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**Psychological Resilience in the Face of Occupational Trauma:
An Evaluation of a Multidimensional Model**

A thesis presented in partial fulfilment of the requirements for the degree of Doctor of
Philosophy in Psychology at Massey University, Manawatu, New Zealand.

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2012

ABSTRACT

The occupation of a police officer is considered to be stressful. However, police personnel, like those in a number of other occupations, do not routinely develop pathogenic consequences, such as posttraumatic stress, psychological distress, and poor physical health, when exposed to traumatic events. In fact, when police officers are exposed to traumatic events most are psychologically resilient. For this reason, traumatic events are referred to as potentially traumatic events. This study attempted to answer the question of why some police officers develop pathogenic consequences when exposed to potentially traumatic events and others do not. This study developed a psychological resilience model based on the five-part model, which involves cognitions, emotions, behaviours, physical activities, and an individual's environment. The model, referred to as the 5-PR model, included the constructs of adaptive coping, optimism, emotional competence, adaptive health practices, and social support. A sample of 176 police officers, who had been surveyed at the commencement of training at the Royal New Zealand Police College in 1997 and 1998 and resurveyed 1 year later, were surveyed with a web-based or paper questionnaire to test the 5-PR model. This study involved testing the hypotheses that greater exposure to potentially traumatic events would be related to pathogenic outcomes, that the 5-PR model would be negatively related to pathogenic consequences, that the 5-PR model would moderate the relationship between exposure to potentially traumatic events with pathogenic consequences, the relationship between emotional competence and pathogenic consequences would be mediated by adaptive health practices, and there

would be no difference between the levels of pathogenic consequences between those participants who had consulted a psychologist. Multiple regression analyses to test these hypotheses found that the components of 5-PR model that contributed to the psychological resilience of police officers were optimism, adaptive coping, adaptive health practices, and social support from colleagues. These results suggested that the three aspects of the 5-PR model, cognitions, behaviours, and environment, contributed to psychological resilience, and that the model should be redefined as the three part model of psychological resilience (3-PR model). Emotional competence had a minimal contribution to psychological resilience. Additional analyses showed that the psychological support was being sought appropriately by members and whilst current employees had a higher level of exposure to potentially traumatic events in comparison to former employees there were no significant differences regarding pathogenic consequences. From this study, it was found that the components of optimism, adaptive coping, adaptive health practices, and peer social support contributed to the multidimensional nature of psychological resilience. The theoretical framework of psychological resilience was reconceptualised as the 3-PR model.

ACKNOWLEDGEMENTS

There are so many people to thank in relation to this thesis and there is no particular order that I have chosen to thank people. I would like to thank my supervisors, Associate Professor Christine Stephens and Associate Professor David Johnston. Chris has taught me a tremendous amount about the research process and she is a supervisor whom I have much admiration. David was my “pastoral care” supervisor. He was extremely supportive in providing resources and financial support throughout this thesis. Without both supervisors I would not have made it to this point.

I would like to thank a number of people who provided me with various types of encouragement and support during my thesis journey. These people include Ms Julia Becker, Dr Larry Owens, Dr Duncan Babbage, Mr Ash Smith, and Associate Professor Mandy Morgan. I would like to thank all the participants who completed the study, without those individuals this research would not have been possible. I have the greatest respect and admiration for police officers and taking the time to complete this study was very beneficial to me and the welfare of police officers. To enable me to complete this research, I had to rely on various support from Mr Peter Hayes, Mr David Trevelyan, Mr Greg Fleming, and Ms Deb Stringer from the New Zealand Police Association, and Mr Stu Duncan, Mr Paul Berry, and Mr Steve Darroch from the New Zealand Police. In addition, I would like to thank the Health Research Council for providing financial assistance to enable this project to be completed.

Last and by no means least, I would like to thank my family, and my wife and best friend, Kristy Trillo. I appreciate that things have been difficult for us over the past

few years, but I know it has been worth it. I would also like to thank my children, for whom this thesis has impacted on the time that I have had available to spend with them. I would also like to thank my parents. My mum was alive when I started this project, but did not live to see the end of this thesis. I know she would have been proud of me. Both Mum and Dad have been an inspiration for me.

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CHAPTER ONE

INTRODUCTION

Since the advent of posttraumatic stress disorder (PTSD) in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; American Psychiatric Association, 1980), there has been a great deal of research that has investigated the prevalence of PTSD due to occupational trauma (e.g., Emsley, Seedat, & Stein, 2003), disasters (e.g., Chung, 2006), motor vehicle accidents (e.g., Wu & Cheung, 2006), and criminal acts (e.g., Brewin, Andrews, & Rose, 2003). In the context of occupational trauma there are some occupations such as, police officer, fire fighter, paramedic, and soldier that are regarded by many as particularly stressful. Cash (2006) argued that police officers, paramedics, firefighters, and rescue workers are routinely exposed on a daily or weekly basis to traumatic experiences such as body handling (Figley, 1995), and consequently are at high risk of developing PTSD (Haslam & Mallon, 2003). In addition, to the possibility that individuals will develop PTSD, there is also the possibility that individuals will develop mental and physical health consequences.

Mental health consequences due to the exposure to occupational trauma include depression (Holtz, Salama, Cardozo, & Gotway, 2002), sleep disorders (Neylan, et al., 2002), alcohol abuse, psychological distress (Boxer & Wild, 1993), emotional exhaustion, anxiety (Holtz, et al., 2002), and burnout (Goodman, 1990). Possible physical health consequences include gastrointestinal disorders, liver or kidney toxicity (Polakoff, 1984), elevated heart rates (Barnard & Duncan, 1975), increased medical consultations, musculoskeletal disorders, and neurological symptoms (Schnurr &

Green, 2003). These effects have important implications for the health of workers in organisations such as the police, both in the field, and for those who have retired (Stephens, 2004). Previous research has focused on identifying the risk factors that place individuals exposed to occupational trauma at greater risk of developing mental illnesses (Bryant & Harvey, 1995), factors influencing the development of PTSD from the exposure to occupational trauma (Gersons, 1989), and the efficacy of intervention strategies such as debriefing (Deville, Gist, & Cotton, 2006).

Individuals exposed to traumatic events are expected to develop pathogenic consequences such as, posttraumatic stress, psychological distress, and poor physical health (Bonanno, 2005b). However, not everyone exposed to traumatic events will develop pathogenic consequences (Bonanno & Mancini, 2008; Reyes, 2006). In fact, the majority of people who are exposed to adverse events will not develop any adverse outcomes (Galea, et al., 2003). Bonanno, Brewin, Kaniasty, and La Greca (2010) argued that the highest recorded level of psychological distress in people exposed to disasters is 30% and they observed that this rate is much lower in sound, robust studies. For example, the lifetime prevalence rate of PTSD following exposure to a traumatic event was found to be around 7% (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). It has been argued that approximately 5 to 10% of people who are exposed to traumatic events will develop some form of psychopathology (Bryant & Harvey, 2000). In addition, research studies have demonstrated that individuals who have been exposed to traumatic events will develop transient pathogenic effects from such events rather than experiencing ongoing or enduring difficulties (Bonanno, et al., 2010; Vernberg, et

al., 2008). Some researchers have estimated that approximately 10 to 15% of people will need some minor assistance or intervention, but the majority of people exposed to such events will not develop any psychopathology (Bonanno, et al., 2010; Bryant & Harvey, 2000; Galea, Nandi, & Viahov, 2005; Galea, et al., 2003). Thus, those events that could evoke pathogenic consequences will be referred to as potentially traumatic events.

Why is it that some people develop psychopathology when exposed to potentially traumatic events and others do not? That is the main focus of this study and an understanding of why some individuals do not develop pathogenic consequences can be directly transferable to areas such as education, prevention, and intervention. Not all individuals exposed to potentially traumatic events go on to develop psychopathology. In fact, Bonanno (2004) argued that the majority of individuals are psychologically resilient when faced with adversity. There are a number of formulations that have been advanced to conceptualise psychological resilience. On the one hand, psychological resilience has been conceptualised as the ability of an individual to recover from an adverse situation and may include factors such as, coping mechanisms, social support, protective factors, previous experience, and social skills (Harvey & Delfabbro, 2004). On the other hand, psychological resilience is the ability of an individual to maintain healthy psychological and physical well-being despite being exposed to potentially traumatic events (Bonanno, 2004). The definition of psychological resilience to be used in this study is a combination of these two conceptualisations. Psychological resilience is viewed as the ability of an individual to

maintain psychological and physical well-being despite being exposed to adversity and may include factors such as cognitions, emotions, behaviours, physical activities, and environmental aspects.

Various aspects of psychological resilience have been investigated, for example, optimism (e.g., Scheier & Carver, 1992), but limited research that has investigated psychological resilience from a multidimensional nature. The five-part model has been utilised in the treatment of the PTSD (Giarratano, 2004), and is generally accepted to be part of the domain of cognitive-behavioural therapy. Cognitive-behavioural therapy has been shown to be effective in the treatment of PTSD (e.g., Ehlers, Clark, Hackmann, McManus, & Fennell, 2005). The five-part model involves an individual's cognitions, emotions, behaviours, and physical activities that are encompassed in an individual's environment. These five components are separate dimensions, but are believed to be interactive (Giarratano, 2004). For these reasons, it was decided to utilise the five-part model as the basis for conceptualising psychological resilience. The five-part model of psychological resilience (5-PR model) involves the five components of cognitions, emotions, behaviours, physical activities, and environment (de Terte, Becker, & Stephens, 2009, see Appendix A).

Overview of Study

This study focuses on the question of why some individuals develop pathogenic consequences after being exposed to potentially traumatic events and why some individuals do not. This research tested the 5-PR model with a sample of police officers who each have approximately 11 years of police service. The study will add to our

theoretical knowledge and provide information about psychological resilience in people who are routinely exposed to potentially traumatic events during the course of their work.

The first part of the study will present an argument for a multidimensional view of psychological resilience. This argument will draw on the literature in the areas of traumatic stress, psychological resilience, and emotional competence. Chapter 2 will discuss potentially traumatic events, posttraumatic stress, the pathogenic consequences for individuals who are exposed to potentially traumatic events, the stressful nature of police work, and the efficacy of psychological interventions for individuals who have pathogenic outcomes from potentially traumatic events. Chapter 3 will discuss the importance of resilience, the construct of resilience, theories of resilience, the multidimensional nature of resilience, and the theoretical framework of the 5-PR model. Chapter 4 will focus on one of the key aspects of psychological resilience, emotional competence. In particular, this chapter will discuss the construct of emotional competence, the clinical utility of emotional competence, the causal mechanisms of emotional competence, and the relationship emotional competence has to the other elements of the 5-PR model.

The second part of the study will outline the research study. Chapter 5 will outline the research aims and hypotheses. Chapter 6 will describe the methodology used in this study. Chapter 7 will present the results from this study. Chapter 8 will provide a discussion of this study, the ramifications of this research, and the limitations of this study.

CHAPTER TWO

TRAUMATIC STRESS

There are a number of questions or points that need to be addressed in the understanding of traumatic stress. The questions addressed in this chapter are: What are potentially traumatic events? What is posttraumatic stress? What are the possible pathogenic consequences for individuals exposed to potentially traumatic events? Is policing stressful or traumatic? Finally, do psychological interventions work for individuals who have pathogenic outcomes from potentially traumatic events?

Potentially Traumatic Events

A traumatic event has been defined in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994), within the ambit of PTSD and acute stress disorder, as a situation in which a person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others and the person's response involved intense fear, helplessness, or horror (American Psychiatric Association, 1994). Alternatively, Norris (1990) defined a traumatic event as any event that involved extreme or sudden violence brought about by an outside force, for example, disasters. Furthermore, Norris (1992) argued that a traumatic event is any process that may result in symptoms of stress. McFarlane and de Girolamo (2007) described traumatic stressors as "events that violate our existing ways of making sense of our reactions" (p. 131).

As can be seen there is not an agreed definition on the concept of what constitutes a traumatic event. The commonly used definition of traumatic stressor or event has been the criterion stipulated in the DSM-IV. Although the definition in the DSM-IV includes the exposure to a series of events, in practice the definition does not allow for the effects of cumulative trauma. Some theorists (e.g., Kira, et al., 2008) have argued that single event exposure is rare and that most individuals are exposed to multiple traumatic events. Furthermore, the definition stipulated in the DSM-IV is quite narrow and is limited to events that threatened an individual's physical integrity (Kira, et al., 2008). However, despite the narrowness of the definition of traumatic events stipulated in the DSM-IV there is still some utility in using this definition because of the consistency in the use of this definition in the research domain.

It has been postulated that most individuals will be exposed to a potentially traumatic event at some stage in their lives (Ozer, Best, Lipsey, & Weiss, 2003). However, rates of lifetime exposure to a traumatic event vary in the literature. For instance, Norris (1992) reported a lifetime exposure to a potentially traumatic event of 69% in a sample of 1000 adults in the United States. Cusack, Grubaugh, Knapp, and Frueh (2006) reported a lifetime exposure to a potentially traumatic event of 87% in a sample of mental health consumers. Dragan and Lis-Turlejska (2007) presented a lifetime exposure to a potentially traumatic event of 81% in a sample of patients with substance abuse disorders. Finally, Mizuta et al., (2005) established prevalence rates for exposure to traumatic events of between 53% and 80% in women participants from

Japan. From these studies, the likelihood of an individual in the general population being exposed to a potentially traumatic event ranges from 53% to 87%.

One particular area that has increased our understanding of the frequency of potentially traumatic events is disaster research. Disasters have been categorized into two separate domains, natural disasters and human-made disasters (Galea, et al., 2005). Sometimes human-made disasters have been further divided into human-made and technological disasters. Natural disasters are events that occur because of acts of nature, for instance, floods, earthquakes, and hurricanes. Human-made disasters are events that are the result of some act by human beings, such as terrorism. Technological disasters are events that occur because of some malfunction in technology, such as oil spills, factory explosions, and nuclear reactor accidents (Neria, Nandi, & Galea, 2008). The frequency of disasters has remained relatively constant, but the number of deaths and number of people affected by these events has increased dramatically. To illustrate, in 2008, there were 585 disasters that resulted in 242,662 deaths, and affected 213 million people. In 2007 there were 680 disasters that resulted in 23,853 deaths, and affected 214 million people. In 2006 there were 710 disasters that resulted in 33,539 deaths, and affected 142 million people (International Federation of Red Cross and Red Crescent Societies, 2009).

Given the likelihood that individuals will be exposed to a traumatic event at some stage in their lifetime, it seems appropriate to discuss the issue of cumulative trauma. Cumulative trauma is the exposure an individual has to multiple potentially traumatic events. Kira et al., (2008) argued that cumulative trauma involves two types

of trauma: Core traumas and triggering traumas. Core traumas are the events that cumulate and sensitize an individual to a triggering event. Triggering traumas are those potentially traumatic events that set off the pathogenic consequences of having previously been exposed to a series of potentially traumatic events. There is evidence that has demonstrated a link between exposure to multiple potentially traumatic events and pathogenic consequences (Brewin, Andrews, & Valentine, 2000). An explanation that has been proposed as to why an increase in exposure to potentially traumatic events increases the likelihood that an individual will experience pathogenic outcomes is the stress sensitization hypothesis (Cogle, Resnick, & Kilpatrick, 2009). The causal mechanism that has been argued to underpin this theory is that prior exposure to potentially traumatic events leads to individuals responding with greater distress at second or subsequent exposures to potentially traumatic events (e.g., Yehuda, et al., 1995). The probability that an individual will experience more than one potentially traumatic event was established to be 29% in a sample of 5877 participants in an epidemiological study in the United States (Kessler, et al., 1995). In a study of military personnel, 74% of the participants had experienced a potentially traumatic event that met the PTSD traumatic stressor criterion as stipulated in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM). In this same study, the mean number of PTSD traumatic events was 3.6. It should be pointed out that in this study, the variable of being exposed to military combat was not included in the definition of potentially traumatic events (Dedert, et al., 2009).

Posttraumatic Stress Disorder

The main pathogenic consequence of exposure to potentially traumatic events is PTSD. PTSD was first included in the nosological literature in 1980 (American Psychiatric Association, 1980) and has been formally recognized as a clinical diagnosis for approximately 30 years. However, the symptoms of trauma were first recognized in ancient Egypt approximately 4000 years ago (Veith, 1965). The symptoms were contained within the rubric of hysteria and the symptoms were considered to only affect women because it was believed to cause alterations to the womb (Veith, 1965). The term hysteria was coined because the Greek word "hysteria" means uterus. However, the relationship between hysteria symptomology was not established until the 1880s by Pierre Janet (van der Kolk, et al., 1996). Janet postulated that this phenomenon was threefold in that the three components involved were aggression, psychosomatic reactions, and dissociation. Janet argued that the essential element was dissociation in that individuals were using this phenomenon to counter the memories of the traumatic event (van der Kolk & van der Hart, 1989). Fundamentally, Janet's argument was that the extreme emotions suffered by individuals, who have been exposed to potentially traumatic events, disrupted the information processing cycle that in turn caused the memories to be separated from normal consciousness. Other proponents of traumatic psychopathology argued that the consequences were dissociation, affect dysregulation, and somatization (van der Kolk, et al., 1996).

During the last century there has been an accumulation of knowledge regarding the phenomenon of a traumatic reaction to a highly stressful event. This increased

knowledge has mainly resulted from military research. Initially the terms of battle fatigue, shell shock, combat neurosis, and physioneurosis were used to describe this psychological reaction of military personnel who had been engaged in combat (Lasiuk & Hegadoren, 2006). Other labels that were used to describe traumatic pathology post-world war two were rape trauma syndrome, battered woman syndrome, abused child syndrome, and stress response syndrome (Courtois, 2004; S. L. Ray, 2008).

Clinical Diagnosis

PTSD is in the text revision version of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR, American Psychiatric Association, 2000). The current diagnostic criteria are reproduced in Table 1. PTSD is the only diagnosis in the DSM where the event that causes the psychological difficulties must be part of the diagnostic criteria. From a diagnostic viewpoint, PTSD is broken down into four criteria. The first part is the event and the second part consists of the three consequences of the event, which are reexperiencing, avoidance, and hyperarousal.

Table 1

Diagnostic Criteria for Posttraumatic Stress Disorder (American Psychiatric Association, 2000)

- A. The person has been exposed to a traumatic event in which both of the following were present:
 - 1. the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
 - 2. the person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior
- B. The traumatic event is persistently reexperienced in one (or more) of the following ways:
 - 1. recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. **Note:** In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
 - 2. recurrent distressing dreams of the event. **Note:** In children, there may be frightening dreams without recognizable content.
 - 3. acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.
 - 4. intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
 - 5. physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
 - 1. efforts to avoid thoughts, feelings, or conversations associated with the trauma
 - 2. efforts to avoid activities, places, or people that arouse recollections of the trauma
 - 3. inability to recall an important aspect of the trauma
 - 4. markedly diminished interest or participation in significant activities
 - 5. feeling of detachment or estrangement from others
 - 6. restricted range of affect (e.g., unable to have loving feelings)
 - 7. sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)
- D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:
 - 1. difficulty falling or staying asleep
 - 2. irritability or outbursts of anger
 - 3. difficulty concentrating
 - 4. hypervigilance
 - 5. exaggerated startle response
- E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

Acute: if duration of symptoms is less than 3 months

Chronic: if duration of symptoms is 3 months or more

Specify if:

With Delayed Onset: if onset of symptoms is at least 6 months after the stressor

Simplifying the criteria for PTSD, the first criterion relates to the experience of the traumatic event. The main point of this first group is that the individual encounters a serious event that involves the presence of actual or threatened death or serious injury and the person's response is intense fear, helplessness, or horror. The second group relates to the reexperiencing of the event. This may be in the form of distressing memories, images, thoughts, dreams, reliving the event, psychological distress, and physiological arousal. The third group relates to the avoidance of stimuli associated with the traumatic event. For instance, the avoidance of thoughts, feelings, conversations, activities, places, or people that is associated with the trauma or brings back recollections of the traumatic event. In addition, the inability to recall aspects of the traumatic event, diminished interest in significant activities, feelings of detachment or estrangement from others, restricted range of affect, or sense of foreshortened future. The fourth group relates to hyperarousal. Examples of this would include sleep disturbance, irritability, anger, concentration difficulties, hypervigilance, and intensified startle response. In addition, the DSM-IV-TR stipulates length of duration the symptoms must be present, the number of criteria under each domain that must be present, and specifies whether PTSD should be acute or chronic. There are indicators in the criteria as to how the presentation will be different for children (American Psychiatric Association, 1994; Rogers & Liness, 2000).

With the anticipated release of the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V) in May 2013, there has been considerable debate about the expected changes to the diagnostic criteria, especially criterion A, which

refers to the potentially traumatic event (Spitzer, First, & Wakefield, 2007). At this point in time, the changes include the redefining of criterion A. The new definition will include individuals who have been repeatedly exposed to aversive details of events. This would include police officers who have been subjected to graphic details of child sexual abuse. There are changes in the conceptualisation of some of the criteria, but the main changes proposed are the grouping of the pathogenic symptoms that may result from the potentially traumatic events. These groupings have now been placed under the criteria of intrusive symptoms, avoidance symptoms, negative alterations in cognitions and emotions, and alterations in arousal and reactivity (American Psychiatric Association, n. d.). There is still ongoing consultation and debate about what the criteria for PTSD will be in DSM-V.

Risk Factors

Not everyone who is exposed to a traumatic event will experience some form of pathogenic outcome. Some theorists (e.g., Ozer, et al., 2003) have argued that all individuals will be exposed to a life-threatening incident during their lifetime. In addition, most people are exposed to a grief situation where a close friend or relative die (Bonanno, 2004). However, not all people cope in the same manner and not all people develop pathogenic outcomes. Bryant and Harvey (2000) argued that approximately 5% of individuals exposed to a potentially traumatic event will develop PTSD. Bonanno and colleagues (2010) argued that rarely will the proportion of adults who develop PTSD be above 30% when they have been exposed to a disaster. There is also a group of people who in the immediate aftermath of traumatic events have PTSD

symptoms, but that these symptoms generally remit about 3 months after the event (Litz, Gray, Bryant, & Adler, 2002). There is also evidence to suggest that people who are exposed to potentially traumatic events will have subclinical PTSD. That is individuals will not meet a diagnosis for PTSD, but will have aspects of the diagnosis, for example, hyperarousal symptoms. Galea et al., (2003) showed about 4% of people had subclinical PTSD after the terrorist attacks in New York City in 2001. Therefore, because not all events that are deemed to be traumatic evoke pathogenic consequences, the best way to describe these events is by labeling them potentially traumatic events.

There has been a great deal of research that has examined risk factors or predictors for the development of traumatic reactions following exposure to trauma, especially in what are seen as high risk occupations, such as, police officer, fire fighter, paramedic, soldier, and other emergency services' occupations (Brewin, et al., 2000; Bryant & Harvey, 1995; Carlier, Lamberts, & Gersons, 1997; Hodgins, Creamer, & Bell, 2001; Marmar, et al., 1999; Ozer, et al., 2003; Regehr, Hill, & Glancy, 2000; Tucker, et al., 2002). Other groups of interest have been the survivors of motor vehicle accidents (Hickling & Blanchard, 2007; Jeavons, 2000; Wu & Cheung, 2006), and other occupational groups, such as, mountain guides (Sommer & Ehlert, 2004). Primarily, the research has focused on the prevalence rates of PTSD, depression, substance abuse, and social dysfunction in those individuals exposed to traumatic events (Wagner, Heinrichs, & Ehlert, 1998). Like protective factors, this interest in risk factors has been due to clinicians and academics wanting to know why some individuals develop

pathogenic consequences (e.g., PTSD) following the exposure to potentially traumatic events and why some individuals do not (Brewin, et al., 2000).

To my knowledge, risk factors have not been operationalise in the literature regarding pathogenic consequences from potentially traumatic events. However, the developmental literature does define risk factors. For example, Nelson and Israel (2000) defined risk factors as any “variables that increase the chance of behavioral difficulties or impairments. In the presence of risk, some individuals are adversely affected (are vulnerable)” (p. 38). Therefore, in relation to the risk of posttrauma difficulties, risk factors are any factors that increase the likelihood of individuals developing posttrauma sequelae. Some theorists (e.g., Ozer, et al., 2003) have argued that risk factors are akin to predictors of the development of posttrauma sequelae. Thus, risk factors of posttrauma sequelae are important to understand in the framework of resilience. There have been scientific investigations that have explored the risk factors associated with posttrauma sequelae. In this domain, research has primarily investigated what risk factors lead to the development of PTSD. Factors that have been identified as risk factors have included individuals being single or separated/divorced (Iverson, et al., 2008), having lower educational achievement (Brewin, et al., 2000; Iverson, et al., 2008), having suffered an adversity during their childhood (Brewin, et al., 2000; Iverson, et al., 2008; Ozer, et al., 2003), appraisal of events (Iverson, et al., 2008), low morale (Iverson, et al., 2008), lack of social support (Iverson, et al., 2008; Ozer, et al., 2003), previous exposure to trauma (Breslau, Davis, Andreski, & Peterson, 1991; McFarlane, 1988; Ozer, et al., 2003), being female (North,

et al., 1999), the severity of traumatic experience (Brewin, et al., 2000), events that involve combat exposure (Shalev, 2007), the emotional expression about the traumatic event (Shalev, 2007), the age of the individual when the trauma was experienced (Brewin, et al., 2000), and peritraumatic emotional responses by the individual exposed to the event (Shalev, 2007).

There is evidence that the severity of the potentially traumatic event is related to the development of pathogenic outcomes. That is the more serious or personal the event is, the greater the likelihood that there will be a pathogenic outcome. For example, Norris, Perilla, and Murphy (2001) demonstrated in two different populations that after exposure to separate hurricanes the severity of the potentially traumatic events exposure was related to the symptoms of PTSD. Brewin et al., (2000) completed a meta-analysis of 14 risk factors and established that trauma intensity and severity were strong risk factors for pathogenic outcomes. In another meta-analysis, Ozer and colleagues (2003) established that people who believed their life was in danger during the potentially traumatic events were at greater risk of developing PTSD. Hapke, Schumann, Rumpf, John, and Meyer (2006) established that sexual attacks, sexual abuse, death of relatives or close friends, or being physically threatened increased an individual's likelihood of developing PTSD.

Protective Factors

Factors that act as protective mechanisms or mitigate the pathogenic consequences from potentially traumatic events have also been the subject of scientific investigation. Garmezy (1991) argued that protective factors were variables that

moderated individual emotional responses to potentially traumatic events, how they were able to deal with or cope appropriately with potentially traumatic events, or were able to maintain an individual's psychological equilibrium when exposed to potentially traumatic events. Other factors that have been described as protective factors to potentially traumatic events are preparedness, social support, trauma exposure, religion, education, family and marital status, high social economic status, cognitive skills, interpersonal skills, and internal locus of control (Agaibi & Wilson, 2005; Begic & Joskic-Begic, 2002; Hoge, Austin, & Pollack, 2007; Johnson & Thompson, 2008).

Hoge et al., (2007) argued that protective factors is an alternative term for psychological resilience. They placed protective factors at the opposite end of the continuum to risk factors. In a similar vein, Agaibi and Wilson (2005) sees protective factors to potentially traumatic events as an element of resilience. Furthermore, these authors argued that protective factors were part of the allostatic response to traumatic events. These protective factors will be integrated and discussed further in the chapter on psychological resilience. However, the protective factors that will be considered under psychological resilience are those factors that can be changed and not constructs that are considered to be static.

Etiologies

There are various theoretical models that have been suggested as explanations of PTSD. For example, stress response theory, theory of shattered assumptions, conditioning theory, information-processing theory, anxious apprehension model, emotional processing explanation, dual representation theory, neuropsychological or

neuroanatomical explanations, cognitive-behavioural theory, and social cognitive theory (Brewin & Holmes, 2003; Schnurr & Green, 2003; van der Kolk, McFarlane, & Weisaeth, 2007). However, the most relevant to this study is the cognitive-behavioural explanation because this conceptualisation of PTSD revolves around an individual's thoughts, feelings, behaviours, physical activities, and their environment. How these components relate to the core theme of this study will be explained in the next chapter. However, it is imperative to understand how the cognitive-behavioural framework has been used to explain PTSD because this may explain why some individuals do not develop pathogenic consequences when exposed to potentially traumatic events.

Ehlers and Clark (2000) presented a thorough explanation of a cognitive-behavioral framework of PTSD. Their model is based on the premise that PTSD occurs when an individual processes the traumatic event or its sequelae as a current threat. Ehlers and Clark postulated that there are key themes that lead to processing the potentially traumatic events as a current threat. These themes are individual differences in the appraisal of the trauma and its sequelae, individual differences in the memory of the event, and the linking of the memory to other autobiographical memories. Ehlers and Clark argued that the appraisal of the potentially traumatic event may be a cognitive overgeneralisation of the event. They discussed how an individual may perceive any changes as permanent and how this would prevent engagement in adaptive coping behaviours. In addition, Ehlers and Clark discussed how the negative emotional responses may be due to the cognitive appraisals of the potentially

traumatic event. Other factors they suggested as involved in the development of PTSD at the time of experiencing the event are dissociation, emotional numbing, and deficient cognitive processing. Further, they described maladaptive behavioural strategies and cognitive styles that maintain the symptoms of PTSD. These strategies include, avoidance, use of alcohol, abandonment of normal behaviours (e.g., exercise, socializing), rumination about the event, poor sleep management, avoiding emotional appraisals of recalling the event, and the use of safety behaviours. This model has been empirically supported (Brewin & Holmes, 2003).

Other Pathogenic Consequences of Potentially Traumatic Events

There are other pathogenic consequences of potentially traumatic events, such as, depression (Holtz, et al., 2002), sleep disorders (Neylan, et al., 2002), alcohol abuse (Boxer & Wild, 1993), psychological distress (Boxer & Wild, 1993), emotional exhaustion, anxiety (Holtz, et al., 2002), increased suicidal ideation, and burnout (Goodman, 1990). Most of these terms are defined in the DSM, but the term psychological distress, which is relevant to this thesis, refers to an individual believing that they have general feelings suffering, perceptions of bodily dysfunction, and performance difficulty (Walkey & McCormick, 1985). Gabriel and colleagues (2007) investigated the psychological consequences of terrorist attacks in Madrid in 2004. They sampled three populations that were involved in the attacks, including the police, local residents, and individuals injured in the attacks. They found that individuals who were injured in the event had significant differences when compared with local residents in relation to mental health outcomes. For instance, individuals who were

injured had prevalence rates of 32% for depression, 24% for agoraphobia, 13% for generalised anxiety, and 9% for panic disorder. Kisac (2006) looked at a sample of students in Turkey 15 to 18 months after two earthquakes, and noted elevated levels of obsessive-compulsive behaviour, depression, anger-hostility, and paranoia. In another study, Williams and colleagues (2007) established a link between the amount of traumatic exposure and psychological distress. They found that the more potentially traumatic events an individual encountered the higher the risk of psychological distress. The sample was from the general civilian population in South Africa and did not include people working in the military or people residing in prisons or hospitals. In addition to psychological distress being a common consequence of potentially traumatic events, Mason, Andrews, and Upton (2010) established in a sample of 444 people who had been exposed to floods that approximately a quarter of the sample would meet the criteria for clinical anxiety and a third of the sample would meet the criteria for clinical depression. They established that if individuals had previously been exposed to floods, had severe flooding, or had to relocate then this increased their risk for developing pathogenic outcomes. They found that females had higher mean scores of anxiety and depression than males. Furthermore, a detachment style of coping reduced the risk of psychological distress whereas avoidance, rational, and emotional coping increased the risk of psychological distress.

Physical health consequences are also associated with exposure to trauma. Examples of these consequences include gastrointestinal disorders, liver or kidney toxicity (Polakoff, 1984), elevated heart rates (Barnard & Duncan, 1975), increased

medical consultations, musculoskeletal disorders, and neurological symptoms (Schnurr & Green, 2003). Another significant finding in relation to health outcomes is the reduction in proactive health practices due to the exposure to potentially traumatic events (Schnurr & Green, 2003). Furthermore, some research has found a relationship between potentially traumatic events and mortality rates. For example, Bullman and Kang (1994) established an increased rate of mortality in a sample of 16,527 Vietnam veterans when the sample was dichotomised between those with PTSD compared to those without PTSD. In a New Zealand study of 1500 participants from the community, Flett, Kazantzis, Long, MacDonald, and Millar (2002) found a relationship between exposure to crime and accidental traumatic events and prevalence of physical illness.

Occupational Trauma: Is Police Work Traumatic?

“Even people who do not like cops have to admit that theirs is a difficult, dangerous, and often thankless job. Police officers regularly deal with the most violent, impulsive, and predatory members of society, put their lives on the line, and confront miseries and horrors that the rest of us view from the sanitized distance of our newspapers and TV screens.” (Miller, 1995, p. 592). This assertion by Miller suggested that police work is inherently stressful and traumatic. Police work has often been claimed to be stressful and traumatic (e.g., Wang, et al., 2010). There are various lay perspectives on the nature of police work and the media portrayal of what a police officer encounters does suggest that policing is traumatic. However, does the research evidence confirm this belief? Is policing any more dangerous or traumatic than what the general population experiences?

G. Buchanan, Stephens, and Long (2001) established in a sample of 177 police personnel that 89% had been exposed to at least one potentially traumatic event. Huddleston, Stephens, and Paton (2007) established in a sample of 230 police officers with 7 months service that 74% had experienced at least one potentially traumatic events. Inslicht and colleagues (2010) showed in a sample of 278 police trainees that after one year of police work, 67% of the sample had been exposed to life-threatening critical incidents. This research suggests that the base rates of potentially traumatic events are similar to the civilian population.

G. Buchanan and colleagues (2001) demonstrated in a sample of New Zealand Police Officers that the greater number of exposures to potentially traumatic events increased the likelihood of the development of PTSD. This has also been demonstrated in the general population, where individuals who have been previously exposed to traumatic events were at greater risk of developing pathogenic consequences. Breslau, Chilcoat, Kessler, and Davis (1999) demonstrated in a sample of 2,181 individuals that previous trauma increases the risk of PTSD. This risk factor was repeated in 2006/2007 in a sample of 444 refugees where greater exposure to traumatic events was significantly related with current and lifetime PTSD (Kolassa, et al., 2010).

The lifetime prevalence rate of PTSD in a sample from the United States has been shown to be 8% (Kessler, et al., 1995). The base rates or prevalence rates of PTSD appears to be higher in police personnel. For example, Violanti and colleagues (2007) demonstrated that 34% of a random sample of 92 police officers who were working in Buffalo, New York would meet the criteria for PTSD using the Impact of Event Scale

(IES) and a cutoff score of 26. Kopel and Friedman (1997) established in a sample of 55 members of the South African Police, a base rate for PTSD of 49%. Kopel and Friedman used the IES and utilised a diagnostic cutoff score of 25. Martin, Marchand, Boyer, and Martin (2009) demonstrated a prevalence rate of PTSD among a sample of Canadian police officers of 8% and a partial PTSD rate of 7%. The sample was 132 randomly selected Canadian police officers. Inslicht and colleagues (2010) established in a sample of 278 police recruits in three sites in the United States that only 3 met the diagnosis for PTSD. However, the police applicants were screened for mental health difficulties before police training. Renck, Weisaeth, and Skarbo (2002) studied the prevalence of PTSD in a sample of police personnel 18 months after they had been involved in a technological disaster. Renck and colleagues established that the mean score on the IES-R was 16.2, but the standard deviation for the group was 14.6. This would point to the fact that there would be a group of individuals who would be over the recommended clinical cutoff point of 33 (Creamer, Bell, & Failla, 2003). Renck and colleagues reported that only one of the police officers had partial PTSD difficulties. However, if a clinical cutoff on the IES-R was utilised these results may have been different. Huddleston (2002) studied a sample of New Zealand Police Officers who entered the training establishment over a period of 12 months between September 1997 and September 1998. Huddleston then resurveyed the participants one year later. Huddleston established their levels of traumatic stress at both points. She utilised the IES and used group means that showed a decrease in the mean scores on the IES. However, if she had used a clinical cutoff score of 25 there would have been 15% of the

participants who after 7 months of exposure to police work were above the diagnostic cutoff. In addition, before this sample commenced police training, only 12% would have been above the recommended diagnostic cutoff.

McCaslin and colleagues (2006) investigated the relationship between alexithymia and PTSD in a sample of police officers. Alexithymia is a condition in which individuals have difficulty identifying, describing, or expressing emotions, and have an externally oriented style of thinking (Sifneos, 1973). Alexithymia has been linked to various psychiatric difficulties including PTSD (Frewen, Dozois, Neufeld, & Lanius, 2008). Previous research does not provide sufficient evidence on whether alexithymia is a risk factor for PTSD or a feature of PTSD (McCaslin, et al., 2006). McCaslin and colleagues investigated prospectively a sample of 54 police officers who had been exposed to the terrorist attacks of 11 September 2001 in New York. They established that male officers had higher levels of alexithymia and that higher pre-9/11 alexithymia scores were correlated with higher pre-9/11 PTSD scores. In addition, pre-9/11 alexithymia symptoms were predictive of PTSD post-9/11 symptoms. McCaslin and colleagues postulated that these results indicated that alexithymia may be a personality trait that has developed due to PTSD or the presence of alexithymia may be a risk factor for the development of PTSD. However, McCaslin and colleagues argued that there is the possibility that officers with greater levels of alexithymia may have difficulty processing the emotional components of traumatic stress and subsequent utilisation of social support. Other studies (e.g., Frewen, Pain, Dozois, & Lanius, 2006; Wastell, 2002) have demonstrated a relationship between alexithymia and PTSD or

exposure to trauma. In particular, Wastell established in a sample of 437 ambulance officers that those with high levels of alexithymia had higher levels of stress. This finding is consistent with the view that emotional recognition and emotional expression are imperative for maintaining psychological wellness and physical health (Pennebaker, 1995).

Carlier, Lamberts, and Gersons (2000) presented a model of establishing PTSD in a sample of police officers which addressed the multidimensional nature of traumatic events. Carlier and colleagues argued that there were three dimensions underlying how police officers evaluated traumatic material. The first dimension is emotional reactivity, the second is vulnerability and physical integrity, and the third is moral responsibility. Carlier and colleagues argued that the interaction of these dimensions produced pathogenic outcomes. In particular, they postulated that when individuals have their cognitive schemas shattered by potentially traumatic events, this may trigger psychological difficulties.

In regard to other mental health issues for police officers exposed to traumatic events, van der Velden, Kleber, Grievink, and Yzermans (2010) investigated mental health problems in police officers who faced incidents involving physical aggression. van der Velden and colleagues monitored 473 police officers over a period of 27 months. They defined mental health problems as severe anxiety, depression, hostility, and sleep difficulties. They found that previous mental health difficulties were a predictor of future mental health problems, and that mental health problems were not associated with exposure to aggressive incidents. They argued that the best predictor

of mental health difficulties was a history of mental health problems. West and colleagues (2008) examined 912 police personnel who had been involved in assisting after Hurricane Katrina. Twenty-six percent of the sample had symptoms consistent with depression whilst 19% of the sample had symptoms consistent with PTSD.

Another consideration is vicarious trauma, which has also been referred to as secondary trauma and compassion fatigue (Lerias & Byrne, 2003). The terms have been used interchangeably to describe the effects of reliving potentially traumatic events via a secondary source. However, there is a distinction between some of the terms. Secondary traumatic stress is the outcome of experiencing potentially traumatic events via another individual (Figley, 1995). Vicarious traumatization refers to the alteration in cognitions and belief systems due to empathy displayed by a clinician to their client (McCann & Pearlmann, 1990). Compassion fatigue has a parallel meaning to secondary traumatic stress, but has been viewed as a "softer" term (Bride, Radey, & Figley, 2007). These effects have been observed in emergency service workers, such as police officers (Hyman, 2004). The term of vicarious trauma has been previously defined as an alteration in cognitions and beliefs systems in a clinical environment due to an excess of empathic involvement. However, vicarious trauma is the preferable term to use in this thesis because vicarious means to experience through the second hand experience of another (Merriam-Webster, 1984). Police officers are not only exposed to potentially traumatic events they also endure other potentially traumatic events from the people that relay events to them, such as colleagues, victims, witnesses, and offenders. In this

study, vicarious trauma will be used where an individual has indirect exposure to a traumatic event via a third person and displays the same symptoms as PTSD.

Lerias and Byrne (2003) reviewed a number of articles regarding vicarious trauma and summarised the predictors of the phenomenon. These included severity of the trauma, empathic engagement with the victim, previous trauma, external locus of control, life experience, gender, appraisal of the trauma, degree of exposure, age of traumatised individual, history of prior mental health difficulties, relationship with direct victim, negative coping style, education level, and socio-economic status. These factors are consistent with the risk factors discussed for PTSD. There are various factors that mitigate the development of vicarious trauma, but one of the most influential factors is social support. In particular, the perception and availability of social support has been seen as a mitigating factor on the psychological wellbeing of individuals who have been vicariously exposed to traumatic events (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009).

In relation to police work there are some risk factors that have been identified as unique to police officers developing psychopathology. These factors include gender, length of service, family history of psychopathology, deficits in emotional regulation, cumulative exposure to trauma, attitude to work, and situations high in personal responsibility (Inslicht, et al., 2010; Martin, et al., 2009). Gender is of particular interest as a risk factor in the development of pathogenic outcomes because in the general population females are at greater risk of developing PTSD (Tolin & Foa, 2006). However, in studies of police and military this gender difference has not been observed

(Pole, et al., 2001). Furthermore, when there has been a comparison between female police officers and female civilians, more severe PTSD symptoms were observed in the female civilian group despite the greater exposure to potentially traumatic events that had been endured by police personnel (Lilly, Pole, Best, Metzler, & Marmar, 2009).

Does Intervention Work or is it Harmful?

Recent evidence has persuaded mental health professionals to refocus their attention to the prevention of the psychological consequences of traumatic stress (Cash, 2006). Historically, prevention strategies have been separated into three divisions: Primary, secondary, and tertiary. Primary prevention refers to strategies that are aimed at reducing the frequency of mental health disorders, for example, public education programs (Cash, 2006). Secondary prevention refers to the early detection of mental health disorders to reduce the likelihood that the disorders will become full-blown or chronic, for example, grief counseling (Cash, 2006; Davison, Neale, & Kring, 2004). Tertiary prevention refers to the strategies that are designed to reduce the long-term consequences of a mental health disorder, for example, therapy (Cash, 2006; Davison, et al., 2004; Orford, 1992). In relation to the intervention strategies that have been implemented to address the psychological consequences of traumatic stress, most would fall into the ambit of secondary and tertiary prevention and most have been developed to address the phenomenon of PTSD.

Cognitive-behavioural therapy has been shown to be the most effective therapy to remedy PTSD (van Etten & Taylor, 1998). However, Ehlers and colleagues (2005) postulated that there is room for improvement because there are a large number of

patients who do not complete treatment and some individuals still meet the diagnosis for PTSD at the conclusion of treatment. Ehlers and colleagues (2005) presented an intervention model, which is based on Ehlers and Clark (2000), that suggested that an individual's PTSD is maintained by appraisals, memory characteristics and triggers, and cognitive-behavioural strategies. In addition, Giarratano (2004) suggested an individual who is suffering from PTSD should be assessed with the five- part model. The five-part model involves the assessment of an individual's thoughts, feelings, behaviours, physical reactions, and their environment. Whilst other cognitive-behavioural techniques may be used to address the presenting issues, the case formulation of the psychological difficulties will be conceptualised using the five-part model. However, given the extent of the number of individuals who are routinely exposed to potentially traumatic events during their routine work and the base rates of PTSD in these populations, a new and more economical approach has been developed and utilised. This approach was psychological debriefing and it was considered a more economical way of addressing police officers who have routinely been exposed to traumatic events.

Psychological debriefing has been a widely used intervention strategy over the last 30 years (Stuhlmiller & Dunning, 2000). The process makes the assumption that individuals exposed to potentially traumatic events will endure pathogenic outcomes and that debriefing will reduce the likelihood of this outcome. As indicated earlier, most police personnel are likely to endure potentially traumatic events at some stage during their career. Psychological debriefing has been a widely used intervention strategy in various industries where there is an increased risk of potentially traumatic

events, such as, the military, police, and fire service (Deville, et al., 2006). In addition, there has been the utilisation of the process where there has been a potentially traumatic event in a particular work environment (Rose, Bisson, Churchill, & Wessely, 2009). Some theorists (e.g., Mitchell, 1992) have postulated that debriefing is a compassionate response to psychological distress. However, it may be that psychological debriefing was instigated because of the legislation in New Zealand and the belief that employers need to be “doing something” to mitigate the possible pathogenic consequences. For example, George Brickell, a New Zealand Police photographer, was awarded \$242,000 because of the pathogenic consequences from the traumatic nature of police work and the inadequate response by his employers at the time (S. Parker, 2000, June 14). Therefore, psychological debriefing may have been implemented because it was seen as a cost-effective approach and the most appropriate way to ensure individuals are not “slipping through the cracks.”

The effectiveness of psychological debriefing has not been well supported (Deville, et al., 2006). For example, a meta-analysis showed that debriefing was an ineffective intervention method in preventing PTSD symptoms in people who had been exposed to traumatic events (Litz, et al., 2002). Some studies have even showed that psychological debriefing may exacerbate pathogenic outcomes of traumatic events. For example, Addis and Stephens (2008) presented evidence that attending psychological debriefings was correlated with increased symptoms of PTSD approximately 5 years later. Addis and Stephens studied a group of police officers who had been involved in a specific traumatic event. That event was the murder of an on-duty police officer and

the subsequent apprehension and fatal shooting of the person responsible for the crime. Addis and Stephens established that individuals who had attended psychological debriefing had increased levels of traumatic symptoms. However, this finding was explained by other traumatic exposure. Addis and Stephens also presented evidence that debriefing had no effect on physical health. There were limitations with this study, as acknowledged by the authors, such as, group sizes, a confounding variable may be responsible for the results, no controlled random allocation, and the type of debriefing was not controlled for. A further factor that may be contributing in these results and other debriefing literature is that the psychological debriefing intervention has not been standardised and that there are perhaps aspects of debriefing that may be effective.

Devilley and colleagues (2006) reviewed the literature on psychological debriefing. They postulated that critical incident stress debriefing and psychological debriefing have been used interchangeably in the research domain. In addition, critical incident stress debriefing was revamped and renamed critical incident stress management. Devilly and Cotton (2003) argued that there is insufficient empirical evidence to warrant that they are separate interventions or are efficacious. Rose and colleagues (2009) conducted a meta-analysis of psychological debriefing and established that individuals who were debriefed were no better off than controls and in some instances were worse off. A suggestion as to why debriefing may be ineffective is that, because most individuals will normally recover from an adverse event, debriefing may interfere with the natural processing of such an event (Devilley, et al., 2006).

A further intervention strategy that has become prevalent in clinical practice with individuals who have been exposed to potentially traumatic events is psychological first aid (Ruzek, et al., 2007). Psychological first aid is an informal approach that provides information, support, comfort, engagement, stabilization, and information on coping strategies (Vernberg, et al., 2008). Psychological first aid is provided in the first 48 hours after the traumatic event. The assumption is that because of the traumatic event there is disconnectedness in their environmental context (Litz, 2008). This approach also suggests that individuals affected by potentially traumatic events need support with human and practical needs. Psychological first aid has yet to be utilised in work cultures that may be affected by vicarious trauma (Litz, 2008). However, a psychological first aid guide has been developed for disaster mental health workers who may respond to individuals who have been exposed to disasters or terrorism (Vernberg, et al., 2008). All these strategies are either at a tertiary intervention stage or are extremely expensive to implement. That is why the impetus has changed to try and establish how it is some individuals do not develop pathogenic outcomes when they have been exposed to potentially traumatic events and others do.

CHAPTER THREE

PSYCHOLOGICAL RESILIENCE

In recent years, attention has turned from an interest in risk factors for developing mental health consequences, and treatment (e.g., debriefing) following potentially traumatic events to the identification of resilience factors and a focus on supporting the normal and healthy responses to potential trauma (e.g., Bonanno, 2005b). Resilience has been defined as the ability of an individual to recover or rebound from any adverse situation. Individuals who work in stressful, high risk occupations, such as the police, have learned how to deal with the negative consequences of situations that they are exposed to regularly. Some individuals who are exposed to potentially traumatic events develop posttrauma sequelae whilst other individuals who are exposed to the same set of potentially traumatic events do not develop any posttrauma pathology. Research studies have previously investigated the prevalence of posttrauma pathology (e.g., Galea, Tracy, Norris, & Coffey, 2008; Galea, et al., 2003) and there was a belief that resilience in individuals exposed to potentially traumatic events was atypical (Bonanno, 2005b). However, Bonanno and colleagues (Bonanno, 2005b; Bonanno, et al., 2010; Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Bonanno, Moskowitz, Papa, & Folkman, 2005; Bonanno, Rennie, & Dekel, 2005; Bonanno, et al., 2002) have established that psychological resilience in adults exposed to potentially traumatic events is actually a relatively common occurrence.

Much of the early research investigated the concept of resilience in relation to vulnerable children and the subsequent pathogenic effects in adult life (e.g., Rutter,

Tizard, Yule, Graham, & Whitmore, 1976). These early studies investigated difficult life circumstances, such as, poverty, family dysfunction, parental mental health issues, and parental criminality. In addition, initial research investigated the construct of resilience by ascertaining who had lower levels of mental health difficulties (Hoge, et al., 2007). There was a shift in the field of resilience research from at-risk children or youth to investigating adult populations, but these initial inquiries were with people who had major medical concerns or had experienced significant life events (Hoge, et al., 2007). With the introduction of PTSD into the classification systems, there was a shift in studies toward investigating the role of resilience in response to potentially traumatic events (Agaibi & Wilson, 2005). The focus of this research is on the concept of psychological resilience in relation to the reaction to potentially traumatic events.

The Importance of Resilience

Although the normal response to potentially traumatic events is psychological resilience, there are still those individuals who develop pathogenic outcomes from exposure to such adversity. The negative consequences experienced by people who have been exposed to potentially traumatic events can be enormous. For example, police officers have been found to have PTSD prevalence rates of 13% (Robinson, Sigman, & Wilson, 1997), and shown to have partial PTSD rates of 34% (Carlier, et al., 1997). In addition to PTSD, some individuals who have been exposed to potentially traumatic events have been found to develop other psychological difficulties such as, depression, cognitive impairments, substance abuse, and anxiety (Caruana, 2009). Given the high human and economic cost of exposure to potentially traumatic events,

it seems imperative to reduce these negative costs by some form of intervention (Arnetz, Nevedal, Lumley, Backman, & Lublin, 2009). There are several occupations where exposure to potentially traumatic events is part of their occupation and the understanding of psychological resilience would be beneficial. Psychological resilience is important because prevention of the impact of potentially traumatic events would be very beneficial to the physical and psychological health of individuals concerned. In addition, understanding resilience may help with the development of prevention and intervention strategies. However, before implementing such strategies, it is important to understand psychological resilience.

What is Resilience?

Resilience has a lexical definition of “the act or power of springing back to a former position or shape” (C. E. Funk, 1952, p. 1114). Luthar, Cicchetti, and Becker (2000) defined the construct of resilience as positive adaptation when faced with a major adversity. Al-Naser and Sandman (2000) viewed resilience as the ability of individuals to deal with life events or changes in regard to their respective circumstances. Tusaie and Dyer (2004) described resilience as “a dynamic process involving a personal negotiation through life and fluctuating across time, developmental stage, and context” (p. 6). Strumpfer (2003) argued that there are five psychological variables that come under the ambit of the construct of resilience. These psychological variables are engagement, meaningfulness, subjective well-being, positive emotions, and proactive coping. The main theme from these definitions is that

resilience describes an individual's ability to recover from a major traumatic event or adversity (Haglund, Nestadt, Cooper, Southwick, & Charney, 2007).

Some theorists (e.g., Ozer, et al., 2003) have argued that increased vulnerability to traumatic sequelae is equivalent to a lack of resilience. For example, Hoge and colleagues (2007) postulated that risk factors tend to lead to psychopathology whereas resilient factors operate covertly and only become apparent when traumatic events occur (Hoge, et al., 2007). An example of how resilient factors only become apparent when traumatic events occur could be when an individual uses the mechanism of social support when exposed to a potentially traumatic event, but do not routinely use such a mechanism. They clarified this argument by defining a "resiliency characteristic as a factor that is intrinsic to the individual and that might be modifiable" (p. 142). Furthermore, they argued that there are psychological and biological variables, which may interact, that act as protection against traumatic sequelae and that some variables may be environmental factors, for example, social support. However, they argued that it is the individual's ability to utilise these variables that makes them resilience factors. Moreover, they argued that resilience should not be linked to the amelioration of symptoms of mental health difficulties, but it should be linked to an individual's ability to manage traumatic events. They reviewed the psychological variables of the construct of resilience and postulated that these variables included family cohesion, task-focused coping, emotion-focused coping, positive distancing, hardiness, social support, preparedness, internal locus of control, hope, optimism, and religious

behaviour. They defined resilience as the “psychological or biological factors that may have been alterable at some point, and that confer protection from PTSD” (p. 148).

Bonanno and colleagues (2004, 2005a, 2005b; 2006; 2007; 1999; 2008; 2005; 2004; 2005; 2002; 2006, 2010) have investigated the concept of resilience in various domains and have presented a different analysis of the construct of resilience. Bonanno (2004) has defined resilience as “the ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event, such as the death of a close relation or a violent or life-threatening situation to maintain relatively stable, healthy levels of psychological and physical functioning” (p. 20). Bonanno and colleagues have proposed some key arguments around the concept of resilience. First, they differentiated between resilience and recovery. They argued that resilience reflects an ability to maintain balance when faced with adversity whereas recovery indicates that an individual has some form of suffering and is returning to normal functioning. Second, Bonanno and colleagues argued that resilience in the face of potentially traumatic events is relatively common. They suggested that people routinely exposed to violent and life-threatening events do not always develop psychopathology like PTSD. Third, Bonanno and colleagues proposed that there are several pathways to resilience and there is not a single factor that explains the construct. Bonanno and colleagues argued that factors such as hardiness, self-enhancement, coping mechanisms, positive emotion, previous life experiences, and laughter underpin resilience.

The discussion above shows that our understanding of the construct of psychological resilience in relation to the exposure to potentially traumatic events is still evolving. The rationale for the evolving nature of psychological resilience is that there has been limited research in the field in relation to potentially traumatic events (Bonanno & Mancini, 2008). In addition, theorists have failed to agree on a definition of the construct and this has resulted in an inconsistent definition and theoretical models that has hindered the understanding of the concept (Kumpfer, 1999). Further, the scientific understanding of psychological resilience has produced mixed results because of these difficulties (Kumpfer, 1999). To date, the explanations of resilience have involved single factor theories, personality theories, and multidimensional models, and in some instances, multidimensional models have evolved from various pieces of research that have not been empirically tested (e.g., Paton, et al., 2008).

Theories of Resilience

There are various conceptualisations of resilience and a range of variables which are believed to underpin the concept of resilience, and it would be beyond the scope of this thesis to review all these theoretical viewpoints. However, it would be relevant to review examples of single factor theories, personality variables, and theoretical models. These theoretical frameworks add to our understanding of resilience, but they do not offer an answer to psychological resilience. Nevertheless, it is important to review frameworks or concepts to understand the complicated nature of psychological resilience. The constructs or theories that will be reviewed are hardiness (Kobasa, 1979), sense of coherence (Antonovsky, 1979, 1987), conservation of resources

(Hobfoll, 1989), stress shield (Paton, et al., 2008), coping (e.g., Folkman & Moskowitz, 2004), and Connor and Davidson's (2003) conceptualisation of resilience.

Hardiness

Kobasa (1979) coined the term hardiness, which is considered to consist of the personality characteristics of control, commitment, and challenge. Control refers to the belief by individuals that they can influence events in their lives. Commitment refers to the ability to be deeply involved or dedicated to events in their lives. Challenge refers to the fulfillment and development from the anticipated change in a person's life. Early research encountered measurement problems, for example, the intercorrelations between the subconstructs of control, commitment, and challenge were inadequate to warrant a total hardiness score (S. C. Funk & Houston, 1987). Moreover, earlier studies showed that the negative wording of measurement scales meant that the construct was inversely correlated with negative affect (Hull, Van Treuren, & Vimelli, 1987). Later studies appear to have corrected this problem, although there is a suggestion that the construct of hardiness remains inversely correlated with negative affect (Maddi, 2001). In addition, research has shown that hardiness acts as a buffer between stress and illness symptoms (Bartone, Ursano, Wright, & Ingraham, 1989). The mechanisms which appear to underpin this buffering effect are appraisal (Ghorbani, Watson, & Morris, 2000), effective coping strategies (Maddi & Hightower, 1999), reduced physiological arousal (Allred & Smith, 1989), and positive practices (Maddi, Wadhwa, & Haier, 1996).

Hardiness has been found to be a characteristic of psychological wellbeing. To illustrate, hardiness has been shown to be negatively correlated with reported levels of

anxiety, depression, somatization, neuroticism, psychoticism, posttrauma reactions, and hypochondriasis (S. C. Funk & Houston, 1987; Ghorbani, et al., 2000; Hull, et al., 1987; Ramanaiah & Sharpe, 1999; Waysman, Schwarzwald, & Solomon, 2001). Furthermore, psychoeducation in hardiness has been shown to not only increase hardiness, but also reduce levels of anxiety, depression, and blood pressure (Maddi, Kahn, & Maddi, 1998). Thus, an increase in hardiness appears to positively influence psychological wellbeing and may be utilised as an intervention strategy.

Although there is evidence that hardiness is a component of resilience, there are some theoretical difficulties with the construct which suggests that hardiness is not equivalent to psychological resilience. For example, there are some ongoing concerns regarding the construct of hardiness. Some of the studies have only reported significant findings in regards to one or two of the subconstructs of hardiness (Lambert & Lambert, 1999). For example, Ganellen and Blaney (1984) found that commitment and challenge correlated with social support, but control did not. Moreover, whilst there has been some reported efficacy from hardiness training (Maddi, 2007) it appears that the research in this area has been limited.

Sense of Coherence

Sense of coherence has been conceptualised as a personality trait that has salutogenic qualities (K. E. Hart, Wilson, & Hittner, 2006). In particular, an individual with a well developed sense of coherence sees life as meaningful, has resources to cope with life's demands, and life's demands and stresses are comprehensible (Antonovsky, 1979, 1987). These three components of sense of coherence can be

viewed as cognitive (comprehensibility), behavioural (manageability), and motivational (meaningfulness; M. Eriksson & Lindstrom, 2005).

Antonovsky (1992) postulated that an individual who has a strong sense of coherence is likely to be healthy. Research has shown that people with a strong sense of coherence enjoy greater psychological and physical wellbeing (Pallant & Lae, 2002; Sommer & Ehlert, 2004). In particular, individuals with a strong sense of coherence have been shown to have lower levels of depression and anxiety (Schnyder, Buechi, Sensky, & Klaghofer, 2000). Studies have shown that individuals with a high sense of coherence tend to have less traumatic stress (Pham, Vinck, Kinkodi, & Weinstein, 2010).

Antonovsky (1992) viewed the construct of sense of coherence as a dispositional orientation rather than a personality trait or a coping strategy. Evidence suggests that an individual's sense of coherence increases with age and is not stable. For example, the greater the mean age of a population sample, the higher the level of sense of coherence (M. Eriksson & Lindstrom, 2005). In addition, the construct of sense of coherence appears to be multidimensional and not a single entity (M. Eriksson & Lindstrom, 2005).

Conservation of Resources

Hobfoll (1989) postulated a new stress model with the premise that individuals try to retain, protect, and build resources and that the actual loss or possible loss of these resources is threatening. The model suggested that people build, acquire, and maintain resources for positive reinforcement and self-enhancement. Hobfoll argued

that stress is derived from the model and is a reaction to the environment where there is a threat of net loss of resources, a net loss of resources, or a lack of gain of resources. Hobfoll defined four types of resources: objects, conditions, personal characteristics, and energies. Object resources are physical possessions, such as, houses, cars, or physical belongings. Conditions are societal roles, for example, marriage, employment, and community roles. Hobfoll argued that conditions are resources because they are valued and sought after. Personal characteristics refer to an individual's skills, attributes, and traits. Hobfoll likens the term to Antonovsky's (1979) term, general resistance resources and suggested that a person's view of the world aids in their ability to resist stress. Hobfoll included social support under this domain on the premise that increased social support promoted an individual's own self-worth and which in turn, increased stress resistance. Other examples of personal characteristics include age, locus of control, self-esteem, knowledge, and skills. Energies refer to resources that aid in the attainment of other resources. This may include items such as financial means, knowledge, and social networks.

Scientific research based on the conservation of resources model has equated resource loss to psychological unwellness following natural disasters (Freedy, Shaw, Jarrell, & Masters, 1992; Kaiser, Sattler, Bellack, & Dersin, 1996). In particular, Monnier, Cameron, Hobfoll and Gribble (2002) ascertained in a sample of fire fighters that resource loss acted as a mediator between critical incidents and pathogenic consequences. Furthermore, resources of conditions, personal characteristics, and energies were implicated in this relationship. In another study, Dekel and Hobfoll

(2007) found in a sample of survivors from the holocaust that approximately 21% of the participants meet the criteria for PTSD. They found that resource losses during the holocaust were predictors of PTSD. However, one of the resource losses identified was the loss of a partner during the holocaust. This could be interpreted as a component of the predictor variable. In another study, Slobodin, Caspi, Klein, Berger, and Hobfoll (2011) investigated the relationship between exposure to potentially traumatic events and pathogenic outcomes in a military sample. They found that the loss of personal resources mediated this relationship. In particular, they found that the loss of personal resources mediated the relationship between trauma exposure and depression, anxiety, and reexperiencing and hyperarousal from posttraumatic symptomology. Moreover, they found that an increase in object resources related to an increase in avoidance symptoms of posttraumatic stress. The conservation of resources model has merit. However, there are some limitations with the model. First, there are components of this model that could be considered as nonpsychological and the only resource that appears to be of a psychological nature is personal resources. Second, some of the resources that could be lost could also be seen as potentially traumatic events. For example, the loss of a house in a disaster could be a resource loss, but it also could be a potentially traumatic event. Third, the resources that are encapsulated in some of the components of the model are static and not considered to be dynamic. Some examples include age and community role.

Stress Shield

Paton and colleagues (2008) proposed a model of resilience in relation to police work, which they labeled as the stress shield of resiliency. Although the model is based on empirical data, it has yet to be evaluated in a police environment. They suggested that the stress shield is integrated across individual, group, and organisational levels. They argued that it is imperative that any model of resilience is multidimensional in this way because there are influences on the police officer from various levels that directly affect the resiliency of the individual.

Paton and colleagues (2008) postulated that the outcomes from the stress shield model are adaptive capacity, posttraumatic growth, and job satisfaction. The factors which influence these outcomes in a positive manner include conscientiousness, problem focused coping, positive work environment, peer cohesion, organisational climate, trust, supervisor support, and empowerment. Furthermore, emotional stability, emotional focused coping, negative work environment, and organisational climate have a direct and indirect influence on empowerment, which in turn has an influence on the outcomes of this model.

Paton and colleagues (2008) proposed that empowerment is influenced by task assessment and global assessment. Two pertinent components that contribute to task assessment are competence and choice. Competence is analogous to Bandura's (1977) concept of self-efficacy and is described as the ability of the individual to complete their role successfully and deal with the unexpected. Another component that influences task assessment is the extent to which choice is self-determined and this

component of choice in turn influences empowerment. Choice refers to an individual's ability to be involved in how they perform their role and equates to the personality variable of control as described in Kobasa's (1979) hardiness construct. Paton and colleagues (2008) further proposed that police officers' schemas have an influence on their empowerment. They argued that how the officers attribute their causes for failure, will impact on their respective empowerment. In particular, officers who anticipate positive outcomes will increase task and global assessments that will in turn increase their empowerment. In this model, supervisor support plays a pivotal role in the enhancement of empowerment. They argued that senior officers who practice constructive discussion, positive reinforcement, and supportive behavior will increase the sense of trust and empowerment. Moreover, a collegial work environment will increase workers' personal development that in turn will contribute to their own self-determination. Thus, support by senior officers and the cohesion of work colleagues have an immense contribution to make to this model of resilience.

Coping

The literature is vast in relation to coping (Folkman & Moskowitz, 2004), and Aldwin and Yancura (2004) claimed that there were over 30,000 published articles on the subject. It is not the purpose of this section to do an extensive review of the coping literature (for a review see Folkman & Moskowitz, 2004). However, it is important to understand the predominant theories of coping because of their relationship to the construct of resilience.

Several theorists have investigated how an individual copes in reaction to a traumatic event (e.g., Horowitz, 1986), and some theorists have proposed that coping strategies or methods are how an individual should manage a reaction to a traumatic event (e.g., Lazarus & Folkman, 1984). The appreciation of the different coping mechanisms does not directly answer the question of why some individuals develop posttrauma sequelae and others do not, but it does help us advance our knowledge of resilience in relation to occupational traumatic stress.

There are three types of coping approaches that have been described, psychoanalytical, coping style, and coping mechanisms (Aldwin & Yancura, 2004). Psychoanalytical refers to the unconscious ways of resisting anxiety, for example, humor. Coping style refers to how an individual typically deals with information and is believed to be stable and consistent over time. These have been described in terms of dichotomies, for example, approach-avoidance (Aldwin & Yancura, 2004; Beutler, Moos, & Lane, 2003). Coping mechanisms describes how an individual responds to environmental stressors and are flexible over time (Aldwin & Yancura, 2004; Beutler & Moos, 2003; Beutler, et al., 2003). It is important to note that the terms coping styles and coping mechanisms have appeared in the literature under other names. Coping styles has been described as coping dispositions (Moos & Holahan, 2003). Coping mechanisms has been described using the terms coping behaviour (Greenwald & Harder, 2003), coping response (Beutler, et al., 2003), coping process (Aldwin & Yancura, 2004), and coping strategies (Aldwin & Yancura, 2004). In this thesis, the term coping mechanisms will be used.

Coping mechanisms have been separated into five general types; problem-focused coping, emotion-focused coping, social support, religious coping, and meaning making. Problem-focused coping refers to addressing the problem concerned, for example, problem solving (Aldwin & Yancura, 2004; Folkman & Lazarus, 1980; Folkman & Moskowitz, 2004). Emotion-focused coping refers to alleviating the negative emotions associated with the problem concerned, for example, by distraction (Aldwin & Yancura, 2004; Folkman & Lazarus, 1980; Folkman & Moskowitz, 2004). Social support involves seeking emotional support and tangible support (Aldwin & Yancura, 2004). Religious coping involves the ability of an individual to reinterpret the meaning of a stressful event according to their model of how the world works due to religious scripture (Aldwin & Yancura, 2004; Pargament, Poloma, & Tarakeshwar, 2001). Meaning making refers to an individual viewing the positive aspects of a stressful situation (Aldwin & Yancura, 2004). Although there are five types of coping mechanisms, the predominant two are emotion focused coping and problem focused coping. The remaining three are relatively new areas of coping or can be subsumed under emotion-focused coping or problem-focused coping. Some theorists have argued that this dichotomy is too simplistic and have suggested alternative categories (Skinner, Edge, Altman, & Sherwood, 2003). However, Folkman and Moskowitz (2004) argued that creating these further categories can mask important differences in the types of coping.

Research studies have established that individuals who are confronted with a potentially traumatic event and who use problem-focused coping do not experience as

many mental health difficulties in comparison to individuals who utilise emotion-focused coping (Gil & Caspi, 2006). However, Stanton and colleagues (Stanton, Danoff-Burg, Cameron, Bishop, & Collins, 2000; Stanton, Danoff-Burg, Cameron, & Ellis, 1994; Stanton, Kirk, Cameron, & Danoff-Burg, 2000) argued that the measurement of emotion-focused coping is flawed. For example, many of the items on coping scales that measure emotional strategies are laden with distressful connotations and this can potentially increase the emotional distress during measurement. From the work that Stanton and colleagues have completed it appears that emotional processing is effective in the short-term, but may be less beneficial over a long-term time period.

Lazarus and Folkman (1984) argued that the coping process is contextual in that the situation is appraised as to whether it is personally significant and is personally taxing on an individual's resources. Folkman and Moskowitz (2004) proposed that the coping process commences when an individual appraises the situation that involved an alteration in their plans because of some adverse event. Furthermore, Folkman and Moskowitz argued that these initial appraisals evoke negative emotions that need to be regulated.

Research has established that coping mechanisms are strongly linked to the regulation of emotion and that certain types of coping mechanisms, for example, avoidant coping mechanisms have been linked to poor mental health outcomes (Folkman & Moskowitz, 2004). Some coping mechanisms have been shown to be maladaptive or adaptive. However, coping effectiveness has been shown to be more complex than this simplistic dichotomy of adaptive versus maladaptive. Somerfield and

McCrae (2000) argued that determining the usefulness of various coping mechanisms is extremely complex because there is ambiguity about what is a preferred outcome of a coping response. Folkman and Moskowitz (2004) proposed that coping effectiveness is dependent on the context in which a given strategy is utilised. Nevertheless, there are some coping mechanisms that are deemed to be generally ineffective, such as, binge alcohol drinking (Vujanovic, Bonn-Miller, & Marlatt, 2011), binge eating of sugary foods, and impulsive acts of inappropriate behavior (Biro, Novovic, & Gavrilov, 1997). In addition, M. Buchanan and Keats (2011) have illustrated that physical exercise is useful in assisting individuals to cope with mental health difficulties.

Resilience: Stress-Coping Ability

Connor and colleagues (Connor, 2006; Connor & Davidson, 2003) argued that resilience involves various elements that are individual qualities which allows a person to deal with potentially traumatic events. They proposed that these elements include hardiness, self-efficacy, attachment style, social support, sense of humor, self-esteem, action oriented approach, patience, tolerance of negative affect, religious faith, and optimism. They proposed that these characteristics develop over time and have been shown to be the building blocks for psychological resilience. They view resilience as the ability to successfully deal with adverse events in a stress-coping relationship.

In an internet survey of 1,558 participants, 38% met the diagnostic criteria for PTSD (Nicholls, Abraham, Connor, Ross, & Davidson, 2006). Nicholls and colleagues conceptualise resilience utilising a component of the theoretical framework proposed by Connor and Davidson (2003). Individuals that were defined as meeting the criteria

for PTSD also had lower levels of psychological resilience. They showed an association between those participants that had PTSD and poor self-perception of health. In another study, Ahmad and colleagues (2010) established that those individuals who had higher psychological resilience, utilising Connor and Davidson's framework, had lower levels of traumatic stress. Ahmad and colleagues examined 92 participants who had experienced an earthquake in Pakistan in 2005. In a final study utilising this framework, Campbell-Sills, Cohan, and Stein (2006) found resilience was negatively correlated with emotion-oriented focused coping and positively correlated with task-orientated coping. They also found that resilience moderated the relationship between childhood emotional neglect and psychopathology. In addition, they established that resilience had a strong negative relationship with neuroticism and these authors wondered whether this conceptualisation of resilience added value to our theoretical understanding of pathogenic outcomes due to potentially traumatic events.

Key Themes

Research thus far has gone some way to explaining the psychological makeup of resilience, but has not produced a complete framework. Some of the key themes in the literature are thought processes, human behaviour, physical activities, emotional responses, and an individual's environment. Kumpfer (1999) presented a transactional model of resilience in relation to at-risk youth. A component of this model included internal resiliency factors. The internal resiliency factors were grouped under the domains of cognitive, emotional, spiritual, physical, and behavioural. Kumpfer has developed this model from a review of the literature and labeled these five clusters as

internal personality or cognitive capabilities. Several of the variables suggested for inclusion under the various domains are items that could be changed or learnt and are not internal personality characteristics. Moreover, several of the characteristics have been placed in the incorrect domain or are inconsistently placed in domains. For example, in the pictorial depiction of the model, empathy is placed under the emotional component, but when empathy is mentioned in the text, the construct is discussed under behavioural competencies. In addition, the variable of optimism, which is a cognitive process, has been positioned under the domain of spirituality, although Kumpfer does acknowledge that spirituality included cognitive or belief systems that acted to motivate individuals. There is no dispute that the variables presented act as resilient factors, but they are not placed under the correct domain. Kumpfer has attempted to describe the difficult multidimensional nature of resilience in a comprehensible way, but the model needs to be adjusted and empirically tested.

Multidimensional Nature of Psychological Resilience

There have been various definitions and frameworks regarding the concept of resilience, which remain ill-defined (Kumpfer, 1999). The theories that have been reviewed in this chapter do not sufficiently explain the construct of psychological resilience. They may add weight and understanding to the concept, but each does not address the multidimensional nature of psychological resilience.

A major point of debate in the literature is whether resilience is a trait or a process (Kumpfer, 1999; Mancini & Bonanno, 2010; Masten, 1994). Mancini and Bonanno (2010) accept that personality traits play a role in resilience, but they argue

that the construct of resilience loses its meaning when personality is considered to be the main underlying mechanism in resilience. The main argument is that if resilience is predominately a personality trait, which is supposedly stable, (Terracciano, McCrae, & Costa, 2010), some individuals would not be resilient in the face of an adverse event (Mancini & Bonanno, 2010). Furthermore, this would mean that psychological resilience could not be learnt, taught, or implemented, and this would have serious consequences in the aftermath of potentially traumatic events.

Arnetz et al., (2009) have demonstrated that resilience training with a sample of police officers resulted in less negative mood, less heart rate reactivity, an increase in antithrombin, and improved police performance. The training involved imagery and relaxation training, skills training in effective coping procedures, and discussion regarding thoughts and feelings. Thus, it appears that a process orientated theory of resilience is more applicable than a trait approach of resilience, although personality factors no doubt have a role to play in psychological resilience. Incidentally, Mischel (1969) established that personality traits very rarely account for more than 10% of an individual's behavior. Therefore, personality factors may contribute to resilience, but only in a small way.

Another conceptualisation is that there are static and dynamic factors that contribute to the development of psychological resilience. Static factors are characteristics of the individual or events from the individual's past that are historical, stable, and generally cannot be changed. Dynamic factors are those aspects of an individual or their environment that are malleable, active, and can be changed.

Psychological resilience is made up of both static and dynamic factors, but that resilience predominately consists of dynamic factors. Thus, resilience training that utilises dynamic variables can enhance and develop an individual's psychological resilience (Albano & Fearing, 2000).

In this research, resilience is viewed as a combination of static and dynamic factors and that an individual can learn to be more resilient. The majority of an individual's resilience consists of dynamic factors, but that static factors do contribute to the makeup of psychological resilience. Resilience is a phenomenon that is malleable, dynamic, and can be changed or adapted (Mancini & Bonanno, 2006). Some of the variables at the opposite end of the continuum to risk factors may well be resilience variables, but the phenomenon is not that straightforward. Psychological resilience is conceptualised as the ability of an individual who is exposed to an adverse or traumatic event to maintain their levels of psychological and physical health. Psychological resilience consists of cognitive, emotional, behavioural, physical, and environmental variables. Previous research has illustrated useful constructs that act as psychological resilience factors, but a large percentage of the research has focused on single variables (e.g., Bartone, 1999), and as Kumpfer (1999) illustrated psychological resilience is multidimensional. Multidimensional frameworks of psychological resilience have been presented, but either they have not been tested (e.g., Paton, et al., 2008) or do not fully answer the question of psychological resilience (Hobfoll, 1989).

The Five-Part Model of Psychological Resilience (5-PR Model)

The five-part model has been a pivotal component of cognitive-behavioural therapy and the treatment of various psychological disorders (C. Williams & Garland, 2002). The model consists of five components, thoughts, feelings, physical reactions, behaviours, and the environment. There are many ways this model is depicted or utilised in clinical practice and it is not proposed to compare and contrast the various conceptualisations of the five-part model. Nevertheless, the five-part model is viewed as an interaction of an individual's thoughts, feelings, behaviours, physical reactions, and their environment. The core component of this model is that what an individual thinks may alter or amplify their emotions and physical reactions and this in turn may change their behaviour (C. Williams & Garland, 2002). Furthermore, these four components are part of an individual's environment (Curran, Machin, & Gournay, 2006). This model is depicted in Figure 1.

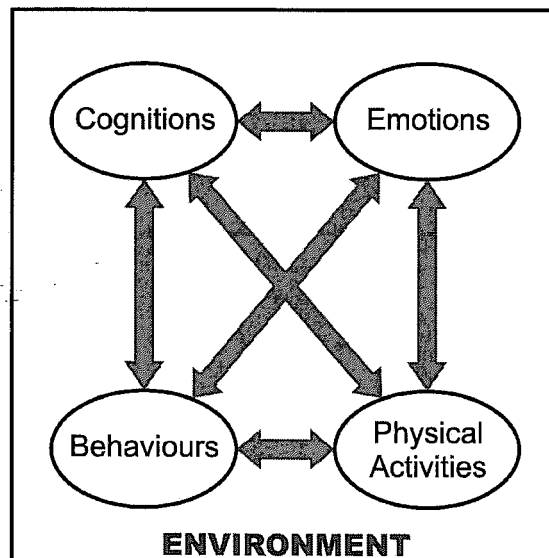


Figure 1. A visual depiction of the five-part model.

From a practical viewpoint, the five-part model is useful in the assessment and treatment of psychological disorders. For example, in relation to an individual who presents with PTSD, their presenting signs and symptoms could be classified into the five areas. This could have implications for the assessment, treatment, and monitoring of the psychological issue. To illustrate, an individual who has been exposed to a traumatic event, may have thoughts of "it was my fault." These thoughts may evoke feelings of guilt and physically they may be nauseated. This in turn may lead an individual to avoid situations where these thoughts and physical reactions are triggered. In addition, these factors may be compounded in their environment because they have no one to confide in.

Although there is limited published literature on the subject of the five-part model, this conceptualisation of psychological complaints is the backbone of cognitive-behavioural therapy (Giarratano, 2004) and there is a vast amount of literature on the utility of cognitive-behavioural therapy in treating psychological disorders (e.g., Salkovskis, 1996). Thus, the five-part model is based on the sound theoretical framework of cognitive-behavioural therapy (J. S. Beck, 1995).

In recent times the five-part model has primarily been used to understand what has already happened, for example, when an individual is struggling with PTSD. However, to my knowledge there has been no empirical investigation of the five-part model to the concept of psychological resilience. Given the effectiveness of the model as an assessment and treatment tool, then it would appear that this model would be

effective in the conceptualisation and understanding of resilience (de Terte, et al., 2009, see Appendix A).

The next consideration is how each of the subconstructs of the model fit in with the overarching view of resilience. The multidimensional nature of the construct of resilience can be mapped onto the five-part model. The main question is what areas of resilience are to be considered within the 5-PR model. In addition, there are components of the proposed model that appear more significant when discussing resilience. For example, given that approximately 50% of the disorders listed in the DSM-IV involve emotional dysregulation, it appears that the emotional aspect of the proposed model is an important facet of this structure. The key argument of this model is that resilience is not something you have or do not have. Resilience is something that can be learnt and this is the central theme to the 5-PR model. Therefore, the structure of this model has been based on the resilience literature and also on aspects of the five-part model that have been shown to be effective in the treatment of various mental health issues.

The Integration of Resilience Phenomena into the 5-PR Model

From the literature there is an array of constructs that could be placed under the various aspects of the 5-PR model. However, the actual components of the 5-PR model are optimism (cognitions), adaptive coping (cognitions), emotional competence (emotions), adaptive health practices (physical activities and behaviours), and social support (environment). These components will be explained further, but emotional competence will be explained in detail in the next chapter because it is believed to be a

key component of the 5-PR model. These components were chosen because they are believed to be dynamic factors, they have been shown from empirical research to be factors involved in psychological resilience, and they fit in the framework of the 5-PR model.

Optimism involves an individual's belief that good things will happen to them in the future (Scheier & Carver, 1992). Optimism has evolved from Carver and Scheier's (1981) research on self-regulation where it is believed that an individual who is optimistic will see themselves as able to achieve a goal when impediments are in their way. Optimism is viewed as a cognitive attribute (Peterson, 2000). There may be some confusion in that optimism is considered by some to be a personality trait and that goes against the theoretical underpinnings of the 5-PR model. However, optimism has been shown to be dependent on the situational context. For example, variation has been shown when a hazard has been encountered (Carver, Scheier, & Segerstrom, 2010). Furthermore, optimism has been shown to be unstable over long periods of time and can be enhanced or learnt (Carver, et al., 2010; Fresco, Moore, Walt, & Craighead, 2009; Meevissen, Peters, & Alberts, 2011). From a resilience point of view, optimism has been found to be linked with psychological wellbeing when confronted with adversity, better physical health, and adaptive coping mechanisms (Carver, et al., 2010).

Adaptive coping comes within the ambit of the coping literature. As reviewed earlier there are three different types of coping approaches, psychoanalytical, coping style, and coping mechanisms. The phenomenon of coping refers to the ability of an

individual to manage a situation (Moos & Holahan, 2003). There are various types of coping that have been identified within the three main approaches in the coping literature (Aldwin & Yancura, 2004; Folkman & Lazarus, 1980; Folkman & Moskowitz, 2004). The common theme is that the coping processes have to do with a reaction to an adverse event and how an individual manages that adverse event (Folkman & Moskowitz, 2000). However, this theme would not fit the definition of resilience that has been proposed in this study. Whereas the definition of resilience utilised in this research is that psychological resilience is the ability of an individual who is exposed to an adverse or traumatic event to maintain their levels of psychological and physical health. Thus, adaptive coping refers to the general cognitive ability to actively deal with global adversity (Sinclair & Wallston, 2004).

The next component that is integrated into the 5-PR model is adaptive health practices. Adaptive health practices refer to physical exercise, rest, relaxation, good nutrition, appropriate alcohol use, and smoking abstinence. These adaptive health practices could be referred to as coping mechanisms, but they are not instigated in response to any actual adversity. There is a wealth of research that has established the link between adaptive health practices and physical health (e.g., Shi, Nakamura, & Takano, 2004). There is limited research which has established the same relationship between adaptive health practices and the pathogenic consequences from potentially traumatic events. However, there is evidence that those individuals who do suffer from pathogenic consequences due to being exposed to adverse events utilise maladaptive health practices (Neria & Koenen, 2003; Shalev, Bleich, & Ursano, 1990). Moreover,

there is support for the use of adaptive health practices in relation to the prevention of mental health difficulties (M. Buchanan & Keats, 2011). Given the evidence, there would be an expectation that adaptive health practices would fit within the physical activities and behavioural components of the 5-PR model.

Research evidence has shown that social support has ameliorated depression, PTSD, and anxiety (Dirkzwager, Bramsen, & van der Ploeg, 2003; Jovanovic, Aleksandric, Dunjic, & Toderovic, 2004; Laffaye, Cavella, Drescher, & Rosen, 2008; Pietrzak, et al., 2009; Regehr, Hill, Knott, & Sault, 2003; Stephens, 1997; Stephens & Long, 1999; Stephens, Long, & Miller, 1997; S. E. Taylor, 2007). Social support has also been shown to promote psychological wellness, reduce cognitive decline, and contribute to physical health (Dupertuis, Aldwin, & Bosse, 2001; Seeman, Lusignolo, Albert, & Berkman, 2001). Social support has been put forward as a protective factor for depression (Burcusa & Iacono, 2007). Burcusa and Iacono argued that social support not only protects individuals against the first episode of depression, but also against recurrent episodes. Social support has been placed within related resilience constructs such as, stress shield, coping, and hardiness. There is a significant body of literature regarding social support. For instance, S. E. Taylor (2007) postulated that over 1000 articles occur in the scientific literature every year. Further, there are various different components of social support, for example, instrumental social support, emotional social support, structural social support, and functional social support (S. E. Taylor, 2007). However, typically social support comes from two main areas, family and friends, and work colleagues or supervisors. Reis and Collins (2000) postulated that the

nuclear family is the main source of social support. Schroevers, Helgeson, Sanderman and Ranchor (2010) illustrated with a group of people who have survived cancer that social support from family and friends is likely to produce positive meaning or growth. In relation to social support at work, Woods (2005) argued that the concept fell into the domains of general social support, good communication, satisfactory relationships, understanding of pain, and helpfulness. In her review of the literature, Woods established that there was evidence that poor social support at work is associated with poor musculoskeletal health. Thus, it seems appropriate to include social support in the 5-PR model under the umbrella of an individual's environment.

CHAPTER FOUR

EMOTIONAL COMPETENCE

A key component of psychological resilience is emotional competence. It is argued that without emotional competence the other aspects of psychological resilience are not as effective. Although the individual elements of psychological resilience are not by themselves ineffective, it is argued that emotional competence enhances the other components of the model. Emotional competence itself also plays a role in the prevention of pathogenic outcomes in people who have been exposed to potentially traumatic events. This chapter will discuss the construct of emotional competence, the clinical utility of emotional competence, the causal mechanisms of emotional competence, and the relationship emotional competence has to the other elements of the 5-PR model.

The Construct of Emotional Competence

What is Emotional Competence?

Emotional competence is the ability of an individual to perceive emotions, utilise emotions, and regulate emotions. Sometimes the term emotional intelligence has been used to describe these skills (Matthews, Zeidner, & Roberts, 2007). However, the term emotional intelligence has often been criticized and there has been a debate about whether the construct should be regarded as an “intelligence” (Mayer, Salovey, Caruso, & Sitarenios, 2001). According to Giardini and Frese (2006) the appropriate term to describe these components of actions is emotional competence. Thus, the term emotional competence will be used throughout this thesis.

Despite the introduction of the construct into the popular literature in 1995 (Goleman, 1995), and the subsequent explosion of the topic into the academic literature there is no agreed definition of the term emotional competence (Zeidner, Roberts, & Matthews, 2008). However, there are some consistent themes in the various definitions or models of emotional competence (Bar-On, 1997, 2004; Brackett & Salovey, 2004; Matthews, Zeidner, & Roberts, 2002; Mayer, 2001; Mayer & Salovey, 1997; Mayer, Salovey, & Caruso, 2000; J. D. A. Parker, 2005; Saarni, 1999). These themes are the ability to perceive, appraise, and identify emotions; the ability to understand and utilise emotions; and the ability to regulate emotions (Roberts, Zeidner, & Matthews, 2007).

The ability to perceive, appraise, and identify emotions means that an individual is able to recognize emotions in themselves and others through physical cues, appearance, behaviours, sounds, actions, and language. This component also includes the ability to distinguish between different types of emotions. An example of this aspect of emotional competence would be an individual recognizing that another person is angry by perceiving anger in their facial expressions (Neubauer & Freudenthaler, 2005).

The understanding of emotions reflects an individual's ability to understand, interpret, and recognize changes in emotions. Examples would include the emotions that may accompany an event, the change from one emotional state to another emotional state, and the combinations of various emotional states (Mayer, Salovey, & Caruso, 2002). The utilisation of emotions includes using emotions to be attentive to

certain information, to assist in memory recall, to aid an individual's judgment, to assist in an individual's future, and to facilitate creativity (Neubauer & Freudenthaler, 2005). To explain further, let us consider how emotions may act as an aid to memory recall. Reflect on a time when someone has heard a tragic piece of news and this may invoke a certain emotion in an individual. That emotion will assist in the recall of the memory by the individual. For example, due to the emotion an individual experienced when he or she became aware that Princess Diana died, the individual will be able to recall their location when they became aware of this event.

The ability to regulate emotions is the control or management of emotional responses or activations in self and others (Kashdan, Breen, & Julian, 2010). Emotional regulation is considered to be the core component of several mental health conditions (American Psychiatric Association, 1994) and psychological difficulties. Furthermore, when people experience emotional dysregulation they may utilise adaptive or maladaptive coping strategies in order to regulate their affect (Scherer, 2007). If an individual commences utilising maladaptive coping mechanisms, these strategies will invariably compound the psychopathology. For instance, an individual may use extreme alcohol consumption as a means to cope and this may compound the psychological or physical health of the individual concerned.

Other important aspects of emotional competence are the ability to express emotions and empathy. Appropriate emotional expression involves being able to express emotions appropriately and correctly (Kennedy-Moore & Watson, 2001). Empathy is the ability to share an emotional state of another person. Empathy has

been shown to involve a series of four stages, which are recognizing emotions in another person, being able to see the other person's perspective, being able to replicate the emotional state of the other person, and being able to make an appropriate response to the other person (Marshall, Hudson, Jones, & Fernandez, 1995).

Theoretical Models of Emotional Competence

There are two types of theoretical models of emotional competence: trait models and ability models (Roberts, et al., 2007). Trait models of emotional competence refer to a dispositional approach and involve a combination of personality attributes. An example of a trait model of emotional competence is Bar-On's (1997) conceptualisation, which includes the personality characteristics of interpersonal skills, intrapersonal skills, adaptive functioning, stress management, and general mood. Furthermore, trait models are not "purely" about emotional competence. For example, these models comprise other dimensions that do not relate to the domain of emotion such as self-regard, interpersonal relationships, and optimism (Neubauer & Freudenthaler, 2005). However, there are elements within the trait models that do relate to the construct of emotional competence. Thus, research evidence that relates to trait models will be utilised.

An ability model of emotional competence has been defined as a set of mental abilities that involve emotional content (Salovey & Mayer, 1990). These mental processes include the appraisal and expression of emotions, the regulation of emotion, and the utilisation of emotion. It is suggested that these mental abilities are important

because they are required for a minimal level of competency and functioning. Mayer, Salovey, Caruso and colleagues (Mayer, 2001; Mayer & Beltz, 1998; Mayer, Caruso, & Salovey, 1999; Mayer & Geher, 1996; Mayer & Salovey, 1993; Mayer & Salovey, 1995, 1997; Mayer, et al., 2000, 2002; Mayer, Salovey, & Caruso, 2004; Mayer, et al., 2001; Mayer, Salovey, Caruso, & Sitarenios, 2003; Salovey, 2001; Salovey, Brackett, & Mayer, 2004; Salovey & Grewal, 2005; Salovey & Mayer, 1990; Salovey & Pizarro, 2003; Salovey, Stroud, Woolery, & Epel, 2002) developed the best known and most cited ability model of emotional competence, the Mayer-Salovey-Caruso model of emotional competence.

Mayer-Salovey-Caruso Model

Goleman (1995, 1998) is credited with being the first person to bring the concept of emotional competence into worldwide prominence. However, Mayer, Salovey, and colleagues established the concept in the scientific literature (Mayer, 2001; Mayer & Beltz, 1998; Mayer, et al., 1999; Mayer & Geher, 1996; Mayer & Salovey, 1993; Mayer & Salovey, 1995, 1997; Mayer, et al., 2000, 2004; Mayer, et al., 2001, 2003; Salovey, 2001; Salovey, et al., 2004; Salovey & Grewal, 2005; Salovey & Mayer, 1990; Salovey & Pizarro, 2003; Salovey, et al., 2002). Salovey and Mayer (1990) first defined emotional competence as “the *ability to monitor one’s own and others’ feelings and emotions, to guide one’s thinking and actions*” (p. 189). Salovey and Mayer provided a framework for emotional competence, reviewed the respective components, and discussed the utility of the construct. The three components of this

model are appraisal and expression of emotion; regulation of emotion; and adaptive utilisation of emotion.

This early conceptualisation formed the basis for Salovey and Mayer's first ability model of emotional competence (Mayer, et al., 1999). Mayer and Salovey (1997) refined their original conceptualisation of emotional competence to a four-branch model. The first branch of their model is the perception of emotion (Brackett & Salovey, 2004). This is the ability to perceive emotion in oneself and in others, and in other stimuli, for example, works of art, objects, music, and stories (Brackett & Salovey, 2004; Mayer, et al., 1999; Neubauer & Freudenthaler, 2005). The second branch of their model is the use of emotion to facilitate thought (Brackett & Salovey, 2004). This branch is concerned with the ability to use emotion to facilitate cognitive processes. These cognitive processes would include reasoning, decision-making, problem solving, communication, and creative thought (Brackett & Salovey, 2004; Neubauer & Freudenthaler, 2005). The third branch of the model is the understanding of emotions (Brackett & Salovey, 2004). This branch involves an individual's ability to understand the complexity of emotions and how emotions combine, evolve, and change (Brackett & Salovey, 2004). The fourth branch of the model is the regulation of emotions (Neubauer & Freudenthaler, 2005). This branch involves the regulation of emotions in oneself and in others. An individual must be able to identify, monitor, and regulate his or her own emotions. They must be able to evaluate whether the strategies they use to regulate their emotions are adaptive or maladaptive. In addition, this branch of the model describes an individual's ability to manage emotional processes in others

(Brackett & Salovey, 2004; Neubauer & Freudenthaler, 2005). An ability based model is considered to be the appropriate conceptualisation of the construct because emotional competence is believed to be a dynamic skill that is able to be taught and not a stable personality trait. The model consists of four components: perception, appraisal, and identification of emotions; the ability to use emotions to communicate or facilitate thought; the understanding and utilisation of emotions; and the ability to regulate emotions.

The Clinical Utility of Emotional Competence

There is evidence that different aspects of emotional competence provide people who are exposed to potentially traumatic events with resilience against the development of traumatic stress or psychological stress (e.g., Hunt & Evans, 2004). Furthermore, deficits in various aspects of emotional competence have been linked to different types of psychopathology (Saarni, 1999). Aspects of emotional competence that have been identified include emotional regulation (Eftekhari, Zoellner, & Vigil, 2009), emotional coping, emotional processing, emotional identification (Bagby, Parker, & Taylor, 1994), and emotional management (Kabat-Zinn, 2003). There is limited research that has investigated the multifaceted dimensions of emotional competence as a moderating factor between potentially traumatic events and pathogenic outcomes. Most research has focused on single factor theories that explain this relationship between potentially traumatic event and pathogenic outcomes (Hooberman, Rosenfeld, Rasmussen, & Keller, 2010). For example, some research has investigated the different components of emotional competence, such as emotional

regulation in relation to psychopathology (e.g., Berking, Orth, Wupperman, Meier, & Caspar, 2008).

The Impact of Emotional Competence on Traumatic Outcomes

There is scientific evidence to show that people who are emotionally competent are able to utilise adaptive coping mechanisms and are therefore less likely to develop traumatic sequelae. Hunt and Evans (2004) examined a sample of 414 participants to question whether emotional competence could predict how individuals act in response to a potentially traumatic event exposure. This study used the Nottingham Emotional Intelligence Scale (Hunt & Evans, 2004) to assess emotional competence, and the Impact of Events Scale-Revised (IES-R; Weiss, 2004) to assess traumatic stress. The results showed that individuals with higher levels of emotional competence experienced lower levels of traumatic stress. In addition, this relationship was established with the subclinical components of intrusion, avoidance, and hyperarousal. Furthermore, Hunt and Evans found that people with high levels of emotional competence tended to use processing coping strategies, whereas people with low levels of emotional competence tended to use avoidance coping strategies. Avoidance coping strategies have been shown to be less effective than processing coping strategies in dealing with traumatic stress.

Research has found that maladaptive emotional regulation strategies such as binge alcohol drinking (Berking, Meier, & Wupperman, 2010) may in the short-term reduce negative emotions, but in the long-term these strategies will worsen the negative affect and likely traumatic stress. Apart from the issue that the strategy of

binge alcohol drinking may have on the likelihood of increased traumatic stress, it also may have a deleterious effect on the physical health of the individual concerned.

Another aspect of emotional competence that has been associated with aspects of traumatic consequences is the inability to express emotions (Tull, Jakupcak, Paulson, & Gratz, 2007). There appears to be a link between symptoms of PTSD and aggressive behaviour. Tull and colleagues investigated whether the inability to express emotions was responsible for the connection between aggressive behaviour and symptoms of PTSD. They found that the inability to express emotions explained this relationship, and that aggressive behaviour was used to cope with negative emotions. Furthermore, they postulated that the inability to express emotions may increase arousal and emotional dysregulation that paradoxically increased an individual's risk for aggressive behaviour to regulate their emotions.

Previous research has established a link between the severity of PTSD symptoms and emotional regulation difficulties (Ehring & Quack, 2010). Ehring sampled 616 trauma survivors to ascertain a link between symptoms of PTSD and awareness of emotions, low levels of accepting negative affect, high levels of emotional suppression, and emotional dysregulation. Ehring argued that emotional regulation difficulties are both a risk factor and a maintenance factor for PTSD.

The Impact of Emotional Competence on Psychological and Physical Wellbeing

Research has explored the role that emotional competence plays in physical health, psychological health, and mental health. For example, low levels of emotional competence have been shown to be associated with poor mental health (Ciarrochi,

Deane, & Anderson, 2002; G. J. Taylor, Bagby, & Parker, 1997). Ciarrochi, Deane, and Anderson (2002) investigated the moderating effect of emotional perception and managing others' emotions in the relationship between stress and health in a sample of university students. They found that emotionally perceptive individuals are susceptible to stress and reported more depression, hopelessness, and suicidal ideation. They argued that this can be explained by the insensitivity hypothesis which states that individuals low in emotional perception acknowledge routine stress, but are able to repress associated thoughts. A second hypothesis suggested by Ciarrochi and colleagues (2002) to explain this outcome is the confusion hypothesis that people low in emotional perception are insensitive to stress and are unaware that it is impacting on them. Another finding by these researchers is that there was greater suicidal ideation in people who are less able to manage other people's emotions. Ciarrochi and colleagues argued that people with the ability to manage others' emotions form deeper relationships and more social support which in turns buffers the effects of stress.

Schutte, Malouff, Thorsteinsson, Bhullar, and Rooke (2007) conducted a meta-analysis of 35 studies to establish the relationship between emotional competence and physical, mental, and psychosomatic health. These researchers found a significant relationship between emotional competence and physical health ($r = .22$), mental health ($r = .29$), and psychosomatic health ($r = .31$). Martins, Ramalho, and Morin (2010) completed an updated meta-analysis of 81 studies that confirmed the relationship between emotional competence and physical health, mental health, and psychosomatic health.

Tsaousis and Nikolaou (2005) investigated the relationship between the dimensions of perception, control, emotional understanding, psychological wellness, and physical health. These researchers demonstrated that emotional competence was negatively related to poor psychological wellness and physical health. Furthermore, they showed that emotional competence was negatively related to health-risk behaviours, such as smoking and drinking, and positively correlated with health promoting behaviours like exercise.

Individuals with high levels of emotional competence are likely to utilise adaptive coping strategies and conversely individuals with low levels of emotional competence are likely to employ maladaptive or passive coping strategies (Furnham, Petrides, & Spencer-Bowdage, 2002; Matthews, et al., 2002; Salovey, et al., 2002). Saklofske, Austin, Galloway, and Davidson (2007) examined the relationship between personality, coping, emotional competence, and health-related behaviours in a sample of 364 students. These researchers found a positive correlation between emotional competence and healthy diet and exercise. Furthermore, they found that emotional competence was positively correlated with internal health locus of control and rational focused coping, but negatively correlated with emotion focused coping.

Slaski and Cartwright (2003) demonstrated with a group of 60 managers that emotional competence training improved psychological and physical health. This study also showed that emotional competence levels increased after a period of 6 months. Montes-Berg and Augusto (2007) found in a sample of 119 nursing students that emotional competence minimised stress, increased social support, and acted as a

protective factor in mental health and wellbeing. Other studies have investigated the role that emotional competence has in burnout in a sample of teachers (Chan, 2006); in nonsurgical treatment procedure in people with chronic periodontitis (Gamboa, Hughes, & Marcenes, 2005); and in social interaction (Lopes, et al., 2004).

Alexithymia and Emotional Competence

Alexithymia is a significant disorder of affect. Alexithymia has been linked to the development of PTSD and other mental health difficulties, such as eating disorders, substance abuse, somatoform disorders, gambling, and anxiety disorders (G. J. Taylor, et al., 1997). Furthermore, alexithymia has been linked to empathy deficits, emotional processing difficulties, emotional identification, emotional understanding, and emotional recognition deficits. In addition, individuals who have alexithymia have difficulties establishing adaptive health behaviours. Bagby and Taylor (1997) defined alexithymia as the inability to identify feelings and communicate these feelings to others, which is dependent on being unable to distinguish feelings from the accompanying physiological sensations; and an externally oriented cognitive style that conveys an absence of thoughts, and fantasies, and a deficit in emotional expressiveness. People with alexithymia are vulnerable to PTSD (Frewen, et al., 2006), utilise maladaptive coping strategies (J. D. A. Parker, Taylor, & Bagby, 1998), and are susceptible to stress (Bagby, et al., 1994).

J. D. A. Parker, Taylor, and Bagby (2001) researched the relationship between emotional competence and alexithymia in a sample of 734 adults using the BarOn Emotional Quotient Inventory and the Toronto Alexithymia Scale. They argued that

these two constructs are independent, but inversely related. J. D. A. Parker and colleagues argued that the findings are consistent with other studies that have found alexithymia to be associated with maladaptive coping styles, stress vulnerability, and emotional regulation difficulties. Furthermore, they argued that high levels of emotional competence may be a protective mechanism for mental and physical health. Research has shown that individuals who have high traits of alexithymia have difficulty regulating emotions (Chen, Xu, Jing, & Chan, 2011). In another study, it was found that high levels of alexithymia and low levels of emotional competence were related to reduced emotional skills (Grieve & Mahar, 2010). Given the relationship alexithymia has with PTSD, coping styles, and stress it appears that alexithymia is at the opposite end of the continuum to emotional competence.

The Causal Mechanisms of Emotional Competence

The previous section described evidence which indicates that people low in emotional competence will be more likely to develop pathogenic outcomes, such as posttraumatic stress, psychological distress, and poor physical health when exposed to potentially traumatic events. Why some individuals develop pathogenic outcomes and why some individuals do not is not a simple question. It would be too simplistic to suggest that a single factor such as emotional competence explains the complex nature of such outcomes. Nevertheless, the components of emotional competence appear to buffer or prevent such effects. How do these components of emotional competence achieve this buffering or prevention effect?

The first component of emotional competence is the perception of emotions. This involves the ability of people to identify emotions in self and others (Neubauer & Freudenthaler, 2005; Salovey & Grewal, 2005). This component of emotional competence is considered to be the core of the construct. Individuals need to know when they are experiencing certain emotions or when others are experiencing certain emotions. For example, if an individual is not able to recognize when they or others are feeling sad, angry, or jealous then it would be difficult to instigate other aspects of emotional competence, such as emotional regulation. This component of emotional competence also recognizes the ability of people to be able to express emotions appropriately and distinguish between the portrayal of emotional responses (Neubauer & Freudenthaler, 2005). Individuals who have a deficit in this component of emotional competence and are exposed to potentially traumatic events may struggle with the consequences of such events. For instance, individuals who are not able to identify emotions may find it difficult to instigate the appropriate coping mechanisms or behaviours (Borrill, Fox, Flynn, & Roger, 2009).

The second component of emotional competence is how emotions facilitate cognitive processes. In particular, this component deals with how different mood states facilitate different types of cognitive reasoning (Neubauer & Freudenthaler, 2005). For example, individuals may view an event differently depending on their mood state. In relation to an individual who has been exposed to a potentially traumatic event they may fluctuate between different mood states and this may have ramifications for how an individual deals with an event. For example, an individual's mood state may cause

them to oscillate between being optimistic and being pessimistic (Neubauer & Freudenthaler, 2005), and this may have implications for how they view their situation. To illustrate, an individual who has experienced a potentially traumatic event, such as an earthquake may have their house destroyed or severely damaged. When they view the future from an optimistic viewpoint they may see the positive consequences of the earthquake. However, when they view the future from a pessimistic viewpoint they may see the negative consequences of such an event.

The third component of emotional competence is the understanding of emotions. The understanding of emotions has been conceptualised as involving four skills. These skills are labeling emotions, recognizing emotions, interpreting emotions, understanding combinations of emotions, and the shift in emotions (Neubauer & Freudenthaler, 2005). In relation to individuals who are exposed to potentially traumatic events, if an individual has survived an event and a colleague has died from such an event they may experience a combination of feeling guilty and relieved. They may feel guilty about their colleague not surviving, but feel relieved that they have survived.

The fourth component of emotional competence is the ability to regulate or manage emotions. Emotional regulation allows an individual to instigate adaptive methods to deal with unhelpful or “negative” emotions that may surface due to the exposure to potentially traumatic events. For example, an individual may have been involved in a motor vehicle accident where they were the driver and believe they were at fault in the accident, which may evoke various emotions. An individual may manage

these feelings by either repressing them or engaging in some adaptive activity, such as, physical exercise. The individual who has higher levels of emotional regulation engages in adaptive strategies to manage the feelings that have arisen due to the motor vehicle accident. The individual who does not have sophisticated emotional regulation strategies may initiate unhelpful strategies, such as alcohol use. In relation to potentially traumatic events, individuals who have experienced such an event may instigate adaptive emotional regulation strategies to cope with such an event, such as problem solving, utilising social support, or physical exercise.

The Jigsaw Puzzle of 5-PR Model: Where does Emotional Competence fit?

Emotional competence alone does not answer the question of psychological resilience because it is not a single factor theory. As mentioned in Chapter 3, psychological resilience is multidimensional and emotional competence is part of the multifaceted nature of psychological resilience. To answer the question of where emotional competence fits within the 5-PR model, this section will examine the relationships that emotional competence has with optimism, adaptive coping, adaptive health practices, and social support.

Bar-On (2009) described the relationship between positive psychology and emotional competence. Bar-On argued that factors such as optimism have an impact of psychological and physical wellbeing. Furthermore, Bar-On argued that there is considerable overlap between emotional competence and factors such as optimism. In addition, Extremera, Duran, and Rey (2009) proposed that people who are optimistic are more likely to have positive emotional reactions when faced with adversity. To

support these claims, positive correlations have been found between optimism and emotional regulation, and optimism and emotional clarity (Augusto-Landa & Pulido-Martos, 2011; Extremera, et al., 2009).

Research studies (e.g., Ciarrochi, et al., 2002) have shown that individuals low in emotional competence tend to use maladaptive methods of coping. For example, Salovey et al. , (2002) showed that individuals low in emotional competence have reduced ability in utilising adaptive coping strategies. In addition, Rogers, Qualter, Phelps, and Gardner (2006) demonstrated a positive relationship between cognitive coping and emotional regulation, appraisal of emotions, and utilisation of emotions. These studies indicate that there is an overlap between adaptive coping and emotional competence and that emotional competence and adaptive coping are interrelated.

The relationship between health-promoting behaviours and health has been well documented (Trull, 2005). However, what promotes an individual to engage in these health-promoting behaviours? A positive relationship has been found between the health practices of exercise and balanced diet, and emotional competence (Saklofske, et al., 2007). In addition, emotional competence has been shown to be negatively related with alcohol consumption (Austin, Saklofske, & Egan, 2005). Furthermore, aspects of emotional competence have been shown to be protective factors against smoking. Thus, there appears to be some overlap in the relationship between emotional competence and health practices.

The last piece of the jigsaw puzzle is the relationship between social support and emotional competence. Kwako, Szanton, Saligan, and Gill (2011) ascertained in a

sample of 78 individuals who had been exposed to a potentially traumatic event that there was a positive relationship between the degree of social support and the level of emotional competence. Gallagher and Vella-Brodrick (2008) replicated this result in a sample of 267 participants. Furthermore, Gallagher and Vella-Brodrick established that emotional competence moderated the relationship between social support and subjective wellbeing. They established that when an individual has low levels of emotional competence they rely on social support to increase wellbeing. However, when an individual's emotional competence is high, the perceived level of social support does not matter. These studies illustrate that emotional competence is related to social support.

CHAPTER FIVE

RESEARCH AIMS AND HYPOTHESES

Research Overview

There are four aims of this research: (1) to explore the relationship between exposure to potentially traumatic events and pathogenic outcomes; (2) to test the 5-PR model; (3) to compare the pathogenic outcomes between those individuals who have consulted a psychologist and those individuals who have not consulted a psychologist; and (4) to explore the differences in exposure to potentially traumatic events, psychological resilience, and pathogenic outcomes in those individuals who are current members of the New Zealand Police compared with those individuals who are former members of the New Zealand Police. Pathogenic outcomes refer to the consequences of exposure to potentially traumatic events, which are posttraumatic stress, psychological distress, and poor physical health. This chapter will outline the hypotheses that predict the relationship between potentially traumatic events and pathogenic outcomes, that will test the 5-PR model, and that will compare the pathogenic outcomes of individuals who have seen a psychologist and those individuals who have not seen a psychologist. Furthermore, this chapter will outline the exploratory investigation that will make comparisons regarding the research variables between those participants who are current members of the New Zealand Police and those participants who are former members of the New Zealand Police.

Traumatic Exposure

There is scientific evidence that has proposed that there is a relationship between potentially traumatic events and pathogenic outcomes. In particular, Johnson and Thompson (2008) argued that as the exposure to more potentially traumatic events increases the rate of posttraumatic stress also increases. Specific types of potentially traumatic events, such as rape, sexual assault, and personal assaults have a higher risk of posttraumatic stress (Breslau, 2002; Hapke, et al., 2006). In addition, Ozer and colleagues (2003) established that where individuals perceived that their life was under threat during the potentially traumatic events there is a higher frequency of posttraumatic stress symptoms. Finally, Carlier and colleagues (1997) established a link between the severity of the potentially traumatic event and posttraumatic stress.

Research has also established a link between potentially traumatic events, psychological distress, and physical health. Williams and colleagues (2007) postulated that there is a link between cumulative potentially traumatic events and psychological distress. They established that individuals who have experienced at least six potentially traumatic events were five times more likely to be psychologically distressed. Vatselle and Moen (1997) postulated that there is a link between traumatic events and physical health, in particular, they showed that the higher the posttraumatic stress symptoms the greater the physical health problems. In addition, F. H. Norris, Murphy, Baker, and Perilla (2003) showed that individuals with more serious and chronic posttraumatic symptoms had more physical health problems. Thus, it is postulated that the greater the level of exposure to potentially traumatic events will be related to pathogenic

outcomes and the greater exposure to potentially serious traumatic events will be related even more.

Model Testing

The 5-PR model encapsulates an individual's cognitions, emotions, behaviours, and physical activities, and these four elements of the model are subsumed within an individual's environment (de Terte, et al., 2009, see Appendix A). The 5-PR model suggests that psychological resilience is multidimensional and that there is no single factor that explains why an individual is more resilient to potentially traumatic events than any other individual. The 5-PR model is made up of the components of emotional competence, optimism, adaptive coping, adaptive health practices, and social support. Given the composition of the 5-PR model it is not possible to provide an overall score for psychological resilience. However, it is argued that when an individual has higher levels of the 5-PR model they will be more resilient to potentially traumatic events. The components of the model are not seen as equivalent and this research may provide evidence that some components are more influential than others. In particular, it is suggested that emotional competence is a potent factor of the 5-PR model. Emotional competence is seen as a pivotal factor of the 5-PR model because of the various elements that contribute to emotional competence. These elements are the perceiving of emotions, using emotions to facilitate thought, the understanding of emotions, and the management of emotions. Testing the 5-PR model in this manner will assist in enhancing our understanding of why some individuals develop pathogenic consequences after exposure to potentially traumatic events.

There is a pathway from potentially traumatic events to the consequences of the event. Some individuals experience pathogenic outcomes and other individuals do not experience any pathogenic outcomes as a consequence of potentially traumatic events. The main argument of this study is that an individual who is more resilient as measured by the 5-PR model will be less likely to experience pathogenic outcomes. There is the potential for the components that comprise the 5-PR model to act as moderating factors on the pathway between potentially traumatic events and pathogenic outcomes. However, the extent of this moderating effect will be dependent on the levels of each component that are present. The majority of people who are exposed to potentially traumatic events will rebound or are resilient to such events (Bonanno, et al., 2010). Resilience is a dynamic process and needs to be continually enhanced. An analogy that has been portrayed in the literature is the comparison between resilience and the immune system (Bonanno, 2005a). Some people may have stronger immune systems than other people, although all immune systems can be overrun. Thus, being psychologically resilient does not mean that some people are resilient and other people are not resilient. It is argued that resilience can be learnt or enhanced, but it can also be eroded.

To test this theory, this research will investigate the relationship between potentially traumatic events, the 5-PR model, and pathogenic outcomes. Other theories of psychological resilience have been suggested, but there is limited investigation of the multidimensional nature of psychological resilience (Kumpfer, 1999). It is hypothesized that there will be a relationship between potentially traumatic

events and pathogenic outcomes; psychological resilience will be negatively related to posttraumatic stress; psychological resilience will be positively related to psychological health and physical health; psychological resilience will moderate the relationship between potentially traumatic events and pathogenic outcomes; and the relationship between emotional competence and pathogenic outcomes will be mediated by adaptive health practices.

Psychological First-Aid

Members of the New Zealand Police have access to the services of a psychologist when they have been exposed to certain potentially traumatic events pursuant to the trauma policy (see Appendix B). In some situations, group debriefs may be utilised following potentially traumatic events (Addis & Stephens, 2008). On other occasions, individual consultations have been utilised following exposure to potentially traumatic events. On the one hand, aspects of this psychological consultation may be viewed as a psychological debriefing intervention. On the other hand, aspects of this psychological consultation may be viewed as a psychological first-aid intervention. There is scientific evidence that psychological debriefing makes no difference in the pathogenic outcomes of individuals who have been exposed to potentially traumatic events (Addis & Stephens, 2008). In addition, some theorists (e.g., Devilly, et al., 2006) have argued that debriefing can actually be psychologically harmful to individuals. However, there is evidence that components of psychological debriefing may be beneficial. For example, the National Institute for Clinical Excellence (2005) does not recommend single session interventions, such as debriefing that focuses on the

potentially traumatic event. These guidelines do recommend single sessions that focuses on providing practical support and direction regarding the exposure to a potentially traumatic event. The practical support and direction appears to be encapsulated in the new psychological intervention strategy known as psychological first-aid (Vernberg et al., 2008). Psychological first-aid is a relatively new concept and some researchers (e.g., Vernberg, et al., 2008) have postulated that this method of intervention is beneficial to individuals exposed to potentially traumatic events. The scientific literature regarding the merits of psychological first-aid is still emerging (Ruzek, et al., 2007).

Given that both intervention strategies appear to be present in psychological consultations pursuant to the trauma policy, it is hypothesized that there will be no difference in pathogenic outcomes between those individuals who have consulted a psychologist and those individuals who have not consulted a psychologist. However, it should be noted that for ethical reasons data was not collected regarding what components of the psychological debriefing and psychological first-aid were used during the psychological consultations. However, this hypothesis is based on the assumption that consultations involved a mixture of intervention processes, such as practical advice and discussion regarding the potentially traumatic event.

Research Hypotheses

The hypotheses for this study are as follows:

1. *Greater exposure to potentially traumatic events will be related to higher posttraumatic stress, higher psychological distress, and poorer physical health.*

2. *Those who have greater exposure to potentially serious traumatic events will have higher posttraumatic stress, higher psychological distress, and poorer physical health.*
3. *Psychological resilience (emotional competence, optimism, adaptive coping, adaptive health practices, and social support) will be negatively related to posttraumatic stress and psychological distress.*
4. *Psychological resilience (emotional competence, optimism, adaptive coping, adaptive health practices, and social support) will be positively related to physical health.*
5. *That the relationship in hypothesis 1 will be moderated by psychological resilience (emotional competence, optimism, adaptive coping, adaptive health practices, and social support).*
6. *The relationship of emotional competence with posttraumatic stress, psychological distress, and physical health will be mediated by adaptive health practices.*
7. *There will be no difference in the levels of posttraumatic stress, psychological health, and physical health between those who saw a psychologist pursuant to the Trauma policy and those who did not see a psychologist.*

Exploratory Investigation

The fourth aim of this research is to conduct exploratory analyses of variables to see if there is a difference between the participants who are current members of the New Zealand Police and the participants who are former members of the New Zealand

Police. These analyses will investigate if there are any variables that can differentiate between these two groups and see if such variables are able to predict why members exited the New Zealand Police. Although psychological resilience is argued to be dynamic, there may be some value in investigating the predictive nature of the 5-PR model. Furthermore, there may be some relationship between the potentially traumatic event exposure and pathogenic consequences in members who have left the organisation.

Control Variables

Throughout these statistical analyses the three variables of gender, age, and education will be controlled. Research evidence has established that females are more susceptible to developing PTSD in the general population (Brewin, et al., 2000). However, this finding has not always been shown in studies of police and military personnel (Pole, et al., 2001). Research has indicated that younger age at the time of exposure to the potentially traumatic event is a risk factor for the development of PTSD (Brewin, et al., 2000). In addition, higher intelligence and education levels (Rutter, 1987) are protective factors against the development of PTSD.

CHAPTER SIX

METHOD

This chapter will describe the method utilised to investigate psychological resilience in a sample of police officers. The majority of research that has examined psychological resilience in police personnel or related occupations such as, military personnel, ambulance officers, or fire fighters, has used cross-sectional research designs (e.g., Marmar, et al., 2006). This chapter will outline the research design, cohort sample, study sample, method considerations, web-based questionnaire, procedure, measures, rationale for the selected measures, and how the constructs were measured.

Research Design

To enable the hypotheses, which were outlined in Chapter 5, to be tested there were a number of matters to be considered. Some of these matters included research questions, recruitment of participants, sample size, generalisation of results, previous research methods, and variables (Coolican, 2004; Kline, 2009). These matters impacted on the type of research design that was utilised. The heart of this research is why some individuals develop pathogenic outcomes when exposed to potentially traumatic events and others do not. Therefore, consideration had to be given to a sample who was routinely exposed to potentially traumatic events. There are some obvious sample groups, such as victims of motor vehicle accidents, victims of sexual abuse, and victims of violent crime. The participants in those sample groups may be exposed to one potentially traumatic event and in some instances more than one potentially traumatic

event, but to test the research hypotheses, routine exposure to multiple potentially traumatic events was required. The use of an occupational sample means the results would be transferable to other similar type occupations. For these reasons, emergency service personnel were considered an appropriate sample, in particular, the Police. Huddleston (2002) had completed research with a sample of police officers who commenced their training at the New Zealand Police College in 1997 and 1998. A decision was made to resurvey this group of police officers.

Cohort Sample

This study is a continuation of an earlier exploration of a sample of police officers. Time 1 involved inviting every recruit that entered the New Zealand Police College in a 12-month period from September 1997 to September 1998 to participate in a study (Huddleston, 2002). During this time period there were 693 recruits who entered the police college. Of these 693 recruits who were invited to participate, 512 elected to participate in the research project. Huddleston (2002) then resurveyed 503 of the 512 police officers, who elected to participate at Time 1, a year later. Nine of the officers had left the police during the year. The follow-up a year later will be referred to as Time 2. At Time 2, 326 participants continued with the study. Between Time 1 and Time 2, the participants had completed a 22 week recruit training course and 7 months of operational duties as a probationary constable. This study involved the 326 police officers who were involved at Time 2 being invited to continue in this research approximately 10 years later. This phase is known as Time 3. At Times 1 and 2 all

participants were members of the police, but at Time 3 participants were included even if they were no longer employed by the New Zealand Police.

There were eight intakes of recruit training during Time 1. The mean age of all recruits that entered the police college was 27 years. There were 522 males and 172 females. Seventy participants identified their ethnicity as Maori, 599 as European, 23 as Pacific Islander, and 2 identified as other (Huddleston, 2002). The sample that was surveyed for this study consisted of a prospective group of 326 participants. The demographic information was missing for eight of the participants, so this left 318 participants. The mean age as at Time 1 was 27.56 years. There were 230 males and 88 females. Twenty-six participants identified their ethnicity as Maori, 267 identified as European, 8 identified as Pacific Islander, and 17 identified as other (Huddleston, 2002).

Study Sample

The 326 officer identification numbers (QIDs) of the participants who were involved at Time 2 were given to the liaison officer of the New Zealand Police. The liaison officer was able to identify 321 individuals. Of these 321 individuals, 230 were still employed and 91 were no longer employed by the New Zealand Police. The New Zealand Police supplied addresses for the current members and the last known address for those who were no longer employed.

To assist in the process of locating the 91 participants who were former members of the New Zealand Police, the services of the New Zealand Police Association were utilised. The New Zealand Police Association is a service organisation that

represents sworn and nonsworn members across all levels of the New Zealand Police (New Zealand Police Association, n. d.). The New Zealand Police Association is a voluntary organisation that promotes the wellbeing of its members. In addition, when members are no longer employed by the New Zealand Police they may remain members of the New Zealand Police Association. The New Zealand Police Association had postal addresses for 80 of the 91 ex-members. In addition, before the commencement of the data collection phase an article was placed in the New Zealand Police Association's monthly news magazine (New Zealand Police Association, 2009, May). The monthly news magazine is sent out to all current members of the New Zealand Police Association. This article attracted responses from two individuals who were not involved in the study.

Of the 321 participants who were identified by the liaison officer from the New Zealand Police, a further 48 prospective participants were eliminated because their mail was returned, there was insufficient address information, or there was insufficient name information. This leaves a prospective sample size of 273. There were demographic details in the database from Huddleston's (2002) research project for 267 participants. Five of the six participants completed the questionnaire at Time 3. The information from those participants has been included in the data set. Table 2 shows data information for 272 prospective participants and the demographic information of gender, ethnicity, and educational achievement as at Time 1. Huddleston (2002) collected the demographic information at Time 1, but did not collect the demographic information again at Time 2. The demographic variables of gender and ethnicity would

have remained relatively consistent, so this information was entered from Time 3. The age was entered from Time 3, but the mean difference between Time 1 and Time 3 was subtracted from the age. In relation to the five participant's educational achievement, this was not entered because it was possible that during the intervening period that the five individuals have completed further educational qualifications. The mean age for the prospective sample (N = 272) was 27.51 years (SD = 5.31) and the range was 26 years (19 to 45 years). Note this demographic information is based on information collected at Time 1.

Table 2

Demographic Profile of Prospective Sample at Time 3

<i>Variable</i>	<i>N</i>	<i>Percentage</i>
<i>Gender</i>		
Male	203	75
Female	69	25
Total	272	100
<i>Ethnicity</i>		
Maori	20	7
NZ European	229	84
Pacific Islander	8	3
Other	15	6
Total	272	100
<i>Education</i>		
No Qualification	3	1
School Certificate	48	18
University Entrance	69	26
Trade Certificate	78	30
University Degree	69	26
Total	267	100

From the 273 participants who were identified in this sample, 176 individuals completed the questionnaires. This resulted in a response rate of 64%. The response

rate for current members was 69% and for former members was 47%. The response rate per recruit intake at Time 3 is itemised in Table 3.

Table 3

Response Rate at Time 3 per Recruit Intake

<i>Intake Number</i>	<i>Current Members</i>	<i>Former Members</i>	<i>Number Responded/ Number Distributed</i>	<i>Percentage Return Rate</i>
Intake 1	13	2	15/29	52
Intake 2	19	5	24/30	80
Intake 3	23	1	24/44	55
Intake 4	27	3	30/43	70
Intake 5	19	5	24/39	62
Intake 6	20	2	22/27	81
Intake 7	16	1	17/32	53
Intake 8	14	6	20/29	69
Total Intakes	151	25	176/273	64

Method Considerations

Following on from Huddleston's (2002) design there were advantages to utilising the sample she had obtained, such as comparing exposure to potentially traumatic events after a set period of police work. If a random sample procedure had been used then participants would have had various career lengths and this would create added differences in potentially traumatic event exposure. The main disadvantage that had to be considered for this study was the attrition of participants who withdrew from this research. Strategies were considered about how to retain the participants in this study.

These strategies included positive reinforcement, regular reminders, multimodal methods of data collection, and the timing of the data collection. Positive reinforcement has been shown to be an effective method of dealing with behaviour

(Spiegler & Guevremont, 1998). In this study, participants were advised that this was a very important study and that they were a special group of police officers who if they completed this study would add to our knowledge for police officer's welfare (see Appendix C). In addition, if participants continued in this research project then they would be able to obtain a summary of the project at the completion of the research (see Appendix D), and go into a draw for one of two iPods. The strategy of positive reinforcement created an incentive for prospective participants to remain in this study.

The next strategy used was that of regular reminders. The regular reminders were the result of several issues that had to be clarified regarding the web-based questionnaire. There was a definite increase in the completion of the web-based questionnaire after reminders were mailed out. However, it would be impossible to evaluate if the increase in completions was due to the reminder letters. Nevertheless, it seems likely that the regular reminders of the research project increased the response rate.

The next strategy that was used was the utilisation of a web-based questionnaire and a paper questionnaire. The use of both methods to collect data also appeared to increase the return rate. Evidence suggests that utilising both data collection methods will increase the return rate (Dillman, Smyth, & Christian, 2009) and this appears to have come to realization in this research project. To illustrate, there were 46 participants that completed the paper questionnaire. Thus, it appears that using both methods has increased the return rate.

The last strategy that was considered to increase the participation rate in this study was the timing of the data collection. Consideration was given to when the data was collected because of the “busy periods” in police work. However, given that police work is inherently busy, no particular time period was considered to be “less busy.” However, it did seem that it would not be a good idea to commence the data collection phase during the Christmas period because this is generally a period that is busy for most people and would be considered to be a very busy time for police officers. In addition, the collection of data when there was a major police operation, such as the rugby world cup would also not be an appropriate time to commence to collect data. Although no time period was considered an appropriate time to conduct this survey there were time periods that were considered to be an inappropriate time to commence this research project.

Web-Based Questionnaire

The primary method used to collect data was a web-based questionnaire. The finite sample made this an appropriate medium. In addition, the web-based questionnaire technique was chosen because of the ability to conduct a larger questionnaire online, and the increased response rate that has been observed in web-based questionnaires (Cobanoglu, Warde, & Morco, 2001; Sue & Ritter, 2007). Other advantages include financial costs, efficiency, appearance, flexibility, data handling, and the use of technology (Best & Harrison, 2009; Dixon & Turner, 2007; Lumsden, 2007). Furthermore, a web-based questionnaire allowed difficult skip patterns to be utilised (Lumsden, 2007). The printed version of the questionnaire was 60 pages. Therefore, a

web-based questionnaire with skip patterns allowed for a longer questionnaire to be utilised. In addition, a progress bar was used that informed the participants how much further they had to complete the questionnaire. Finally, the questionnaire was automatically saved, which meant that participants did not have to complete the questionnaire in one session and they could return to the questionnaire at a later time. When the participant returned to the questionnaire, he or she would be returned to the same stage.

When designing a web-based questionnaire the order of measures is an important decision because this will assist to retain people in the study. Lumsden (2007) postulated that initial questions should be routine, questions should be repeated to assess consistency of responses, and questions that are tricky or difficult should be placed about halfway through the questionnaire. Further, Lumsden argued that the order of the measures should be placed in a conventional and systematic manner. Bearing these issues in mind the order of the measures was determined by placing them in an order that was believed to maintain participants in the study. The demographic questions were placed at the beginning of the questionnaire. The demographic questions were followed by questions about the participant's trauma history. This represented about a third of the questionnaire. In the middle third of the questionnaire, the questions about psychological resilience and consequences of trauma were placed. The final third of the questionnaire contained the section on emotional competence. The last section contained the most difficult section because it was envisaged that participants may elect not to continue with the questionnaire due

to the complexity of this section. Whilst this is contrary to the research literature, the most difficult set of questions were placed in the final section of the questionnaire because it was envisaged that participants would see how far they have progressed through the questionnaire and maintain their participation. Furthermore, placing the questions regarding emotional competence at the end appeared to be coherent and logical. The question about the health of participants was repeated as a method to assess consistency of responses (Lumsden, 2007).

The next step in the process was to enter the measures into the web-based questionnaire tool. Once the measures were placed into the web survey portal, survey create, they were proof read. In addition, the web-based questionnaire was reviewed by three independent individuals who had some psychological knowledge. Part of this review process involved the individuals answering the questions to ensure the data was collected correctly. A further review process involved checking the questionnaire for formatting issues, visual display, and coherence.

Procedure

Ethical Considerations

There were some ethical matters that had to be considered. In particular, there were two issues to consider. These matters were considered before the data collection phase of the study commenced. The first issue was the provision of a reward versus providing all participants with some form of compensation. A decision was made to provide better compensation in the form of two iPods because there would be less personal information about participants released to the principal investigator. The

second matter was the release of personal details of prospective participants from the original study to the principal investigator. Both of these matters were brought to the attention of the Massey University Ethics Committee and ethics approval was obtained. It should be noted that the personal details of the prospective participants was not released to the principal investigator until ethics approval had been obtained. The data collection procedure was explained to the Massey University Ethics Committee and subsequent approval for this methodology was obtained.

Data Collection

The first phase of the data collection involved sending out a preliminary information sheet to all participants (see Appendix C). This information sheet advised the prospective participants on the details of the forthcoming study. Given that the data was going to be collected via the internet, the main purpose of this preliminary information sheet was to give participants the option of electing to receive a paper copy of the questionnaire. The preliminary information sheet was posted out by the New Zealand Police Association on 3 July 2009. The preliminary information sheet was given to the New Zealand Police to post out on the 26 June 2009, but because of staff resources they were not able to post out the preliminary information sheet. Instead, a spreadsheet was supplied to the principal investigator with the contact details of the 321 participants. To maintain the confidentiality of these individuals from the principal investigator, envelopes were addressed by a member of the administration team at the School of Psychology at Massey University. This procedure was continued for the other mail-out procedures to police personnel. This preliminary information sheet indicated

that the questionnaire would be completed via the internet. However, the preliminary information sheet indicated a procedure that participants could follow if they wanted to complete the questionnaire in paper format.

The second phase of the data collection involved the mail-out of the first information sheet (see Appendix E). This information sheet explained the details of the website and how to gain access to the questionnaire. There were different information sheets for completing the questionnaire via the internet and in paper format. One participant indicated that they wanted to complete the questionnaire in paper format.

There were several issues that arose during the collection of data via the internet. Prospective participants e-mailed, texted, or telephoned the primary investigator about these issues. These issues included participants not being able to access the website via the police computer servers, the case-sensitive nature of login information to access the website, and participants believing that the questionnaire was for current members of the police. Furthermore, the first information sheet stated that the web questionnaire took approximately 90 minutes to complete. However, from computer records it appeared that the questionnaire took approximately 60 minutes to complete. To address these matters, further information sheets were sent out to the prospective participants outlining how to access the website via police servers, that the case-sensitive nature of the login details had been corrected, that the questionnaire was for both current and former members of police, and that the questionnaire would take approximately 60 minutes to complete (see Appendices F and G). A third reminder sheet was posted out indicating that the web questionnaire

would stop on 31 December 2009 (see Appendix H). The third reminder sheet repeated the information on how to access the web-based questionnaire via the police servers. A final reminder information sheet was posted out to prospective participants. Included with this reminder sheet was the original information sheet (see Appendix E). The web-based questionnaire was available online from 1 August 2009 to 31 December 2009.

To increase the return rate of the research, a paper copy of the questionnaire was sent out at the end of the web-based survey (Dillman, et al., 2009). Attached to the printed version of the questionnaire was an information sheet and a reminder letter (see Appendices I and J) explaining that the web-based survey had concluded, but inviting prospective participants who had not completed the web-based questionnaire to complete the pen and paper version of the questionnaire. Eliminated from this procedure were participants who had already completed the web-based questionnaire or whose addresses were incorrect. This resulted in the mail-out of 158 printed booklets. Forty-six participants completed the printed questionnaires via the mail-out process.

Consideration was given to randomisation of the questionnaires to reduce order effect (Coolican, 2004). Randomisation was not utilised because it was not possible to put the questions into random order on the web survey portal. In addition, randomisation is typically used in experiments where the tasks involve levels of processing (Coolican, 2004). This research study did not involve a randomised control methodology and the measures were placed in a consistent order to maintain

participants in the study. Randomisation of the questionnaires was not seen as a vital element in this study.

The Measures

The questionnaires that were used in this study have been reproduced in Appendix K. One of the measures, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), was copyrighted and has not been reproduced. The questionnaire that was sent out by the mail-out procedure was a direct replication of the internet questionnaire, although there were three minor alterations to remove internet terminology. The measures that were utilised in this study are now outlined.

Demographic Information

The initial part of the questionnaire included items that recorded the participant's QID, age, gender, ethnicity, educational qualifications, consultation with a psychologist, and employment status with the New Zealand Police. The participant's QID enabled the data to be linked to previous data collected during this research.

Potentially Traumatic Events Exposure

Traumatic Stress Schedule

The Traumatic Stress Schedule (TSS) is a self-report measure that was used to measure exposure to potentially traumatic events. Norris (1990) developed the TSS to investigate the frequency of traumatic events in a community sample. Stephens and Miller (1998) then augmented the TSS to include items that related to police duties. The TSS used in this study included questions that related to military combat, robbery, physical assault, sexual assault, fire, disaster, the death of a police officer, the death of

a close friend or family member, motor vehicle accident, witnessing the death of a police officer, witnessing the death or serious injury of a member of the public by the police, working with a victim of a horrific homicide, attendance at a severe accident, disaster victim identification work, on-going distressing traumatic stress, and any other sources of traumatic stress that would meet criterion A of PTSD in DSM-IV (American Psychiatric Association, 2000). Each item included information about the extent of repeated traumatic exposure, time elapsed since the last traumatic event occurred, whether the event was before or after they joined the police, and if this traumatic incident occurred whilst on duty as a police officer. Stephens and Miller (1998) proposed that a simple trauma score can be calculated by summing the number of potentially traumatic events experienced. Furthermore, they postulated that to account for multiple traumatic events those incidents that were experienced more than once were multiplied by two. A higher score on these indices indicated greater exposure to potentially traumatic events. In the current study, the same scoring method was utilised to establish a trauma exposure score, a frequency of trauma exposure score, a serious trauma exposure score, and a frequency of serious trauma score. The individual items that were utilised for the serious trauma indices were robbery, sexual assault, the tragic death of a police officer, witnessing the death of a police officer, witnessing the death or serious injury of a member of the public by the police, attendance at a severe accident, and other sources of traumatic stress that were not covered in the previous questions, but met definition of a traumatic event as outlined in the DSM-IV (American Psychiatric Association, 2000).

The TSS has been used to ascertain adverse outcomes to traumatic events in various high-risk occupations such as the police (G. Buchanan, et al., 2001; Huddleston, Paton, & Stephens, 2006; Huddleston, et al., 2007; Stephens, et al., 1997; Stephens & Miller, 1998), emergency recovery work (Dougall, Heberman, Delahanty, Inslicht, & Baum, 2000), and war veterans (Hankin & Miller, 1999). The TSS has also been used to ascertain traumatic histories with students (Calhoun, Cann, Tedeschi, & McMillan, 2000; Hoffman, 2002), women who have suicidal ideation (Reviere, Battle, Farber, & Kaslow, 2003), community samples (Flett, et al., 2002; Kazantzis, et al., 2010), and women who are pregnant with a history of substance abuse (Thompson & Kingree, 1998). The main criticism of the TSS has been the lack of items that measure emotional neglect and emotional abuse (Nijenhuis, van der Hart, & Kruger, 2002).

Norris (1992) demonstrated internal reliability coefficients alphas ranging between .73 and .76. Norris and Perilla (1996) established that the TSS had an unspecified test-retest reliability correlation of .88 in a Spanish version of the instrument. The TSS has been shown to establish lifetime prevalence rates of at least one traumatic event of 51% (Kazantzis, et al., 2010), 69% (F. H. Norris, 1992), 71 % (Hoffman, 2002), and 79% (G. Buchanan, et al., 2001). The TSS has been shown to have convergent validity with the Civilian Mississippi Scale for PTSD ($r = .31$ Stephens, et al., 1997).

Optimism

The Life Orientation Test-Revised

The Revised version of the Life Orientation Test (LOT-R) was developed to appraise dispositional optimism and pessimism (Scheier, Carver, & Bridges, 1994). The LOT-R is a 10-item measure and items are rated on a 5-point Likert scale and scores range from 0 to 24. Higher scores reflect a tendency for the expectation of a positive outcome (Extremera, Duran, & Lourdes, 2007). The items on the LOT-R range from *I agree a lot* to *I disagree a lot*. The LOT-R is a brief psychometric instrument, but this makes it ideal when placed with several other measures (Carver, 2007). Three items relate to the concept of optimism, three items to the concept of pessimism, and four items are fillers. In some studies the LOT-R has been utilised without the filler items (e.g., S. L. Hart, Vella, & Mohr, 2008). In this study the filler items were eliminated.

Puskar, Sereika, Lamb, Tusaie-Mumford and McGuinness (1999) demonstrated a Cronbach's alpha of .78. Scheier et al., (1994) found an alpha of .82. Furthermore, they found test-retest reliability correlations of .56 to .79 over a 4 to 28 month period with a sample of college students. Scheier and colleagues provided evidence of corrected item-scale correlations ranging from .43 to .63. Tusaie and Patterson (2006) demonstrated an alpha of .71 in relation to internal reliability. In this study, the alpha coefficient for the LOT-R was .79.

The LOT-R has been shown to have construct validity, predictive validity, convergent validity, and discriminate validity. Scheier and colleagues (1994) demonstrated construct validity by conducting a factor analysis on a sample of 2,055

undergraduate students. Scheier and colleagues established a single factor for the six items that accounted for 48% of the variance. Construct validity has also been demonstrated in a Greek version of the LOT-R between dispositional optimism and generalised optimism (Lyrakos, Damigos, Mavreas, Georgia, & Dimoliatis, 2010).

Herzberg, Glaesmer, and Hoyer (2006) examined the predictive utility of the LOT-R by investigating the relationship of optimism and pessimism with depression and quality of life. They argued that depression was highest among those with true pessimism and lowest among those with true optimism. Those individuals with true optimism are those individuals who scored high in optimism and low in pessimism on the LOT-R. In addition, they showed that true pessimists showed low quality of life and true optimists showed having the highest quality of life.

Scheier and colleagues (1994) demonstrated convergent validity with the Self-Mastery Scale, Rosenberg's Self-Esteem Scale, and the original Life Orientation Test. Furthermore, Scheier and colleagues demonstrated discriminate validity with the constructs of trait anxiety and neuroticism in that they established a negative relationship with these two constructs.

Adaptive Coping

Brief Resilient Coping Scale

The Brief Resilient Coping Scale (BRCS) was used to assess the adaptive coping style of individuals. The BRCS is a 4-item scale that measures an individual's tendency to cope with stress in an adaptive manner (Sinclair & Wallston, 2004). The items were rated on a 5-point Likert scale where higher scores represent better adaptive coping.

Scores on the BRCS range from 4 to 20. The item responses ranged from *does not describe you* to *describes you very well* (Wallston, 28 February 2008).

Sinclair and Wallston (2004) provided evidence regarding reliability of the BRCS. They showed that the BRCS had internal consistency with coefficient alphas that ranged from .64 to .76. They demonstrated test-retest reliability over a 3 month period with a correlation of .68 ($n = 83$; $p < .001$). Ahern, Kiehl, Sole, and Byers (2006) argued that due to the brevity of the BRCS, the scale only meets the minimum requirements for reliability and validity. However, Sinclair and Wallston (2004) postulated that the BRCS would provide utility in longitudinal research. The alpha coefficient for this study was .60.

Initial validity testing indicated that high scores on the BRCS were correlated with optimism, perceived health competence, self-efficacy, reappraisal, active problem solving, seeking social support, positive affect, and life satisfaction (Sinclair & Wallston, 2004). Furthermore, the BRCS has shown to be negatively correlated with helplessness, psychological vulnerability, catastrophizing, venting, and negative affect (Sinclair & Wallston, 2004). The BRCS has been shown to have predictive validity with two samples of women who had been diagnosed with rheumatoid arthritis. They demonstrated that the BRCS was sensitive to change by comparing scores on the BRCS before and after a cognitive-behavioural intervention that addressed adaptive coping patterns. They found that there was significant increase in the average scores of the BRCS before and after the intervention. Further, they argued that adaptive coping acted as a defence

mechanism and a buffer against psychological distress. Overall, the BRCS appears to measure adaptive coping in relation to adversity.

Emotional Competence

Mayer-Salovey-Caruso Emotional Intelligence Test

The MSCEIT was used to assess emotional competence. The MSCEIT was developed to assess emotional competence (Mayer, et al., 2002). The MSCEIT is an ability test that comprises 141 questions (Mayer, et al., 2002). The MSCEIT comprises of eight subscales, and two of these subscales relate to each domain of the model of emotional competence (Mayer, et al., 2002). The four branches of emotional competence are perceiving emotions, using emotions to facilitate thought, understanding emotions, and managing emotions. The subscales that contribute to perceiving emotions are the faces and pictures subscales. In the faces subscale, participants view faces and then are asked to rate various emotions that are present on a 5-point Likert scale. On the picture subscale, participants complete a similar activity, but the pictures of faces are replaced with abstract designs and landscapes. The subscales that relate to the domain of using emotions to facilitate thought are sensations and facilitation. The sensation subscales involves participants envisaging an emotion and then determining how much the emotion is like different sensations. In the facilitation subscale, participants are asked to determine how much a certain emotion will assist the individual to perform a particular behaviour or cognitive task. The understanding emotions domain is measured by the blend and changes subscales. In the blend subscale, participants are asked to classify emotions that merge to form a

more complex emotion. In the changes subscale, participants are required to identify emotions that result from the amplification of other emotions. The last domain of managing emotions is measured by the subscales of emotional management and emotional relationships. For the emotional management subscale, participants are asked to determine how effective a certain strategy may be in regulating emotions. For the emotional relationships subscale, participants are asked to establish how successful certain strategies employed by an individual may be in regulating another person's emotions (Mayer, et al., 2002).

The MSCEIT is scored by entering the responses into an internet based portal. The scores are then transformed into percentiles where the average score is 100 with a standard deviation of 15. If an individual scores 100, they are considered to be in the average range. If an individual scores below 70, some development in emotional competence is required and if they score above 130 the individual has a significant strength in the domain of emotional competence (Mayer, et al., 2002). These score interpretations are also applicable to the four subdomains of perceiving emotions, facilitating thought, understanding emotions, and managing emotions. There are also two methods utilised to score the MSCEIT, the expert method and the consensus method. In this study, the consensus method was utilised.

The reliability of the MSCEIT from independent psychometric evaluations has been consistent with the research completed by the authors (Mayer, et al., 2003). For example, Palmer, Gignac, Manocha, and Stough (2005) established split-half coefficients for the subscales that ranged from .86 to .48, and split-half coefficients for

the overall scale, area score, and branch score that ranged from .66 to .90. There has been limited research regarding test-retest reliability of the MSCEIT (Zeidner, et al., 2008). There has been scientific research regarding the expert versus consensus method of scoring. The different method of scoring was controversial in the predecessor to the MSCEIT and one reason for the redevelopment of the scale (Palmer, et al., 2005). However, Palmer et al., (2005) established a high correlation between the expert and consensus scoring methods ($r=.97$).

There have been limited independent psychometric evaluations of the MSCEIT (Palmer, et al., 2005). Whilst construct validity is seen as the most critical of all validity parameters, there is limited scientific research regarding the construct validity of the MSCEIT (Zeidner, et al., 2008) and the term is not in the user's manual for the MSCEIT (Mayer, et al., 2002). Researchers have tended to focus on factor analysis, convergent and discriminate validity, and predictive validity. Factor analysis has been an area where the MSCEIT has had difficulties. For example, Mayer and colleagues (2001) postulated that the MSCEIT has four factors. However, Fan, Jackson, Yang, Tang, and Zhang (2010) completed a meta-analytic structural equation modelling approach to answer the question of the four factor structure of the MSCEIT. Fan and colleagues established that although the four factors proposed by Mayer and colleagues (2002) do fit, the better fit is for a three factor solution. Fan and colleagues argued that the domains of facilitating and perceiving are tapping into the same underlying construct. There is suggestion that a person who scores high in the MSCEIT is more emotionally aware, empathetic, conscientious, and of higher intelligence (Mayer, et al., 2002).

Adaptive Health Practices

Health Practices Index

The Health Practices Index (HPI) was developed for this research study to measure the participant's adaptive health practices. The HPI was based on work by Inoue, Takeshita, Kondo, and Morimoto (1996); Shi, Nakamura, and Takano (2004); and Lu, Morimoto, and Nakayama (2006). The HPI measured the health practices of cigarette smoking, sleep, physical exercise, alcohol use, eating habits, and relaxation habits. An example of a question was *how many days in a typical week do you drink alcohol?* Participants were then given the choices of *0 – 1 days, 2 – 4 days, and 5 or more days*. The scoring method adapted consisted of adding together scores from respective questions and a higher score indicated more adaptive health practices. Scores on the HPI range from 0 to 16. In addition, because of the relationship between sleep and pathogenic consequences, the sleep item was removed from the HPI score calculations.

Inoue and colleagues (1996) demonstrated that poor adaptive health practices were associated with higher rates of mortality, chromosomal damage, and natural killer cells (e.g., Kusaka, Kondou, & Morimoto, 1992). In addition, they found that adaptive health practices were associated with positive immune responses to tumours with a sample of middle aged Japanese men. The health practices that they investigated were cigarette smoking, alcohol use, eating breakfast, number of hours sleep, hours worked, physical exercise routine, nutritional balance, and levels of mental stress. Shi and colleagues (2004) investigated adaptive health practices in a sample of middle aged

men in Japan. The health practices that they examined were eating three meals a day, having a balanced diet, avoiding excessive salt, not eating when 80% full, regular exercise, regular rest and relaxation, adequate sleep, smoking behaviour, and frequency of physical exercise. Lu and colleagues (2006) found that adaptive health practices were associated with the risk of damage to DNA in a sample of Japanese middle aged hard-metal workers. They examined eight health practices: smoking, alcohol consumption, breakfast consumption, sleep patterns, work patterns, physical activity, balanced diet, and levels of stress.

Social Support

Social Support Scale

The Social Support Scale was developed by Caplan, Cobb, French, Van Harrison, and Pinneau (1975). Caplan and colleagues postulated that their scale tapped into the social support domains of emotional and instrumental support. Scientific research has proposed that there are various types of social support, including emotional, instrumental, informational, and appraisal (e.g., Ostberg & Lennartsson, 2007). The Social Support Scale involves assessing how much social support an individual perceives they receive from their immediate supervisor, other people at their work, and their spouse or partner, friends, and relatives. The participant is asked to rate on a 5-point Likert scale how much support they may receive from different people. The item responses ranged from *very little* to *a great deal*. The participants are requested to determine how much support they get from each of these groups of individuals in relation to certain situations. Subscale scores can range from 4 to 20 and a total score

can range from 12 to 60. There are numerous iterations of the scale developed by Caplan and colleagues (1975). However, the changes appear to be predominately in the wording of the questions relating to social support of the different domains. In some situations these changes were brought about because the scale has been utilised for different professional groups (Beehr, Farmer, Glazer, Gudanowski, & Nair, 2003). Higher scores on the scale indicate that the participant has more social support in that particular area or overall social support.

The alpha coefficient for this scale utilised with a sample of nurses for supervisor support was .85 (Beehr, King, & King, 1990). The alpha coefficient with a sample of book-dealers who were surveyed regarding coworker support produced a .71 alpha coefficient (Beehr, Jex, Stacy, & Murray, 2000). The mean inter-item reliability for the respective subscales has been shown to be .65 for supervisor subscale, .50 for colleagues subscale, and .61 for family subscale (Stephens, 1996). Test-retest reliability has been considered over a 16-month period with a sample of 90 German males employed in blue-collar work (Frese, 1999). Frese separated the domain of family into partners and friends/relatives. The test-retest correlations for the four groups ranged from .44 to .60. The alpha coefficients for this study ranged from .85 to .91 for the three subscales and the total score.

In terms of validity, the scale has been shown to converge with variables such as social stress and to discriminate with constructs, such as social desirability (Frese, 1985). A criticism of the construct of social support has been whether it is a personality trait or really is reflective of social support. That is, whether the individual is actually

getting social support or is simply reporting the perception that he or she is receiving social support (Frese, 1999). It should be noted that the criticism is pointed at the phenomenon of social support rather than this scale. No one scale of social support has become the leader in the domain of social support (Halbesleben, 2006). The Social Support Scale has been utilised in 18 studies and there are 39 different measures of social support (Halbesleben, 2006).

Pathogenic Outcomes

The Impact of Event Scale-Revised

Weiss and Marmar (1997) developed the IES-R to measure posttraumatic stress. The IES-R is based on the original version of the IES. The IES-R is a 22-item self-report measure that assesses traumatic distress in the previous 7 days for a specific event. In order to identify a specific event participants were asked of all the experiences on the TSS what has affected the respondent the most. Respondents then used this incident when endorsing items on the IES-R (Huddleston, 2002). There are three subscales on the IES-R, which are intrusion, avoidance, and hyperarousal, that are aligned to the three criteria as stipulated in the diagnosis of PTSD in the current version of the DSM (American Psychiatric Association, 2000). The IES-R is aligned to the original version of the IES (Weiss, 2007), so that comparisons can be made between the measures. Eight items measure the avoidance subscale, eight items measure the intrusion subscale, and six items measure the hyperarousal subscale (Weiss, 2004). There are a series of questions and respondents rate each item using a 5-point Likert scale. The questions relate to symptoms that respondents may have had in the previous week. The

responses range from *not at all* to *extremely*. Items on the respective subscales are totalled up to give a subscale score, the scores can range from 0 to 32 for the avoidance subscale, 0 to 28 for the intrusion and hyperarousal subscales. All items are summed up to give a total posttraumatic stress score. The total score can range from 0 to 88.

There are two scoring methods that have been suggested in the literature. The first scoring method is the mean score of the responses endorsed on the items of the IES-R (Weiss, 2004). The second scoring method, is adding all the endorsed items. The second approach allows for the utilisation of a clinical cutoff score. There have been various clinical cutoff scores proposed in the literature. Creamer et al., (2003) argued that a cutoff score of 33 suggested the presence of PTSD. In addition, Asukai and colleagues (2002) suggested that a cutoff of 30 indicated the presence of PTSD. In other studies, Mitani, Fujita, Nakata, and Shirakawa (2006) diagnosed PTSD with a clinical cutoff of 24/25 on the IES-R. In this research, the scoring method of adding all the items together and a clinical cutoff of 33 were utilised. The scoring method of adding all the items together was utilised to enable the results to be compared over the three data collection points and to enable a clinical cutoff to be used. In addition, by employing this scoring method the results could be compared to studies where a clinical cutoff has been used (e.g., Violanti et al., 2007). This study used a clinical cutoff of 33 (Creamer et al., 2003), but there have been other studies where a lower threshold has been used. The cutoff score of 33 was used because the Creamer et al., (2003) study was conducted in Australia, and in that study the participants completed the IES-R and the

PTSD checklist to establish that the cutoff score of 33 provided the best diagnostic accuracy. Overall, the recommended cutoff score of 33 seemed the best way to reduce the likelihood of false positives.

The IES and the IES-R are the most widely used psychometric measure of traumatic stress (Creamer, et al., 2003; Weiss, 2004). The IES-R has been translated into various languages including Chinese (Wu & Chan, 2003), Dutch (Olde, Kleber, van der Hart, & Pop, 2006), French (Brunet, St.-Hilaire, Jehel, & King, 2003), Greek (Mystakidou, Tsilika, Parpa, Galanos, & Vlahos, 2007), Japanese (Asukai, et al., 2002), Korean (Lim, et al., 2009), Lithuanian (Kazlauskas, Gailiene, Domanskaite-Gota, & Trofimova, 2006), and Norwegian (Eid, et al., 2009). Although the IES-R and its predecessor were developed to measure the direct effects of trauma, these scales have been used to measure vicarious trauma (Bride, et al., 2007). The IES-R has been used with special populations such as police officers (e.g., Violanti, et al., 2007).

Scientific evaluations have shown the IES-R to be a valid and reliable psychometric instrument. Alpha coefficients for internal reliability range from .80 to .96 for the subscales and the total score of the IES-R (Asukai, et al., 2002; J. G. Beck, et al., 2008; Creamer, et al., 2003; Wu & Chan, 2003). Weiss and Marmar (1997) provided evidence of test-retest reliability coefficients for the three subscales that ranged from .51 to .94. The alpha coefficients for the present study ranged from .87 to .95 for the three subscales and the total score.

Hopkins Symptom Checklist-21

Current psychological distress was measured with the Hopkins Symptom Checklist-21 (HSCL-21; Green, Walkey, McCormick, & Taylor, 1988). The HSCL-21 has been extensively used as a measure of psychological distress (Green, et al., 1988), and was based on the original version that contained 58 items (Parloff, Kelman, & Frank, 1954). The HSCL-21 was designed to measure psychological distress experienced in the previous 7 days on a 4-point Likert Scale. The item responses ranged from *not at all* to *extremely*. Walkey and McCormack (1985) established a three factor structure of the Hopkins Symptom Checklist: general feelings of distress, somatic distress, and performance difficulty. Items on the respective subscales are totalled up to give a subscale score, and the three subscales are summed up to give a total psychological distress score. Scores on the subscales can range from 7 to 28, and the total psychological distress score can range from 21 to 84.

The internal reliability of the HSCL-21 has been shown with a Cronbach alpha to be .90 (Harari, Waehler, & Rogers, 2005) and .89 (Kawamura & Frost, 2004). In addition, Green and colleagues (1988) demonstrated split-half reliabilities ranging from .80 to .91 and coefficients alpha ranging from .75 to .90 for the subscales and the total score. Deane, Leathem, and Spicer (1992) investigated the test-retest reliability of the HSCL-21 over a 2-month period, the coefficients ranged from .55 to .63 for the three subscales and the total score. The alpha coefficients for this study ranged from .77 to .90 for the subscales and the full scale.

Deane and colleagues (1992) explored the validity of the HSCL-21 with a New Zealand sample of clients undergoing psychotherapy. They determined construct validity by comparing the clinical sample with a nonclinical sample. They found a significant difference between the clinical sample and the nonclinical sample such that the clinical sample scored higher than the nonclinical sample. This result indicated support for the construct validity of the scale. However, they postulated that the differences between the two samples was relatively modest and suggested that the discriminate validity of the scale was limited. They provided some evidence of concurrent validity with the State Trait Anxiety Inventory and the Brief Hopkins Psychiatric Rating Scale.

Physical Health

Self-Rated Health

Physical health was measured with a single question that asked participants to compare their health with respect to someone in excellent health (Idler & Benyamini, 1997). A 7-point Likert scale was utilised with responses ranging from *terrible* to *excellent*. Scores ranged from 0 to 7. A higher score on the Self-Rated Health reflected a better self-reflection of the participant's own physical health. For this research, the same question that was used at Time 1 and 2 was used at Time 3 (Huddleston, 2002).

Self-Rated Health has been shown to be a predictor of mortality (Frankenberg & Jones, 2004; Manderbacka, Kareholt, Martikainen, & Lundberg, 2003), health difficulties (Emmelin, et al., 2003), and health care utilisation (DeSalvo, Fan, McDonell, & Fihn, 2005). Idler and Benyamini (1997) described the use of the question in 27

studies and whilst there was inconsistency in the wording of the question there was consistency in the results in that it is an excellent predictor of mortality. Sargent-Cox, Anstey, and Luszcz (2010) divided the wording of the self-rated health question into three areas, global reference, self-comparative, and age-comparative. The global reference is where the question asks about the participant's health. The self-comparative question is where the question compares the participant's health with their previous health. The age-comparative question is where the participant is asked to compare their health to a group of same aged peers. The self-comparative and age-comparative questions could be grouped under the domain of reference point questions (Sargent-Cox, et al., 2010).

Research has shown that reference point questions may affect patterns of health change over time (Sargent-Cox, et al., 2010). For example, McCullough and Laurenceau (2004) discovered that self-comparative ratings become poorer with advancing age. Whereas, Denning and colleagues (Denning, et al., 1998) established that age-comparative ratings may improve one's description of health with age. These results were supported by Sargent-Cox and colleagues (2010) in that self-rated health reference point questions influenced health evaluations over time. Sargent-Cox and colleagues were involved in a longitudinal study of ageing and for this research were investigating a sample of older adults. In contrast, I. Eriksson, Unden, and Elofsson (2001) argued that there was no difference between global measure of self-rated health and age-comparative self-rated health. However, I. Eriksson and colleagues acknowledged that men have a tendency to overestimate their health with increasing

age on an age-comparative self-rated health. There have been mixed results in relation to gender and self-rated health. However, research evidence has shown that men have a steeper decline in self-comparative self-rated health before 57 years of age (McCullough & Laurenceau, 2004). DeSalvo and colleagues (2006) investigated the properties of a global self-rated health and an age-comparative self-rated health. DeSalvo and colleagues established reproducibility of .69 for global self-rated health and .85 for the age-comparative self-rated health. DeSalvo and colleagues established alternate forms reliability of .74.

The Rationale for the Selected Measures

Consideration had to be made on deciding which scale to select in order to measure the constructs in this study. Measures were selected that assessed the constructs that have been described in the first part of this thesis. In addition, in order to assess the constructs over the three data collection points consideration was given to the continuity of measures. Consideration was also given to selecting measures that assessed the dynamic nature of the 5-PR model, the measure that was psychometrically sound, or the measure that was previously utilised with a police sample. For the pathogenic outcomes, there was merit in using the same measures to assess the pathogenic outcomes that had been used in Huddleston's (2002) study, for example, the HSCL-21. The same rationale was used when selecting a measure to assess the participant's exposure to potentially traumatic events. This left deciding which measures to select for the constructs that formed the 5-PR model. The main focus of this research was the emotional competence aspect of the 5-PR model, and

considering that the MSCEIT is the only ability measure of this construct it was decided to use this measure. An ability measure was used because not only does it assess the dynamic nature of emotional competence, but it also limits the possibility of socially desirable responding (Tett & Simonet, 2011). Furthermore, emotional competence has been conceptualised as an ability (Mayer et al., 1999). For these reasons, it was believed that an ability test of emotional competence would be a more effective assessment method. The other measures that were selected for the other components of the 5-PR model because they either assessed the construct (e.g., optimism), they had previously been utilised with a police sample (e.g., Stephens, 1996), they were psychometrically sound, or they were based on previous research (e.g., Inoue et al., 1996).

How the Constructs Were Measured

Table 4 displays the construct, measure, and abbreviation used during the current study. The constructs relate to what was assessed in the study. The measures relate to the specific psychometric instruments utilised to assess the constructs. In some instances only parts of some psychometric instruments have been used to measure the construct. The abbreviation has depicted what aspect of a psychometric test has been used and this can be traced back to the construct that has been measured.

Table 4

Study Constructs, Measures, and Abbreviations

<i>Construct</i>	<i>Measure</i>	<i>Abbreviation</i>
<i>Potentially Traumatic Events Exposure</i>		
Trauma Type	Traumatic Stress Schedule	TSS: Trauma Type
Frequency of Trauma	Traumatic Stress Schedule	TSS: Frequency of Trauma
Serious Trauma	Traumatic Stress Schedule	TSS: Serious Trauma
Frequency of Serious Trauma	Traumatic Stress Schedule	TSS: Frequency of Serious Trauma
<i>Psychological Resilience</i>		
Optimism	Life Orientation Test-Revised	LOT-R
Adaptive Coping	Brief Resilient Coping Scale	BRCS
Emotional Competence	Mayer-Salovey-Caruso Emotional Intelligence Scale	MSCEIT: Total
Perceiving Emotions	Mayer-Salovey-Caruso Emotional Intelligence Scale	MSCEIT: PE
Facilitating Thought	Mayer-Salovey-Caruso Emotional Intelligence Scale	MSCEIT: FT
Understanding Emotions	Mayer-Salovey-Caruso Emotional Intelligence Scale	MSCEIT: UE
Managing Emotions	Mayer-Salovey-Caruso Emotional Intelligence Scale	MSCEIT: ME
Adaptive Health Practices	Health-Practices Index	HPI
Social Support	Social Support Scale	SS: Total
Social Support: Supervisor	Social Support Scale	SS: Supervisor
Social Support: Colleagues	Social Support Scale	SS: Colleagues
Social Support: Family	Social Support Scale	SS: Family
<i>Pathogenic Outcomes</i>		
Posttraumatic Stress	Impact of Event Scale-Revised	IES-R: Total
Traumatic Stress: Intrusion	Impact of Event Scale-Revised	IES-R: Intrusion
Traumatic Stress: Avoidance	Impact of Event Scale-Revised	IES-R: Avoidance
Traumatic Stress: Hyperarousal	Impact of Event Scale-Revised	IES-R: Hyperarousal
Psychological Distress	Hopkins Symptom Checklist-21	HSCL-21: Total
General Feelings of Distress	Hopkins Symptom Checklist-21	HSCL-21: GFD
Somatic Distress	Hopkins Symptom Checklist-21	HSCL-21: SD
Performance Difficulty	Hopkins Symptom Checklist-21	HSCL-21: PD
Physical Health	Self-Rated Health	Self-Rated Health

CHAPTER SEVEN

RESULTS

This chapter reviews the hypotheses to test the 5-PR model which were outlined in Chapter 5. At the commencement of each section the hypothesis is restated and the way in which the relevant hypothesis will be tested is described. At the end of each section, where relevant, post hoc analyses are reported that were utilised to explore the area of interest or clarify particular results. In the appendices are a summary of the descriptive statistics (see Appendix L) and a table that illustrates the Pearson's correlations for all measures in this study (see Appendix M).

This chapter is divided into the following sections: (1) data screening; (2) sample description; (3) potentially traumatic events; (4) pathogenic outcomes; (5) the relationship between potentially traumatic events and pathogenic outcomes; (6) psychological resilience; (7) psychological support; and (8) summary of results. The main statistical methods that were utilised to analyse the relationships between the various constructs were chi-square, t-tests, ANOVAs, correlations, and multiple regressions. These statistical analyses were completed using the statistical package SPSS, version 17.0.

Data Screening

There were several matters that had to be considered before statistical analyses of the data commenced. These issues were missing data, outliers, and normality of data (Tabachnick & Fidell, 2007).

Missing Data

Missing data refers to responses on variables that were not available for analyses. In this case it was because participants elected not to answer questions on the web portal or the paper version of the questionnaire. The missing data was evaluated in the SPSS program and it was established that the data was missing completely at random. There were no variables from the data collected at Time 3 that were above the recommended level of 10% (Hair, Black, Banin, Anderson, & Tatham, 2006). From Time 1 and Time 2 the variables of intrusion and avoidance from the IES were above the 10% threshold. The intrusion and avoidance subscales at Time 1 each had 17% data missing and at Time 2 the same subscales had 15% data missing. Hair and colleagues (2006) recommended that missing data below the threshold of 10% was considered acceptable. Mean substitution was not considered a viable option and some researchers (e.g., Howell, 2008) have recommended that mean substitution is not used unless the sample is very small. Given the size of this sample, the amount of missing data, and the pattern of missing data it was decided to utilise listwise deletion.

Outliers

All variables were assessed on a univariate basis to consider if there were any extreme values in the data. All values were converted to a standard score, and the values were considered to be outliers if they were above or below three standard deviations from the mean (Osborne & Overbay, 2004). Twenty-two of the outliers came from 12 variables. The variables TSS: Frequency of Trauma, LOT-R, SS: Total, MSCEIT: UE, HSCL: PD, HSCL: Total, and IES-R: Avoidance each had one outlier, the variables HPI,

IES-R: Intrusion, and IES-R: Total each had two outliers, the variable SS: Family had three outliers, and the variable IES-R: Hyperarousal had six outliers. Consideration regarding the outliers was given to the following: Was the data entered correctly? Was one participant responsible for the majority of the outliers? Were the outliers part of the intended sample (Tabachnick & Fidell, 2007)? After consideration of these questions a decision was made to retain the outliers because of the relatively small number of outliers and because the outlying data points would represent a normal distribution of the sample (Osborne & Overbay, 2004; Wiggins, 2000). It is believed that the scores were representative of the population of police officers. Furthermore, it has been shown that outliers due to extreme responding show very little statistical bias (Zijlstra, van der Ark, & Sijtsma, 2011). Multivariate outlier analyses were performed using the Mahalanobis Distance test (Tabachnick & Fidell, 2007) every time there was more than one predictor variable. No significant outlier relationships were established when the recommended p value of .001 was used (Tabachnick & Fidell, 2007).

Normality of Data

Another consideration was whether the data was normally distributed. To consider this all variables were viewed graphically. The only data sets that appeared nonnormal were SS: Family, IES-R: Total, IES-R: Intrusion, IES-R: Avoidance, and IES-R: Hyperarousal. Using the significance levels on Z-scores for the skewness and kurtosis of the data (Hair, et al., 2006) it was established that the data from the LOT-R, SS: Total, SS: Colleagues, HSCL-21: Total, HSCL-21: GFD, IES-R: Total, IES-R: Intrusion, IES-R: Avoidance, and IES-R: Hyperarousal were skewed. Coolican (2004) suggested that if

there is over half a standard deviation between the mean and median then there is unacceptable skewness. On this basis, none of these variables were considered to be overly skewed. The variables of IES-R: Total, IES-R: Intrusion, IES-R: Hyperarousal, and SS: Family had significant kurtosis statistics. However, all of the kurtosis statistics were positive and Tabachnick and Fidell (2007) argued that with sample sizes over 100 and where the kurtosis statistic is positive the impact of variance on statistical analyses is negligible. Data that has a kurtosis shape is not considered as vital to statistical analyses as data that is skewed (Coolican, 2004). There were some anomalies in the data, but the data was considered normal and no data transformations were undertaken. In addition, transformation of data has been shown to be problematic and not recommended by some researchers (Games, 1984; Grissom, 2000; A. E. Norris & Aroian, 2004; Wilcox & Keselman, 2003). Finally, the data in this study seemed consistent with the sampled population and the general population. For instance, the occurrence of posttraumatic stress in the study sample using a diagnostic cutoff of 33 (Creamer, et al., 2003) was 15%. This would be consistent with other studies of PTSD prevalence in police personnel. For example, West and colleagues (2008) found a prevalence rate of 19% for PTSD in a police sample. Many data samples of this nature would have skewed data that would be analogous with several other clinical sets (Sara, 2010).

Multiple Regression Analysis Considerations

Additional assumptions for multiple regression analyses include multicollinearity tests, centering of moderating variables, and ratio of cases.

Multicollinearity was evaluated by comparing the independent variables that were utilised in the multiple regression analyses. Multicollinearity is believed to exist if there is a correlation between the independent variables of above .90 (Hair, et al., 2006). There were no correlations of above .90 between the independent variables. All multiple regression analyses tolerance statistics were evaluated for multicollinearity and there was no evidence of multicollinearity. When moderation analyses were completed all moderating variables were centered to reduce the likelihood of multicollinearity (Echambadi & Hess, 2007). The final consideration when utilising multiple regression analyses is the size of the sample. In this study, the sample size required was 98. In addition, the sample size is required to be greater than 59 if the dependent variable data is skewed and to ensure no data transformations are required (Tabachnick & Fidell, 2007). Normality is not considered a concern if the sample size is greater than 100 and there are less than five predictor variables (Allison, 1999). Thus, given the sample size of this study, using multiple regression analyses was considered an appropriate statistical method.

Sample Description

There were 176 participants in the sample who had trained to become police officers between September 1997 and September 1998. The demographic variables obtained from the participants at Time 3 were age, gender, ethnicity, educational achievement, employment status, and whether they had consulted a psychologist pursuant to the trauma policy (see Appendix B). Table 5 provides a summary of this demographic information. Owing to missing data the N ranged from 174 to 176. The

mean age for the sample (N = 175) was 39.21 years (SD = 5.55 years) and the range was 27 years (30 to 57 years).

Table 5
Demographic Profile of Study Sample

<i>Variable</i>	<i>N</i>	<i>Percentage</i>
<i>Gender</i>		
Male	129	73
Female	47	27
Total	176	100
<i>Ethnicity</i>		
Maori	7	4
NZ European	165	94
Pacific Islander	2	1
Other	1	0
Total	175	100
<i>Education</i>		
No Qualification	2	1
School Certificate	23	13
University Entrance	35	20
Trade Certificate	54	31
University Degree	60	34
Total	174	100
<i>Employed by NZ Police</i>		
Yes	151	86
No	25	14
Total	176	100
<i>Psychologist Consultation</i>		
Yes	94	54
No	80	46
Total	174	100

In the participant sample 27% were female and 73% were male. In June 2010, in the New Zealand Police 17% were female and 83% were male (New Zealand Police, 2010). The sample composition showed that the ratio of female to male was slightly higher than the New Zealand Police gender demographics: $\chi^2(1, N = 176) = 11.75, p = .001$. In relation to the participant's ethnicity, 94% identified as New Zealand European, 4% identified as New Zealand Maori, 1% identified as Pacific Islander, and less than 1% identified as other. Three participants who identified as Maori also identified as New

Zealand European. One individual who identified as Pacific Islander also identified as other, namely Irish. The person who identified solely as other was of Jewish ethnicity. In the New Zealand Police, 89% identified as New Zealand European/Pakeha or European, 11% identified as New Zealand Maori, 5% identified as Pacific Peoples, 2% identified as Asian peoples, and less than 1% identified as other. Note, these percentages add up to more than 100% because employees were given the option of identifying more than one ethnicity. The ethnic composition of the sample is similar to the New Zealand Police data, apart from the statistical information regarding Asian people.

In relation to educational achievement, 1% identified no qualification, 13% identified school certificate, 20% identified university entrance, 31% identified trade certificate, and 34% identified university degree as their highest qualification. In some instances, participants indicated two qualifications. Where this happened the highest qualification was recorded. In instances where university entrance and trade certificate were both endorsed, then trade certificate was taken as the higher qualification because it is a post secondary school qualification. Of the sample, 86% (n = 151) participants were still employed by the police and 14% (n = 25) were no longer employed by the police. One participant who had left the police and rejoined was included as currently employed by the police. In addition, there were four participants who had two QIDs. There was no information regarding whether these individuals had left the police and then rejoined. However, it appears that this could be the case because this is generally the only circumstance where an individual receives a “new”

QID. Of the sample, 54% had consulted a psychologist, and 46% had not consulted a psychologist.

In Table 6, the demographic information is reported in regard to gender. The mean age of female participants was 38.04 years ($n = 47$; $SD = 5.51$) with a range of 27 years (30 to 57 years). The mean age of male participants was 38.04 years ($n = 128$; $SD = 5.58$) with a range of 24 years (31 to 55 years).

Table 6

Demographic Profile of Study Sample by Gender

<i>Variable</i>	<i>Female (n)</i>	<i>Percentage</i>	<i>Male (n)</i>	<i>Percentage</i>
<i>Ethnicity</i>				
Maori	1	2	6	5
NZ European	44	94	121	95
Pacific Islander	1	2	1	1
Other	1	2	0	0
Total	47	100	128	101
<i>Education</i>				
No Qualification	1	2	1	1
School Certificate	5	11	18	14
University Entrance	11	24	24	19
Trade Certificate	10	22	44	34
University Degree	19	41	41	32
Total	46	100	128	100
<i>Employed by NZ Police:</i>				
Yes	36	77	115	89
No	11	23	14	11
Total	47	100	129	100
<i>Seen Psychologist</i>				
Yes	28	61	66	52
No	18	39	62	48
Total	46	100	128	100

In Table 7, the demographic information is reported in regard to current employment status of the New Zealand Police. The mean age of the current members' group was 39.25 years (n = 150; SD = 5.68) with a range of 27 years (30 to 57 years). The mean age of the former members' group was 39.00 years (n = 25; SD = 4.79) with a range of 20 years (33 to 53 years).

Table 7

Demographic Profile of Current Members and Former Members

<i>Variable</i>	<i>Current Members (n)</i>	<i>Percentage</i>	<i>Former Members (n)</i>	<i>Percentage</i>
<i>Gender</i>				
Male	115	76	14	56
Female	36	24	11	44
Total	151	100	25	100
<i>Ethnicity</i>				
Maori	7	5	0	0
NZ European	140	93	25	100
Pacific Islander	2	1	0	0
Other	1	1	0	0
Total	150	100	25	100
<i>Education</i>				
No Qualification	2	1	0	0
School Certificate	22	15	1	4
University Entrance	33	22	2	8
Trade Certificate	46	31	8	33
University Degree	47	31	13	54
Total	150	100	24	100
<i>Seen Psychologist</i>				
Yes	86	57	8	33
No	64	43	16	67
Total	150	100	24	100

Table 8 describes the demographic information regarding those participants who had consulted a psychologist and those participants who had not consulted a psychologist. The mean age of the group who consulted a psychologist was 38.80 years (n = 94; SD = 5.53) with a range of 26 years (31 to 57). The mean age of the group who did not consult a psychologist was 39.75 years (n = 79; SD = 5.61) with a range of 23 years (30 to 53).

Table 8

Demographic Profile of Participants who Consulted a Psychologist and Those who Have not Consulted a Psychologist

<i>Variable</i>	<i>Consulted Psychologist(n)</i>	<i>Percentage</i>	<i>Not Consulted Psychologist(n)</i>	<i>Percentage</i>
<i>Gender:</i>				
Male	66	70	62	78
Female	28	30	18	23
Total	94	100	80	101
<i>Ethnicity:</i>				
Maori	3	3	4	5
NZ European	88	95	75	94
Pacific Islander	2	2	0	0
Other	0	0	1	1
Total	93	100	80	100
<i>Education:</i>				
No Qualification	1	1	1	1
School Certificate	13	14	10	13
University Entrance	18	19	17	21
Trade Certificate	33	35	21	26
University Degree	29	31	31	39
Total	94	100	80	100
<i>Employed:</i>				
Yes	86	91	64	80
No	8	9	16	20
Total	94	100	80	100

Potentially Traumatic Events

This section provides an overview of the potentially traumatic events that the sample had experienced. This section also provides a comparison of comparable potentially traumatic events between Time 2 and Time 3. Time 1 was not included in the comparison because the data collected at that point did not reflect the same categories of potentially traumatic events (Huddleston, 2002).

As outlined in Chapter 6, there are four measures in the TSS which measures the exposure to potentially traumatic events. The first is the TSS: Trauma Type, which measures the different types of potentially traumatic events that participants have encountered. The second is the TSS: Frequency of Trauma which measures the number of types of potentially traumatic events that participants have encountered. The third is the TSS: Serious Trauma, which measures the different types of potentially serious traumatic events that participants have encountered. The fourth measure is the TSS: Frequency of Serious Trauma, which measures the number of potentially serious traumatic events that participants have encountered. During the analyses there were occasions where it was appropriate to utilise one measure of potentially traumatic event exposure from the TSS. In those cases, the TSS: Frequency of Trauma was used because it is the measure that encompasses all potentially traumatic events that a participant encountered.

Potentially Traumatic Event Exposure

Table 9 provides an overview of the exposure to potentially traumatic events for this sample at Time 3. In response to the question “did you ever have some other shocking or distressing experience, something that has not been mentioned yet?” Some participants provided examples that were covered by other questions in the TSS. All responses were reviewed and recorded in the appropriate question section of the TSS. Responses that related to organisational issues or were not considered potentially traumatic events were eliminated. The remaining responses were recorded under additional categories of suicide, sudden death, near death, and heroic acts. The suicide category included events where participants witnessed people committing suicide and participants attending the scenes of suicides. The sudden death category included participants who had attended the scenes of people who have died from natural or unexplained causes, such as sudden infant death syndrome. The near death category included participants who had been involved in an incident where their life was threatened. Heroic acts included events where participants had tried to save the life of an individual. There was one other individual who indicated that they had lived in a war zone and had experienced the effects of terrorist and wartime attacks. Whilst this response did not mean that the individual had served in military combat, it was decided that this response would be best to be recoded under the category of military combat.

Table 9

Exposure to Potentially Traumatic Events at Time 3 for all Participants and by Gender

Event	Complete Sample		By Gender			
	N	%	Male(n)	%	Female(n)	%
Military Combat	6	1	4	1	2	1
Robbery	19	3	15	3	4	2
Assault	155	22	120	23	35	18
Unwanted Sexual Activity	8	1	2	0	6	3
Fire	21	3	15	3	6	3
Disaster	26	4	14	3	12	6
Police Die	51	7	34	7	17	9
Friend Die	74	10	47	9	27	14
MVA	41	6	31	6	10	5
Police Killed	9	1	9	2	0	0
Public Killed	32	5	27	5	5	3
Homicides	66	9	45	9	21	11
Messy Death	142	20	105	20	37	19
DVI	16	2	15	3	1	1
Suicides	14	2	10	2	4	2
Near Death	10	1	7	1	3	2
Sudden Death	14	2	12	2	2	1
Heroic Acts	5	1	4	1	1	1
Total	709	100	516	100	193	100

In just over 11 years of policing, the participants had each experienced an average of four different types of potentially traumatic events ($M = 4.03$, $SD = 1.70$, $N = 176$), approximately six occurrences of potentially traumatic events ($M = 6.30$, $SD = 2.74$, $N = 162$), just under two different potentially serious traumatic events ($M = 1.73$, $SD = 0.99$, $N = 176$), and just under three occurrences of potentially serious traumatic events ($M = 2.66$, $SD = 1.49$, $N = 170$). Huddleston (2002) found at Time 1 that on average the participants had each experienced just under two potentially traumatic events ($M = 1.82$, $SD = 0.75$, $N = 314$), and at Time 2 she found that in 7 months of police service, participants had experienced just over one traumatic event ($M = 1.37$, $SD = 1.15$, $N = 312$). Table 10 shows the potentially traumatic event exposure of the present sample at Time 3 compared to their exposure at Time 2. At Time 2 there were

14 categories while at Time 3, there were 16 categories of potentially traumatic events. The two additional categories were not shown for Time 3 to create consistency between the data collection points.

Table 10

Exposure to Potentially Traumatic Events by Type at Time 2 and Time 3

<i>Event</i>	<i>Time 2</i>		<i>Time 3</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Robbery	1	1	19	3
Assault	70	40	155	24
Fire	2	1	21	3
Disaster	6	3	26	4
Police Die	1	1	51	8
Friend Die	10	6	74	11
MVA	9	5	41	6
Police Killed	1	1	9	1
Public Killed	12	7	32	5
Homicides	13	7	66	10
Messy Death	47	27	142	22
DVI	3	2	16	2
<i>Totals</i>	<i>175</i>	<i>100</i>	<i>652</i>	<i>100</i>

Post hoc analysis compared the four different types of potentially traumatic events across employment status, gender, and education. Education was transformed to a dichotomy of those participants with a degree and those without a degree. Independent t-tests were performed to see if there was a difference between potentially traumatic event exposure across the variables of employment status, gender, and education. When these statistical analyses were performed there were no differences in regards to gender and education on the four measures of exposure to potentially traumatic events. In relation to employment status, there were significant differences on two of the potentially traumatic events scales, TSS: Trauma Type ($t = 2.09$, $df = 160$, $p < .05$, two-tailed), and TSS: Frequency of Trauma ($t = 2.22$, $df = 160$, $p <$

.05, two-tailed). The mean scores on the TSS: Trauma Type were 4.09 (SD = 1.60, n = 138) and 3.33 (SD = 1.88, n = 24), and on the TSS: Frequency of Trauma were 6.49 (SD = 2.68, n = 138) and 5.17 (SD = 2.82, n = 24) for the employed and not-employed subgroups respectively. The effect size for these two analyses was 0.44 and 0.48, which is considered to be a medium effect, for the different types of potentially traumatic events and the frequency of potentially traumatic events.

Pathogenic Outcomes

This section reviews the three pathogenic outcomes used in this study, posttraumatic stress, psychological distress, and physical health. Table 11 provides information regarding the pathogenic outcomes for the sample at Time 1, 2, and 3. At Times 1 and 2 the IES was used. The IES is a 15 item scale that has no hyperarousal index. Comparisons can be made between the two subscales, intrusion and avoidance, because they are virtually identical. The only changes between the 15 items on the IES and the same 15 items on the IES-R was the alteration of the wording of one question in relation to sleep and the addition of an item on the intrusion subscale in relation to flashbacks (Weiss, 2004). Thus, comparisons were made between the IES and IES-R in relation to the two subscales of avoidance and intrusion (Hutchings & Devilly, 2010).

Table 11

Pathogenic Outcomes at Time 1, Time 2, and Time 3

Variable (N)	Time 1 M (SD)	Time 2 M (SD)	Time 3 M (SD)
IES-R: Intrusion (124)	5.60 (7.66)	5.48 (6.53)	6.45 (7.33)
IES-R: Avoidance (124)	5.89 (8.54)	5.48 (7.52)	6.44 (7.00)
IES-R: Hyperarousal (176)	N/A	N/A	2.87 (4.70)
IES-R: Total (176)	N/A	N/A	14.87 (16.99)
HSCL-21: GFD (163)	10.93 (3.66)	10.44 (3.75)	11.82 (4.08)
HSCL-21: SD (163)	10.01 (2.86)	8.88 (2.07)	11.01 (3.66)
HSCL-21: PD (163)	13.02 (3.19)	11.85 (3.40)	13.33 (3.68)
HSCL-21: Total (163)	33.96 (7.89)	31.16 (7.33)	36.16 (9.66)
Self-Rated Health (165)	6.19 (0.72)	5.70 (0.91)	5.86 (0.88)

To complete these analyses repeated ANOVAs were completed. Then if significant differences were established between the pathogenic variables over the three time periods that data had been collected, the appropriate post hoc analyses were completed. Repeated measures ANOVA evaluated the variables of IES-R: Intrusion, IES-R: Avoidance, HSCL-21: GFD, HSCL-21: SD, HSCL-21: PD, HSCL-21: Total, and Self-Rated Health over Time 1, Time 2, and Time 3. No significant differences were found with the variables IES-R: Intrusion or IES-R: Avoidance. There were significant differences on the remaining comparisons. Post hoc analyses were completed to establish if there were significant differences between the pathogenic outcomes over the course of the participants' career.

On the HSCL-21: GFD, the mean score differed significantly across the three time points $F(2, 324) = 9.68, p < .001$. Post hoc tests using the Bonferroni correction revealed significant differences between Time 1 and 3 ($p < .05$), and Time 2 and Time 3 ($p < .001$). On the HSCL-21: SD, with the Greenhouse-Geisser correction method the

mean score differed significantly across the three time points $F(1.85, 299.58) = 27.33$, $p < .001$. Post hoc tests using the Bonferroni correction revealed significant differences between Time 1 and Time 2 ($p < .001$), Time 1 and 3 ($p = .01$), and Time 2 and Time 3 ($p < .001$). In relation to the HSCL-21: PD scale, the mean score differed significantly across the three time points $F(2, 324) = 12.09$, $p < .001$. Post hoc tests using the Bonferroni correction revealed significant differences between Times 1 and 2 ($p < .001$), and Time 2 and Time 3 ($p < .001$). In relation to the HSCL-21: Total score, the mean score differed significantly across the three time points $F(2, 324) = 23.47$, $p < .001$. Post hoc tests using the Bonferroni correction revealed significant differences between all three Times. Time 1 and 2 ($p < .001$), Time 1 and Time 3 ($p < .05$), and Time 2 and Time 3 ($p < .001$).

In relation to the Self-Rated Health, the mean score differed significantly across the three time points $F(2, 328) = 21.53$, $p < .001$. Post hoc tests using the Bonferroni correction revealed significant differences between Time 1 and 2 ($p < .001$), and Time 1 and Time 3 ($p < .001$). The pathogenic outcomes of IES-R, HSCL-21, and Self-Rated Health were tested in relation to gender and employment status and no significant differences were found.

Further post hoc analysis evaluated the effect size between Time 1 and Time 3 for the HSCL-21: Total score and Self-Rated Health. The effect size for the HSCL-21: Total Score was 0.20 which is considered to be a small effect. The effect size for Self-Rated Health was 0.41 which is considered to be just under a medium effect size.

The Relationship Between Potentially Traumatic Events and Pathogenic Outcomes

Hypothesis One

Hypothesis 1 stated that exposure to potentially traumatic events will be positively related to pathogenic outcomes. To test this hypothesis, correlation analyses were completed in relation to the two relevant measures of potentially traumatic event exposure and the pathogenic variables. There were significant positive correlations between TSS: Trauma Type and IES-R: Intrusion, IES-R: Avoidance, IES-R: Total, HSCL-21: GFD, HSCL-21: SD, and HSCL-21: Total. There were significant positive correlations between TSS: Frequency of Trauma and IES-R: Intrusion, IES-R: Avoidance, IES-R: Hyperarousal, IES-R: Total, HSCL-21: SD, and HSCL-21: Total (see Table 12).

Hypothesis Two

Hypothesis 2 stated that exposure to potentially serious traumatic events will be positively related to pathogenic outcomes. To test this hypothesis, correlation analyses were completed in relation to the two relevant measures of potentially serious traumatic event exposure and the pathogenic variables. There were significant positive correlations between TSS: Serious Trauma and IES-R: Intrusion, IES-R: Avoidance, IES-R: Hyperarousal, IES-R: Total, and HSCL-21: Total. There were significant positive correlations between TSS: Frequency of Serious Trauma and IES-R: Intrusion, IES-R: Avoidance, IES-R: Hyperarousal, and IES-R: Total (see Table 12).

Table 12

Pearson's Correlations Between Exposure to Potentially Traumatic Events and Pathogenic Outcomes (N = 160)

	TSS: Trauma Type	TSS: Frequency of Trauma	TSS: <i>Serious Trauma</i>	TSS: Frequency of Serious Trauma
IES-R: Intrusion	.19**	.20**	.23**	.26***
IES-R: Avoidance	.16*	.17*	.18*	.18*
IES-R: Hyperarousal	.12	.15*	.19**	.22**
IES-R: Total	.18*	.19*	.22**	.24**
HSCL-21: GFD	.14*	.12	.11	.07
HSCL-21: SD	.16*	.14*	.12	.11
HSCL-21: PD	.10	.10	.13	.09
HSCL-21: Total	.16*	.14*	.14*	.10
Self-Rated Health	-.06	-.06	-.07	-.06

*p < .05, **p < .01, *** p < .001 (one-tailed).

Post hoc analyses were completed to consider whether the exposure to potentially traumatic events after the participants had been employed by the New Zealand Police was related to pathogenic outcomes at Time 3. A separate hierarchical regression analysis for each pathogenic outcome was completed. At Step 1 the pathogenic outcome was entered into the equation as the dependent variable and the frequency of potentially traumatic events at Time 1 was entered as an independent variable. At Step 2, the frequency of potentially traumatic events at Time 3 was entered as an independent variable. The only significant model was when the dependent variable IES-R was entered as a dependent variable (see Table 13). At Step 1, the control variable of Frequency of Trauma at Time 1 was not significant in relation to IES-R. At Step 2, the addition of Frequency of Trauma at Time 3 accounted for 4% of the variance of IES-R: Adjusted $R^2 = .04$, $F(2, 153) = 4.60$, $p < .05$.

Table 13

Hierarchical Multiple Regression of IES-R on Frequency of Trauma Variables Showing Standardised Regression Coefficients, Multiple R, Total R², Adjusted R², and R² Change.

Predictor Variable	Step 1	Step 2
Step 1: Control	-.07	-.12
Frequency of Trauma (Time 1)		
Step 2: Police Trauma Exposure		.23**
Frequency of Trauma (Time 3)		
Multiple R	.07	.24
Total R²	.01	.06
Adjusted R²	.00	.04*
R² Change	.01	.05**

* $p < .05$, ** $p < .01$, *** $p < .001$.

Psychological Resilience

Hypothesis Three

Hypothesis 3 stated that psychological resilience will be negatively related to posttraumatic stress and psychological distress. This hypothesis was first tested by evaluating the correlations between the 5-PR model variables and the pathogenic outcome variables as measured by the IES-R and HSCL-21. There were significant negative relationships between the variables of LOT-R, HPI, SS: Supervisor, SS: Colleagues, SS: Total, MSCEIT: PE, and MSCEIT: UE, and IES-R (see Table 14). There were significant negative relationships between the variables of LOT-R, HPI, SS: Supervisor, SS: Colleagues, SS: Family, SS: Total, and MSCEIT: UE, and HSCL-21 (see Table 14).

Table 14

Pearson's Correlations Between the 5-PR Model Variables and Pathogenic Consequences (N = 156)

	IES-R: Total	HSCL-21: Total	Self-Rated Health
BRCs	-.01	-.04	.25**
LOT-R	-.24**	-.49***	.18*
HPI	-.31***	-.15*	.42***
SS: Supervisor	-.19**	-.24**	.17*
SS: Colleagues	-.32***	-.38***	.05
SS: Family	-.08	-.14*	.06
SS: Total	-.27***	-.34***	.13*
MSCEIT: PE	-.14	-.12	.15*
MSCEIT: FT	.03	.04	.07
MSCEIT: UE	-.24**	-.19**	-.09
MSCEIT: ME	.02	-.08	.08
MSCEIT: Total	-.12	-.12	.10

*p < .05, **p < .01, *** p < .001 (one-tailed).

To further test these results, those who would meet the diagnostic criteria for PTSD were compared to those who would not meet the diagnostic criteria for PTSD on the IES-R. There were 24 participants who were above the recommended diagnostic cutoff score of 33 (Creamer, et al., 2003) on the IES-R and 134 participants who were below the recommended cutoff score. When independent t-tests were conducted between the two groups there were significant differences on three scales, LOT-R ($t = 2.03$, $df = 156$, $p < .05$, two-tailed), HPI ($t = 3.20$, $df = 156$, $p < .05$, two-tailed), and SS: Colleagues ($t = 2.33$, $df = 156$, $p < .05$). The mean scores on the LOT-R were 14.84 ($SD = 4.45$) and 16.76 ($SD = 4.26$), on the HPI were 8.38 ($SD = 1.93$) and 9.97 ($SD = 2.30$), and on the SS: Colleagues were 11.63 ($SD = 3.67$) and 13.43 ($SD = 3.48$), respectively. The effect sizes were 0.22, 0.75, and 0.50 for LOT-R, HPI, and SS: Colleagues respectively, which are small, large, and medium effect sizes.

To further test this hypothesis, the contribution of traumatic stress to the independent variables was controlled. Then the relationship between the variables of IES-R and HSCL-21 and the variables of the 5-PR model was evaluated. This was completed by using hierarchical multiple regressions. At Step 1, the TSS: Frequency of Trauma at Time 3 was entered as the independent variable. The IES-R was entered as the dependent variable. At Step 2, the variables of the 5-PR model were entered as independent variables. In relation to social support and emotional competence, the subscales of the constructs were used. Table 15 shows the results for this analysis. At Step 1, the control variable of Frequency of Trauma at Time 3 was significant and accounted for 3% of the variance. At Step 2, the Frequency of Trauma at Time 3 became nonsignificant and the 5-PR model variables of HPI, SS: Colleagues, MSCEIT: UE, and MSCEIT: ME accounted for 25% of the variance: R^2 change = .25, $F(10, 133) = 4.69$, $p < .001$. The MSCEIT: ME was positively related to IES-R. The MSCEIT: PE level of significance was equal to .05.

Table 15

Hierarchical Multiple Regression of IES-R on the Frequency of Trauma and the 5-PR Model Variables.

Variables	Step 1	Step 2
Step 1:		
Frequency of Trauma (Time 3)	.19*	.16
Step 2:		
BRCS		-.04
LOT-R		-.11
HPI		-.25**
SS: Supervisors		.08
SS: Colleagues		-.26*
SS: Family		-.02
MSCEIT: PE		-.17
MSCEIT: FT		.09
MSCEIT: UE		-.20*
MSCEIT: ME		.19*
Multiple R	.19	.54
Total R²	.04	.29
Adjusted R²	.03*	.23***
R² Change	.04*	.25***

* $p < .05$, ** $p < .01$, *** $p < .001$.

When the dependent variable was HSCL-21 (see Table 16), at Step 1, the control variable of Frequency of Trauma at Time 3 was nonsignificant. At Step 2, the Frequency of Trauma at Time 3 remained nonsignificant and the 5-PR model variables of LOT-R and SS: Colleagues accounted for 33% of the variance: R^2 change = .33, $F(10, 133) = 6.81$, $p < .001$.

Table 16

Hierarchical Multiple Regression of HSCL-21 on the Frequency of Trauma and the 5-PR Model Variables.

Variables	Step 1	Step 2
Step 1:		
Frequency of Trauma (Time 3)	.12	.06
Step 2:		
BRCS		.01
LOT-R		-.41***
HPI		-.08
SS: Supervisors		.03
SS: Colleagues		-.23*
SS: Family		-.01
MSCEIT: PE		-.13
MSCEIT: FT		.07
MSCEIT: UE		-.14
MSCEIT: ME		.07
Multiple R	.12	.59
Total R²	.01	.35
Adjusted R²	.01	.29***
R² Change	.01	.33***

* $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis Four

Hypothesis 4 stated that psychological resilience would be positively related to physical health. This hypothesis was tested first by evaluating the correlations between the 5-PR model variables and Self-Rated Health. There were significant positive relationships between the variables of BRCS, LOT-R, HPI, SS: Supervisor, SS: Total, and MSCEIT: PE, and Self-Rated Health. (see Table 14).

To further test this hypothesis, as in Hypothesis 3, the contribution of the frequency of trauma at Time 3 was controlled. Then the relationship between the pathogenic variable of Self-Rated Health and the variables of the 5-PR model was evaluated. This was completed by using a hierarchical multiple regression. At Step 1,

the TSS: Frequency of Trauma at Time 3 was entered as the independent variable. The variable of Self-Rated Health was entered as a dependent variable. At Step 2, the variables of the 5-PR model were entered as independent variables. In relation to social support and emotional competence constructs, the subscales of the social support and emotional competence measures were used. Table 17 shows the results for this analysis. At Step 1, the control variable of Frequency of Trauma at Time 3 was not significant. At Step 2, the Frequency of Trauma at Time 3 remained nonsignificant and the 5-PR model variables of BRCS and HPI accounted for 30% of the variance: R^2 change = .30, $F(10, 131) = 5.55$, $p < .001$.

Table 17

Hierarchical Multiple Regression of Self-Rated Health on the Frequency of Trauma and the 5-PR Model Variables.

Variables	Step 1	Step 2
Step 1:		
Frequency of Trauma (Time 3)	-.02	.00
Step 2:		
BRCS		.23*
LOT-R		.07
HPI		.42***
SS: Supervisors		.11
SS: Colleagues		-.14
SS: Family		.07
MSCEIT: PE		.14
MSCEIT: FT		-.02
MSCEIT: UE		-.12
MSCEIT: ME		.00
Multiple R	.02	.55
Total R²	.00	.30
Adjusted R²	-.01	.24***
R² Change	.00	.30***

* $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis Five

Hypothesis 5 stated that the relationships in Hypothesis 1 will be moderated by psychological resilience. A moderation analysis refers to situations where the relationship between the independent variable and the dependent variable change because of the moderating variable. In this hypothesis, the independent variables were the exposure to potentially traumatic events and the dependent variables were the pathogenic outcomes. The moderating variables were the components of the 5-PR model. To complete a moderation analysis, the independent and moderating variables are centered. Centering is completed by subtracting each variable's mean from the observed score. An interaction term was then created by multiplying these newly centered variables together (Howell, 2010).

This hypothesis was then tested with a moderation analysis utilising a hierarchal multiple regression. For this analysis, the dependent variables were: IES-R: Total, HSCL-21: Total, and Self-Rated Health. The independent variable was TSS: Frequency of Trauma. The moderating variables were the 5-PR model variables of BRCS, LOT-R, HPI, Social Support, and the MSCEIT. No significant correlations were observed between the three possible control variables, gender, education, and employment status, and the dependent variables, so these variables were not included in the moderation analyses (Allison, 1999). Ethnicity was not included because the variable did not reach the recommended split of at least 10/90% for criterion variables (Spector, 2011).

Moderation analysis was performed following the process outlined in Frazier, Tix, and Barron (2004). At Step 1 of the multiple regression the dependent variable was placed in the equation. Also at Step 1, the centered independent variable was entered as an independent variable. At Step 2 the centered moderating variable was entered as an independent variable. At Step 3, the interaction variable was placed as an independent variable. Calculations were performed with centered variables and original variables and there were no differences in the results.

The moderation analyses of the components of the 5-PR model were conducted individually. However, where social support and emotional competence were involved the four components of emotional competence and three components of social support were entered simultaneously. Three significant moderation analyses were observed in relation to the dependent variable of Self-Rated Health. The significant moderating variables were BRCS, SS: Supervisor, and SS: Colleagues. Table 18 shows the moderating effect of BRCS on the relationship between frequency of trauma and Self-Rated Health. At Step 1 the frequency of potentially traumatic events was not significant in predicting the variance of Self-Rated Health. At Step 2, the addition of BRCS explained 8% change in variance of Self-Rated Health: Adjusted R^2 change = .08, $F(1, 157) = 14.32$, $p < .001$. At Step 3, the addition of the interaction term, Frequency of Trauma (Time 3) x BRCS, explained 6% change in variance of Self-Rated Health: Adjusted R^2 change = .06, $F(1, 156) = 9.94$, $p < .05$.

Table 18

Hierarchical Multiple Regression of Self-Rated Health on Frequency of Trauma, BRCS, and Frequency of Trauma x BRCS Variables Showing Standardised Regression Coefficients, Multiple R, Total R², Adjusted R², and R² Change.

Variables	Step 1	Step 2	Step 3
Step 1: Potentially Traumatic Events Frequency of Trauma (Time 3)	-.06	-.13	-.13
Step 2: 5-PR Model Variable BRCS		.30***	.32***
Step 3: Interaction Term Frequency of Trauma (Time 3) x BRCS			.24**
Multiple R	.06	.29	.38
Total R²	.00	.09	.14
Adjusted R²	.00	.08**	.13***
R² Change	.00	.08***	.06**

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 19 shows the moderating effect of the variables of social support on the relationship between frequency of trauma and Self-Rated Health. At Step 1 the frequency of trauma at Time 3 was not significant in predicting the variance of Self-Rated Health. At Step 2, the addition of the social support variables explained a nonsignificant change in variance of 3% of Self-Rated Health. At Step 3, the addition of the interaction terms explained 6% change in variance of Self-Rated Health: Adjusted R² change = .06, $F(3, 139) = 3.17$, $p < .05$.

Table 19

Hierarchical Multiple Regression of Self-Rated Health on Frequency of Trauma, SS: Colleagues, SS: Supervisors, SS: Family, Frequency of Trauma x SS: Colleagues, Frequency of Trauma x SS: Supervisors, Frequency of Trauma x SS: Family Variables Showing Standardised Regression Coefficients, Multiple R, Total R², Adjusted R², and R² Change.

Variables	Step 1	Step 2	Step 3
Step 1: Potentially Traumatic Events			
Frequency of Trauma (Time 3)	-.02	.01	.02
Step 2: 5-PR Model Variables			
SS: Colleagues		-.09	-.08
SS: Supervisors		.18	.14
SS: Family		.08	.09
Step 3: Interaction Terms			
Frequency of Trauma (Time 3) x SS: Colleagues			.36**
Frequency of Trauma (Time 3) x SS: Supervisors			-.25*
Frequency of Trauma (Time 3) x SS: Family			-.15
Multiple R	.02	.18	.31
Total R²	.00	.03	.09
Adjusted R²	-.01	.01	.05
R² Change	.00	.03	.06*

* $p < .05$, ** $p < .01$, *** $p < .001$.

The interaction effects were plotted on a graph by utilising an online computer program (Jose, 2008). This produced a high score of one standard deviation above the mean and a low score of one standard deviation below the mean for the dependent variable in relation to the interaction between the moderator variable and independent variable. The moderation interaction of the effect of frequency of trauma and adaptive coping on Self-Rated Health was plotted on a graph (see Figure 2). The scores for this interaction were: 5.89 (Low Frequency of Trauma and Low Adaptive Coping), 6.01 (Low Frequency of Trauma and High Adaptive Coping), 5.22 (High Frequency of Trauma and Low Adaptive Coping), and 6.22 (High Frequency of Trauma and High Adaptive Coping). BRCS significantly moderated the frequency of trauma to

Self-Rated Health relationship. The relationship between frequency of trauma and Self-Rated Health was positive in relation to high BRCS scores. If the scores on BRCS were low then the relationship between Frequency of Trauma and Self-Rated Health was negative. This indicated that physical health improved on average when adaptive coping was high despite increased exposure to trauma, and that physical health decreased when adaptive coping was low when there was increased exposure to trauma.

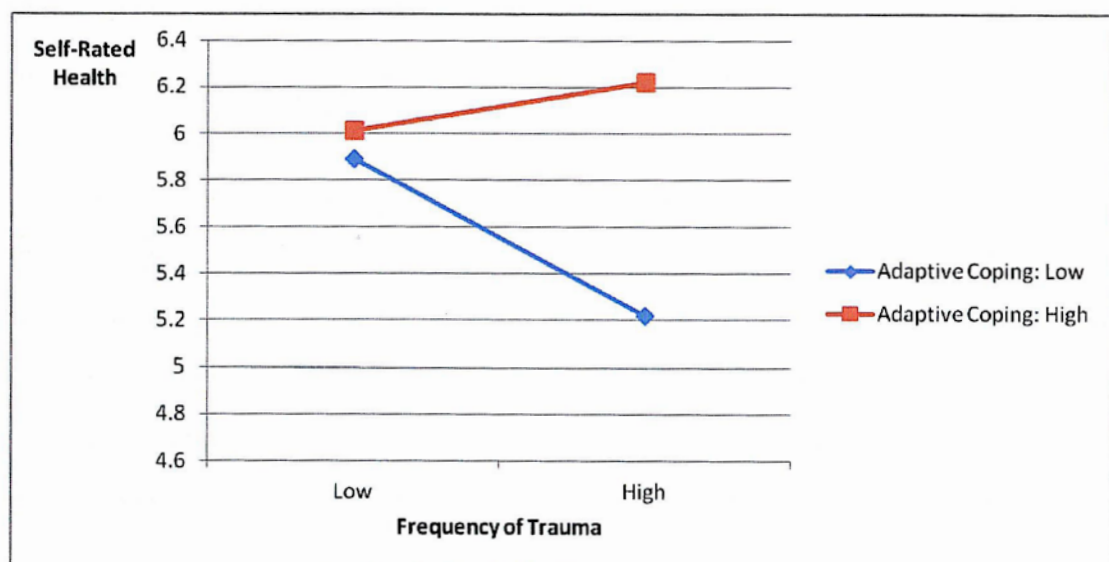


Figure 2. Moderating effect of adaptive coping on the relationship between frequency of trauma and self-rated health.

The moderation interaction of the effect of frequency of trauma on Self-Rated Health by collegial social support was plotted on a graph (see Figure 3). The scores, which were established using an online computer program (Jose, 2008), were 6.24 (Low Frequency of Trauma and Low SS: Colleagues), 5.52 (Low Frequency of Trauma and High: Social Support Colleagues), 5.71 (High Frequency of Trauma and Low SS: Colleagues), and 6.17 (High Frequency of Trauma and High: Social Support Colleagues).

SS: Colleagues significantly moderated the frequency of trauma to Self-Rated Health relationship. The relationship between frequency of trauma and Self-Rated Health was positive when SS: Colleagues was high. If the scores on the SS: Colleagues was low then the relationship between frequency of trauma and Self-Rated Health was negative. This indicated that physical health improved on average when social support from colleagues was high despite increased exposure to trauma.

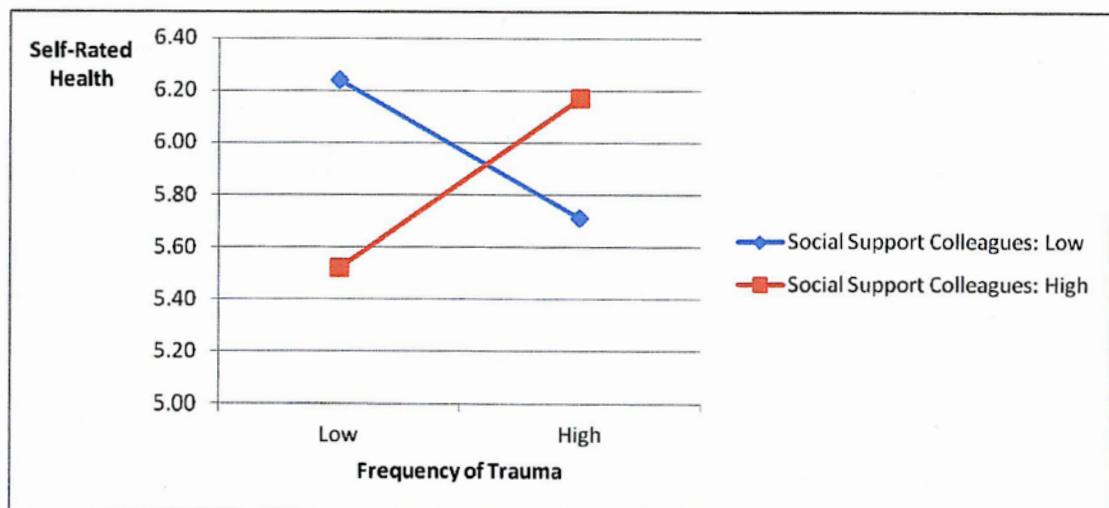


Figure 3. Moderating effect of collegial social support on the relationship between frequency of trauma and self-rated health.

The moderation interaction of the effect of frequency of trauma on Self-Rated Health by supervisor social support was plotted on a graph (see Figure 4). The scores, which were established using an online computer program (Jose, 2008), were 5.57 (Low Frequency of Trauma and Low SS: Supervisor), 6.22 (Low Frequency of Trauma and High: SS: Supervisor), 6.01 (High Frequency of Trauma and Low SS: Supervisor), and 5.85 (High Frequency of Trauma and High SS: Supervisor). SS: Supervisor significantly moderated the frequency of trauma to Self-Rated Health relationship. The relationship

between frequency of trauma and Self-Rated Health was positive when SS: Supervisor was low. The relationship between frequency of trauma and Self-Rated Health was negative when SS: Supervisor was high. This indicated that on average physical health improved when they had less social support from supervisors despite increased exposure to trauma.

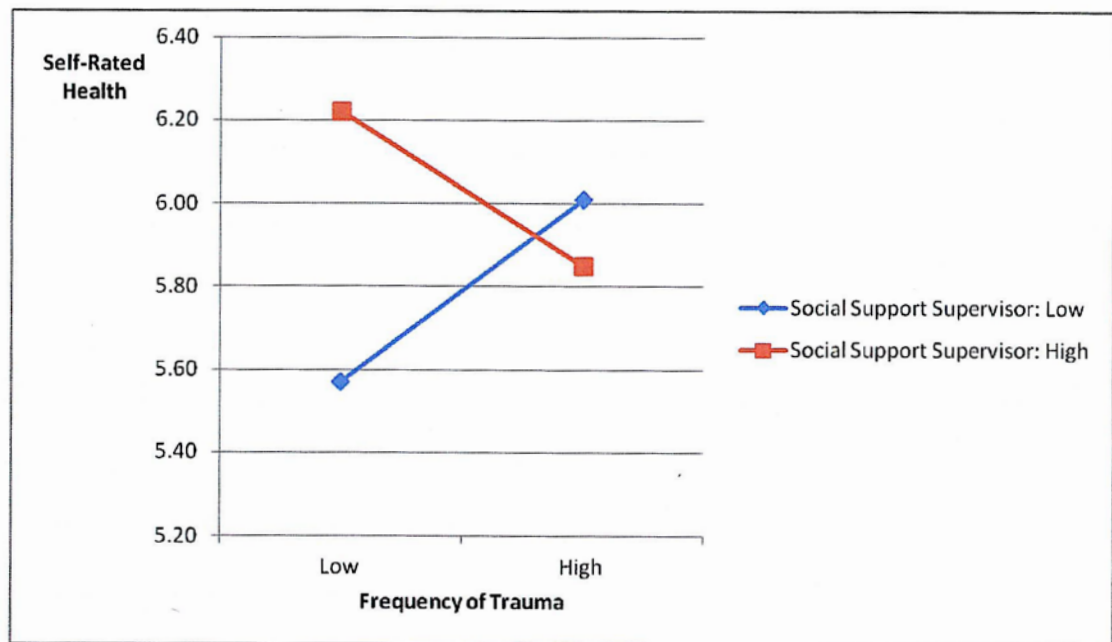


Figure 4. Moderating effect of supervisor social support on the relationship between frequency of trauma and self-rated health.

Hypothesis Six

Hypothesis 6 stated that the relationship of emotional competence with posttraumatic stress and psychological distress would be mediated by adaptive health practices. Mediation occurs when the relationship between the independent variable and the dependent variable is explained by a third variable known as the mediator. There must be significant correlations between the independent variable and the mediator, the mediator and the dependent variable, and the independent variable and

the dependent variable. When the mediator and the independent variable concurrently predict the dependent variable, the previously significant correlation between the independent variable and the dependent variable will reduce (Shrout & Bolger, 2002).

Table 20 reported the correlations between emotional competence, posttraumatic stress, and psychological distress. No mediation analyses were completed because the assumptions stipulated by Baron and Kenny (1986) were not met. Baron and Kenny stated that the assumptions required for a mediation analysis are correlations between the three variables concerned: the independent variable, the mediating variable, and the dependent variable. There were significant correlations between adaptive health practices and posttraumatic stress, facets of emotional competence and psychological distress, and facets of emotional competence and posttraumatic stress. However, there were no correlations between emotional competence and adaptive health practices. This hypothesis was therefore not supported.

Table 20

Pearson's Correlations between Emotional Competence, Adaptive Health Practices, Posttraumatic Stress, and Psychological Distress (N = 170)

	1	2	3	4	5	6
1. MSCEIT: PE						
2. MSCEIT: FT	.47***					
3. MSCEIT: UE	-.02	.03				
4. MSCEIT: ME	.22**	.39***	.13			
5. MSCEIT: Total	.72***	.77***	.35***	.65***		
6. HPI	.07	.07	.15	.06	.13	
7. IES-R: Intrusion	-.10	-.08	-.25**	.04	-.08	-.29***
8. IES-R: Avoidance	-.10	.00	-.26**	.00	-.12	-.25**
9. IES-R: Hyperarousal	-.16*	.01	-.18*	.03	-.10	-.33***
10. IES-R: Total	-.12	.04	-.25**	.02	-.11	-.31***
11. HSCL: GFD	-.08	.03	-.11	-.09	-.08	-.09
12. HSCL: SD	-.10	.07	-.12	-.03	-.06	-.14
13. HSCL: PD	-.19*	-.06	-.19*	-.09	-.20**	-.14
14. HSCL: Total	-.14	.02	-.16*	-.08	-.14	-.15

*p < .05, **p < .01, *** p < .001 (two-tailed).

Because of the correlations found between the HPI and all facets of the IES-R, post hoc analyses were completed in relation to the variables of HPI and the variables from the IES-R. When the IES-R was regressed on exercise, good eating habits, not smoking, alcohol consumption, and rest and relaxation these variables together explained 9% of the variance: $F(5, 168) = 4.40, p < .01$. However, only eating habits: $B = -.16, p < .05$, and rest and relaxation: $B = -.17, p < .05$ significantly contributed to the equation. The subscales of the IES-R, hyperarousal, avoidance, and intrusion, were regressed on the adaptive health practices. Table 21 reports the standardised regression coefficients β , R^2 , Adjusted R^2 , and F score for these equations. These results showed that the adaptive health practices of rest and relaxation contributed negatively to intrusive symptoms, appropriate eating habits contributed negatively to avoidance symptoms, and good alcohol practices, appropriate eating habits, and rest and

relaxation contributed negatively to hyperarousal symptoms. Note the adaptive health practice of not smoking had a significant level of .05 in relation to intrusive symptoms. Adaptive health practices were responsible for 8% of the variance in intrusive symptoms, 6% of the variance in avoidance symptoms, and 10% of the variance in hyperarousal symptoms (de Terte, Stephens, & Huddleston, 2011, July).

Table 21

Hierarchical Multiple Regression of IES Subscales: Intrusion, Avoidance, and Hyperarousal, on Health Practices Variables (N = 174).

<i>HPI Variable</i>	<i>Intrusion (β)</i>	<i>Avoidance (β)</i>	<i>Hyperarousal (β)</i>
Not Smoking	-0.15	-0.07	-0.07
Exercise	-0.10	-0.03	-0.08
Alcohol Use	-0.08	-0.11	-0.16*
Eating Habits	-0.10	-0.19**	-0.15*
Rest & Relaxation	-0.17*	-0.13	-0.19**
R²	.10	.09	.13
Adjusted R²	.08	.06	.10
F	3.85**	3.35*	4.86***

* $p < .05$, ** $p < .01$, *** $p < .001$.

Psychological Support

Hypothesis Seven

Hypothesis 7 stated that there would be no difference in the levels of posttraumatic stress, psychological health, and physical health between those who saw a psychologist pursuant to the trauma policy and those who did not see a psychologist. There were 94 participants who indicated that they had consulted a psychologist and 80 participants who indicated that had not. To evaluate this hypothesis, the main variables of posttraumatic stress, psychological distress, and physical health were compared. The means of these three variables are displayed in Table 22.

Table 22

Mean Comparisons on Pathogenic Outcomes of Those Participants who Consulted a Psychologist and Those Participants who did not Consult a Psychologist

<i>Variables</i>	<i>Consulted Psychologist (n = 94)</i>		<i>Not Consulted Psychologist (n =80)</i>	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
IES-R: Total	17.63	18.74	11.79	14.34
HSCL-21: Total	37.55	10.31	34.76	8.15
Self-Rated Health	5.88	0.83	5.89	0.91

An independent t-test showed that the mean level of posttraumatic stress was significantly higher in the group who consulted a psychologist than the group who did not consult a psychologist ($t = 2.33$, $df = 170.16$, $p < .05$, two-tailed). The mean difference between the groups was 5.84 and the 95% confidence interval for the mean difference between the two groups was between 0.88 and 10.80. The effect size was 0.35 (J. W. Ray & Shadish, 1996). An independent t-test showed that the mean level of psychological distress was significantly higher in the group who consulted a psychologist than the group who did not consult a psychologist ($t = 1.99$, $df = 171.10$, $p < .05$, two-tailed). The mean difference between the groups was 2.79 and the 95% confidence interval for the mean difference between the two groups was between 0.03 and 5.56. The effect size was 0.30 (J. W. Ray & Shadish, 1996). An independent t-test showed no significant difference between the two groups in relation to physical health.

To control for the effects of traumatic experiences, a hierarchical multiple regression was conducted. The variable of IES-R was the dependent variable, and the frequency of trauma was entered as the first step as a control variable. At Step 2, consultation with a psychologist was entered as an independent variable. When this analysis was performed the relationship between IES-R and consultation with a psychologist remained significant (see Table 23), but the relationship was negative.

Table 23

Hierarchical Multiple Regression of IES-R on Frequency of Trauma and Consulting a Psychologist Variables Showing Standardised Regression Coefficients, Multiple R, Total R², Adjusted R², and R² Change.

Variables	Step 1	Step 2
Step 1: Control	.19*	.14
Frequency of Trauma (Time 3)		
Step 2:		
Consult Psychologist		-.16*
Multiple R	.19	.25
Total R²	.04	.06
Adjusted R²	.03*	.05**
R² Change	.04*	.02*

* $p < .05$, ** $p < .01$, *** $p < .001$.

A further hierarchical multiple regression analysis was completed to test whether the degree of exposure to trauma explained the relationship between consulting a psychologist and the variable of HSCL-21. When HSCL-21 was the dependent variable, the frequency of trauma was entered as the first step as a control variable. At Step 2, consultation with a psychologist was entered as an independent variable. When this analysis was performed the relationship with seeing a psychologist became nonsignificant (see Table 24).

Table 24

Hierarchical Multiple Regression of HSCL-21 on Frequency of Trauma and Consulting a Psychologist Variables Showing Standardised Regression Coefficients, Multiple R, Total R², Adjusted R², and R² Change.

Variables	Step 1	Step 2
Step 1: Control	.14	.10
Frequency of Trauma (Time 3)		
Step 2:		
Consult Psychologist		-.14
Multiple R	.14	.19
Total R²	.02	.04
Adjusted R²	.01	.03
R² Change	.02	.02

* $p < .05$, ** $p < .01$

Summary of Results

This section reviews the results of the hypothesis testing from this chapter:

Hypothesis 1: Exposure to potentially traumatic events was positively related to posttraumatic stress and psychological distress, but was not related to physical health.

Hypothesis 2: Exposure to potentially serious traumatic events was related to posttraumatic stress, but was not related to physical health. Exposure to different types of potentially serious traumatic events was positively related to psychological distress, but the frequency of potentially serious traumatic events was not related to psychological distress.

Hypothesis 3: The aspects of the 5-PR model that were negatively related to posttraumatic stress were adaptive health practices, social support from colleagues,

and understanding emotions. The aspects of the 5-PR model that were negatively related to psychological distress were optimism and social support from colleagues.

Hypothesis 4: The aspects of the 5-PR model that were positively related to physical health were adaptive coping and adaptive health practices.

Hypothesis 5: The aspects of the 5-PR model that moderated the relationship between exposure to potentially traumatic events and physical health were adaptive coping, social support from supervisors, and social support from colleagues.

Hypothesis 6: The hypothesis that the relationship of emotional competence with posttraumatic stress and psychological distress will be mediated by adaptive health practices was not supported. However, the adaptive health practices were negatively related to posttraumatic stress.

Hypothesis 7: When the exposure to potentially traumatic events was controlled the relationship between consultation with a psychologist and posttraumatic stress remained significant, but consultation with a psychologist was negatively correlated to posttraumatic stress. Furthermore, when exposure to potentially traumatic events was controlled the relationship between consultation with a psychologist and psychological distress was nonsignificant.

CHAPTER EIGHT

DISCUSSION

This study involved conceptualising psychological resilience in a multidimensional nature in the form of the 5-PR model. A research project that involved the evaluation of the 5-PR model with a series of hypotheses was reported. This chapter will discuss the results of the examination of these hypotheses in regards to the multidimensional model of psychological resilience. After a review of the hypotheses to evaluate the 5-PR model, a reconsideration of the 5-PR model and how the results from this study have contributed to reconceptualising the multidimensional nature of psychological resilience will be discussed. A key component of the 5-PR model was emotional competence and a section of this chapter will review this proposed aspect of psychological resilience. Finally, this chapter will review the web-based methodology used in this project, the limitations of this research project, and future research that could be undertaken.

Results of Research Aims and Hypotheses

Potentially Traumatic Events

In just over 11 years of police service these participants had experienced on average approximately four different types of traumatic events, six occurrences of traumatic events, two different serious traumatic events, and fewer than three occurrences of serious traumatic events. During the 11 years of police work, most of the sample had been assaulted or attended an unpleasant death. These findings are

consistent with other research with police officers in New Zealand (G. Buchanan, et al., 2001).

As outlined by Huddleston (2002) this sample had experienced a high level of exposure to potentially traumatic events in their first year of police work which included a 22-week training course. This level of exposure has continued in their current police service, but not at the same rate as during the participants' first year of service. There may be several reasons for this tapering off of exposure to potentially traumatic events. First, it may be an artefact of the TSS, in that the TSS does not capture all the potentially traumatic events that these participants have experienced. Second, the ability of participants to remember all occurrences of potentially traumatic events may be limited. These aspects of the measurement of potentially traumatic events will be discussed later in this chapter.

Another explanation for the tapering off of traumatic exposure may be that the sample included participants who had since left the police and there would be an expectation that those participants who had left the police would add to the reduction of the levels of exposure to potentially traumatic events. There were significant differences between the current employees and former employees of the New Zealand Police in relation to different kinds of potentially traumatic events experienced trauma and frequency of exposure overall. To my knowledge, there is limited published literature that has compared current police employees and former police employees. It was not surprising that there was a difference between the degree of exposure to potentially traumatic events between these two groups because it would be

anticipated that the exposure to potentially traumatic events would reduce appreciably when individuals left the organisation.

Pathogenic Outcomes

There were no significant gender differences between the three pathogenic outcome variables of posttraumatic stress, psychological distress, and physical health. In relation to posttraumatic stress, gender is a risk factor in the general population (Tolin & Foa, 2006), but in police and military populations the difference between genders has not been observed (Lilly, et al., 2009; Pole, et al., 2001). The result of no difference between genders in relation to posttraumatic stress was replicated in this study.

In this study, when using a diagnostic cutoff score of 33 on the IES-R (Creamer, et al., 2003), approximately 15% of the sample were above the recommended diagnostic cutoff score. In comparison to other studies with police officers, base rates of PTSD utilising a diagnostic cutoff score from the IES-R have been found to be 34% (Violanti, et al., 2007), 49% (Kopel & Friedman, 1997), and 8% (Martin, et al., 2009). It should be noted that Violanti et al., used a cutoff score of 25, and Kopel and Friedman used a cutoff score of 26. In this sample with a recommended diagnostic cutoff of 25 with the IES, it was established at the commencement of training that 12% of the sample would have had PTSD. Whilst a year later, there was about 15% of the sample who were above the recommended diagnostic cutoff for PTSD. This sample's rate of PTSD was reasonably consistent, but the rate of cases was lower than some other studies (e.g., Violanti, et al., 2007) highlighted.

There appear to be limited studies that have utilised the total score of the IES-R to indicate levels of posttraumatic stress, particularly with samples of police officers. Researchers have either used a mean score of the 22 items (J. G. Beck, et al., 2008) or a clinical cutoff (Creamer, et al., 2003). Although there are limited studies of samples of police officers to make comparisons of the levels of posttraumatic stress found in this study, there are some studies to compare the results of this study.

The mean score for posttraumatic stress for this sample was 14.87, which is considered to be indicative of some symptoms of posttraumatic stress. In a sample of police officers, who had been exposed to a technological disaster, a mean score of 16.2 on the IES-R approximately 18 months after the event was found (Renck, et al., 2002). The results from this study were compared to that of a sample of Australian Navy Personnel who were exposed to a multiple fatality from a fire that occurred on one of their ships. The sample of Navy personnel was surveyed twice. The first time was 4 months after the fire and the second time was 11 months after the fire. The scores on the IES-R were 24.29 and 24.09 respectively (Rayner & Viney, 2010). A further study investigated the occupational traumatic stress that journalists encountered during the course of their work. Journalists report in the media on various events involving potentially traumatic events. In this sample of 270 journalists working for Japanese news companies the mean score on the IES-R was 7.33 (Hatanaka, et al., 2010). Fujita and Nishida (2008) investigated the levels of posttraumatic stress in a Japanese sample who had been involved in motor vehicle accidents. They found levels of posttraumatic stress to be 21.00 and 21.10 approximately 5 and 14 months after the motor vehicle

accident. A further study that investigated levels of posttraumatic stress in a sample of rescue workers and a sample of military personnel after an earthquake found levels to be 27.70 and 10.40 respectively. The level of posttraumatic stress found in this sample of police officers was comparable to the police sample that had endured the technological disaster and the military sample, but not the Australian Navy sample. In addition, the results in this study showed that the levels of posttraumatic stress in the general population appeared to be higher.

Although the levels of posttraumatic stress found in this study are comparable to some studies, they are lower than some studies highlighted. The obvious explanation is that this sample is able to manage the outcomes from potentially traumatic events and the participants from this sample are able to cope with the demands of police work. Another possible explanation for these levels of posttraumatic stress is that the participants are underreporting their symptoms. Apart from the obvious explanation that participants are loath to report the full extent of their posttraumatic stress, it may be that the participants are not aware of the impact of the potentially traumatic events, and that they may have limited insight into the actual symptoms of posttraumatic stress. This may be an example of the confusion hypothesis (Ciarrochi, et al., 2002) in that individuals who are low in emotional perception are insensitive to stress and the effect it is having on them. The confusion hypothesis was not an objective of this study, but the positive relationship found in the current study between the measures of managing emotions with posttraumatic stress provides some evidence of this relationship. This may mean that participants who are more able to

manage their emotions are more aware of their emotions that in turn increase their risk of developing posttraumatic stress.

In relation to psychological distress there were significant differences between all three data collection points. Psychological distress appears to have increased over the 11 years of data collection. It appears that police personnel become more distressed as they have been in the job longer. The explanation for this increase could be that police personnel are more likely to indicate symptoms of psychological distress as measured by the HSCL-21 because the measure asks about a series of questions relating to behavioural and physical symptoms that are not anchored to any specific event. Recording actual behavioural examples may be more effective than recording thoughts and feelings in relation to a specific event. The level of psychological distress is lower than a student sample in Australia who had a mean score of 39.72 (Wilson, 2010). In contrast, the level of psychological distress was higher than a sample of 317 students in USA who had a mean score of 33.24 (Harari, et al., 2005). In neither of these studies were the subscales of the HSCL-21 reported. Although in the current study the participants' level of psychological distress had increased over the three data collection points, the level of psychological distress at Time 3 was consistent with other reported studies.

The results indicated that the participants' evaluation of their own physical health reduced between Time 1 and Time 2, but there were no significant differences between Time 2 and Time 3. This appears to indicate that the sample's reported perception of their own physical health decreased over the initial phases of their police

work, but their perception of their physical health did not significantly change between Time 2 and Time 3. These results suggest that initially an individual involved in police work may perceive that their physical health decreases, but that this perception plateaus as their career continues. However, this result needs to be replicated.

The Relationship Between Potentially Traumatic Events and Pathogenic Outcomes

This study investigated the relationship between the type of potentially traumatic event, the type of potentially serious traumatic event, the frequency of these two forms of potentially traumatic events and pathogenic consequences. There was an expectation that exposure to potentially traumatic events and potentially serious traumatic events would lead to pathogenic outcomes. In addition, given that exposure to serious trauma is a risk factor for developing pathogenic consequences, there was a belief that there would be a noticeable difference in the effect of exposure to potentially serious traumatic events in comparison to the exposure to all potentially traumatic events.

This study found positive correlations between the measures of potentially traumatic events with posttraumatic stress. There were also positive correlations between three of the indices of potentially traumatic exposure with psychological distress. There were no correlations between the measures of potentially traumatic events with physical health. These results support the hypothesised relationship between exposure to potentially traumatic events and posttraumatic stress. This result is in accordance with other studies that have found a relationship between exposure to potentially traumatic events and posttraumatic stress (G. Buchanan, et al., 2001). The

results also supported the relationship between three of the indices of potentially traumatic events with psychological distress. However, this relationship was quite weak, and given the established relationship that has been found between exposure to potentially traumatic events and psychological distress (e.g., S. L. Williams, et al., 2007), it was surprising that this relationship was not stronger. It should be pointed out that there was a reasonable consistency in the relationship between the indices of potentially traumatic events and the two pathogenic outcomes of posttraumatic stress and psychological distress. This has been found in another study where there was little difference between measures of exposure to potentially traumatic events and exposure to potentially serious traumatic events in relation to posttraumatic stress (Weiss, et al., 2010). However, research has predominately found that exposure to more potentially serious traumatic events is a risk factor for developing posttraumatic stress and other psychopathology (e.g., Lerias & Byrne, 2003). No relationship was found in the current study between exposure to potentially traumatic events and physical health, despite there being evidence that such exposure is detrimental to an individual's physical health (Schnurr & Green, 2003). Thus, there was a relationship between exposure to potentially traumatic events and the pathogenic consequences of posttraumatic stress and psychological distress, but there were minimal differences between the effects of different indices.

Psychological Resilience

This part of the study investigated the utility of the 5-PR model. There were promising relationships found between the cognitive, behavioural, and environmental

components of the model and pathogenic outcomes. There were aspects of emotional competence that were found to have resilience abilities. However, the overarching construct of emotional competence had limited contribution to the 5-PR model and the construct of emotional competence should not be considered as contributing to the domain of psychological resilience. The concept of emotional competence is discussed in greater detail later in this chapter.

The current study found that adaptive health practices, social support from colleagues, and a greater understanding of emotions acted as resilience factors in relation to the development of posttraumatic stress. This study also found that optimism and social support from colleagues acted as resilience factors to prevent psychological distress. Finally, adaptive coping, adaptive health practices, and social support from colleagues acted as resilience factors to support physical health. These results suggest that the factors of optimism, adaptive coping, adaptive health practices, and collegial social support show promise in the 5-PR model of psychological resilience.

The negative correlations observed in the current study between the measures of optimism with the measures of posttraumatic stress and psychological distress, and the positive correlations with the measure of physical health indicate that maintaining an optimistic outlook will reduce the negative effects of potentially traumatic events. A simplistic view is that the more optimistic a police officer is, the less likely they are to experience pathogenic consequences after exposure to potentially traumatic events. Research studies have shown that when people have encountered adversity, those individuals who are less optimistic tend to report more distress (Carver, et al., 2010). In

addition, researchers have argued that individuals who are optimistic are more likely to engage in practices that prevent or mitigate pathogenic outcomes of potentially traumatic events. Conversely, people who are less optimistic are more likely to engage in maladaptive coping strategies (Carver, et al., 2010). People who are optimistic when confronted with adversity tend to draw positive emotions from the event. For example, people who are optimistic tend to display lower levels of depression or other mental concerns (Segerstrom, 2007). The results from the current study suggest that being optimistic will reduce the consequences of exposure to potentially traumatic events.

Adaptive health practices were found to have a relationship with all the measures of pathogenic outcomes. Negative correlations were found between the measures of adaptive health practices with posttraumatic stress and psychological distress, and positive correlations were found between the measures of adaptive health practices with physical health. These results support previous findings that suggest that there may be some benefit in eating well, maintaining physical exercise, rest and relaxation, not smoking, and appropriate alcohol consumption on the reduction in psychopathology. There is a large amount of research that has shown the beneficial effect of adaptive health practices to physical health (e.g., Shi, et al., 2004). There was limited scientific evidence that made the same link between adaptive health practices in the prevention of mental health difficulties with people who have been exposed to potentially traumatic events. However, M. Buchanan and Keats (2011) illustrated in a sample of journalists that physical exercise was a helpful strategy to address burnout from their work. There was a large effect in relation to adaptive health

practices between groups dichotomised into those probably with PTSD and those without PTSD. This study has provided support for the idea that adaptive health practices including physical exercise may help to reduce pathogenic outcomes experienced by police officers exposed to potentially traumatic events.

Social support was found to have a negative relationship with the measures of pathogenic consequences. In particular, there were negative relationships between the measures of social support from colleagues and supervisors with posttraumatic stress and psychological distress. Furthermore, it was established that those participants who were below the cutoff score of 33 on the IES-R, which was used to classify participants as having PTSD, utilised more social support from colleagues. This relationship resulted in a medium effect. The only social support variable that contributed to the 5-PR model in relation to posttraumatic stress was social support from colleagues. The social support from colleagues had the strongest impact on posttraumatic stress. The 5-PR model accounted for 25% of the variance to posttraumatic stress. The only social support variable that contributed to the 5-PR model in relation to psychological distress was social support from colleagues. The 5-PR model accounted for 29% of the variance in relation to psychological distress. From these findings it appears that the key social support variable that impacts on pathogenic consequences of police work is social support from colleagues.

An explanation for those police officers who utilise collegial social support is that they view colleagues as an appropriate source of support as opposed to supervisors because their peers may be less intimidating than supervisors (Martin, et

al., 2009). Police officers may seek support from their colleagues because there are no ramifications or consequences associated with colleagues while there may be with supervisors (Rowe & Regehr, 2010). In addition, police officers do not utilise family members as a means of social support because they want to protect their family from the traumatic nature of police work. Generally, social support from colleagues looks to be an effective strategy to reduce the effects of exposure to potentially traumatic events.

It was predicted that the 5-PR model would moderate the relationship between exposure to potentially traumatic events and the pathogenic outcomes of posttraumatic stress, psychological distress, and physical health. However, there were only three significant moderating variables, adaptive coping, social support from supervisors, and social support from colleagues. These variables only modified the relationship between potentially traumatic events and physical health. Adaptive coping modified the relationship between exposure to potentially traumatic events and physical health. When the exposure to potentially traumatic events was low there was minimal difference between the two types of adaptive coping styles. However, when the exposure to potentially traumatic events became high, if the participants' adaptive coping style was low then their physical health decreased, but when the participants' adaptive coping style was high then their physical health increased. This result suggests that an adaptive coping style will help when faced with high adversity, which is in accordance with the literature (Sinclair & Wallston, 2004).

The next moderating variable was social support from colleagues. The results of the current study suggested that participants who are faced with high exposure to potentially traumatic events will have better physical health on average if they have higher social support from colleagues. When the frequency of exposure to potentially traumatic events is low, participants who perceive that their physical health is low may need more social support than participants who perceive that their physical health is high. This result was masked because of the different relationships between the aspects of social support with physical health. Thus, social support from colleagues appears to assist participants' physical health where there have been high levels of exposure to potentially traumatic events.

The last moderating variable was social support from supervisors. The results of the current study suggest that social support from supervisors moderated the relationship between exposure to potentially traumatic events and physical health. This result suggested that participants who are faced with low levels of exposure to potentially traumatic events will seek more social support from supervisors and have better physical health. However, when the exposure to potentially traumatic events is high, physical health is slightly higher for participants who have low social support from supervisors. It may be that for routine exposure to potentially traumatic events participants seek the support of supervisors that improves their perceived physical health, but for high levels of exposure to potentially traumatic events participants do not seek the same levels of social support from supervisors and their physical health is not perceived to be as high.

It should be pointed out that with the last two relationships when the exposure to potentially traumatic events increased, so did the participants' physical health. This is contrary to the scientific evidence (Schnurr & Green, 2003) and also to the present correlations that illustrated a nonsignificant, but negative relationship. The positive main effect shown in the regressions remains nonsignificant and the change in sign is caused by the listwise deletions when the moderating analyses were completed. The effect of importance here is the difference between low and high levels of supervisor support. It seems that high supervisor support may be required when exposure to potentially traumatic events is low and this impacts on participants' perception of physical health. However, the effect sizes for the support interactions are small and require further investigation.

The relationship between emotional competence and pathogenic consequences was not mediated by adaptive health practices. This result suggests that because someone is emotionally competent they are not more likely to engage in adaptive health practices to mediate pathogenic consequences. However, post hoc analyses showed that the adaptive health practices did account for the variance in the three subconstructs of posttraumatic stress. This suggests that adaptive health practices are preventive strategies for people routinely involved in exposure to potentially traumatic events. This is in accordance with the scientific evidence that illustrates that adaptive health practices are protective mechanisms for mental health issues (M. Buchanan & Keats, 2011), physical health, and general wellbeing (Shi, et al., 2004).

Psychological Support

This hypothesis stated that there would be no difference in levels of pathogenic consequences between those participants who had consulted a psychologist and those who had not consulted a psychologist. In the group that consulted a psychologist there were significantly higher levels of posttraumatic stress and psychological distress. There were no differences between the groups in relation to physical health. Further analyses showed that when the frequency of exposure to potentially traumatic events was controlled there was no relationship between psychological distress and consultation with a psychologist. When further analyses were completed between the levels of posttraumatic stress and consultation with a psychologist the relationship remained significant, but it was negatively correlated. This is contrary to the evidence regarding psychological debriefing (Deville, et al., 2006). However, this could be tentative support for psychological first-aid (Vernberg, et al., 2008). Nevertheless, this study illustrates that individuals who need the most help are seeking professional help.

Psychological Resilience: What is it?

A central question for this study is how has our knowledge of psychological resilience increased? The results of this study suggest that a useful way to interpret psychological resilience is as a combination of cognitions, behaviours, and environmental factors. These factors are optimism, adaptive coping, adaptive health practices, and social support from colleagues. The emotional competence factor of understanding emotions did show some effect, but this factor could actually be conceptualised as cognitive factors. It is evident that cognitions play a pivotal role in

how an individual reacts to experiences that would contribute to resilience. The psychological resilience model presented in this study could be reconceptualised as involving three components and more appropriately be known as the three-part model of psychological resilience (3-PR model).

The cognitive component would include optimism and adaptive coping. Other factors that would need to be considered to be included under this component would be cognitive coping mechanisms. Cognitive coping mechanisms include reappraisal, behavioural distraction, and cognitive distraction (Pietrzak, Morgan, & Southwick, 2010). Given the role of the cognitive aspect in the 5-PR model and the role that adaptive coping has played in this research project it seems important to expand this area of the model. In addition, Pietrzak and colleagues found that cognitive distraction was a protective factor in relation to sleep difficulties in military personnel with PTSD. Consideration would need to include self-efficacy. Self-efficacy refers to the ability of an individual to perform tasks when faced with adversity (Bandura, 1997). Why has self-efficacy been suggested as a component of the cognitive aspect of the 3-PR model? The results of the current study has provided some evidence that optimism and adaptive coping are factors in a multidimensional model of psychological resilience. However, from the results of this study there appears to be other factors that contribute to the psychological resilience of police officers. Bandura has suggested that self-efficacy is a precursor to having an optimistic view on future events. Thus, given the resilient effects of optimism that were illustrated in this study it seems imperative to evaluate the domain of self-efficacy to see if it has the same resilient characteristics.

In this study, the cognitive aspect has found to be important to psychological resilience, in particular the components of optimism and adaptive coping.

A promising aspect of this research was the adaptive health practices that police officers utilised and the resilient effects these practices showed. Post hoc analyses of the components that were assessed during this research included smoking habits, alcohol use, rest and relaxation, eating habits, and exercise. These adaptive health practices showed promise as resilience factors. Research studies have shown that adaptive health practices such as exercise are beneficial in the reduction and alleviation of mental health difficulties (M. Buchanan & Keats, 2011). These components assessed actual behaviours that have been completed and can be classified as health behaviours and physical behaviours. The role of adaptive health practices needs to be replicated and extended as potential factors that contribute to psychological resilience to pathogenic consequences when individuals are faced with adversity.

The last component that needs some further clarification is an individual's environment. This study has shown that social support is an important aspect of psychological resilience. This project found that the aspect of social support that appeared to be the most beneficial to police officers after exposure to potentially traumatic events was collegial social support. Social support from the participant's supervisor and family were also examined, but collegial social support was the most consistent resilience factor. Thus, it may be that the peer support provided from their colleagues needs to be examined in greater depth. Greater in-depth analysis of how colleagues provide social support using a focus on different aspects of social support

such as informational, instrumental, and emotional support, and perceived, functional, or structural support (S. E. Taylor, 2007). Moreover, other sources of social support that could be explored are spiritual support and community support because they may prove to have similar attributes or mechanisms to peer social support. Peer social support seems a beneficial characteristic of psychological resilience and was effectively measured in this study, but a greater analysis of the construct is warranted.

What About Emotional Competence?

In Chapter 4 emotional competence was conceptualised as a key component of psychological resilience. Emotional competence was conceptualised as including the perception of emotions, using emotions to facilitate thought, the understanding of emotions, and the regulation of emotions (Neubauer & Freudenthaler, 2005). These aspects have been shown to impact on posttraumatic stress, psychological wellbeing, and physical health. Emotional competence was measured in this research with the MSCEIT. The four branches of the model assessed the four aspects of emotional competence. Despite previous research (e.g., Hunt & Evans, 2004) which indicated that emotional competence was a key factor in psychological resilience there was limited evidence from this research that emotional competence contributed to the 5-PR model.

There was some evidence that a greater ability in perceiving emotions and understanding emotions had a negative relationship with posttraumatic stress. However, these relationships were limited and the effect sizes were small. The only important relationship that was found was the relationship where understanding

emotions explained some of the variance of posttraumatic stress. Understanding emotions has been conceptualised as the ability of an individual to understand the complexity of emotions and how they combine, evolve, and change (Brackett & Salovey, 2004). Previous research projects have not focused on the multidimensional nature of emotional competence and tended to focus on certain aspects of what has been termed emotional competence in this study. The complexity of how emotional competence was conceptualised in this study may be why there have been limited significant results in relation to emotional competence. Despite the limited results found in relation to emotional competence, there was some importance found regarding the understanding of emotions.

Is an effective understanding of emotions important for individuals to be psychologically resilient? The understanding of emotions is thought to be important for individuals who are exposed to potentially traumatic events. It is believed that those individuals who have high understanding of emotions will be able to better manage the consequences of exposure to potentially traumatic events. There is limited research of the understanding of emotions in relation to individuals being exposed to potentially traumatic events. However, research has found that emotional understanding was negatively related to psychological wellness and physical health (Tsaousis & Nikolaou, 2005). In addition, research studies have found that those with higher levels of alexithymia, which includes a lack of emotional understanding, are more susceptible to stress and PTSD (Bagby, et al., 1994; Frewen, et al., 2006). Given these relationships, it would appear that this research project promotes the understanding of emotions as a

protective factor against pathogenic outcomes. Although this study did find some evidence of a negative relationship between the understanding of emotions and pathogenic outcomes, the relationship was tenuous.

The understanding of emotions may not fit within the emotional component of the 5-PR model. The reason that understanding emotions may not come within the ambit of the emotional component of the 5-PR model is because the understanding of emotions may actually involve more cognitive processes than emotional processes. As previously mentioned this aspect of emotional competence involves understanding the complexity of emotions and how they combine, evolve, and change (Neubauer & Freudenthaler, 2005). Although this component of emotional competence involves emotions, it involves a certain amount of intellectual understanding of how emotions combine, evolve, and change. Mayer and Salovey (1993) suggested that their model involved a certain amount of mental capacity. Thus, it is believed that this aspect of emotional competence may be better conceptualised under the cognitive theme of the 5-PR model.

The other aspects of emotional competence showed virtually no significant relationships with pathogenic outcomes. This study provides support for the confusion hypothesis that portrays individuals who are low in emotional perception are insensitive to psychopathology and not cognisant that the consequences of potentially traumatic events are impacting on them (Ciarrochi, et al., 2002). Thus, the results found in this project may illustrate that individuals who are routinely exposed to potentially traumatic events during the course of their work are not emotionally competent. Or as

was found in this study when participants were emotionally competent this resulted in an increase in psychopathology. If participants were emotionally competent it may be counterproductive to their psychological wellbeing.

One aspect of emotional competence that was anticipated to be involved in the 5-PR model was emotional regulation. Emotional regulation involves the ability to manage the emotional responses in self and others (Kashdan, et al., 2010). There is evidence that emotional dysregulation is the core of many mental health conditions (American Psychiatric Association, 2000). Research has found an association between emotional regulation difficulties and PTSD (Ehring & Quack, 2010), and that individuals who are emotionally competent utilise adaptive coping behaviours as a mechanism to alleviate the pathogenic consequences of potentially traumatic events (Saklofske, et al., 2007). However, in this study, emotional regulation was not found to be a psychological resilient factor, and there was a result that suggested that having high levels of emotional regulation may be counterproductive.

Emotional competence was expected to be a major factor in the 5-PR model. However, emotional competence did not contribute to the model as expected. Given the previous research that has indicated the role that emotional competence plays as a protective factor it was surprising. However, the cognitive, behavioural, and environmental aspects of the model seem to provide more compelling information.

Reflections

Web-Based Research

One of the methodological implications of this research was the utilisation of an internet based survey. One consideration when designing research is whether it will increase the response rate. The response rate in this study was comparable to other research projects involving police. For example, response rates with samples of police officers have been found to be 20% (McMurray & Karim, 2008), 58% (Leino, Selin, Summala, & Virtanen, 2011), 64% (Huddleston, 2002). The return rate in this study may be due to other considerations other than the use of a web-based survey. Other matters, such as the use of rewards, constant reminders, and the longitudinal research design. However, there appears to be advantages to a web-based survey.

These advantages include the ability to change or alter information as errors in the questionnaire were established, the ability to conduct a longer survey, and the ability to use both web-based and mail-out questionnaires together. The ability to alter mistakes or differences as they became apparent was vital. Some of these changes were only relevant to the web-based process, for example, the log-in details. There were other changes or information, which were communicated to prospective participants, that would not have been done without the use of technology. For instance, it was initially envisaged that the survey took about 90 minutes to complete. However, after reviewing computer records, it appeared that the survey took about 60 minutes to complete. Whilst this piece of information seems trivial, it would be

imperative to increase the return rate of the sample because time to complete a survey has been shown to be a key factor in increasing rate (Vicente & Reis, 2010).

Another factor in utilising this type of research design is that more information can be collected from the participants. The paper version of the survey was 60 pages in length. However, several of these pages were redundant especially during the TSS. These redundant pages cannot be eliminated in a paper based version of the questionnaire, but when a web-based questionnaire is utilised different skip patterns can be used to give the impression of a shorter questionnaire. There is also the consideration that participants will be able to return to an electronic questionnaire because of the automatic save facility. This would allow prospective participants to return to their last data entry point when they received reminders or they wanted to take a break. Whereas with a paper questionnaire prospective participants may have misplaced the questionnaire and they may not want to recommence the survey.

The final matter to consider when using a web-based questionnaire is how to reduce sampling bias. Sampling bias is an inherent problem with web-based questionnaires because there are still several groups who do not have access to the internet (Gurau, 2007). This was not an issue with this study because the sample was closed and whilst the primary method of data collection was via the web, a paper based questionnaire was also utilised. The use of the internet may be less useful when recruiting anonymous participants because there may be some security issues and sampling bias. Other advantages of using a web-based questionnaire include costs, efficiency, data handling, and data processing.

Implications

Although the model postulated did not prove completely successful, there were aspects of the model that were beneficial. From this research there is evidence that the components of the model are useful in the moderation and reduction of pathogenic outcomes. Thus, there seems some utility in disseminating this information to potential users. The potential users of this information are providers of care to police officers such as psychologists, and personnel in the New Zealand Police, such as welfare officers and human resources staff. In addition, an education package could be prepared that would be delivered as part of recruit training or modules that police officers complete as part of their probationary period with the New Zealand Police. This study has utilised a population of New Zealand Police officers who had approximately 11 years service. However, this research would be directly transferable to other organisations whose personnel are routinely exposed to potentially traumatic events, such as the military, ambulance service, fire service, and humanitarian services. It is acknowledged that the 3-PR model needs refinement and more studies need to replicate the present findings to develop the revised theoretical model. However, this research appears to have shown that the 3-PR model is an effective tool that can be used to conceptualise the multidimensional nature of psychological resilience and to enhance the resilience of people who are exposed to potentially traumatic events as part of their occupation.

The other implication of this research is the role of peer social support. Given that peer social support appears to reduce pathogenic outcomes it may be helpful to instigate some form of peer social support system. However, it should be noted that

some forms of peer social support can be detrimental to this process of enhancing psychological resilience to pathogenic outcomes. For example, it has been found that those who discuss the negative aspects of their occupation with their colleagues may actually increase their psychopathology (Stephens, et al., 1997). This study did not differentiate the types of peer social support, so it is possible that some of peer social support may have been harmful. In addition, Lowery and Stokes (2005) found that dysfunctional peer social support after being exposed to potentially traumatic events may have an indirect effect on an individual's ability to withstand pathogenic outcomes. However, it should be noted that peer social support has been found to be a protective factor against mortality (Shirom, Toker, Alkay, Jacobson, & Balicer, 2011), survivors of burns (Badger & Royse, 2010), and posttraumatic stress (Martin, et al., 2009). Peer social support appears to have some beneficial effects, but further research around the different types of peer social support would be required.

Limitations

Measurement Issues

Issues that may create measurement difficulties are retrospective data collection and self-report data collection (Sarafino, 2005). Retrospective data collection is not as effective as prospective data collection. One reason is the reduced ability of participants to accurately recall historical information. Self-report data collection has limitations such as participants not recording sincere results. This would have been true for several if not all of the self-report measures and there are limited ways to counter this issue. However, there are two mitigating circumstances. On the one hand, an

ability measure was utilised for the emotional competence aspect of psychological resilience and this was done because of a possible self-report bias and retrospective data collection. The second factor that would counter the self-report bias and retrospective data collection is the large sample size. Sample size mitigates the impact of those individuals who were not sincere with their responses. The issue of retrospective data collection and self-report data collection was addressed in this study.

There were few issues with the measurement of the majority of constructs utilised in this study. However, there were some concerns with the measurement of exposure to potentially traumatic events and social support. Potentially traumatic events are measured with a checklist of exposure to such events. There appears to be some merit in a checklist method of traumatic events that an individual has experienced. Some of the issues with the TSS were the categories of traumatic events, the scoring of the TSS, the ceiling effect of the TSS, and the participants' reliance on memory.

The categories listed did not capture all the traumatic events that a police officer experiences in the course of their work life. This was illustrated by the addition of four categories to capture other potentially traumatic events that the participants experienced. In addition, this highlights a broader example of variance of responding to a checklist of potentially traumatic events (Dohrenwend, 2006). For example, Dohrenwend explained that respondents may be over inclusive with regards to potentially traumatic events. In this study, there appeared to be evidence of that

phenomenon because individuals reported further events that they had been exposed to, although these events had been captured by other questions in the TSS.

Another difficulty with measuring potentially traumatic events in this way is the recall of such events, which is the reliability of the measure. Research has shown that there have been limited studies to test the reliability of measures utilised to assess exposure to potentially traumatic events. Dohrenwend (2006) reviewed this issue of reliability and found that reporting of potentially traumatic events was poor when a long time period was covered. Other measurement issues that he alluded to that may prove difficult are recall biases and participants forgetting potentially traumatic events they have experienced. When measuring exposure to potentially traumatic events the reliability of how to measure this phenomenon is an issue.

The last difficulty with measuring potentially traumatic events with the TSS is the ability of the instrument to differentiate when participants who are no longer members of the police experienced the events. It may be that the group of participants who left the police experienced some of the events since they have left the police. In addition, there was one participant who had rejoined the police and four participants who had new QIDs. There was no explanation established as to why these participants had new QIDs, but an answer may be that these participants may have left and rejoined the organisation. Thus, these five participants may have experienced potentially traumatic events during the time that they were not members of the New Zealand Police. The TSS was not able to establish if the potentially traumatic events

occurred after the participants left the organisation or if the participants were not on duty.

Given these aforementioned issues the validity of the TSS may be a concern, in particular, the basic method that is used to score the TSS. This sample has now been involved in police work for about 11 years, and it would be anticipated that some of the participants would have experienced some of the events more than twice. For example, participants reported that being assaulted was one of the most common events they had been experienced. However, given that respondents are only able to indicate that this potentially traumatic event happened once or more than once, it may well be that individuals are assaulted more frequently, but they only receive a score of two when the respondents indicate more than once and yet they could have been assaulted more frequently. Thus, the TSS may be a limited way to capture the true experience of these participants' exposure to potentially traumatic events.

There was an expectation from this study that there would be a stronger relationship between exposure to potentially serious traumatic events and pathogenic outcomes than between exposure to potentially traumatic events and pathogenic outcomes (Lerias & Byrne, 2003). However, this was not found in this study. An explanation could be the measurement of potentially serious traumatic events as part of the TSS. There is limited research in the area of measures for determining the magnitude of potentially traumatic events (Gray, Elhai, Owen, & Monroe, 2009). In relation to measuring severe traumatic events, studies (e. g., Lilly, Valdez, & Graham-Bermann, 2011) have utilised a measure of exposure to potentially traumatic events,

such as the TSS then identified items within the measure as more severe events. It may be that the method utilised in this study did not capture all the potentially serious traumatic events. Thus, if a new measure is developed to tap into the construct of potentially traumatic events some thought will have to be given about how the exposure to potentially serious traumatic events is measured.

The other consideration in this study is the measurement of social support. The measurement of social support in this research project was adequate, but some consideration would have to be given to how the branch of the scale that measured social support from colleagues could be extended, given the benefit this area of social support attributed to psychological resilience. Consistent with Martin and colleagues (2009), this study found no protective relationship in social support from supervisors. As Martin and colleagues suggest it may be that police officers tend to share confidences with their work colleagues. In addition, the organisational values may play an important factor on why the participants used collegial social support (Martin, et al., 2009). There is the potential for expanding the measure of social support from colleagues in relation to police officers. Martin and colleagues also found that low peritraumatic social support was a predictor of PTSD, so there may be some merit in including this area in the development of any collegial social support measure. Social support was measured adequately, but there seems to be benefit with emergency service personnel in measuring collegial social support particularly at the time of the traumatic event.

Other measurement issues that were established during this study were the internal reliability alpha of the BRCS, the measurement of physical health, and the consideration of Type 1 errors. The alpha coefficient for the BRCS for this study was .60, which is considered to be below the acceptable standard of .75 for good internal reliability (Coolican, 2004). Therefore, when interpreting the results from the BRCS consideration must be given to measurement error. The next measurement matter was that there was no physiological measurement of physical health, although the measurement of physical health with the Self-Rated Health question has been shown to be a predictor of mortality (Frankenberg & Jones, 2004; Manderbacka, Kareholt, Martikainen, & Lundberg, 2003), health difficulties (Emmelin, et al., 2003), and health care utilisation (DeSalvo, Fan, McDonell, & Fihn, 2005). There is no substitute for a physiological measure of physical health. The last consideration was reducing the alpha level when testing significance to reduce the likelihood of a Type I error. However, the reduction of the alpha level to reduce Type I errors may actually increase Type II errors (Coolican, 2004). Consideration was given to reducing the alpha level when testing for significance. However, because of the possibility of increasing the chances of a Type II error no alteration to the alpha level was undertaken, but all alpha levels have been reported. These three additional measurement limitations of the internal reliability alpha of the BRCS, the measurement of physical health, and the consideration of Type 1 errors have been considered when discussing the results of this study.

Unmeasured Variables

There are several other variables that could have been investigated. However, this section will focus on variables that may be relevant to the construct of psychological resilience that have been presented. The findings of this study suggest the importance of investigating other variables that would advance the concept of psychological resilience. A revised model suggests that psychological resilience involves cognitions, behaviours, and environment. The behavioural section involves physical activities, health behaviours, and coping mechanisms. Some of the coping mechanisms may fall within the domain of cognitions. A variable that would need to be investigated under the domain of cognitions is self-efficacy. There is definitely scope to extend the ambit of adaptive health practices. In addition, there seems some utility in investigating those behavioural strategies that individuals utilise consciously to alleviate pathogenic outcomes. The final aspect of psychological resilience that needs to be expanded is that of an individual's environment. This research has considered resilience as a psychological concept, but there is some merit in considering community resilience and how this impacts on an individual's wellbeing. The wider community resilience has been considered in a theoretical sense (de Terte, et al., 2009, see Appendix A), but has not been investigated as to how it impacts on an individual's wellbeing. This study has added to the scientific literature regarding psychological resilience, but there are other aspects within the reconceptualised model that need to be addressed.

Generalisability

The main issue is whether the sample studied was consistent with the population of the New Zealand Police. Demographic comparisons suggested that the sample was largely consistent with the population of the New Zealand Police. The only aspect that has raised concern is the discordance regarding the Asian ethnicity. However, it may be that this is a product of the cohort that was sampled because from the prospective sample, Asian ethnicity was not recorded, but only 5.41% of the sample identified themselves as other (Huddleston, 2002). Thus, it may be that there were a small number of Asian recruits who trained in that particular year at the Royal New Zealand Police College. Alternatively, it may be that Asian police officers may have only increased post this period of recruitment and not representative of the police demographics at that time.

A separate issue is how generalisable this study is to police populations or other populations. This is one study and the results are relevant. However, this research needs to be replicated to ensure that the 3-PR model is the correct way to conceptualise psychological resilience. This study needs to be replicated with police samples, other emergency services occupational groups who are routinely exposed to potentially traumatic events, and the general population to see how applicable this model of psychological resilience is to those populations. Replication of the 3-PR model with police samples or other populations will illustrate whether this model is useful or there was an erroneous finding in relation to the 5-PR model.

Future Research

This research study investigated this sample for a third time and whilst there was a longer time period between Time 2 and Time 3, there were extremely beneficial results from this study. Although there are still gaps in the proposed multidimensional model of psychological resilience, this study has supported the thesis regarding the multidimensional nature of psychological resilience. However, this model requires further refinement and testing.

In regards to further study of the present sample, whilst the response rate between Time 2 and Time 3 was comparable to other studies with police personnel, there was still a large dropout rate from Time 1. An interesting question would be why participants did not continue with this study?

A further area for consideration is occupational PTSD. Occupational PTSD is where an individual's reactions are a normal process of how an individual responds to traumatic events as part of their occupational role (Castro & Adler, 2011). This is the paradoxical role of, in this case, police officers who may use some of the "symptoms" as adaptive in their work environment. Castro and Adler (2011) argued that military personnel use adaptive strategies to deal with combat that may be labelled as PTSD phenomenology. Therefore, it would be prudent to investigate this area within a police environment because some of the subconstructs of PTSD may be adaptive in police work. For example, the symptoms of hyperarousal could be quite adaptive because police officers may be alert to any threat that they may come across. Some of the symptoms of avoidance may also be adaptive for police officers in that when dealing

with potentially traumatic events they may have a restricted range of affect to adequately deal with the event. The third group of symptoms from PTSD that may be adaptive for police officers is the intrusive or reexperiencing cluster. Police officers may use previous cues from potentially traumatic events as a means to warn for future events or warnings for other such events. To research this area would be extremely difficult. It would be best investigated utilising a qualitative approach with participants from a range of emergency services personnel to examine this phenomenon.

Conclusion

The present study confirmed findings from other scientific literature that not everyone exposed to traumatic events will develop psychopathology (Bonanno, et al., 2010). This research investigated the utility of the 5-PR model in understanding psychological resilience in relation to potentially traumatic events. This study has shown that aspects of the 5-PR model are useful, but that other components of the model are not useful. For example, emotional competence does not appear to be a helpful aspect of psychological resilience in relation to pathogenic outcomes from potentially traumatic events. The components of the model that showed some utility were optimism, adaptive coping, adaptive health practices, and social support. The psychological resilience model initially proposed has been reconceptualised as a 3-PR model, but requires further empirical and theoretical development.

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APPENDICES

APPENDIX A

PUBLICATIONS THAT RESULTED FROM THIS STUDY

APPENDIX B

TRAUMA POLICY

Trauma policy

Publication Number:

Trauma policy

- Overview
- Referrals
- Roles and responsibilities

Overview

Purpose

This chapter outlines the NZ Police Trauma policy including:

- the purpose of the policy and how it is delivered
- when and how employees can access support under the policy
- the roles and responsibilities of employees, supervisors, managers and welfare officers in relation to the policy.

What is the Trauma policy?

Police work can sometimes be traumatic and disturbing leading to occupational stress and trauma for employees. Everyone has different reactions to stress and trauma.

For some, the psychological impact of their involvement in particular serious incidents may be great. In other cases, it is the cumulative exposure to a number of events which adversely affects the well being of employees.

The Trauma policy provides:

- access to appropriate psychological assessment and support for all employees to:
 - assist in the maintenance of their health and well being
 - minimise post incident reactions and the risk of developing ongoing psychological harm
- a timely and confidential response to employees following their attendance at critical incidents
- a support system which addresses the psychological risks associated with policing generally

Assessment and treatment of employees is provided by suitably qualified psychologists contracted to New Zealand Police in line with current best practice as supported by the latest literature.

The policy is not designed to replace good management, supervisory practices or personal coping skills. It is however a well established support function for assisting employees maintain their psychological well being.

Trauma policy and performance management

The Trauma policy will not prevent disciplinary action for serious offences or continued unsatisfactory work performance.

Employees cannot use the policy to avoid performance management procedures or the consequences of not adhering to the New Zealand Police's Code of Conduct.

What is provided under the policy?

Under the policy employees may receive an initial three hours of one on one consultation. This may include assessment, debriefing from specific incidents, or counselling between an employee and an approved psychologist.

Some group debriefs may be offered following critical incidents where this is considered appropriate.

Further sessions, if requested by the psychologist, will be considered based on the initial psychological assessment and the psychologist's assessment of the need for further sessions. All requests for additional sessions must be approved by National Coordinator Welfare.

Most employees will obtain the treatment they require from the psychologist. However, it is recognised that some employees will require specialist treatment, and some, long term specialist treatment (e.g. for post traumatic stress disorder or trauma related psychosis). In these cases, a review of the individual case will be conducted by HRM Wellness and Safety to ensure there is prior approval of referral to a specialist. Employees must obtain prior approval **before** they see the specialist, in which case Police will meet the cost of treatment

Service delivery

Psychological support services under the Trauma policy are co-ordinated by district welfare officers and provided by approved psychologists. A list of approved psychologists is available from your district welfare officer or Wellness and Safety PNHQ. The overall management, administration and funding of the Trauma policy is undertaken by Wellness and Safety PNHQ.

Who can access the policy?

Assistance is available under the policy to all Police employees:

- following attendance at a critical incident
- adversely affected by the impacts of policing, or organisational impacts.

Personal issues are not covered by the Trauma policy (see Other related assistance for employees below).

Other related assistance for employees

Employees may be entitled to support and assistance under these related policies:

- Wellcheck support (for employees working within higher risk groups in specific roles)
- Employee Assistance Policy (for personal and work related issues)
- Rehabilitation Policy
- Health and Safety Policy
- Welfare services
- Police chaplaincy services.

Personal health insurance may also cover some support for personal issues.

Seek advice about all of these policies from your district welfare officer.

APPENDIX C

PRELIMINARY INFORMATION SHEET



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Resilience and the Prevention of Work Related Traumatic Stress: Testing an Ecological Model

PRELIMINARY INFORMATION SHEET

Dear Prospective Participant,

My name is Ian de Terte. I was a sworn officer with the police from 1981 to 1997. During the time I was employed by the police, I served in Wellington and Tauranga. When I was a member of the police I reached the rank of detective. I have since left the police and retrained as a clinical psychologist and now I am in the process of completing my doctorate degree at Massey University. My research is the continuation of a longitudinal study in which you have already participated.

In 1998 you were involved in a study of stress conducted by Dr Lynne Huddleston and Associate Professor Christine Stephens at Massey University. This research involved you completing questionnaires when you were a recruit at the Police College and one year later when you were working. The results indicated that during the first year with the police the officers had experienced nearly as many traumatic experiences as they had during their life prior to joining the police. While this is of a concern, these experiences did not translate into increased psychological stress for the group as a whole. On average the recruits were less distressed one year into the job and any health effects were related to everyday work stress. Now I am very interested in understanding how this important group of police officers is doing 11 years on. We are particularly interested in the positive ways people have of dealing with stressful events.

I have sent this letter to you through the New Zealand Police or the Police Association who are able to contact you through your QID number which was on the questionnaires. I have no information about your name and address; this information remains completely confidential to the police.

This letter is to let you know that in 2009 we would like to resurvey you and others who were involved in the first phases of this research. Because we have the opportunity to follow police officers from the time they started work in regard to how they have coped with police work, this research will be nationally and internationally significant and has been endorsed by the Police Association and the New Zealand Police as a very valuable piece of research.

I will be writing to you again soon to formally invite you to participate voluntarily in this research and to explain how you can participate anonymously. The questionnaire includes photographs and we hope that you will be able to complete it via the internet. However, if you wish to complete the questionnaire in "pen and paper" format could you advise me by sending me an e-mail at ian@psych.net.nz with only your QID and **no other details**. I will delete the e-mail and use the QID to send you a questionnaire through the police organizations, instead of an internet information pack.

All individuals who complete the internet or written questionnaires will be placed in a draw for two IPODS. If you want to know any more about my proposed research, I can be contacted via e-mail at ian@psych.net.nz or by cell phone on (021) 779 241. I look forward to your continued participation in this research.

Yours faithfully

Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 08/20. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humanethicsouthb@massey.ac.nz.

APPENDIX D

STUDY SUMMARY

STUDY SUMMARY

Psychological Resilience: An Evaluation of an Ecological Multidimensional Model

In 2009, a study was carried out to investigate how effective a psychological resilience model was in regards to police work. This study involved resurveying 326 participants who had been involved in a study in 1998 and 1999. Two hundred and seventy-six participants were identified and 176 continued in the study, a return rate of 64%. The study involved a series of questionnaires relating to demographic information, exposure to potentially traumatic events, posttraumatic stress, psychological distress, physical health, adaptive coping, optimism, emotional competence, adaptive health practices, and social support. Psychological resilience was believed to reduce the pathogenic consequences of exposure to potentially traumatic events.

Demographic Profile

The mean age of the sample was 39 years. The gender of the sample comprised 73% males and 27% females. The ethnicity of the sample comprised 94% of New Zealand European/Pakeha, 4% Maori, and 1% Pacific Island. The highest educational qualifications of the sample comprised 1% with no school qualification, 13% with school certificate, 20% with university entrance, 31% with trade certificate, and 34% with a university degree. In relation to employment status, 86% were still employed and 14% were no longer employed by the New Zealand Police. In relation to consultation with a psychologist pursuant to the trauma policy, 54% had consulted a psychologist and 46% had not consulted a psychologist.

Exposure to Potentially Traumatic Events

Traumatic events were referred to as potentially traumatic events because not all events that are traumatic by nature will evoke a traumatic response. Exposure to potentially traumatic events was measured with four indices of traumatic event exposure. These indices included types of potentially traumatic events, frequency of potentially traumatic events, potentially serious traumatic events, and frequency of potentially serious traumatic events. In approximately 11 years of police service the sample had experienced on average four different types of potentially traumatic events, approximately six occurrences of potentially traumatic events, just under two different serious potentially traumatic events, and just under three occurrences of serious potentially traumatic events. The most frequently reported potentially traumatic events were assaults and the attendance at an unpleasant death.

Pathogenic Outcomes

Posttraumatic stress, psychological distress, and physical health were measured in this study. Comparisons were made regarding these three measures in relation to the participants' levels when they joined the police and their levels after approximately 11 years of police service. There were no differences between the two times in relation to posttraumatic stress. There was a significant increase in the participant's levels of psychological distress between these two times. There was a significant decrease in the participants' perception of their physical health between these two data collection points. The levels of posttraumatic stress and psychological distress were reasonably consistent with other research studies.

Psychological Resilience

Psychological resilience was defined utilizing a five part model that involved cognitions, emotions, behaviours, physical activities, and the environment. The concept of psychological resilience involved the measurement of adaptive coping, optimism, emotional competence, adaptive health practices, and social support. It was envisaged that psychological resilience would buffer and reduce the pathogenic outcomes of posttraumatic stress, psychological distress, and poor physical health.

Summary of Findings

The main findings of this study are that the components of adaptive coping, optimism, adaptive health practices, and collegial social support seem to be helpful in reducing the effects of potentially traumatic events. It was found that those individuals who utilized these factors had less posttraumatic stress, psychological distress, and better physical health. These factors can provide some protection against the psychological effects of potentially traumatic events. This study also found relationships between exposure to potentially traumatic events with posttraumatic stress and psychological distress. In addition, this study found those participants who used support via the trauma policy were the most distressed, but the use of psychological support was helpful in reducing pathogenic outcomes.

APPENDIX E

INFORMATION SHEET (WEB-BASED QUESTIONNAIRE)



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Resilience and the Prevention of Work Related Traumatic Stress: Testing an Ecological Model.

INFORMATION SHEET

Who is doing this research?

My name is Ian de Terte. I am currently conducting this research as part of my doctorate through the School of Psychology at Massey University. This research is being supervised by Associate Professor Christine Stephens and Associate Professor David Johnston from the School of Psychology.

What is this research about?

This research is the third phase of a study that commenced in 1998. This study will investigate the incidence and nature of traumatic incidents that you may have experienced before joining the police and as part of your police service. This study will investigate how present or past police officers deal with traumatic stress and the health consequences of being exposed to trauma. The results of this study will be particularly important in this area because this is the first time that New Zealand researchers have been able to follow present and past police officers across this length of time. Your ongoing participation in this unique study will be much appreciated. However, your participation is voluntary.

Participant eligibility

You are eligible to take part in this study if you completed Phase 1 and Phase 2 of this study. This information sheet has been sent to you if you did take part in those phases. Even if you are no longer a member of the police we are very interested in your participation.

This is a longitudinal study and I have obtained your QID from your previous questionnaires. This number has been linked to your current contact details by the New Zealand Police or the New Zealand Police Association if you have left the Police. This information has been posted out by the Police organizations, so I do not know your personal details. The New Zealand Police or Police Association will not have access to your questionnaire results. The results will be seen by myself and my chief supervisor only. I will be supplying the New Zealand Police and the New Zealand Police Association with a summary of the group findings.

The information obtained from this study will be extremely useful because a group of police officers have been followed over a long period of time. Therefore, it is intended to retain the data obtained from this study in locked storage at the School of Psychology, Massey University under the strict supervision of Associate Professor Christine Stephens.

What you will be asked to do?

You will be asked to fill out a questionnaire that will take approximately 90 minutes. If you are interested in taking part please go the following website: <http://disasters.massey.ac.nz/survey>. Then click on the link which says: 'proceed to survey' and type in your QID and the password 'police2009.'

As part of this study all participants will have the option of entering a draw for one of two IPODS. When you complete the questionnaire, you will be given a link to a separate page which will ask for your details if you wish to be in the draw. Your contact details cannot be linked to your questionnaire information and will be destroyed as soon as the draw is completed and two participants have received their IPOD.

What are your rights as a participant?

If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study at any time;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used;
- be given access to a summary of the project findings when it is concluded;

In addition, completion of the questionnaire implies consent.

Where can you get support from?

We expect that there will be no difficulties for you in completing the questionnaire. However, there is the possibility that recalling traumatic events will cause some people distress. If this happens to you, please contact your local police welfare officer, or your general practitioner. Alternatively, you could seek assistance from a psychologist in your area. A list of psychologists in your area can be accessed via the internet at www.nzccp.co.nz and following the link to private practitioners or at www.psychology.org.nz and following the link to find a psychologist. Note there would be a fee charged to you for making an appointment with these professionals.

How can you find out about the results?

At the end of the questionnaire there is a link to a separate page on which you will be asked to fill out your contact details if you would like to receive a summary of the results of the questionnaire. These contact details will not be able to be linked to your questionnaire information. A summary of the project will be sent to you at the completion of the research. In addition, a summary of this research will be put on the following website <http://disasters.massey.ac.nz/survey>.

What to do now?

If you would like to take part in this study please go to the following website: <http://disasters.massey.ac.nz/survey> and type in your QID and the password 'police2009.' If you have further questions please contact me by e-mail at: ian@psych.net.nz or my main supervisor Associate Professor Christine Stephens by e-mail at: c.v.stephens@massey.ac.nz. Or we can be contacted by phone or letter at the contact details above.

Thank you very much for your interest in this study.



Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 08/20. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humanethicssouthb@massey.ac.nz.

APPENDIX F

REMINDER SHEET 1



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGĀ TANGATA

Resilience and the Prevention of Work Related Traumatic Stress: Testing an Ecological Model

Dear Prospective Participant,

Recently I sent you out some information about participating in this study. There have been some problems with accessing the website that may have made gaining access difficult. The problems are as follows:

- The website cannot be accessed via the police computer system. I am trying to get this matter corrected. However, in the interim if there is another computer that can be used to access this survey, I would really appreciate that.
- There was a problem with the case sensitiveness of entering your QID and password. However, this matter has now been corrected and it should not matter whether your QID and password is in upper or lower case.
- I am interested in both former members and current members of the police, so if you are no longer a serving member I am still interested in your participation.
- I understand that the survey only takes 60 minutes to complete and not 90 minutes as indicated in the previous information sheet.

I am hoping that you will participate as it is vital to my research that I get as many participants as possible. I am hoping that you will be involved in this third phase of this research because without you the results will not be as robust. If you have any questions do not hesitate to contact me by e-mail at ian@psych.net.nz or by telephone on (021) 779 241.

To obtain electronic access to the survey please go to the following website: <http://disasters.massey.ac.nz/survey> and then click on the link which says: 'proceed to survey' and type in your QID and the password 'police2009'

As part of this study all participants will have the option of entering a draw for one of two IPODS. When you complete the questionnaire, you will be given a link to a separate page which will ask for your details if you wish to be in the draw. Your contact details cannot be linked to your questionnaire information and will be destroyed as soon as the draw is completed and two participants have received their IPOD.

Thank you for your time.

Yours faithfully

Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

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APPENDIX G

REMINDER SHEET 2



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGA TANGATA

Resilience and the Prevention of Work Related Traumatic Stress: Testing an Ecological Model

Dear Prospective Participant,

Recently some information was sent out about participating in this study and problems re accessing the website. At the time of sending the previous information sheet there were some difficulties accessing the web survey via the police computer servers. If the following steps are followed then you should be able to access the website via the police computer servers. :

- Go to the police intranet home page: 'Popular Links'
- Click on the 'Helpdesk Forms' link
- Click on 'non standard access'
- Click on the 'restricted internet'
- Choose 'Other' for the site category
- Then enter the following websites:
<http://disasters.massey.ac.nz/survey/>
<http://survey.e-xpert.co.nz/login.aspx?A=54&S=216&P=1>
- Put in under the reason, that it is a police approved doctoral study
- Then send to your supervisor for approval
- Then send to Paul Berry for national approval (he is aware of this study and will approve access).

I am hoping that you will participate as it is vital to my research that I get as many participants as possible. I am hoping that you will be involved in this third phase of this research because without you the results will not be as robust. If you have any questions do not hesitate to contact me by e-mail at ian@psych.net.nz or by telephone on (021) 779 241.

To obtain electronic access to the survey please go to the following website: <http://disasters.massey.ac.nz/survey> and then click on the link which says: 'proceed to survey' and type in your QID and the password 'police2009'

As part of this study all participants will have the option of entering a draw for one of two IPODS. When you complete the questionnaire, you will be given a link to a separate page which will ask for your details if you wish to be in the draw. Your contact details cannot be linked to your questionnaire information and will be destroyed as soon as the draw is completed and two participants have received their IPOD.

Please disregard this letter if you have completed the web survey and thank you so much for completing this survey.

Thank you for your time.

Yours faithfully

Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

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APPENDIX H

REMINDER SHEET 3



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGĀ TANGATA

Resilience and the Prevention of Work Related Traumatic Stress: Testing an Ecological Model

Dear Prospective Participant,

Recently I sent you out some information about participating in this study. I am hoping that you will participate as it is vital to my research that I get as many participants as possible. I hope that you will be involved in this third phase of this research because without you the results will not be as robust. The value of this research will be enhanced by your participation and the thought that is put into your responses. I would be so pleased if you have the time to participate in this valuable piece of research.

To obtain electronic access to the survey please go to the following website: <http://disasters.massey.ac.nz/survey> and then click on the link which says: 'proceed to survey' and type in your QID and the password 'police2009'

If you need to access this survey via the police computer servers please see the instructions on the back of this sheet.

As part of this study all participants will have the option of entering a draw for one of two IPODS. When you complete the questionnaire, you will be given a link to a separate page which will ask for your details if you wish to be in the draw. Your contact details cannot be linked to your questionnaire information and will be destroyed as soon as the draw is completed and two participants have received their IPOD. This web survey is going to stop on 31 December 2009, and the draw for the two IPODS will be completed in January.

Please disregard this letter if you have completed the web survey and thank you so much for completing this survey.

Thank you for your time and have a safe Christmas.

Yours faithfully

Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 08/20. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humanethicssouthb@massey.ac.nz.

If the following steps are followed then you should be able to access the website via the police computer servers. :

- Go to the police intranet home page: 'Popular Links'
- Click on the 'Helpdesk Forms' link
- Click on 'non standard access'
- Click on the 'restricted internet'
- Choose 'Other' for the site category
- Then enter the following websites:
<http://disasters.massey.ac.nz/survey/>
<http://survey.e-xpert.co.nz/login.aspx?A=54&S=216&P=1>
- Put in under the reason, that it is a police approved doctoral study
- Then send to your supervisor for approval
- Then send to Paul Berry for national approval (he is aware of this study and will approve access).

APPENDIX I

INFORMATION SHEET (PAPER QUESTIONNAIRE)



MASSEY UNIVERSITY
COLLEGE OF HUMANITIES
AND SOCIAL SCIENCES
TE KURA PŪKENGĀ TĀNGATA

Resilience and the Prevention of Work Related Traumatic Stress: Testing an Ecological Model.

INFORMATION SHEET

Who is doing this research?

My name is Ian de Terte. I am currently conducting this research as part of my doctorate through the School of Psychology at Massey University. This research is being supervised by Associate Professor Christine Stephens and Associate Professor David Johnston from the School of Psychology.

What is this research about?

This research is the third phase of a study that commenced in 1998. This study will investigate the incidence and nature of traumatic incidents that you may have experienced before joining the police and as part of your police service. This study will investigate how police officers deal with traumatic stress and the health consequences of being exposed to trauma. The results of this study will be particularly important in this area because this is the first time that New Zealand researchers have been able to follow police officers across this length of time. Your ongoing participation in this unique study will be much appreciated. However, your participation is voluntary.

Participant eligibility

You are eligible to take part in this study if you completed Phase 1 and Phase 2 of this study. This information sheet has been sent to you if you did participate in those phases.

This is a longitudinal study and I have obtained your QID from your previous questionnaires. This number has been linked to your current contact details by the New Zealand Police or the New Zealand Police Association if you have left the Police. This information and questionnaire has been posted out by these Police organizations, so I do not know your personal details. The New Zealand Police or Police Association will not have access to your questionnaire results. The results will be seen by myself and my chief supervisor only. I will be supplying the New Zealand Police and the New Zealand Police Association with a summary of the group findings.

The information obtained from this study will be extremely useful because a group of police officers have been followed over a long period of time. Therefore, it is intended to retain the data obtained from this study in locked storage at the School of Psychology, Massey University under the strict supervision of Associate Professor Christine Stephens.

What you will be asked to do?

Please complete the enclosed questionnaire booklet. This will take approximately 90 minutes. As part of this study all participants will have the option of entering a draw for one of two IPODS. If you wish to enter the draw complete the details on the separate sheet provided. This sheet will be removed from the questionnaire as soon as it is received and will not be able to be linked to your questionnaire information. It will be destroyed as soon as the draw is completed and two participants have received their IPOD.

What are your rights as a participant?

If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study at any time;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used;
- be given access to a summary of the project findings when it is concluded.

In addition, completion and return of the questionnaire implies consent.

Where can you get support from?

We expect that there will be no difficulties for you in completing the questionnaire. However, there is the possibility that recalling traumatic events will cause some people distress. If this happens to you, please contact your local police welfare officer, or your general practitioner. Alternatively, you could seek assistance from a psychologist in your area. A list of psychologists in your area can be accessed via the internet at www.nzccp.co.nz and following the link to private practitioners or at www.psychology.org.nz and following the link to find a psychologist. Note there would be a fee charged to you for making an appointment with these professionals.

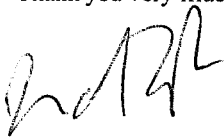
How can you find out about the results?

If you would like to receive a summary of the study results, there is a section at the front of the questionnaire book where you can fill out your contact details. This section will also be detached on receipt and be kept separate from your individual data. A summary of the findings will be sent to you at the completion of the research. In addition, a summary of this research will be put on the following website <http://disasters.massey.ac.nz/projects.htm>.

What to do now?

If you would like to take part in this study please complete the enclosed questionnaire and return it in the postage paid envelope. Note, that this is direct to Massey University and you do not need to use a stamp. If you have further questions please contact me by e-mail at: ian@psych.net.nz or my main supervisor Associate Professor Christine Stephens by e-mail at: c.v.stephens@massey.ac.nz. Or we can be contacted by phone or letter at the contact details above.

Thank you very much for your interest in this study.



Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 08/20. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929, email humanethicsouthb@massey.ac.nz.

APPENDIX J

REMINDER SHEET 4



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*Resilience and the Prevention of Work Related Traumatic
Stress: Testing an Ecological Model*

Dear Prospective Participant,

Recently I sent you out some information about participating in this study. I am hoping that you will participate as it is vital to my research that I get as many participants as possible. I hope that you will be involved in this third phase of this research because without you the results will not be as robust. The value of this research will be enhanced by your participation and the thought that is put into your responses. I would be so pleased if you have the time to participate in this valuable piece of research.

The web survey has now finished, but I have included a questionnaire booklet with this letter to enable you to participate in this study. As part of this study all participants will have the option of entering a draw for one of two IPODS. If you wish to enter this draw please ensure that your survey is returned to me by 24 January 2010. Please return in the enclosed freepost envelope (note that you do not need to use a stamp).

Thanks for your interest in this research.

Yours faithfully

Ian de Terte
BBS, BA, MSc (Hons), PG Dip Clin Psych, MNZCCP

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 08/20. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee: Southern B, telephone 04 801 5799 x 6929; email humanethicsouthb@massey.ac.nz.

APPENDIX K

QUESTIONNAIRE

Please complete the survey by selecting the appropriate answers on each page.

All responses provided by you are confidential, and will not be used for any other purpose outside of this survey and its correspondings analysis.

Please return the survey to me by 24 January 2010 to be in the draw for the IPODs. The survey should be returned to:

Mr Ian de Terte
Freepost 181246
School of Psychology
Massey University
Wellington Campus

Demographic Information

Please enter the following demographic information

QID

Age

Gender

Male

Female

What ethnic group do you identify most with?

NZ Maori

NZ European

Fijian

Samoan

Cook Islander

Tongan

Chinese

Indian

Other - please specify [OTHER]

What is your highest qualification?

- | | |
|--|--------------------------|
| No school qualification | <input type="checkbox"/> |
| School certificate passes | <input type="checkbox"/> |
| School qualifications, university entrance and above | <input type="checkbox"/> |
| Trade certificate, professional certificate or diploma | <input type="checkbox"/> |
| University degree or diploma | <input type="checkbox"/> |

Compared to the person in excellent health, how would you rate your health at the present time?

- | | |
|-----------|--------------------------|
| Terrible | <input type="checkbox"/> |
| Very Poor | <input type="checkbox"/> |
| Poor | <input type="checkbox"/> |
| Fair | <input type="checkbox"/> |
| Good | <input type="checkbox"/> |
| Very Good | <input type="checkbox"/> |
| Excellent | <input type="checkbox"/> |

Have you seen a psychologist pursuant to the Trauma Policy of the New Zealand Police

- | | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

Are you still employed by the NZ Police?

- | | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

A traumatic event is any incident which is outside your normal range of experiences. Some people only ever have one or two traumatic experiences in a lifetime while some have many more.

Listed following are a few traumatic experiences which may have happened to you at some point in your life, either at work or otherwise.

For the following questions, please select the responses that are most accurate for you.

Did you ever serve in military combat?

- No
- Yes

Did this happen...

- Once
- More than once

When did this happen? (If it happened more than once, please give the last time)

- < 6 months ago
- 6-12 months ago
- 1-5 years ago
- > 5 years ago

Was this before or after you joined the police?

- Before
- After

Did anyone ever take something from you by force or threat of force, such as in a robbery, mugging or hold-up?

- No
- Yes

Did this happen...

- Once
- More than once

When did this happen? (If it happened more than once, please give the last time)

- < 6 months ago
- 6-12 months ago
- 1-5 years ago
- > 5 years ago

Was this before or after you joined the police?
Before
After

Did this happen to you while you were on duty as a police officer?
Yes
No

Have you ever been assaulted, injured or had your life placed under threat by another person?
No
Yes

Did this happen...
Once
More than once

When did this happen? (If it happened more than once, please give the last time)
< 6 months ago
6-12 months ago
1-5 years ago
> 5 years ago

Was this before or after you joined the police?
Before
After

Did this happen to you while you were on duty as a police officer?
Yes
No

Did anyone ever make you have sex by using force or threatening to harm you? This includes any type of unwanted sexual activity.
No
Yes

Did this happen...
Once
More than once

When did this happen? (If it happened more than once, please give the last time)

< 6 months ago	<input type="checkbox"/>
6-12 months ago	<input type="checkbox"/>
1-5 years ago	<input type="checkbox"/>
> 5 years ago	<input type="checkbox"/>

Was this before or after you joined the police?

Before	<input type="checkbox"/>
After	<input type="checkbox"/>

Did this happen to you while you were on duty as a police officer?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Did you ever suffer injury or property damage because of fire?

No	<input type="checkbox"/>
Yes	<input type="checkbox"/>

Did this happen...

Once	<input type="checkbox"/>
More than once	<input type="checkbox"/>

When did this happen? (If it happened more than once, please give the last time)

< 6 months ago	<input type="checkbox"/>
6-12 months ago	<input type="checkbox"/>
1-5 years ago	<input type="checkbox"/>
> 5 years ago	<input type="checkbox"/>

Was this before or after you joined the police?

Before	<input type="checkbox"/>
After	<input type="checkbox"/>

Did this happen to you while you were on duty as a police officer?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Did you ever suffer injury, evacuation, or property damage because of severe weather or either a natural or man-made disaster?

No	<input type="checkbox"/>
Yes	<input type="checkbox"/>

Did this happen...

Once	<input type="checkbox"/>
More than once	<input type="checkbox"/>

When did this happen? (If it happened more than once, please give the last time)

< 6 months ago	<input type="checkbox"/>
6-12 months ago	<input type="checkbox"/>
1-5 years ago	<input type="checkbox"/>
> 5 years ago	<input type="checkbox"/>

Was this before or after you joined the police?

Before	<input type="checkbox"/>
After	<input type="checkbox"/>

Did this happen to you while you were on duty as a police officer?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Did a police officer you knew well ever die because of an accident, homicide, or suicide?

No	<input type="checkbox"/>
Yes	<input type="checkbox"/>

Did this happen...

Once	<input type="checkbox"/>
More than once	<input type="checkbox"/>

When did this happen? (If it happened more than once, please give the last time)

< 6 months ago	<input type="checkbox"/>
6-12 months ago	<input type="checkbox"/>
1-5 years ago	<input type="checkbox"/>
> 5 years ago	<input type="checkbox"/>

How did that person die? Was it an...

Accident	<input type="checkbox"/>
Homicide	<input type="checkbox"/>
Suicide	<input type="checkbox"/>

Was this before or after you joined the police?

Before	<input type="checkbox"/>
After	<input type="checkbox"/>

Did this happen to you while you were on duty as a police officer?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Apart from fellow police officers, did a close friend or family ever die because of an accident, homicide, or suicide?

- No
- Yes

Did this happen...

- Once
- More than once

When did this happen? (If it happened more than once, please give the last time)

- < 6 months ago
- 6-12 months ago
- 1-5 years ago
- > 5 years ago

How did that person die? Was it an...

- Accident
- Homicide
- Suicide

Was this before or after you joined the police?

- Before
- After

Were you ever in a motor vehicle accident serious enough to cause injury to one or more passengers?

- No
- Yes

Did this happen...

- Once
- More than once

When did this happen? (If it happened more than once, please give the last time)

- < 6 months ago
- 6-12 months
- 1-5 years
- > 5 years

Was this before or after you joined the police?

- Before
- After

Did this happen to you while you were on duty as a police officer?
Yes
No

Have you been present at an incident in which a police officer was deliberately or accidentally killed?
No
Yes

Did this happen...
Once
More than once

When did this happen? (If it happened more than once, please give the last time)
< 6 months ago
6-12 months ago
1-5 years ago
> 5 years ago

Was this before or after you joined the police?
Before
After

Did this happen to you while you were on duty as a police officer?
Yes
No

Have you been present at an incident in which a member of the public was killed or seriously injured by the police?
No
Yes

Did this happen...
Once
More than once

When did this happen? (If it happened more than once, please give the last time)
< 6 months ago
6-12 months ago
1-5 years ago
< 5 years ago

Was this before or after you joined the police?
Before
After

Did this happen to you while you were on duty as a police officer?
Yes
No

Have you been involved in work with victims of multiple or otherwise particularly disturbing homicides (e.g child or aged victims)?
No
Yes

Did this happen...
Once
More than once

When did this happen? (If it happened more than once, please give the last time)
< 6 months ago
6-12 months ago
1-5 years ago
> 5 years ago

Was this before or after you joined the police?
Before
After

Did this happen to you while you were on duty as a police officer?
Yes
No

Have you worked at accidents in which there are multiple victims or severe mutilation of bodies?
No
Yes

Did this happen...
Once
More than once

When did this happen? (If it happened more than once, please give the last time)

< 6 months ago	<input type="checkbox"/>
6-12 months ago	<input type="checkbox"/>
1-5 years ago	<input type="checkbox"/>
> 5 years ago	<input type="checkbox"/>

Was this before or after you joined the police?

Before	<input type="checkbox"/>
After	<input type="checkbox"/>

Did this happen to you while you were on duty as a police officer?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Have you been involved in a Disaster Victim Identification Process?

No	<input type="checkbox"/>
Yes	<input type="checkbox"/>

Did this happen...

Once	<input type="checkbox"/>
More than once	<input type="checkbox"/>

When did this happen? (If it happened more than once, please give the last time)

< 6 months ago	<input type="checkbox"/>
6-12 months ago	<input type="checkbox"/>
1-5 years ago	<input type="checkbox"/>
> 5 years ago	<input type="checkbox"/>

Was this before or after you joined the police?

Before	<input type="checkbox"/>
After	<input type="checkbox"/>

Did this happen to you while you were on duty as a police officer?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Have you ever worked for a period of time in a work area that constantly included work that was distressing for you (such as child abuse cases or multiple incidents of domestic violence)?

No	<input type="checkbox"/>
Yes	<input type="checkbox"/>

What was the work area? (please type your answer in the box below)

Over what period of time did this happen?

- < 6 months
- 6-12 months
- 1-5 years
- > 5 years ago

Was this before or after you joined the police?

- Before
- After

Did you work in this area as a police officer?

- Yes
- No

Did you ever have some other shocking or distressing experience, something that has not been mentioned yet?

- No
- Yes

The experience was... (please type your answer in the box below)

Did this happen...

- Once
- More than once

When did this happen? (If it happened more than once, please give the last time)

- < 6 months ago
- 6-12 months ago
- 1-5 years ago
- > 5 years ago

Was this before or after you joined the police?

- Before
- After

Did this happen to you while you were on duty as a police officer?

- Yes
- No

Of all the experiences to which you have answered 'yes' in this last section, which one would you say has affected you the most since? Please indicate by describing the question in the space provided.

Consider how well the following statements describe your behaviour and actions on a scale from 1 to 5, where 1 means the statement does not describe you at all, and 5 means it describes you very well.

I look for creative ways to alter difficult situations

- 1 = Does not describe you
- 2
- 3
- 4
- 5 = Describes you very well

Regardless of what happens to me, I believe I can control my reaction to it.

- 1 = Does not describe you
- 2
- 3
- 4
- 5 = Describes you very well

I believe I can grow in positive ways by dealing with difficult situations.

- 1 = Does not describe you
- 2
- 3
- 4
- 5 = Describes you very well

I actively look for ways to replace the losses I encounter in life.

- | | |
|-----------------------------|--------------------------|
| 1 = Does not describe you | <input type="checkbox"/> |
| 2 | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |
| 5 = Describes you very well | <input type="checkbox"/> |

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no 'correct' or 'incorrect' answers. Answer according to your own feelings, rather than how you think 'most people' would answer.

- A = I agree a lot
- B = I agree a little
- C = I neither agree or disagree
- D = I DISagree a little
- E = I DISagree a lot

In uncertain times, I usually expect the best.

- | | |
|----------------------|--------------------------|
| A = I agree a lot | <input type="checkbox"/> |
| B | <input type="checkbox"/> |
| C | <input type="checkbox"/> |
| D | <input type="checkbox"/> |
| E = I DISagree a lot | <input type="checkbox"/> |

If something can go wrong for me, it will.

- | | |
|----------------------|--------------------------|
| A = I agree a lot | <input type="checkbox"/> |
| B | <input type="checkbox"/> |
| C | <input type="checkbox"/> |
| D | <input type="checkbox"/> |
| E = I DISagree a lot | <input type="checkbox"/> |

I'm always optimistic about my future

- | | |
|----------------------|--------------------------|
| A = I agree a lot | <input type="checkbox"/> |
| B | <input type="checkbox"/> |
| C | <input type="checkbox"/> |
| D | <input type="checkbox"/> |
| E = I DISagree a lot | <input type="checkbox"/> |

I hardly ever expect things to go my way.

- A = I agree a lot
- B
- C
- D
- E = I DISagree a lot

I rarely count on good things happening to me.

- A = I agree a lot
- B
- C
- D
- E = I DISagree a lot

Overall, I expect more good things to happen to me than bad.

- A = I agree a lot
- B
- C
- D
- E = I DISagree a lot

Below is a list of questions about what we do in our lives. Please answer each question by endorsing the appropriate responses.

How would you describe your smoking habits?

- Still smoke
- Used to smoke
- Never smoked

If you currently smoke, on average how many cigarettes a day do you smoke?

- 0-9 cigarettes a day
- 10-19 cigarettes a day
- 20 or more cigarettes a day

How many hours of sleep do you usually get a night?

- 6 hours or less
- 7 or 8 hours
- 9 or more hours

On average, how many times a week do you do regular exercise?

- 0-1 times a week
- 2-4 times a week
- 5 or more times a week

When you exercise, on average, how long is each exercise session?

- | | |
|--------------------|--------------------------|
| 0-29 minutes | <input type="checkbox"/> |
| 30-59 minutes | <input type="checkbox"/> |
| 60 minutes or more | <input type="checkbox"/> |

How many days in a typical week do you drink alcohol?

- | | |
|----------------|--------------------------|
| 0-1 days | <input type="checkbox"/> |
| 2-4 days | <input type="checkbox"/> |
| 5 or more days | <input type="checkbox"/> |

When you drink alcohol, how many drinks of alcoholic beverage do you have. A drink equates to one beer, or a glass of wine, or a nip of spirit.

- | | |
|------------------|--------------------------|
| 0-1 drinks | <input type="checkbox"/> |
| 2-4 drinks | <input type="checkbox"/> |
| 5 or more drinks | <input type="checkbox"/> |

Do you regularly eat breakfast, lunch, and dinner each day?

- | | |
|-----|--------------------------|
| Yes | <input type="checkbox"/> |
| No | <input type="checkbox"/> |

How many days in a typical week do you eat five servings of fruit and/or vegetables?

- | | |
|-------------|--------------------------|
| 0-1 days | <input type="checkbox"/> |
| 2-5 days | <input type="checkbox"/> |
| 6 or 7 days | <input type="checkbox"/> |

How many times a week do you set aside time for rest and relaxation?

- | | |
|-----------|--------------------------|
| 0-1 times | <input type="checkbox"/> |
| 2-4 times | <input type="checkbox"/> |
| 5 or more | <input type="checkbox"/> |

These are questions about the sorts of support that you may receive from different people. For each answer below please endorse the number that is best for you.

- 1 = very little
- 2 = a little
- 3 = some
- 4 = a lot
- 5 = a great deal

How much does each of these people go out of their way to do things to make your work life easier for you?

Your immediate supervisor

- | | |
|------------------|--------------------------|
| 1 = very little | <input type="checkbox"/> |
| 2 | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |
| 5 = a great deal | <input type="checkbox"/> |

Other people at work

- | | |
|------------------|--------------------------|
| 1 = very little | <input type="checkbox"/> |
| 2 | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |
| 5 = a great deal | <input type="checkbox"/> |

Your spouse or partner, friends and relatives

- | | |
|------------------|--------------------------|
| 1 = very little | <input type="checkbox"/> |
| 2 | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |
| 5 = a great deal | <input type="checkbox"/> |

How easy is it to talk with each of the following people?

Your immediate supervisor

- | | |
|------------------|--------------------------|
| 1 = very little | <input type="checkbox"/> |
| 2 | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |
| 5 = a great deal | <input type="checkbox"/> |

Other people at work

- | | |
|------------------|--------------------------|
| 1 = very little | <input type="checkbox"/> |
| 2 | <input type="checkbox"/> |
| 3 | <input type="checkbox"/> |
| 4 | <input type="checkbox"/> |
| 5 = a great deal | <input type="checkbox"/> |

Your spouse or partner, friends and relatives

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

How much can each of these people be relied on when things get tough at work?

Your immediate supervisor

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

Other people at work

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

Your spouse or partner, friends and relatives

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

How much is each of the following people willing to listen to your personal problems?

Your immediate supervisor

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

Other people at work

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

Your spouse or partner, friends and relatives

- 1 = very little
- 2
- 3
- 4
- 5 = a great deal

The following questions are about general stress symptoms. Please describe how much of each of the symptoms you experienced during the past seven days. Please use the following scale to record your responses.

- 1 = Not at all
- 2 = A little bit
- 3 = Quite a bit
- 4 = Extremely

Difficulty in speaking in times of excitement

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Trouble in remembering things

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Concerns about sloppiness or carelessness

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Blaming yourself for things

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Pains in the lower part of your back

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Feeling lonely

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Feeling 'blue'

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Your feelings being easily hurt

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Feeling that others do not understand you, or are unsympathetic

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Feeling that people are unfriendly, or dislike you

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Having to do things slowly, to ensure that you're doing them properly

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Feeling inferior to others

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Muscle soreness

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Having to check and double check what you do

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Occasional hot or cold spells

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Your mind occasionally going blank

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Either a numbness or tingling in your body

- 1 = Not at all
- 2
- 3
- 4 = Extremely

A lump in your throat

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Trouble in concentrating

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Feeling of weakness in parts of your body

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Occasional 'heavy' feelings in your arms and legs

- 1 = Not at all
- 2
- 3
- 4 = Extremely

Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you. **DURING THE PAST SEVEN DAYS** with respect to *your experience that has affected you most (this was the question about the traumatic experience that has affected you most)*, how much were you distressed or bothered by these difficulties?

- 0 = Not at all
- 1 = A little bit
- 2 = Moderately
- 3 = Quite a bit
- 4 = Extremely

Any reminder that brought back feelings about it

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

I had trouble staying asleep

0 = Not at all	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4 = Extremely	<input type="checkbox"/>

Other things kept making me think about it

0 = Not at all	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4 = Extremely	<input type="checkbox"/>

I felt irritable and angry

0 = Not at all	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4 = Extremely	<input type="checkbox"/>

I avoided letting myself get upset when I thought about it or was reminded of it

0 = Not at all	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4 = Extremely	<input type="checkbox"/>

I thought about it when I didn't mean to

0 = Not at all	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4 = Extremely	<input type="checkbox"/>

I felt as if it hadn't happened or wasn't real

0 = Not at all	<input type="checkbox"/>
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4 = Extremely	<input type="checkbox"/>

I stayed away from reminders about it

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

Pictures about it popped into my mind

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

I was jumpy and easily startled

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

I tried not to think about it

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

I was aware that I still had a lot of feelings about it, but I didn't deal with them

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

My feelings about it were kind of numb

- 0 = Not at all
- 1
- 2
- 3
- 4 = Extremely

I found myself acting or feeling as though I was back at that time
0 = Not at all
1
2
3
4 = Extremely

I had trouble falling asleep
0 = Not at all
1
2
3
4 = Extremely

I had waves of strong feelings about it
0 = Not at all
1
2
3
4 = Extremely

I tried to remove it from my memory
0 = Not at all
1
2
3
4 = Extremely

I had trouble concentrating
0 = Not at all
1
2
3
4 = Extremely

Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart
0 = Not at all
1
2
3
4 = Extremely

I had dreams about it
0 = Not at all
1
2
3
4 = Extremely

I felt watchful or on-guard
0 = Not at all
1
2
3
4 = Extremely

I tried not to talk about it
0 = Not at all
1
2
3
4 = Extremely

Compared to others of your age, how would you describe your overall physical health?
Excellent
Very good
Good
Fair
Poor

Thank you very much for completing this questionnaire. To be in the draw to win an IPOD, please enter your details below.

Your details will be kept confidential

Name

Contact phone number

If you wish to receive a summary of the study, please supply a contact email address:

APPENDIX L

STUDY MEASURES RESULTS SUMMARY

Table L1

Study Measures Results Summary

<i>Variable</i>	<i>Valid N</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
<i>Potentially Traumatic Events Exposure</i>				
TSS: Trauma Type	176	4.03	1.70	1 – 9
TSS: Frequency of Trauma	162	6.30	2.74	1 – 15
TSS: Serious Trauma	176	1.73	0.99	0 – 4
TSS: Frequency of Serious Trauma	170	2.66	1.49	0 – 7
<i>Psychological Resilience</i>				
LOT-R	176	16.44	4.27	1 – 24
BRCS	176	13.72	2.70	7 – 20
HPI	176	9.73	2.30	2 – 16
MSCEIT: PE	172	106.11	15.68	68 – 132
MSCEIT: FT	171	97.71	13.73	62 – 127
MSCEIT: UE	171	95.64	8.70	75 – 123
MSCEIT: ME	172	92.91	7.94	73 – 113
MSCEIT: Total	170	97.51	10.28	70 – 118
SS: Colleague	169	13.09	3.58	4 – 20
SS: Supervisor	169	12.75	4.64	4 – 20
SS: Family	171	17.27	3.07	7 – 20
SS: Total	163	43.20	8.47	17 – 60
<i>Pathogenic Outcomes</i>				
IES-R: Intrusion	176	6.09	6.89	0 – 28
IES-R: Avoidance	176	5.91	6.71	0 – 29
IES-R: Hyperarousal	176	2.87	4.70	0 – 22
IES-R: Total	176	14.87	16.99	0 – 79
HSCCL-21: GFD	176	11.93	4.09	6 – 22
HSCCL-21: SD	176	10.88	3.61	7 – 23
HSCCL-21: PD	176	13.34	3.65	7 – 24
HSCCL-21: Total	176	36.14	9.48	21 – 67
Self-Rated Health	174	5.89	0.87	3 – 7

APPENDIX M

**PEARSON'S CORRELATIONS BETWEEN THE VARIABLES OF POTENTIALLY TRAUMATIC
EVENTS, 5-PR MODEL, AND THE PATHOGENIC CONSEQUENCES (N = 143)**

Table M1

Pearson's Correlations Between the Variables of Potentially Traumatic Events, 5-PR Model, and the Pathogenic Outcomes (N = 143)

	1	2	3	4	5	6	7	8	9	10	11
1. TSS: Trauma Type	-										
2. TSS: Frequency of Trauma	.95**	-									
3. TSS: Serious Trauma	.69**	.63**	-								
4. TSS: Frequency of Serious Trauma	.67**	.69**	.94**	-							
5. BRCS	.24**	.26**	.27**	.24**	-						
6. LOT-R	-.12	-.11	-.17*	-.18*	.21*	-					
7. MSCEIT: Total	.00	.00	.06	.05	-.05	.10	-				
8. HPI	-.15	-.14	-.13	-.12	-.01	.14	.18*	-			
9. SS: Total	-.20*	-.18*	-.18*	-.16	.11	.37**	.15	.14	-		
10. IES-R: Total	.19*	.20*	.22**	.25**	.01	-.24**	-.09	-.32**	-.24**	-	
11. HSCL: Total	.15	.14	.15	.12	-.04	-.49**	-.13	-.17*	-.34**	.53**	-
12. Self-Rated Health	-.02	-.02	-.03	-.02	.23**	.18*	.11	.43**	.13	-.14	-.22**

*p < .05, **p < .01, (two-tailed).