. (2012). Organizational culture and climate. In S. W. J. Kozlowski (Ed.), *The Oxford Handbook of Organizational Psychology: Volume 1*, 643-666. University Press: Oxford.